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The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-Funded Project

BOOK I

COMPONENT A DELIVERABLES

SUPPORT TO OPERATIONALIZE THE EGYPTIAN WATER AND WASTEWATER REGULATORY AGENCY

August 2002

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THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

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EGYPT LIRR II PROJECT SUMMARY

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ACRONYMS

AWGA	Alexandria Water General Authority
BOD	Biological Oxygen Demand
BOT	Build Operate and Transfer
BWC	Beheira Water and Sanitary Drainage Company
CAPMAS	Central Agency for Population Mobilization and Statistics
CBE	Central Bank of Egypt
CDPSP	Central Department for Private Sector Projects
CIB	Commercial International Bank
COD	Chemical Oxygen Demand
EHDR	Egypt Human Development Report
EIB	European Investment Bank
EWRA	Egyptian Water and Wastewater Regulatory Agency
FRP	Fiberglass-Reinforced Plastic
GDP	Gross Domestic Product
GOE	Government of Egypt
IBP	International Best Practices
IFC	International Finance Corporation
IT	Information Technology
LE	Egyptian Pounds
LIRR	Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt
MHUUC	Ministry of Housing, Utilities, and Urban Communities
M&E	Mechanical and Electrical
MOF	Ministry of Finance
NBE	National Bank of Egypt
NIB	National Investment Bank
NOPWASD	National Organization for Potable Water and Sanitary Drainage
NUCA	New Urban Communities Authority
O&M	Operation and Maintenance
PEA	Public Economic Authority
PPP	Public Private Partnership
PSC	Public Sector Company
PSP	Private Sector Participation
R&R	Renewal and Replacement
RR	Revenue Requirement
UFW	Unaccounted-for Water
UNDP	United Nations Development Program
US	United States
WACC	Weighted Average Cost of Capital
WB	World Bank
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant
W/WW	Water and Wastewater

LIRR II Project Summary

Introduction

Since June 1998 the USAID-funded *Legal, Institutional, and Regulatory Reform (LIRR)* advisory team has been helping the Government of Egypt draft legislative proposals and build support for reform of the water and sanitation sector. Contracted through a delivery order under the SEGIR/LIR IQC [1], the team is comprised of Chemonics International, the Institute of Public-Private Partnerships (IP3), and Chemonics Egypt. The goal of sector reform is to increase autonomy and promote commercial management of local utilities, as well as to encourage private financing and management of services.

LIRR I – the predecessor. Highly successful in designing the architecture for reform.

The first phase of the project, designated as LIRR I, operated from June 1998 to July 2000. LIRR I was highly successful in designing the institutional architecture for carrying out reform. It successfully defined the key functions of reform such as privatization process management, independent regulation and rate making and assigned them to quasi-independent entities to be created for those purposes. Draft legislation consisting of a draft Presidential Decree and a draft law on Private Sector Participation (PSP) was approved by the MHUUC and subsequently reviewed by the State Council and the Prime Minister. Following the initial review, the draft Law and Presidential Decree have been revised, but retain the key provisions concerning the delegation of authority for price and quality of service regulation to a new regulatory agency while preserving the role of local utilities in managing operations and maintenance. A central department for PSP is also retained in the draft legislation to support local utilities in identifying, structuring, and closing PSP contractual arrangements with strategic investors and/or operators.

LIRR II – the natural successor, designed to "operationalize" the agencies of reform.

With the reform framework identified and agreed and its formal establishment initiated under LIRR I, there was a need to consolidate the gains made to that point, sustain the reform momentum, and strengthen the organizational capacity of all involved sector entities. USAID and GOE agreed to implement LIRR II as a natural and seamless extension of LIRR I. Its design focused on assisting the GOE in implementing the reforms stipulated in the draft law and decree prepared under LIRR I. Support was to be provided in institution building and strengthening the capacities of the EWRA and CDPSP. The term "operationalize" was coined to succinctly describe this process. LIRR II was also intended to provide assistance in establishing processes, procedures, and documentation for management of the project life cycle for PSP engagements. Project preparation and assistance in the processing of transactions for two pilot projects with PSP involvement was also included to support the

[1] *Support for Economic Growth and Institutional Reform/Legal and Institutional Reform* (SEGIR/LIR) Indefinite Quantity Contract (IQC)

operationalization of the CDPSP. At the utility level, the assistance was to be focused on tariff design and tariff rate applications.

Work Plan Summary

The Vision for LIRR II

This ambitious program of reform is founded on the *GOE's vision of establishing service levels in the sector that meet international standards for quality and value to consumers, by employing industry best practices, and through the selective use of private sector expertise and resources*. Challenging features of the reform effort include:

The vision for Egypt's water and sanitation sector – utilities making optimal use of private sector resources to provide top quality services to their customers at affordable prices.

- Securing enactment of the legislation and implementing decrees. These legislative proposals mark a major shift in GOE policy, constituting the most significant step taken to date to devolve fiscal and managerial authority, strengthen accountability, and establish a policy and institutional framework for market-based financing in the sector. Sufficient time must be allowed for deliberation and consultation; a period of years for this purpose would not be surprising and may be considered the norm.
- Extensive assignment of responsibilities to the proposed EWRA, including evaluating and acting upon tariff rate applications, review of the economic and financial viability of new large capital projects, and setting and enforcing performance standards for utilities. This will require a substantial and well trained staff complement covering a variety of areas of expertise.
- The CDPSP will also require a substantial and well-trained staff to address its main functions. In addition to providing transaction support for specific infrastructure projects, it will also provide program support and facilitation, encompassing investor data services, training for the staff of local utilities, marketing, and project development financial support for the emerging portfolio of PSP projects in the sector.

In achieving the *vision for LIRR II*, a signal will have been sent to all involved that the GOE is dedicated to the improvement of the overall performance of the water and wastewater sector. It would do so by taking an organized and aggressive approach to promoting efficiency in sector operations and creating an attractive environment for private investment

Objectives of LIRR II

LIRR II was designed to assist the MHUUC in making EWRA and CDPSP operational. It would help clarify how the two new organizations interact with each other as well as with other central ministries and local utilities. Areas to be addressed included staffing, organizing, and administering the new units and in engaging local utilities to prepare the first round of tariff rate applications and

private concession transactions. The principal objectives of the assignment are summarized as follows:

1. *Operationalize the Egyptian Water and Wastewater Regulatory Agency.* This task involved assisting the Ministry in setting-up EWRA as a functioning institution. A two-phase approach was planned, first an initial phase to define organizational, staffing, budget and logistical requirements, and a second phase to help core staff of the EWRA implement a work plan. Collaboration with local utilities in developing and reviewing up to *four tariff rate applications* was among the tasks planned for accomplishment during the two-year period of performance of LIRR II.

2. *Operationalize the Private Sector Participation Unit (CDPSP).* This proposed assistance was aimed at assisting CDPSP to become operational, beginning by helping local utilities identify viable PSP projects and then by implementing the transactions through the complete project cycle to reach contract award and financial closure. LIRR II was also designed to help develop strategic plans for initiating operations and prepare model documents and diagnostic tools for dissemination to local utilities.

3. *Demonstrate Best Practices in PSP Development and Procurement.* After an initial phase of assistance in developing the organizational, logistical, and technical capacity of the CDPSP, assistance was to be provided in developing a short list of potential transactions, and preparing and implementing the procurement process for the competitive award of *two concessions or other PSP arrangements.*

LIRR II Objectives – to help make the reform institutions operational and to assist in the performance of their start-up activities.

Work Plan Structure and Deliverables

The Work Plan for LIRR II was organized to mirror the three principal objectives and was structured into three components addressing each of the three objectives. The three components are outlined below; a list of the deliverables prepared and submitted is shown in Annex A.

Component A – Support to Operationalize the Egyptian Water and Wastewater Regulatory Agency (EWRA)

... addressing the organizational and institutional development of EWRA involving such tasks as:

- Assistance in staff recruitment and training
- Support for commencement of operations
- Establishment of key features and procedures of the regulatory agency
- Development of a plan for outreach to local utilities
- Support for the first *tranche* tariff rate application reviews
- Assessment of remaining constraints to utility corporatization

The LIRR II work plan was structured as a mirror image of the three main objectives of the project ...

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Component B – Support to Operationalize the Private Sector Participation Unit (CDPSP)

... featuring the institutional development of the CDPSP and the preparation of guidelines and tools for project appraisal and tendering, such as:

- Clarification of PSP unit services and procedures
- Support for staff recruitment and training
- Definition of budget, office space, and equipment requirements
- Dissemination of guidance and tools for PSP project development
- Establishment of a work plan for support to local utilities
- Design of a Prefeasibility Study Development Fund

Component C – Transaction Support for Two Water and/or Wastewater Concessions

... involving transaction support for two BOT/BOOT projects, concessions, or other forms of public-private partnerships, encompassing the following major tasks:

- Project screening and due diligence on short listed projects
- Prefeasibility studies
- Prequalification of prospective bidders
- Preparation of bid and tender documents
- Tendering, bid evaluation, negotiation, and award assistance.

Deliverables were prepared to address the principal issues under each component, as shown in Annex A. There is not an automatic one-to-one match between tasks and deliverables. In some instances, several tasks or sub-tasks were addressed in a single deliverable. In other tasks, one task was addressed through several deliverables such as Task A.7 that involved the preparation and submission of separate deliverables for the tariff rate application studies for four utilities.

... and deliverables address the work plan and structure, but do not necessarily follow a one deliverable per task pattern.

The highlights of each of the main deliverables are described in the following sections. Copies of each deliverable are provided in the associated three-volume compendium of LIRR II report products. The compendium constitutes the major portion of the LIRR II Final Report. For ease of presentation, the deliverables in the compendium are organized by task area. To help the reader locate a particular report, the corresponding task area is called out in the margin space of these summary report pages. Multiple copies of all deliverables were provided to the MHUUC in both English and Arabic.

LIRR II Deliverables

Deliverables were affected to varying degrees by delays experienced in the formalization of the reform institutions. In most cases, it was possible to produce

manuals, guidelines, training modules, models, plans, and other products that address the Work Plan and have intrinsic and lasting value. These will be of benefit when the EWRA prepares for its initial operations after the law and implementing decree have been enacted.

Component A Deliverables

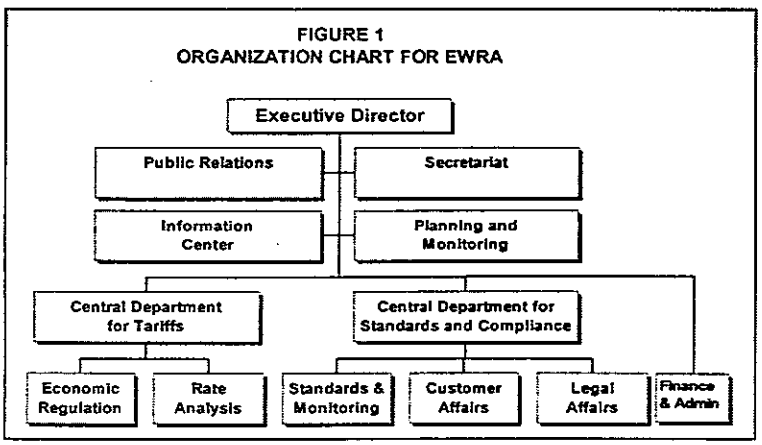
Component A deliverables cover the full range of topics relating to the operations and management of EWRA. Although the EWRA board, management team, and full complement of staff had not been appointed, LIRR II was able to make a major contribution by producing a series of deliverables that constitute a complete blueprint for EWRA operations. Also, several provisional appointments were made, including the executive director and several staff positions, that made it possible to involve them in the preparation of Component A deliverables. Their attendance, along with MHUUC officials, at several workshops on reform objectives and the objectives and modes of regulation can be considered a beginning step in the operationalization of the EWRA. Highlights of Component A deliverables are provided in the following paragraphs.

A.1 - Strategic, Organizational and Personnel Plan for the EWRA – the foundation for an effective and efficient regulatory body.

A.1

The A.1 deliverable describes the fundamental structure needed by any organization that has the aim of attaining its vision and meeting its objectives. It is built upon a strategic plan that seeks to establish EWRA credibility as the legitimate authority over the economic regulation of the sector. The plan also promotes an overall improvement in the performance of utilities, initially to gain full recovery of operating expenses and eventually, self-financing status among the majority of utilities under its jurisdiction. The remaining sections of A.1 provide detailed organizational plans (see overview of organization structure in Figure 1 above), functional descriptions, and job descriptions for identified key positions (26 positions graded "manager" or higher). Key strategies or "success factors" are recommended to optimize institutional growth and development and mitigate factors that might threaten to interfere with attainment of those objectives. The

FIGURE 1
ORGANIZATION CHART FOR EWRA



Strategic, Organizational & Personnel Plan for EWRA, June 2002 – as one of the Component A deliverables, it can be considered the foundation plan in the overall blueprint for EWRA operations.

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plan concludes with recommendations for priority to be implemented during the initial five years of EWRA operation.

As currently defined in the draft laws and decrees, the EWRA will enjoy the status of a quasi-independent public authority, reporting to the Minister of MHUUC for administrative purposes. It is proposed that the executive director be given the rank of First Undersecretary. Six of the twelve members of the board of directors will be from the private sector, four of whom will have technical expertise relevant to the sector with the other two being customer advocates.

As visualized, EWRA will be an organization of substantial size with a projected total staffing of more than 100 persons. The larger of the two main departments is the Central Department for Standards and Compliance with a total projected staff of 48 persons; the projected staff of the Central Department for Tariffs is 30 persons. The scope and depth of EWRA responsibilities call for a wide variety of skills among its staff complement, including individuals with training and experience in public administration, economics, finance, and accounting, engineering, law, communications, and information technology. A EWRA logistics and information technology plan, a five-year budget estimate, and financing options are presented below in the paragraphs covering the A.5 and A.6 deliverables.

A.1.A

A.1.A – Action Plan for EWRA Operationalization – a short-term plan of initial steps to be taken during LIRR II aimed at making EWRA operational

Action Plan for EWRA Operationalization, February, 2001 – a plan for initiating operations in EWRA upon passage of the implementing law and decree.

In January of 2001, a series of landmark decisions was made at a retreat attended by representatives of MHUUC, USAID, and the LIRR II team. At that point in time, the project work plan had been prepared and agreed. Significant progress had also been made under Components B and C and the time had arrived for selecting the two utility organizations to be addressed under the transaction support tasks of Component C. The four utilities to be included in the first tranche of pilot tariff rate application studies under Component A were also selected at this time. In addition, decisions had to be made concerning how to proceed with the remaining Component A tasks, in the light of uncertainties concerning the formalization of the EWRA.

The Task A.1.A Action Plan, therefore, was developed to identify steps that could be taken during the term of LIRR II to achieve progress toward operationalization. It was developed to reflect the agreements reached during the retreat and presented to the Steering Committee in February of 2001. It served its purpose of providing guidance for EWRA operationalization during the term of LIRR II and has been superceded by the more detailed report prepared under Task A.1.

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A.1.B – Manual on Strategic Planning for the EWRA – a comprehensive guide on the preparation of strategic plans for EWRA board members and executive staff

A.1.B

One of the more important early steps to be taken by EWRA board members and senior managers is to prepare a strategic plan that develops its institutional identity, encompassing a well-defined vision and sets milestones for future achievement of specific goals and objectives. The deliverable for Task A.1.B provides a comprehensive guide on the preparation of a strategic plan. The plan incorporated in the deliverable for Task A.1 can serve as an example or model strategic plan that would be produced applying the guidelines outlined in this manual.

Manual on Strategic Planning for the EWRA, April 2001 – a guide to practical, action-oriented planning based on factors that direct results oriented goal-setting and resource allocation.

The manual stresses a "results oriented" and participatory approach to strategic planning. It requires the full support of the EWRA Board and executive director as well as the involvement of employees at all levels of the agency. Strategic planning also considers the needs and expectations of customers, stakeholders, and policy makers in defining agency missions, goals, and performance measures. The manual is user friendly, written in non-technical language. It guides the user through the planning process by asking the following questions:

- Where are we now?
- Where do we want to be?
- How do we measure our progress?
- How do we get there?
- How do we track our progress?

These questions and the corresponding strategic planning components make up the process recommended in the manual. The recommended process is intended to serve as a reference document for the EWRA.

A.2.B – EWRA Training and Twinning Plans – an initial assessment of the professional development needs of EWRA staff

A.2.B

Without the existence of an officially appointed cadre of EWRA staff, achievements under the training portion of this task were necessarily limited. Nonetheless, a training plan was prepared in outline form indicating the types of training that would likely be required by EWRA staff and utility officials. Training materials were prepared in two categories. First, an overview of the regulatory process covering: i) regulation and the regulatory agency, ii) regulation of private service providers, iii) regulation of government-owned utilities, and iv) tariff rate design. Presentations and training on these topics were given to CDPSP and other MHUUC staff in October and November 2001. The second category of training materials prepared under this task,focused more directly on specific regulatory functions such as the evaluation of tariff rate applications. Training sessions using these materials were held with six provisional staff of EWRA and CDPSP during May through July 2001.

EWRA Training & Twinning Plans, June-November, 2001 – prospective professional development planning including interaction with counterparts in established regulatory programs abroad.

The twinning plan outlines activities that could be potentially included in a twinning arrangement, identifies organizations that are prospective twinning partners and presents a proposed action plan and schedule for securing the partner and implementing the plan. Recommended (illustrative) activities to be carried out under the plan include:

- Organizational/institutional research — three representatives of EWRA would visit the Florida Public Services Commission for a three week period to observe its operations and identify organizational design attributes that may be applicable to the Egyptian context.
- Observation of rate-setting practices — to study the principles and strategies of rate setting at the Arizona Corporation Commission, two or three representatives of EWRA could spend two to three weeks gaining a thorough knowledge of Commission's sophisticated and advanced rate setting practices.
- Observation of customer relations programs — to learn first hand how regulatory agencies balance the need to protect consumer interests while at the same time maintaining a fair and balanced relationship with service providers; the director of EWRA's General Department for Customer Affairs and several other staff members would observe these practices at the Scottish Water Industry Commission for a two or three week period, possibly scheduled for the early part of 2003.
- Consultations over the long term — establishment of continuing relationships with regulatory bodies to ensure the ability of EWRA to have an ongoing ability to exchange ideas and gain information on best practices; suggested partners for this purpose include the Jamaican Office of Utility Regulation and the Superintendence of Sanitary Services of Chile .

Each of the aforementioned regulatory agencies has much to offer to a twinning partner such as the EWRA. Each has been contacted and has indicated that they would be interested in receiving a proposal concerning a twinning arrangement. All that remains is to confirm the twinning arrangements through written agreements and to schedule the initial visits.

A.3

A.3 – Tariff Analysis Manual for Government-Owned Water and Wastewater Utilities in Egypt – a comprehensive guide covering preparation and evaluation of tariff rate applications

Task A.3 and A.4 deliverables were combined in several reports and delivered in stages during 2001 and 2002. The first version of the Tariff Analysis Manual was presented in July 2001. It provided guidelines on the preparation of business plans by utilities, including a case study example, as a first step in the tariff rate application process. It also covered the determination of revenue requirements,

the preparation of a cost-of-service study and the rate design process. This initial draft was presented to utilities and their institutional development advisors in several regions in Egypt and served as the basis for discussions on the approach and methodology to be employed in the final version of the Manual.

Tariff Analysis Manual, April 2002 – upon EWRA's establishment, will be invaluable in providing a "jump start" to the agency in initiating its most important function.

The final version of the Tariff Analysis Manual was delivered in April of 2002. Designed to be responsive to the legislative intent of the draft law and decree, it is envisioned that the process of preparing rate applications, reviewing applications and taking action will take approximately one year. Since it would not be practical to attempt to process rate applications for all utilities in Egypt in one year, it was determined to process them in *tranches* of five governorate utilities and three NUCA utilities per year. The Manual describes an interactive process with utilities making submissions to the EWRA for its consideration at each major stage including business planning, setting operational and performance targets, determining revenue requirements and rate modeling. EWRA would address five utilities each year over a period of five years. Utilities will prepare rate applications based on firm goals for improvement of their performance in such areas as cost recovery and operational efficiency. Governors would be involved throughout the process and utilities would keep their communities well informed of the regulatory process and the tariff revisions as they evolve in the process. Both tasks A.3 and A.4 included training deliverables in the rate application and review processes, financial modeling, and rates analysis.

Tariff Manual Main Elements

- Rate Adjustment Process
- Economic Regulation of Government Owned Utilities
- Performance Targets
- Business Planning
- Rate Application Model
- Revenue Requirements Analysis
- Rate Design

A.4 & A.7.A – Tariff Planning Guidelines for Water and Wastewater Utilities in the New Urban Communities – a rate-setting methodology and model for application in NUCA cities under existing regulatory procedures

A.4 & A.7.A

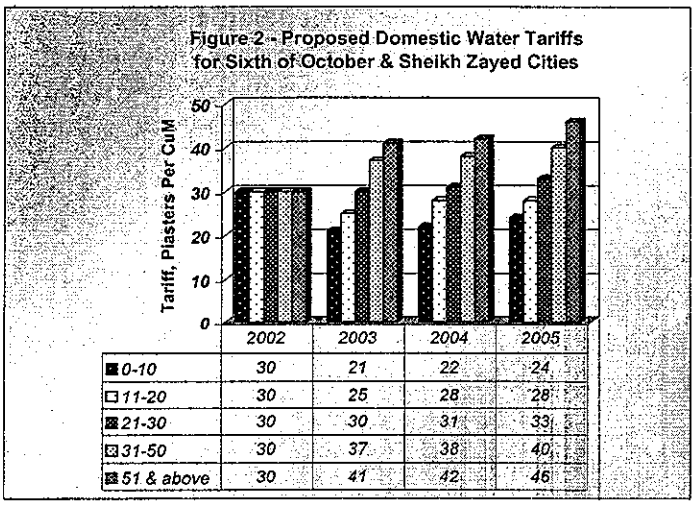
When it became clear that the EWRA would not be established in time to be involved in the tariff rate setting and evaluation tasks under LIRR II, officials of NUCA requested immediate assistance in the development of an interim tariff rate-setting process. NUCA wanted a rate-setting procedure that could be implemented by any or all NUCA communities under current laws and regulations.

Tariff Planning Guidelines for Water and Wastewater Utilities in the New Urban Communities, May 2002 – a practical approach to tariff setting in the absence of the EWRA.

The LIRR II team responded with a rate application process that is uncomplicated, flexible, addresses the principal issues, and that can be readily implemented by NUCA communities. The report for NUCA is presented in two parts. Part A consists of the guidelines and covers the tariff setting process, the rate term (length of time that an approved rate is expected to be effective) and describes the steps to be followed in preparing a rate adjustment case. Part B

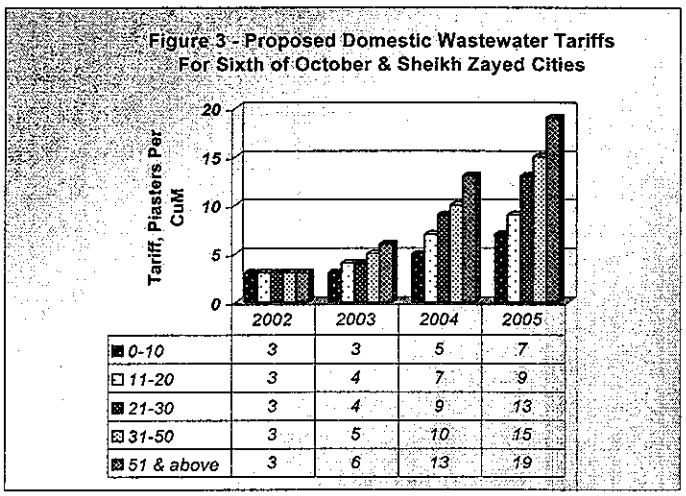
presents an example of the methodology as applied to the water and wastewater utilities of Sixth of October and Sheikh Zayed Cities. There are five main steps:

- Design of a customer classification system
- Preparation of forecasts of the demand for water and the corresponding quantity of wastewater generated that will require treatment
- Estimation and projection of O&M costs
- Determination of the level of revenues required to meet cost recovery targets
- Design of the tariff structure



The tariff analysis for Sixth of October/Sheikh Zayed cities illustrates that cost recovery goals can be achieved while maintaining tariffs at affordable levels.

In the Sixth of October/ Sheikh Zayed study, the projected demand for water and wastewater services was prepared and linked to a simplified customer classification system. Data generated in the prefeasibility study concerning a proposed management contract for the combined utilities was of considerable value in this process as well as in the estimation and projection of O&M costs. NUCA had selected the "cash needs" approach for tariff design with a revenue target based on the recovery of O&M costs plus sufficient surplus cash to cover moderate annual investments in the renewal and replacement of assets (R&R expenditures). Collection efficiency was a factor in determining revenue requirements, since the utilities are only collecting approximately 60% of billed revenue. Even so, with an assumed improvement in collection efficiency over the five years of the rate term, the need for tariff increases is modest as shown in Figures 2 and 3 above. In fact, residential water tariffs at the lowest (lifeline) consumption levels remain below current tariff levels throughout the course of the rate term.



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Tariff increases for residential consumers are limited to the large users; tariff increases in non-domestic categories are significant, but not excessive. Relative to existing levels, tariffs for wastewater services increase the most, but the current tariffs are so low that the impact on monthly or bi-monthly bills would be minimal.

A.5 & A.6 – Logistics and IT Plan for EWRA, Five Year Budget Template and Financing Options for EWRA – additional elements in the structure of a strong and effective regulatory body

A.5 & A.6

These deliverables supplement the organization and personnel plan presented under A.1 by systematically: i) identifying the resources needed by EWRA during the initial years of its operations, ii) showing how the resources would be mobilized over time, and iii) determining how they would be financed. This was a comprehensive and detailed planning, programming and budgeting exercise that addressed the following major topics:

EWRA Logistics and IT Plan, July 2002 – building on the foundation laid by the Strategic, Organizational and Personnel Plan.

- *Roll-Out of Agency Operations* — providing for the gradual build-up of operations during the first four years following its formal establishment. In Year 1, attention would be focused on development and installation of key management and operational systems such as those covering tariff setting and performance monitoring. In the second year, the agency would concentrate on field testing of the operating systems and distributing guidelines to the utilities. The full roll-out of agency operations would begin in the third year when approximately five governorate utilities and three NUCA utilities would be *"inducted"* into the tariff rate application and performance monitoring process. The *induction* process for each utility would cover a two-year period. In the first year, the utility is trained and assisted to prepare a tariff rate application and a performance monitoring plan. In the second year, the utility is trained and assisted to implement the performance monitoring plan. Thus, the EWRA has a rather intensive workload after reaching its full operational status. At any given time, there will be 16 utilities in various stages of the induction process and previously inducted utilities continually monitored to assure compliance with their performance commitments. Based on these assumptions, the staffing complement is projected to begin at 55 persons in year 1, increasing to 84 persons in year 2 and 101 persons in year three before reaching its full staff complement of 105 persons in year 4. Quantification of this information permits the development of budget estimates for salaries and benefits, transportation, travel and per diem.
- *Information Technology Requirements* — based on an indicative design employing a Windows 2000 domain server, with a registered domain name. The server would be connected to the internet through a leased line connected to the Agency's local area network (LAN). This design will permit the agency, utilities, and customers to communicate and share

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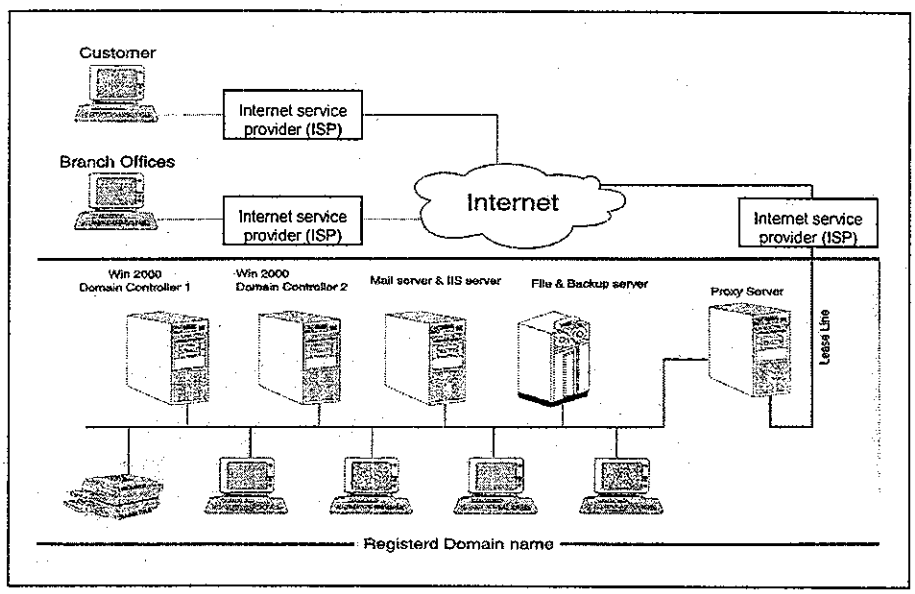
Systematic roll-out of operations through systems design based on workload analyses as the basis for the build-up of staff supported by advanced IT systems.



information through a backbone of directories and an Internet-based solution including Web sites. Communication will be facilitated internally as well as between central department and the Executive Director and externally between customers and the EWRA. The deliverable goes on to recommend specific policies relative to system security and integrity, an outline plan for the prevention of system "crashes", contingency plans for the recovery of data and other measures to minimize disruption of agency operations in the event of failure in any part of the system. The extent of the detail included in the analysis makes it possible to prepare a reasonably accurate estimate the budgetary requirements for the agency's IT program.

- *Expenditure Budget Estimates* — budget estimates were therefore prepared covering EWRA's projected expenditures for staff salaries and fringe benefits, furniture, vehicles and equipment, travel and transportation and other direct costs. Annual budget requirements are estimated at LE 3.6 million in year 1, increasing to LE 4.6 million by year 5. Total costs over the first five years are estimated at nearly LE 21 million. Personnel costs are by far the largest portion of the budget, constituting more than 60% of projected expenditures during the first five years of EWRA operations. Expenditures for the IT system make-up nearly 25% of estimated expenditures in the first year, but decline in importance over the first rate term and are only 6% of total expenditures over the first five years.
- *Sources of Financing* — though not large in comparison with the Ministry's overall budget, the projected budget requirements for EWRA are substantial. A question arises concerning the source of funding to be employed in meeting the Agency's budgetary needs. Should the regulatory program have to compete with other Ministry programs in the traditional government budget process? Or should an alternative funding

A EWRA budgetary assessment on regulated entities, say a small unit charge for each CuM sold, would have negligible impact on consumers and would provide funding stability and flexibility for the agency.

source less closely associated with the political process and potential political influences be sought? The deliverable identifies a total of eight different approaches toward generation of funding support for EWRA as listed in the box at right.

Optional Sources of Funding Considered for the EWRA

- Government appropriations
- Taxation of regulated entities
- Flat assessment on each company
- One-time license fee linked to assets
- Recurring license fees based on sales
- Tariff filing fees
- Hybrid combination of the foregoing
- Other (e.g., charges on sale of documents)

Each of the eight optional funding sources was evaluated according to the extent to which it meets specific criteria as follows:

- *Balance* — there should be a balance between the needs of the regulatory process and the availability of funds in the sector; also a balance between funding sources if more than one is utilized
- *Independence* — there should be no possible connection between the availability of funds and the nature of decisions made by the Agency
- *Stability* — the source of funding should not be subject to wide fluctuations
- *Diversity* — a funding source that has a large number of entities paying into the system is preferable to one that has a limited number paying into the system
- *Flexibility* — the ability to be adjusted upward or downward quickly and effectively would be a valuable attribute of a funding source.

The recommended funding mechanism in the long term is the regulatory assessment. Employing this method, the Ministry of Finance would approve the budget and the EWRA would apportion the funding requirement among the regulated utilities according to some measure of the magnitude of the utility's operations, such as the quantities of water produced and wastewater treated or the number of customers.

A.7 – Technical Assistance in the Preparation of the First Tranche of Tariff Rate Applications – tariff rate application studies in four different utility organizational structures addressing a range of utility issues

A.7.A, A.7.B & A.7.C

The four utilities in the first tranche of tariff rate applications are the utilities for: i) the Sixth of October/Sheikh Zayed cities, ii) Beheira (the Beheira Water Company [BWC]) and the two Alexandria utilities, iii) the Alexandria Water General Authority (AWGA), and iv) the Alexandria General Authority for Sanitary Drainage (AGOSD). Recognizing that delays in the establishment of the EWRA could be protracted, Ministry officials requested that an interim rate application process and methodology be designed for use on a temporary basis pending establishment of the EWRA.

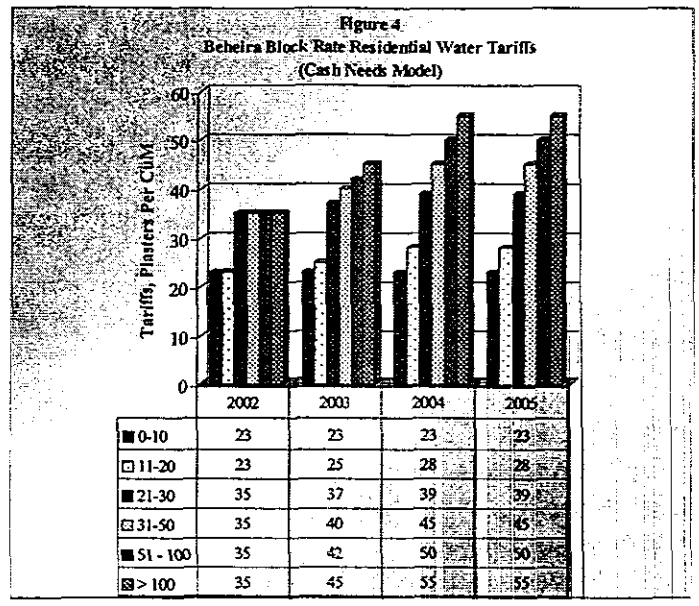
Further refinement of the rate application methodology developed for NUCA cities to permit its application in NUCA utilities throughout Egypt as an interim – pre-EWRA measure.

It was during the first pilot study, for the Sixth of October/Sheikh Zayed cities, that the basic rate application methodology was developed. The design has proven to be practical and sufficiently flexible to be applied in utilities with widely differing characteristics in terms of size, organizational structure, functions and service requirements. Working with Ministry and local utility officials, the model was adapted to the unique circumstances and requirements of each of the four utilities. The principal features of each of the four tariff rate application study are summarized below:

- *Sixth of October/Sheikh Zayed Water and Wastewater Utility* — this study served as an example for the tariff planning guidelines prepared for the utilities in the New Urban Communities. Many of the details concerning the study have therefore been described in the paragraphs above covering the deliverable for task A.4. This is the only utility of the four included in the pilot study group that is a combined water and wastewater utility. The BWC and AWGA utilities provide water services alone and AGOSD provides only wastewater services. The customer base includes a rather large proportion of industrial and commercial users in the high range of consumption. With tariffs for these consumers at the highest level (75 Piasters per cubic meter), the revenues generated by them tend to subsidize residential consumers. Sales of bulk water, available for sale due to excess production capacity, are also projected to be profitable and to subsidize residential consumers. These factors are consistent with the overriding GOE policy of keeping tariffs for residential consumers at the lowest possible level, using cross-subsidization as an acceptable technique.

  The revenue target set by NUCA for these utilities is to generate sufficient cash to cover O&M costs and R&R expenditures. Debt service was not included because there is no existing debt and the utilities do not anticipate the need for borrowing to fund capital investments in the near term. R&R expenditures were estimated at slightly more than one half of one percent of the value of fixed assets plus the cost of metering and other improvements needed to improve collection efficiency. As indicated above in the paragraphs covering the NUCA tariff rate application guidelines, domestic tariffs for consumption up to 20 cubic meters per month are actually lower than current tariffs and show only modest increases for all but the highest consumption blocks. Wastewater tariffs have the greatest percentage increase, but remain low in the aggregate.

- *Beheira Water and Sanitary Drainage Company (BWC)* — this is an established utility that is chartered as a company under Egyptian law, with many of the same features as a public economic authority (PEA). It is significantly larger than the Sixth of October/Sheik Zayed community and has a complete set of historical financial records and reports that were invaluable in the preparation of the tariff analysis. The BWC tariff



	2002	2003	2004	2005
0-10	23	23	23	23
11-20	23	25	28	28
21-30	35	37	39	39
31-50	35	40	45	45
51 - 100	35	42	50	50
> 100	35	45	55	55

analysis followed the same general pattern established in the Sixth of October/ Sheikh Zayed study, developing data on demand, O&M costs, capital costs and revenues and collections in preparation for the rate design activities. The BWC officials, however, wished to consider an alternative to the cash needs approach to rate design, referred to as the "utility approach." Typically used by private utilities, the utility approach differs from the cash needs approach in that the revenue requirement includes depreciation, taxes and a return on rate base as well as O&M costs. BWC also wished to take a different approach to adjustment of revenue requirements to reflect collection efficiency by considering the effect of changes in current assets and current liabilities on cash generation.

Though ultimately electing to apply the cash needs approach for rate design, the BWC considered the utility approach as an alternative; covering depreciation and working capital requirements as well as O&M, tariffs under the utility approach were considered too high.

Responding to BWC's desires, the LIRR II team prepared two different models, one each to reflect the cash needs and utility approaches. Also, instead of discounting revenue directly according to collection efficiency, an analysis of current accounts was made to predict increases in working capital required by the utility as a result of collection deficiencies. BWC has prepared a five-year program of R&R investments for use in the cash needs analysis. It has also identified a number of areas wherein efficiencies can be achieved over the course of the rate term. These include a reduction in unaccounted-for-water (UFW), power conservation and a freeze on hiring of additional staff. It is also projected that purchases of bulk water can be phased-out in the near future. A comparison of the two approaches confirms, as expected, that the utility approach produces a higher revenue requirement and therefore higher tariffs. Compared with an average tariff of 34 Piasters per cubic meter (P/M^3)in 2002, the average tariff over the rate term for the cash needs approach is 40 P/M^3 vs. 56 P/M^3 for the utility approach. The increased requirements under the utility approach are due entirely to the use of depreciation rather than R&R as a measure of funding needed for capital

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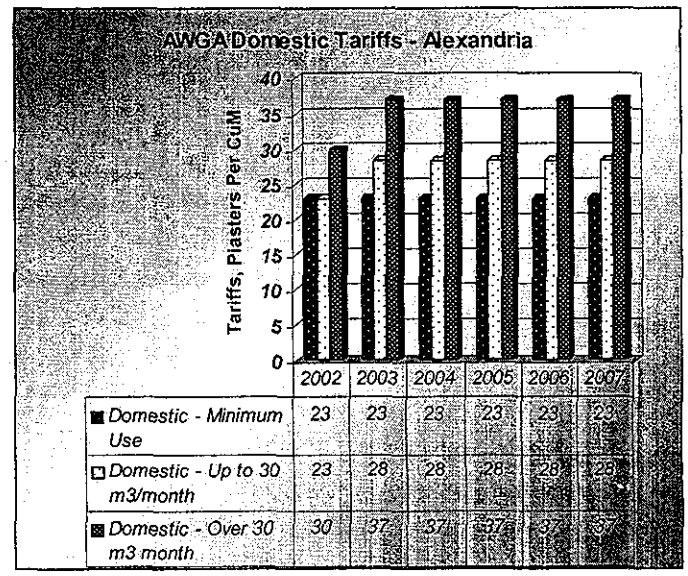
programs. Projected residential tariffs in Beheira using the cash needs approach are shown in the inset box above.

- *Alexandria Water General Authority (AWGA)* — is the second largest water utility in Egypt, serving all of the Alexandria Governorate and parts of Beheira and North Coast areas extending to the city of Marsa Matruh in Matruh Governorate. AWGA's service to the North Coast areas currently represents about 10% of the total and is increasing at the rate of 6% per year, compared with the 3.5% annual growth rate within Alexandria proper. Overall, domestic demand comprises about 62% of total demand with commercial and service customers accounting for 27% and 11% respectively. AWGA is one of the few, if not the only water utility in Egypt to have achieved full cost recovery in line with internationally accepted accounting definitions (e.g. covering O&M, depreciation, interest and taxes and earns a profit). Assumptions associated with the tariff projections include continued improvement of key performance indicators such as the number of staff per 1,000 connections from 3.8 in 2002 to 3.1 in 2007 which requires a reduction from the current staff level of about 4,300 to 4,000 by 2007. Over the duration of the rate term, collection efficiency is expected to improve from the current level of 90% to 95% and UFW is projected to decline from 37% to below 27%. After AWGA began earning positive net incomes on a regular basis, the MOF started requiring AWGA to transfer most of the earnings to the general fund. The cash needs projections therefore include an annual payment to the MOF.

Historically owned and operated by private interests, AWGA has a long-established tradition as a well-managed and efficient service provider.



After O&M expenses, AWGA's next largest annual expenditure item is debt service which is expected to average about LE 100 million per year from 2003 to 2007. At year end 2001, AWGA held LE 336 million in long term debt and plans to borrow an additional LE 300 million over the 2003-2007 rate term against a planned capital improvement program estimated at LE 500 million. All existing and planned borrowing is with

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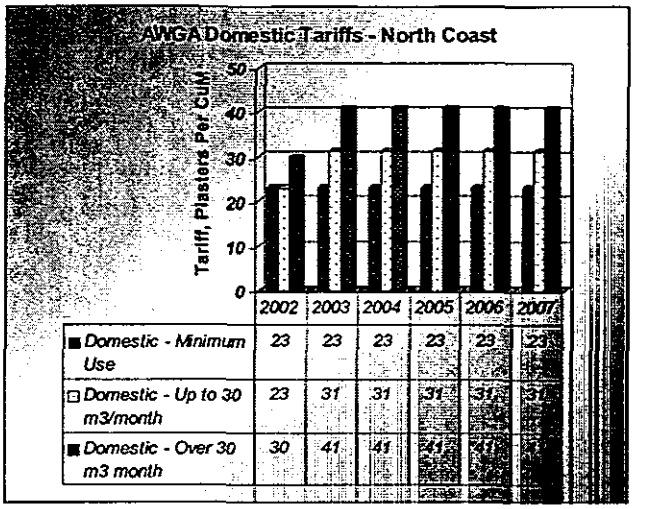
the National Investment Bank (NIB) at 13% interest, 2 years grace period on principal and an 8 year repayment period. AWGA's cash needs and therefore its requirements for tariff adjustments are very closely linked to its annual debt service burden.



Unique among Egyptian water utilities for achieving full cost recovery, AWGA's requirements for tariff increases are closely linked to its capital improvement program and debt service obligations.

AWGA's current tariff structure is somewhat complicated with 41 classifications of customers and 18 different tariff rates if negotiated rates are counted. In addition, certain customer classes are given discounts of up to 75%. AWGA includes a fixed price meter maintenance charge that appears to average just above 50 Piasters per month and earns a substantial amount of non-tariff revenue from activities such as the installation of new connections. Revenues from these items are subtracted from the revenue requirement to be met from tariffs. The tariff analysis indicates that an increase of 22% over the current average tariff is needed to meet requirements in Alexandria proper and that a 35% increase is needed for the North Coast area. Current and projected domestic tariffs for Alexandria and the North Coast are shown in the two inset boxes.

- *Alexandria General Organization for Sanitary Drainage (AGOSD)* — is totally dependent upon AWGA for the billing and collection functions for AGOSD's revenue. AWGA bills all customers connected to the sewerage system on behalf of AGOSD based on a percentage of the water bill for those customers. AGOSD compensates AWGA at the rate of 5% of the amounts collected in exchange for these services. There are only two percentage rates applied, one is 35% and the other 50%, but these produce a variety of "equivalent wastewater tariffs" ranging from a low of 8 Piasters per CuM for domestic use up to 30 CuM to 51 Piasters per CuM for luxury class restaurants and hotels. Approximately 70% of the consumption of AWGA customers is also billed for wastewater services.

With AGOSD's current cost recovery rate at only 65% of cash O&M costs, full recovery of O&M and a modest R&R program will require increase in the average tariff of 115% by 2005 ...

AGOSD projects an increase in O&M costs due to the installation of chlorination equipment in wastewater treatment processes by 2004, although some offsetting efficiencies are expected in power consumption. R&R costs are projected to average LE 19 million per year throughout the rate term for improvements to and expansion of collection systems and procurement of equipment designed to assist AGOSD in improving

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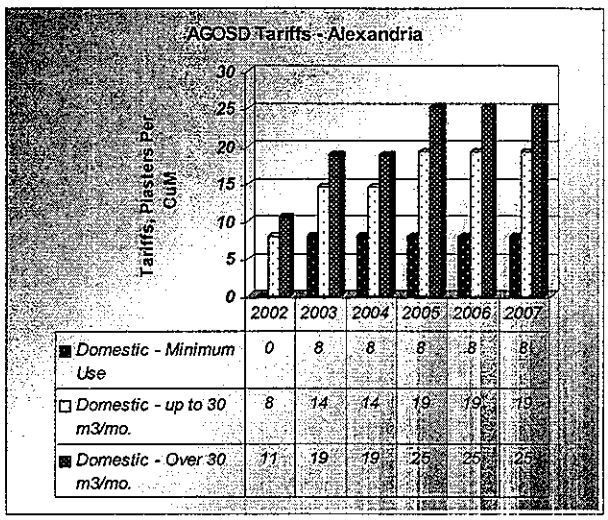
... recovering AGOSD's large and rapidly expanding debt service burden can be an objective of the 2nd or 3rd five-year rate term.



	2002	2003	2004	2005	2006	2007
Domestic - Minimum Use	0	8	8	8	8	8
Domestic - up to 30 m3/mo.	8	14	14	19	19	19
Domestic - Over 30 m3/mo.	11	19	19	25	25	25

its performance on O&M functions. The revenue requirement target for AGOSD does not include debt service because achieving break-even on that basis would require a tariff increase of nearly 800%. It was therefore agreed that recovery of debt service costs by AGOSD at this time would not be a practical consideration. The cause of the huge debt service burden is AGOSD's existing debt of LE 391 million combined with the projected additional amount to be added during the rate term of LE 1,355 million. AGOSD intends to borrow two-thirds of this amount from the NIB and one-third from foreign sources including the governments of France and Spain and the European Investment Bank (EIB).

Unlike AWGA, AGOSD neither achieves full cost recovery nor even recovery of O&M costs. In 2001 for example, AGOSD recovered only 65% of its cash operating expenses or 30% of expenses plus debt service. Clearly, achievement of full recovery of O&M, R&R and earning a small surplus will be a significant challenge. The rate analysis therefore provides for tariff increases in steps over the rate term to lessen the shock to consumers. Positive cash flow is achieved in 2005 with an increase in the average tariff of 85% in 2003 followed by a 30% increase in 2005. The percentages are considerable, but less so in monetary terms with the average tariff only increasing by about 16 Piasters over the rate term (from 11 to 27 Piasters per CuM). Domestic tariffs projected for AGOSD are shown in the inset box..

A.10

A.10 – EWRA/CDPSP Coordination Concept Paper – identification of critical points of interaction between the project life cycle and the overall regulatory process to assure coordination between the two institutions

The relationship between the EWRA and CDPSP is characterized by the primacy or dominance of the EWRA. This conclusion was reached by the LIRR II team after careful evaluation of the draft legislation and decrees that would establish EWRA's powers, duties and responsibilities. It is clear that EWRA has the primary responsibility as the regulator of sector activities, both public and private, vs. CDPSP's role as facilitator. The A.10 deliverable provides an

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indication of the specific points in the project lifecycle that require interaction between the two agencies. Given the nature of the relationship, the interaction at these points will be brought about by the requirement for an EWRA "sign-off" (approval) prior to the proposed project being permitted to move forward to the next stage of its development. A number of such points in the process that require EWRA approval have been identified.

Recognizing EWRA's dominance in its relationship with CDPSP, the points in the project life cycle requiring a EWRA "sign-off" should be institutionalized

The LIRR II team faced a dilemma related to the fact that CDPSP has been officially established and had made plans to proceed with implementation of projects involving PSP. It was possible, if not likely, that those projects could reach the implementation stage prior to the establishment of the EWRA. Without an established regulatory agency, CDPSP guidelines and model documents in the Toolkit had to be prepared in a way that would compensate for its absence — in effect, establishing "regulation by contract" as the operational approach. Had the agency been created earlier, in fact, it would have exercised review and approval authority over the preparation of the guidelines and contract documents. When the EWRA is created and becomes operational, one of its first duties will be to review CDPSP's guidelines and all of the project life-cycle documents and approve them or make recommendations for modification as it deems necessary.

The goals of the two organizations are fully compatible, so the principal requirement is to identify all areas requiring communication and coordination and to institutionalize the necessary points of contact. As a point of departure, EWRA should create an ad hoc PSP Liaison Group dedicated to maintaining close contact with CDPSP and providing assurance that all required EWRA referrals are made. The required "sign-offs" by EWRA would occur, as a minimum at the following stages:

- After completion of project screening and before tentative project selections have been made
- During review of prefeasibility studies, prior to decision on whether or not to proceed with implementation with emphasis on the implications concerning tariffs and financial and economic impacts; identification of licenses and permits required and the agency responsible for processing
- Review of tender and contract documents concerning price setting and tariffs and procedures for adjustments, service standards and performance targets, demand for services vs. proposed capital investments, and the procedures for resolving disputes and customer complaints
- During the procurement process, EWRA representative to participate as member of the PBAC, active during prequalification, tendering, bid opening, bid evaluation, selection, and negotiation
- During the negotiation process, to have approval authority over the contractor's performance monitoring plan

Frequent contacts between EWRA's liaison group and their counterparts at CDPSP will ensure that all required referrals are made and that such referrals are made routine and normal part of the procedures of both organizations.

Component A – General: Supplemental Consulting Product Submissions (SCPS) – consulting products requested by MHUUC and/or USAID that were not required by contract

Supplemental Consulting Product Submissions (SCPS) were made at various times – these are products that were requested by MHUUC and USAID, produced and delivered by LIRR II, though not required by contract.

At various points during LIRR II, the team was requested to conduct studies, prepare analyses, and produce reports or papers on a variety of matters that were not contemplated in the contracted scope of work or the work plan. The team was pleased to be of such assistance in producing and delivering the following:

- Team members were involved on a recurring basis in the redirection of GOE legislative strategy on sector reform, including the preparation of explanatory materials, and preparing comments on subsequent revisions of the draft laws and decrees on concessions and the regulatory regime. Deliverables included revised drafts and presentation materials on: i) the enabling Law on Concessions and Regulation, and ii) the Presidential Decree implementing and organizing the regulatory agency.
- Research and preparation of a paper on best practices in tariff setting for water and wastewater utilities engaged in contracting for BOT/BOOT, concession contracts, or other forms of PSP.
- The tariff rate application process and model specifically designed for NUCA utilities is considered to be in the SCPS category.
- Design and preparation of a survey instrument for collection of data on service levels and cost recovery in Egyptian water and wastewater utilities (see Component B, Supplemental Submissions and Activities).

Additional SCPS products are described under Components B and C.

Component B Deliverables

Component B deliverables – operationalization of the other institution of reform, the CDPSP.

Component B represents the other half of the technical assistance under LIRR II that is designed to "operationalize" a newly created sector reform agency. In this case, the Central Department for Private Sector Projects (CDPSP) was officially established in February of 2001 by Ministerial Decree 41/2001 and its executive director and several staff members were appointed during the course of LIRR II. Under Component B, LIRR II developed and delivered a number of key reports designed to assist the CDPSP in mobilizing to begin delivering services to its Egyptian clientele. Its clientele consists of the local water utilities in the governorates and the three national level agencies under MHUUC, the National Organization for Potable Water and Sanitary Drainage (NOPWASD), the Central Agency for Development (CAD) and the New Urban Communities Authority (NUCA). The services to be provided by CDPSP were primarily in the area of assisting clients in planning and packaging competitive tenders for PSP projects

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and to ensure that best international practices were adopted and adhered to. Component B deliverables are briefly summarized in the following paragraphs.

B.1, B.2 & B.3 – CDPSP Organization, Strategy and Plans – to guide CDPSP toward achieving its mission as a promoter, facilitator and advisor in the implementation of successful PSP transactions

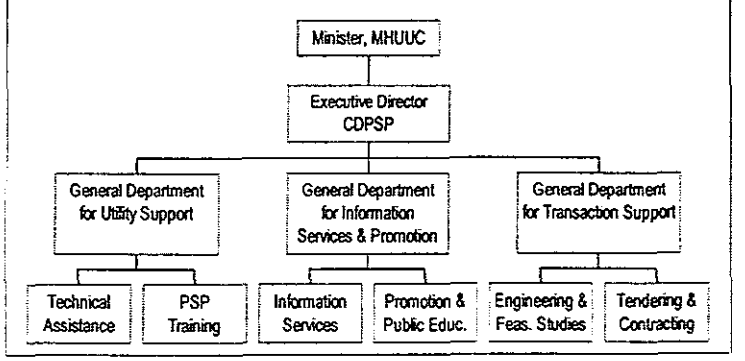
B.1, B.2 & B.3

The plans and strategies laid out in these deliverables, constitute a comprehensive set of guidelines for the CDPSP in initiating operations and successfully maintaining a high level of performance thereafter. The key points covered include its mission and roles, strategies, resources and donor relationships, organization and start-up plan. The mission is defined as: first, to promote PSP projects in the sector, acting as the "point of entry" into Egypt for international strategic investors/operators. Second, to facilitate PSP transactions, acting as advisor in providing technical assistance to its Egyptian clientele. Third, to provide quality control/quality assurance over all PSP-related activities in the sector. Strategies in support of the CDPSP mission are defined as:

"CDPSP Organization, Strategy and Plans, January 2002 – the basis for CDPSP's initial operations ...

- Establish the CDPSP as a business-oriented , high-performance and constituent-oriented service provider
- Deliver independent transaction advisory services to its clientele
- Enhance the credibility and capability of the Egyptian water and wastewater sector
- Create a hospitable environment for private sector involvement in PSP transactions by establishing and maintaining open, transparent and equitable procurement processes

Figure 5
Proposed Organization for CDPSP



Much of the material prepared and presented under Component B has been designed to support implementation of these strategies. The recommended organizational plan, shown in Figure 5, provides for a balanced structure with three general departments reporting to the executive director: Utility Support, Information Services, and Promotion and Transaction Support. Job descriptions for the professional staff of 28 persons are provided in an appendix. The staff will carry out a wide range of functions including technical, legal, financial/economic, tendering and information services, and communications. Outsourcing will be the approach for securing specialized services in such areas as management information systems, information technology, regulatory matters,

... and the first steps toward achieving its mission of facilitating and providing quality assurance for PSP transactions and being the "point of entry" into Egypt for strategic investors ...

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and communication. A budget has also been prepared that indicates the CDPSP will require an average of just over LE 1.0 million per year over the first five years of its existence for a total of LE 5.25 million. Approximately LE 1.0 million of the total is required for office furniture, vehicles, and equipment during the first year. It is recommended that the CDPSP seek donor assistance in funding these amounts along with consulting assistance during its first few years of operations.

List of Rules Incorporated in the IRR

Rule 1 –	Preliminary Provisions – policy statement, coverage, and definitions
Rule 2 –	General Provisions – implementing agencies & procurement methods
Rule 3 –	Prequalifications, Bids and Awards Committee (PBAC) – wide representation including private sector
Rule 4 –	Procurement Documents – use and adaptation of Toolkit documents
Rules 5, 6 & 7 –	On Prequalification of Bidders, Tending and Bidding and Bid Evaluation – ref. Toolkit
Rule 8 –	CDPSP Model Contracts – allowable changes by *implementing units*
Rule 9 –	Directly Negotiated Contracts – for emergencies or one qualified bidder
Rule 10 –	Unsolicited Proposals – innovative approach, challenging bids sought
Rule 11 –	Award and Signing of Contracts – recommendation of PBAC
Rule 12 –	Monitoring of Contracts – monitoring plan linked to performance

B.4

B.4 – CDPSP Proposed Implementing Rules and Regulations (IRR) – working rules or "bylaws" for all involved in PSP in the water/wastewater sector – the CDPSP, local and national implementing agencies, and strategic investor/operators

... including promulgation of implementing rules and regulations to guide utilities and strategic investors on how PSP projects are implemented in Egypt.

The proposed IRR indicates which local and national agencies in Egypt may undertake PSP projects, how procurement and contracting functions are to be performed, and prescribe in detail what is allowed and not allowed over the full range of PSP options. Part I of the deliverable reviews the CDPSP organization, its mission, role, responsibilities, and scope of activities. This is more or less a synopsis of the B.1, B.2 & B.3 deliverable described above. The IRR deliverable also describes how the Project Development Fund (PDF)[2] operates to support project development activities and the relationships between CDPSP and PDF. Part II of the deliverable presents the proposed IRR. The IRR is similar to the bylaws of a private corporation or company. They incorporate by reference the model contract documents, guidelines, and procedures included in the Project Life-Cycle Toolkit. To obtain a full understanding of the IRR, the reader should have a copy of the Toolkit available for cross-referencing purposes. A summary listing of the contents of the IRR is shown in the inset box.

[2] See the report section on deliverable B.6 that follows for a full description of the PDF.

B.5 – The Project Life-Cycle Toolkit – A Roadmap for Bringing Private Sector Resources and Expertise to the Egyptian Water Sector

B.5 (Book 2)

A primary objective of LIR II was to provide the CDPSP with the tools needed to become an active player, with the absolute minimum start-up time, in facilitating private sector involvement in the Egyptian water and wastewater sector. The project scope of work called for the development of a complete set of guidelines, documents, and other materials that would allow CDPSP to become the recognized PSP authority in the Egyptian water sector, fully capable of assisting local utilities in entering the market for private investment capital and operational expertise.

The Project Life-Cycle Toolkit – Best Practices in Project Documentation

- Strategic framework and guidelines for private sector participation
- Guidelines for financial analysis and modeling; financial tools and credit enhancements
- Procurement guidelines
- CDPSP role and strategy in the project life cycle
- Tools and guidelines in project screening
- Tariff setting in private sector projects
- Standard prequalification documents and procedures
- Standard bid documents for performance-based management contracts
- Standard bid evaluation forms, guidelines and checklists
- Model concession agreement
- Model performance-based management contract
- Model service contract
- Model lease agreement
- BOT/BOOT concepts and legal documents
- Sample standard clauses on issues such as incentive payments, guarantees, etc.
- Guidelines on contract monitoring and compliance and case study

Project Life-Cycle Toolkit, Volumes I–III, May 2000 … the new standard in international best practices in project documentation with potential for application in other sectors of the Egyptian economy.

The Chemonics International, IP3, and Chemonics Egypt consortium drew from their respective pools of highly talented and widely experienced specialists to organize the Toolkit preparation team for LIR II. The team included the full range of technical specialists covering PSP deal structuring, procurement and contract law, risk analysis, water sector technical specialists, international banking and project finance. Working carefully over a period of about eight months during 2001, the team systematically evaluated the best examples and most applicable experiences from around the world in the various phases of the PSP life cycle. Based on this research and coupled with the team members' own experiences, a Toolkit was crafted that can be considered as the new standard of best practices in project documentation.

In the early months of 2002, the Toolkit was subjected to intensive review and editing and the English version was produced in its final form in May of 2002. The Arabic version also was subjected to careful review and editing and was published in June of 2002.

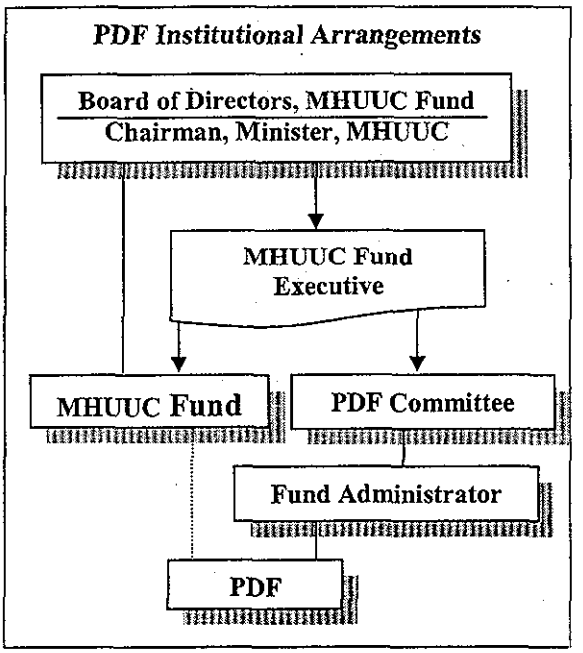
The Toolkit will be of lasting value to all those involved with the implementation of projects in the Egyptian water sector that include private sector participation. It is also understood that the MHUUC intends to share the Toolkit with other Ministries for possible application to PSP projects in other sectors.

B.6

B.6 – Project Development Fund (PDF) Design[3] – Funding support for project preparation and transaction assistance

Design of Project Development Fund, May 2002 – a source of funds for Egyptian water and wastewater utilities to cover the costs of project preparation and transaction assistance.

During the planning sessions for LIRR II, it was recognized that utilities preparing to engage private sector expertise and capital in one of the various forms of PSP would require the assistance of experienced specialists and consultants. The advisors would be needed to help the utilities prepare projects for the market and then provide technical assistance throughout the various stages of the procurement and contracting. However, the cost of transaction advisory services is substantial, and experience elsewhere has shown that those costs can act as a barrier to the implementation of PSP projects. Based on their experiences with similar situations in other projects, Chemonics and its associates suggested that the scope of work include planning and design for a Project Development Facility (PDF) designed to meet project preparation costs.



The B.6 deliverable addresses these issues and provides a workable design to ensure that funds are available to Egyptian water and wastewater utilities in support of PSP project implementation. As shown in the box on the previous page, the plan for development of the PDF as an institution is to create it as a unit in an established fund within the MHUUC referred to as the MHUUC Fund[4]. PDF funds would be established separately as a subaccount of the MHUUC Fund and would be subject to the MHUUC Fund's Executive Regulations. The PDF would be governed by a committee appointed by the Minister, MHUUC. Day-to-day management of PDF activities would be assigned to a fund administrator.

In support of the CDPSP, the PDF Committee and fund administrator authorize disbursements and monitor the performance of advisors throughout the project life cycle.

In addition to managing the funding process for transaction advisory services, the PDF would help with recruitment of advisors, authorize disbursement of funds in tranches, monitor the performance of advisors, and pay consultant invoices approved by the Committee. The CDPSP's role during project preparation and procurement would remain focused on technical assistance to the utilities,

[3] Referred to as the "PSP Prefeasibility Study Fund Design" task in the work plan.
[4] "Fund for Research and Studies in Relation to Urbanization Projects and Activities," established by Presidential Decree No. 242/1977.

ensuring compliance with established policies and facilitation of approvals required by other agencies.

The project life-cycle activities covered by PDF funding include prefeasibility studies, prequalification of bidders, preparation of procurement and contract documents, tendering, bid evaluation, and the negotiation and award processes. All activities, documents, and provisions must be in compliance with established policies, standards, and guidelines of CDPSP.

The CDPSP will help utilities screen candidate projects and make recommendations on short listing and selection. Projects that local utilities wish to move forward are processed by the CDPSP and submitted to the PDF for funding. Upon approval by the PDF Committee, funds are authorized for the Prefeasibility Study (Tranche 1) and the scope of work for the advisors is prepared. The utility is then responsible for recruitment of the advisors and overseeing their work. Technical assistance is provided by CDPSP during this process and, pending the outcome of the prefeasibility study, it prepares a recommendation to the PDF for authorization of funds for document preparation and prequalification (Tranche 2). The process continues in this interactive and supportive manner throughout the remainder of the transaction, ending with tendering and closing (Tranche3).

The PDF design has a multiplier effect, leveraging initial seed funds in support of numerous high quality and successful transactions.

The fund is projected to have a life of 10 years, with the first five years being considered a trial period. The initial period would confirm the "market" for funding for transaction advisory services and serve as a test of the prescribed project development processes. Initial capitalization of LE 20 million would be made with GOE funds and possibly funds contributed by donors. Key assumptions for the base case concerning the performance of the PDF include:

- Initial capital of LE 20 million is made in year 1
- Average amount of funding per project is LE 1.8 million
- 90% of the projects are funded on a nominal loan basis, 10% by grants
- Loan principal is repaid by the successful bidders on projects that reach financial closure; the assumed success rate is 30%
- Loan principal is forgiven for projects that do not reach financial closure
- Interest is paid at 5% per year on the loan principal until repaid or forgiven
- Cash balances in the PDF earn interest at 8% per year
- All expenses of PDF operations are paid out of Fund balances

Based on the foregoing assumptions, the PDF could support 15 projects. Given the conservatively low assumption on the success rate however, it seems likely that many more projects could be supported, perhaps as many as 25 to 30 or more. We believe that the investments in project preparation

and highly qualified transaction advisors combined with the resources of the CDPSP would result in a succession of highly successful PSP transactions.

Component B Supplemental Submissions and Activities – in pursuit of a vision for the Egyptian water and wastewater sector/MHUUC as an established and well-known player in the international market for private sector expertise and capital in water and wastewater activities

Through the active engagement of strategic investor/operators and financiers in project issues, LIRR II introduced MHUUC and CDPSP as participants in the international market for PSP in water and wastewater.

B.5.C

The LIRR II Team's vision for the project was that it should become *the instrument through which Egypt would become well known and respected in the international market for water and wastewater services and capital.* All the expense, time, energy, and intellectual capital devoted to sector reform in Egypt to make it an attractive place for investment should receive recognition worldwide. The project sought to establish and maintain communications with the two main groups of market players: i) strategic investors and operators, and ii) financiers (lenders and financial investors). Two activities provided the entrée to establish these relationships:

- *Private Sector Survey* — in May of 2001, LIRR II placed advertisements in the US Commerce Business Daily (CBD) and the UN Development Business (UBDB) publications, inviting interested parties to participate in the survey. To those responding, a survey form was e-mailed for completion and submission by return e-mail. The survey sought information from respondents dealing largely with the transaction structure preferences of investors. The questions were hypothetical but accurate and specific with respect to overall structure, payment structure, and bid structure of PSP contractual arrangements such as a BOT, concession, or management contract. Complete and helpful responses were received from:

  - Ondeo
  - Thames Water
  - SAUER
  - Bechtel
  - Kharafi International (Kuwait)
  - Alexandria Construction Company

  The information obtained through this process helped the LIRR II team develop transaction designs that were reflective of market concerns while giving full protection to GOE interests. The survey also provided a mechanism for informing the international market of activities underway in Egypt under the MHUUC and establishing communications linkages with market participants.

- *Advice to the MHUUC on Foreign Currency Risks* — as part of the team's own "due diligence" concerning how previous PSP contracts in Egypt had been structured, regular contact had been established with the Sidi Krier project, Egypt's first significant BOT project in the power sector. It was at this point that the LIRR II team became aware of the fact that the contract terms of the Sidi Krier contract included a dollar-denominated "take or pay" guarantee, an obvious major foreign exchange risk for the GOE. Of even greater concern, we learned that the contracts for the "EDF Projects," which were successors to the Sidi Krier Project, followed the Sidi Krier model including the same foreign currency risk factors. Based on the team's own experiences and knowledge of such situations, and with input from Thames Water Treasury and Citibank Treasury, LIRR II in January 2002 produced a paper titled "BOT Projects — Foreign Currency Risk" for circulation in the MHUUC. The paper was also included in the Beheira BOT Prefeasibility Study Final Report in February 2002. Through submission of the report and subsequent discussions of its main provisions, LIRR II was able to forewarn CDPSP and other MHUUC officials of the foreign currency risks associated with the type of contract terms used for the Sidi Krier and EDF projects that have proven to be so costly. The paper identifies the risks and outlines approaches that can be used to avoid or mitigate them and how to allocate any residual risks.

Lessons learned through interaction with the Sidi Krier project staff allowed LIRR II to specify financing terms that would avoid or mitigate foreign exchange risks in BOT or other PSP projects.

B.5.B

- *Continued Interaction with Strategic Investors and Financiers* — follow-up meetings were held with the six survey respondents as well as several other firms that had not responded, including Vivendi, SNC-Lavalin, and Arab Contractors. These contacts allowed LIRR II to keep abreast of market factors that affected our work as well as to test ideas and approaches for use in deliverables such as the two prefeasibility studies.

  We also initiated contacts with a large group of financiers (see box). These contacts were important in gaining full knowledge of project financing arrangements that have been used successfully in Egypt and details concerning terms. We also sought to identify the characteristics of future projects that would enhance the prospects of securing financing and the financing terms likely to be acceptable to financiers on projects in the future. Based on the information gained through these contacts, we prepared "Summary Outlines of Terms and Conditions" that are useful in designing projects.

- *Nascent Version of a Financing Guide for Egypt* — one outgrowth of our contacts with the market was the preparation of "Summary Outlines of Terms and Conditions" which are useful in designing projects and which we see as the beginning of an Egyptian Financing Guide. The Financing Guide would include i) contacts with

Through continuing engagement with strategic investors and financiers, LIRR II was able to keep abreast of financing terms and arrangements having a record of successful implementation in Egypt.

financiers, ii) types of facilities offered, iii) profiles of the types of opportunities sought by financiers, and iv) summary outline of terms and conditions.

We are confident that the market orientation given to the project by the LIRR II team added great value to the project and drew the attention of the international market toward Egypt and a greater appreciation of how Egypt is creating an attractive environment for investment.

Financiers Contacted by LIRR II

- Citibank (corporate finance and treasury)
- BNP (advisor to SNC Lavalin)
- Barclays
- Arab Bank
- Hong Kong Bank
- Dresdner Bank
- Credit Agricole Indo-Suez
- Egyptian American Bank
- Commercial International Bank
- Credit International d'Egypt
- IFC and World Bank
- EIB
- African Development Bank
- KfW
- Spanish Govt. Financing Agency
- French Govt. Financing Agency
- IMF

The market orientation of LIRR II added value to the project and gave recognition to Egypt for creating an attractive climate for investment.

Component C Deliverables

Transaction support activities under Component C were conducted in parallel with the *operationalization* activities being carried out for the two new reform agencies under Components A and B. They provided the means for demonstrating to MHUUC and CDPSP how a transaction is processed from its conception to financial closure. Involvement of CDPSP staff in these activities in fact made a significant contribution to the *operationalization* of the department.

C.1 and C.2 – Guidelines for Project Screening and Screening Results

C.1 & C.2

Shortly after the mobilization of LIRR II, the team presented a workshop intended to be the first step toward the implementation of CDPSP's first two PSP projects. LIRR II would provide assistance in project preparation and all aspects of the transaction leading to and including financial closure. The workshop was a full day of presentations and discussion with officials of MHUUC, other involved ministries, and representatives of some utilities and their institutional development contractors. The workshop was organized in segments along the following lines:

C.2.A

- PSP projects, problems with conventional government financing, and factors for success with the PSP approach
- Screening criteria for PSP projects, detailing CDPSP's role, describing how utilities prepare "candidate project profiles" as applications for assistance and how the CDPSP should conduct the screening process
- Forms of PSP transactions including design/build/operate, BOT/BOOT, concessions, and service/management contracts

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- Financial analysis of PSP projects such as estimation of project cash flow, financial performance criteria including discounted cash flow, and debt service coverage and tariff setting
- Methods of enhancement of PSP projects, e.g., minimizing foreign currency involvement, maximizing equity (including all members of consortium), and postponement of return of equity, risk mitigation and reduction strategies, and credit enhancements

By giving early emphasis to project identification, preparation, due diligence, screening, and selection, LIRR II helped stimulate interest in PSP resulting in applications for 81 projects from central agencies and utilities throughout Egypt.

The workshop generated a high level of interest among utilities and central departments of MHUUC in pursuing PSP as an element of their long-term development programs. LIRR II followed up by preparing suggested procedures for managing the application, review, screening and selection process for candidate projects, titled "Tools and Guidelines for Project Screening." The paper identified the information to be submitted by applicants such as an explanation of the need for the project, operational and financial information, and how such would be affected by implementation of the proposed project. The application and review process was detailed and clarified the roles of the respective participants. Application forms were included along with suggested screening criteria, forms, and tables. LIRR II then worked with CDPSP officials to familiarize them with the suggested procedures, forms, and guidelines.

With assistance from LIRR II, the CDPSP then issued an invitation to central agencies and local utilities throughout Egypt to submit projects for consideration to become one of the two pilot projects to be undertaken by CDPSP with the assistance of LIRR II. Project screening packages, including instructions on completion and use of the various forms, accompanied the invitations. A total of 81 individual projects were submitted for consideration as a result of the invitation. The LIRR II team summarized and tabulated the proposals and combined projects where appropriate into a total of 42 proposals, 34 involving investments and 8 projects classified as management or service contract options. The team met with CDPSP, other Ministry officials, and utility chairmen and directors at a workshop in Sharm El-Sheikh in November of 2000 to obtain additional information and confirm the consolidations as recommended. After a systematic and thorough analysis following the screening criteria and consideration of all other relevant factors, the list was narrowed to 6 finalist candidate projects and subsequently to the two selected projects:

After consolidation of the 81 applications into 42 proposals and then short listing of 6 finalists, proposals of the Sixth of October City and the BWC in Beheira governorate were selected for implementation.

- Sixth of October city — water treatment plant, transmission lines, and a wastewater treatment plant with a wastewater reuse component
- Beheira Water and Sanitary Drainage Company (BWC) — water treatment plant and expansion of the distribution system

The results of the screening process were summarized in the report "Project Screening Results" and submitted to the Ministry on January 28, 2001. The selections were confirmed and LIRR II was authorized to proceed with the implementation of prefeasibility studies in February, 2001. The process was

considered highly successful by the Ministry because it generated so much interest and gave the CDPSP an excellent initial exercise in project screening and selection. It also provided sufficient experience with the process to permit fine tuning and refinements to make the system more effective and efficient. Many candidate projects, though not selected for implementation at this time, still have good potential for implementation at a later stage.

C.3 – Prefeasibility Studies for Sixth of October City and the Beheira Water and Sanitary Drainage Company (BWC)

The original work plan for the conduct of these two studies scheduled a lag of about six months between the start of the first and the second studies. This strategy was based on the assumption that the first study would be initiated in December 2000. Since the prefeasibility work could not be effectively started until March 2001, and it was desired to maintain the completion date of November 25, 2001, the schedule was changed to conduct the two studies in parallel.

The revised schedule proved quite satisfactory as one study was submitted to MHUUC for comment in late October and the other in early November, several weeks ahead of the November 25 target date for completion of the second prefeasibility study in the original plan.

C.3.A

1.C.3 – Prefeasibility Study for Sixth of October and Sheikh Zayed Cities

Prior to the start of the prefeasibility study for the Sixth of October, its scope was expanded to include an adjacent NUCA community, Sheikh Zayed City.

The scope of work for the Sixth of October prefeasibility study was expanded at a retreat held with the Project Steering Committee in January 2001. It was decided then that the study should include Sheikh Zayed City, a small community located immediately adjacent to Sixth of October, as an integral part of a combined utility that would implement the projects. Numerous project proposals had originally been submitted for Sixth of October City including BOT proposals for a water treatment plant with a capacity of 864,000 CuM per day and a wastewater treatment plant of 250,000 CuM per day. Numerous proposals for O&M contracts for various Sixth of October facilities indicated that ultimately, a concession contract could prove to be the best arrangement for Sixth of October City. Now covering two cities and both water and wastewater investments, and in parallel with the start of the Beheira prefeasibility study, work on the Sixth of October prefeasibility study commenced in March of 2001.

Prefeasibility studies are comprehensive in scope, intending to address all the factors that influence success or failure of the project being considered for implementation under the control of a private sector entity. After reviewing the background leading up to the study, the report describes the present situation in the two utilities and sets forth the objectives of the study. The principal components of the study are shown in the box on the next page.

Contents: Sixth of October/Sheikh Zayed Prefeasibility Study

- Existing conditions – water sources, land use, utility operations
- Water/wastewater demand – population growth, expansion of non-domestic users
- Quality standards – raw and potable water and wastewater effluent and sludge
- Recommended plan – investment in assets designed to improve revenues & use of existing utility plant
- Financial analysis of the plan – capital and O&M cost projections, tariffs & sensitivity
- Project permitting – permits required and permitting agencies
- Implementation and schedule – principal steps in procurement process, bid evaluation techniques

Soon after work started, it became evident that there would be significant difficulties in obtaining reliable data on most of the main utility operational parameters including population served, number of customers, number of customers with meters, and quantities of water produced and wastewater treated. The lack of reliable data for these parameters is attributable in part to deficiencies in metering, both primary meters (bulk meters to measure flows from water treatment plants[5] and through larger pipelines within the distribution system) and secondary meters to measure the consumption of individual customers. The deficiency in metering also stymies the ability of the utility to gauge the amount of UFW. The database for customer accounts is also deficient in terms of its coverage with large gaps in information on registered accounts. Further, billing is performed manually, making the billing process cumbersome and inefficient. Clearly, the utility must make major improvements in these areas to support efforts of management in planning and developing strategies for expansion and improvement of services as well as to simply operate more efficiently.

Despite a lack of reliable data on population, customers, consumption, and system operations, LIRR II determined that neither the proposed water nor wastewater treatment plants were needed at the present time, thus allowing deferral of nearly LE 800 million in capital expenditures.

The most important finding of the LIRR II team, however, was the determination that neither the 864,000 CuM water treatment plant nor the 250,000 CuM wastewater treatment plant are required in the near term. A new water treatment plant in Sheikh Zayed City with a capacity of 450,000 CuM per day was under construction and expected to become operational in 2002. In addition, the existing treatment plant in Sixth of October City was being expanded from a capacity of 140,000 CuM per day to 267,000 CuM per day, also expected to become operational in 2002. Together, there is sufficient unused capacity in these plants to meet the needs of both Sixth of October and Sheikh Zayed Cities in the medium term and it will likely be decades before additional capacity is required. Thus, the estimated investment of nearly LE 500 million in a new water treatment plant can be postponed indefinitely.

With regard to wastewater treatment, the capacity of the plant at Sixth of October is currently 100,000 CuM per day and NUCA is currently preparing plans for an additional plant with a capacity of 50,000 CuM per day. With current flows estimated at 50,000 CuM per day, the LIRR II team determined that the combined capacities of the existing and new plant would meet requirements for

[5] It is understood that the Sixth of October utility planned to install 7 primary meters on the transmission mains leaving the water treatment plant sometime during 2002.

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about ten years allowing the deferral of an expenditure of about LE 300 million until approximately 2012.

LIRR II recommends that a 5-year performance-based management contract be implemented to allow time to build databases, improve operations, and set development strategies, then being better prepared to consider the use of a concession or BOT model for subsequent periods.

These conclusions made it clear that neither a BOT nor concession is the appropriate structure for private sector involvement with the Sixth of October/Sheikh Zayed utility. Instead, it is recommended that a five-year performance based management contract structure be used. This approach will provide time to implement the programs needed to strengthen and build the utility's essential data bases, set strategies for long term development and improve operational systems. At the end of the five year period, estimated to be in 2007, the utility could then decide to pursue the implementation of a concession and take full advantage of private sector expertise and capital over a much longer term. While the investment requirements for the management contract are greatly reduced, they still amount to an estimated LE 18.2 million ($US 3.9 million). This amount will be needed, in addition to the contractor's working capital requirements, to cover the costs of primary and secondary meters, development of a distribution system model, establishing the computerized customer data base and billing system, surveying/installing customer meters[6] and identifying and quantifying UFW. The breakdown of costs is shown in the box on the previous page. At the conclusion of LIRR II, the CDPSP/MHUUC remained undecided concerning whether or not to undertake the implementation of the management contract.

Management Contract Investments

Item	LE – m
Install primary meters	1.035
Distribution system model	0.460
Automated customer data base and billing system	1.440
Data base on system assets	1.840
Install secondary meters[6]	12.650
Locate/quantify UFW	0.736
Total	18.161

C.3.C

2.C.3 – *Prefeasibility study for the Southern Beheira Water Supply Project*

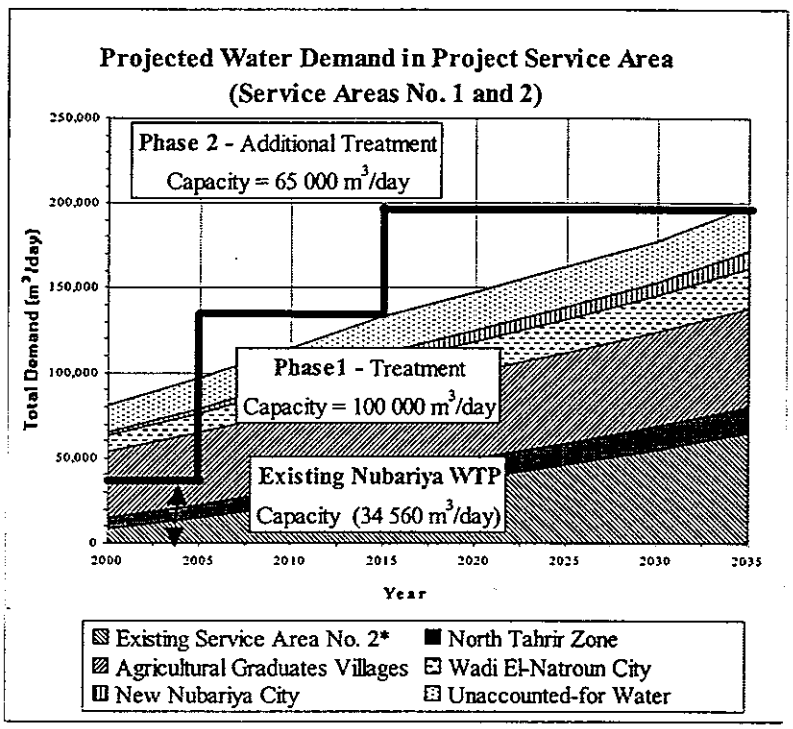
The Beheira Project was ranked second among the project submissions based on the sound overall financial situation of its proponent, the Beheira Water and Sanitation Company (BWC), apparent customer support for the project and its potential for consideration as a concession. With regard to the specific ranking criteria, considerations contributing to its selection are as follows:

- Project need — there is a clear and demonstrated need to improve water quality and expand coverage in the project area
- Capability — though subsidy may be required on a temporary basis, BWC has substantial financial capability and consumers appear willing to pay higher tariffs

[6] The cost of secondary meters will be paid by the customers receiving them. The contractor, however, will be required purchase them and bear the cost of installation. The utility may or may not decide to allow the customer payments to be passed on to the contractor.

- Support — the project is a GOE priority and there is strong support for PSP within BWC
- Marketability — there are aspects of the project that are thought to be attractive to international strategic investors in the water industry
- Expansion of scope — it was considered that some potential existed for expansion of the project's scope into wastewater treatment and reuse
- Demonstration — perceived value for demonstrating PSP concepts and to be a model for replication in other projects

Beheira Governorate is located in the Nile River Delta area of Egypt. It has a population of 4.16 million, with just over 75% residing in rural areas. Three major transportation links traverse the governorate in parallel in a SE–NW direction, two are roadways known as the Cairo–Alexandria Agricultural Road and the Cairo–Alexandria Desert Road and the third is a waterway known as the Nubariya Navigation Canal. The canal runs approximately half way between the two roads and ends at the Mediterranean Sea at Alexandria. The area to be served by the project was originally limited to communities located on the south side of the canal extending to the Cairo–Alexandria Desert Road. However, during consultations with BWC staff and governorate and local officials, it was decided to expand the service area to include communities on the north side of the canal that are also in need of improved and expanded water service. The service area thus defined has a current population estimated at 447,000, with the majority residing in the communities to the south of the canal. Population is expected to grow to about 750,000 by 2015 and to exceed 1,000,000 by 2030. Demand during the same period is expected to increase from the current level of 81,211 CMD to 133,237 CMD in 2015 and 178,000 CMD in 2030.



Designed to fill a major gap in BWC's service area, the Beheira project was highly ranked due to demonstrated need, BWC's financial strength, and its solid databases on operations and finances.

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The selected project design calls for a major expansion of water production capacity and installation of associated transmission lines and booster pumping facilities, increasing water production capacity 165,000 CuMD by 2015.

Least-cost analyses were conducted of the two main alternatives for providing the required water services. The least-cost solution was determined to be to locate the new plant at the site of an existing treatment plant located on the north side of the canal known as the Nubariya Water Treatment Plant. The Nubariya plant's existing capacity is 34,560 CMD per day and the capacity of the new plant would be 100,000 CMD to become fully operational in 2005. A further expansion of 65,000 CDM is projected to be required by 2015. The box above is a graphic portrayal of demand forecasts and the timing and extent of water supply expansion.

In addition to the expansion of the water treatment capacity, other components of the project include approximately 99 km of transmission lines, primary metering, ground storage reservoir, and a booster pump station. The estimated capital cost of the initial project (2003-2005) is LE 169.0 million and the cost of the extension in 2015 is LE 39.2 million. It is expected that the BOT contractor will operate both the existing and new plants with annual O&M costs estimated at LE 15.0 million. The foreign exchange component of construction cost is estimated at 20%.

A wide range of financing plans for prospective BOT contractors was examined in an attempt to identify the optimum profile in terms of debt–equity relationship, currency of debt, and lending terms that may be available for financing of this project. Numerous contacts were made with both local and international commercial banks as well as bilateral and multilateral lending institutions to ascertain financing arrangements that would be sought for a project of this type. LIRR II financing specialists determined that minimization of foreign borrowing is a top priority for the GOE to avoid exposure to foreign exchange risk associated with debt service payments. The financing profile selected for the base case was developed based on these and other factors and is summarized below:

Planning for project financing gives top priority to limiting foreign exchange risk by minimizing foreign content, borrowing LE from local banks, and specifying that foreign currency requirements be covered by the investor's equity.

- Borrowing to be in LE from syndicates organized by local and international banks
- In the procurement, preferred bids would have equity contributions up to 40% of financing with sufficient foreign currency to cover the foreign component of capital costs, to be held at 20%
- Terms for LE loans
  - Interest at 14%, floating
  - Repayment of principal in equal annual installments
  - Overall loan term of 12 years, with 2-year grace and 10 years for repayment
  - Interest during construction capitalized to loan principal
  - Debt–equity ratio — 60/40
  - Financing of bankers commitment, legal, and other fees, 3% of loan
  - Debt service coverage ratio, 1.3 to 1.5 times debt service

- Expected return on investment of contractor is approximately 20%
- BOT contractor pays income tax at an effective rate of 42%

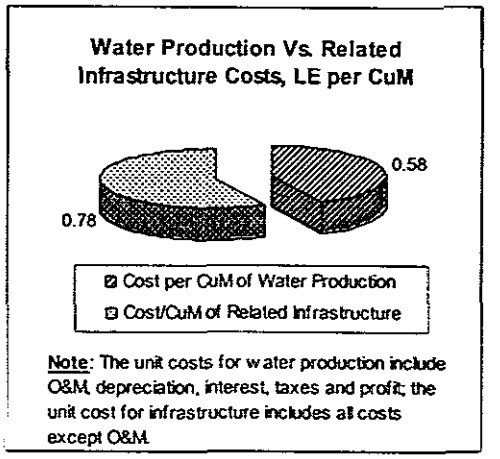
Based on the capital and operating cost estimates given above and under the foregoing base case financing terms, it is estimated that on the average, the BOT contractor's charges would be LE 1.36 per CuM. Unit charges are somewhat lower at LE 1.07 per CuM if US$ financing is used. The lower charge is due to lower interest rates, an increased leverage, and involvement of international development banks offering longer loan repayment periods. However this does not consider the high risk of incurring substantial exchange rate losses during the repayment period.

It must be emphasized that the apparently high unit cost of water is due to a number of factors, including:

- The price per CuM is the amount to be paid to the contractor; it covers a substantial amount of infrastructure unrelated to water production, actually about 2/3 of total development cost
- The final demand figures were reduced significantly based on consultations with representatives of BWC and officials of the local communities to be served; demand reductions were especially dramatic in the areas north of the canal that can be served most efficiently, because the transmission and distribution lines are generally already in place
- With revised demand at only about 52% of demand in the draft report, the unit prices of construction (e.g., construction cost per CuM) are all generally higher, so that costs do not decline in parallel with lower levels of demand, and
- The demand is generated by widely dispersed urbanized clusters of population, which results in higher per capita transmission and distribution costs; this effect is accentuated when demand in the urbanized clusters is reduced

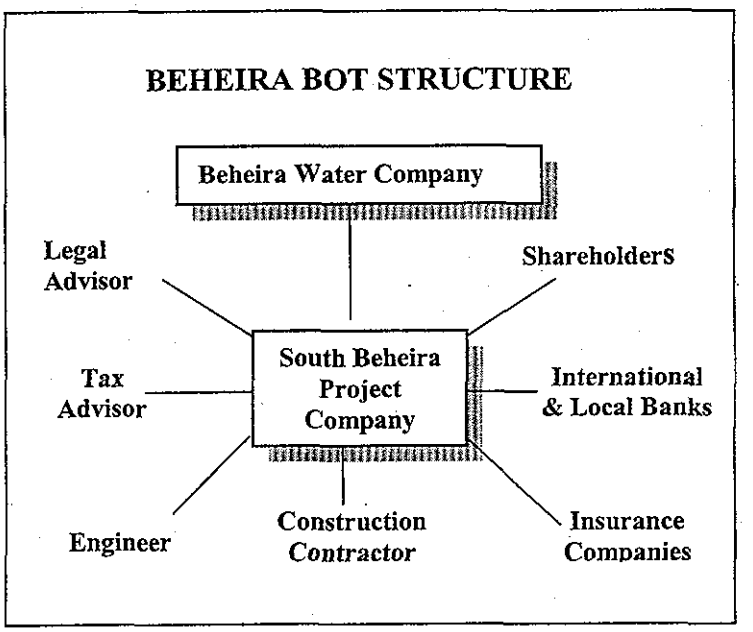
Average compensation required by the BOT contractor is estimated at LE1.36 per CuM over the contract term, with LE 0.58 representing the cost of water provided & LE 0.78 for the procurement of transmission lines and related facilities.

Even so, the average cost of water for the base case/local bank financing with LE only appears to be reasonable at LE 0.58/CuM[7], with the remaining LE 0.78 required to cover procurement of the 99 km of transmission lines, tunneling, pump station, and booster pumps. The cost relationship between the cost of water produced and the cost of financing the related infrastructure is shown in the graphic at right.



[7] Note that Beheira's cost recovery target does not include debt service or depreciation whereas the figure of LE 0.58 for the water production cost under the BOT contract makes provision for full recovery of capital costs associated with the water treatment plant.

The LIRR II team concluded that a performance-based BOT contract structured as shown in the box below and with financing organized as shown above best meets the GOE's objectives in the long run. Among the main advantages of this approach is the fact that the project can be implemented faster than otherwise and services to the communities in need can be provided sooner. All of the financing needed for construction and start-up can be arranged by the private sector investor and no borrowing in foreign currency will be needed. Further, the recommended BOT option is preferable to options including soft loans, since soft loans are only made for the foreign currency component of the investment that can influence that element of cost to increase in proportion to the local cost element. The BOT approach is also preferable to GOE financing, on the assumption that the GOE wishes to limit finance provided by the NIB given the possibility of its privatization. The principal disadvantage is that it is more expensive and would require substantial subsidy of the BWC by the government. If, upon re-evaluation of the degree of risk associated with borrowing of foreign currency, it is determined that there is a higher tolerance for that risk than currently perceived, then costs and subsidy levels can be reduced through the use of a larger foreign borrowing component with credit guarantees available from multilateral international lending agencies.



A performance-based BOT contract offers the advantages of meeting the needs of consumers in areas without service sooner with minimal foreign exchange risk associated with the transaction.

Component C Supplemental Submissions and Activities – furthering the image of Egypt and MHUUC as active participants in the international market for private sector expertise and capital in water and wastewater activities

In April 2001, MHUUC counterparts contacted LIRR II for assistance in planning, organizing, and making preparations for a ministerial visit to the United States. The Minister of MHUUC was scheduled to address the United Nations Assembly on June 6. He wished to take advantage of his presence in New York (with a side trip to Washington, D.C. to promote Egypt's growing involvement in the market for private sector operators and investors in the water sector. There was a need to schedule appointments and help prepare briefing materials for the Minister's use during his meetings with representatives of the international financial community in New York and Washington, D. C.

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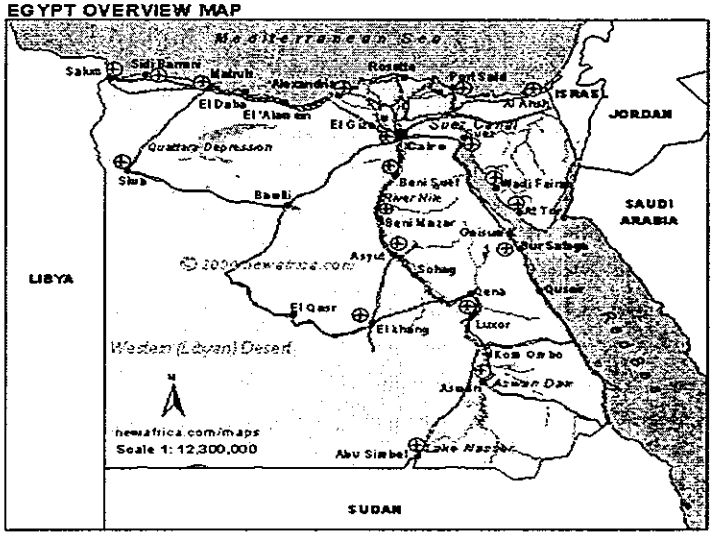
C.3.E

LIRR II accepted the assignment and organized a support effort in both the field office in Cairo and in home offices in Washington, D.C. Field office staff developed the briefing document titled "Investment Opportunities" to be distributed by the Minister during his visits to the members of the financial community. The briefing document was organized in two parts: the first part providing an overview of Egypt, its economy, the status of privatization in Egypt, conditions in the water sector, the status of reform and an introduction to the newly created CDPSP.

EGYPT OVERVIEW MAP



Authority : Luxor Potable Water & Sanitary Drainage Department

Project	Description	Estimated Cost in US$ Millions
Luxor Waste-water O&M and reuse	Wastewater Treatment Plant O&M and reuse of treated effluent for irrigation.	4.40

The second part of the document presented a detailed listing of 49 water and wastewater projects in various stages of planning and implementation located in 15 governorates throughout Egypt. An example of a wastewater project included for Luxor is shown on the following page. The second part of the document also included a reference listing of legislation governing PSP and sector activities and a list of Web sites containing relevant information on Egypt and its economy. This document clearly and accurately portrays Egypt's growing interest in and commitment to PSP in its water and wastewater programs and was well received by those to whom it was distributed.

LIRR II played an important supporting role in Egypt's first venture into international financing centers to demonstrate its interest in and commitment to PSP in its water and wastewater programs.

LIRR II home office staff prepared a schedule of appointments for the Minister in New York on June 5th and 7th and in Washington, D.C. on June 8th. LIRR II staff accompanied the Minister on his visits in both cities and was available throughout to offer support and assistance. Overall, the promotional effort was highly rated as a successful entry into the international marketplace for PSP in water and wastewater.

Lessons Learned

From an overall perspective, LIRR II proved to be well designed and both client and consultant were able to adjust to unexpected circumstances or barriers to the

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achievement of goals and objectives. The most serious obstacle encountered was the delay in enactment of the legislation and decree needed to formally establish the EWRA and provide the foundation for the regulatory regime. Nonetheless, in most areas, LIRR II and the MHUUC devised ways and means to overcome such obstacles and reorient deliverables so that they would be useful resources to the EWRA once it is formally established. Of course, as with most projects, there are aspects of the LIRR II design or performance under it that could have been done better; those aspects of a project become *lessons learned*, as described in the following paragraphs:

- *A two-year project duration is insufficient* . . . to carry out all activities needed for complete implementation of two transactions. Given the fact that MHUUC and CDPSP are going through the project life-cycle activities for the first time, it is natural and understandable that more time is required for analysis and decisionmaking. For example, approximately one-half of the 24-onth project duration was taken-up in: i) project identification, screening, and selection; and ii) providing the guidance needed to move the two prefeasibility studies from draft to final report status. Implementation planning PSP projects must allow adequate time for the deliberative processes, particularly so for a newly formed agency undertaking the implementation of its first pilot projects.
- *Project design lacked a dedicated training component* . . . A training component (Component D) had been included at one time but was removed from the scope and budget during negotiations. LIRR II was handicapped by the lack of a well-defined training mandate and the resources to support it. The project needed to have control over training so that it could have worked in a collaborative way with MHUUC in tailoring the training agenda to the specific needs of the Ministry. Further, the training efforts that were made tended to focus on training at the central level whereas there was a need for major training inputs at the local utility level.
- *The regulatory aspects of the project lacked sufficient counterpart participation* . . . while the project had access to and the occasional participation of the apparent nominee for the position of executive director of the EWRA, no other Ministry staff were designated for transfer (or secondment) to the EWRA upon its formal establishment. Thus, for the most part, the development of the deliverables covering EWRA's organization , staffing, rules and regulations, budgets, financing, and procedures had to be undertaken without significant input from the GOE. The LIRR II team recognized this early in the course of the project but was not sufficiently persuasive to achieve an increase in staff involvement in EWRA functions.
- *Given the lack of an established and staffed EWRA, early efforts in tariff rate application process should have been directed at the development and*

implementation of the simplified methodology . . . LIRR II developed a detailed manual on tariff rate application methodology that will be invaluable to the EWRA as soon as it is authorized by law, staffed, and provided with sufficient resources to cover its operating requirements. Designed to be responsive to the legislative intent of the draft law and decree, the manual covers the myriad of details that need to be addressed by a highly intensive national regulatory program. EWRA, for example, will be continuously dealing with about16 rate applications in varying stages of completion while at the same time monitoring the remaining 20 or so utilities that will be reporting their progress toward meeting stipulated performance criteria. But preparation of the manual consumed large quantities of project resources and delayed the start of the four pilot tariff rate application studies which, in the end, were all performed using the simplified methodology developed for NUCA. Had work on the tariff manual for EWRA been deferred, resources would have become available that would have allowed completion of the pilot studies earlier and a number of additional pilot tariff studies could have been completed employing the simplified methodology, possibly giving rise to a national interim tariff rate application program.

Recommendations

Recommendations evolving from the LIRR II experience are all related to the perception that LIRR II is just one stage in a continuum of technical assistance projects. As visualized, the series of TA projects have commonality in that they are intended to help the GOE achieve full implementation of sector reform. Enhancement of access to private sector capital and expertise in pursuit of the development and management of utilities is also a common goal of the TA projects. On this basic premise, we therefore strongly recommend the following:

- *Continue with the implementation of the Management Contract for the Sixth of October and Sheikh Zayed Cities* . . . NUCA, with the assistance of CDPSP and transaction advisors, should continue to pursue implementation of the recommended management contract. The LIRR II team strongly believes that the management expertise and investments in primary metering, billing and collection, and related systems that form the basis for the management contract will bring the operations of the combined utility to a level of operating performance approaching international standards. We expect this to be achieved by the end of the five-year term of the contract, with minimal increase in tariffs and no impact on residential customers. It is understood that NUCA is exploring the possibility of implementing O&M contracts for these utilities, which would fail to achieve the benefits potentially achievable under a management contract awarded through international competition.
- *Continue with the implementation of the BOT contract for the Beheira Water and Sanitation Company (BWC)* . . . there is a real and urgent

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need for extension of water services into the proposed service area. The database on population and demand has been carefully examined and the demand forecasts are deemed reliable. The engineering analyses have been carefully developed and the least-cost solution has been identified. Financing plans have been devised that minimize foreign content of the project, eliminate foreign currency borrowing, and mitigate remaining foreign exchange risk. It must be emphasized that the estimated price per CuM to be paid to the BOT contractor contains a large capital recovery component and that *the estimated operating costs for the production of water from the new plant would be consistent with, if not lower than, the costs currently experienced by BWC*. Since the BWC currently finances its capital program through subsidy or equity contributions from MOF, capital recovery under the BOT contract could be made through similar subsidies. This could be achieved by segregating capital costs under a design-build component of the BOT contract that would be subsidized and the water production component of the BOT contract could be financed under BWC's normal operating budget. *Unless and until BWC's tariff design includes the recovery of debt service in determining its revenue requirements, some form of subsidy will be required to support capital investments.* BWC should take advantage of the opportunity to fill this gap in its service area and provide the services at the earliest possible time through implementation of a BOT contract.

- *Retain transaction advisors under MHUUC/CDPSP to assist in implementation of the Sixth of October/Sheikh Zayed and Beheira projects* . . . MHUUC should proceed with recruitment of transaction advisors for the implementation of the two projects prepared under LIRR II. Funding requirements from current budget sources can be minimized by linking a meaningful portion of the advisors' compensation to the success of the procurement process. The advisor would be paid for a portion of services rendered through "success fees" which would generally cover compensation for the procurement portion of the transaction. In this manner, the transaction advisors become partners at risk in the procurement process. The success fees normally include incentives to achieve success beyond specified minimums measured through the attainment of an optimum number of responsive bids. Since the two projects have already been prepared through the prefeasibility stage, the portion of fees to be paid to the advisors that is not covered by the success fee would likely be less than half of the total.

- *Seek funding for the PDF and initiate project identification and screening for the next PSP projects* . . . MHUUC should explore funding support options that may exist from international donors and/or through the normal GOE budgetary process. The funding support should be accompanied by technical assistance to the Ministry and CDPSP to establish the PDF within the MHUUC Fund; establish operating procedures and guidelines for the PDF Committee and administrator; and

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initiate the identification, screening, review, and approval process for the next tranche of PSP projects.

- *Determine the next steps to be taken toward implementation of the identified sector reform measures* . . . MHUUC should assess the likelihood of enactment of the reform legislation and decree and take steps to implement interim measures in the continuing absence of the EWRA. It will be important to confirm the GOE's commitment to reform in the establishment of a "level playing field" for international contractors competing for work in the sector. It will be equally important to establish interim measures for the regulation of tariffs that are urgently needed to enhance the viability of utilities while protecting consumer rights and maintaining tariffs at affordable levels.

Notwithstanding the fact that not all of its original goals have been achieved, LIRR II has been successful in providing meaningful assistance to the GOE in advancing needed reforms in the water and wastewater sector. Because of its demonstrated commitment to reform, Egypt is now recognized as part of the international market for private capital and expertise in the water industry. The GOE should take advantage of the momentum that has been gained and continue a systematic and focused approach to the reform effort.

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ANNEX A

List of Deliverables and Supplemental Consulting Product Submissions and Activities

Task Ref.	Deliverable/Product
COMPONENT A — Support to Operationalize the Egyptian Water Regulatory Agency (EWRA)	
A.1.	EWRA Strategic, Organizational and Personnel Plan
A.1A	Action Plan for EWRA Operationalization
A.1.B	Manual on Strategic Planning for the EWRA
A.1 — SCPS[8]	Recurrent Involvement in Redirecting GOE Legislative Strategy on Sector Reform, Preparing Explanatory Materials, Commenting on Subsequent Revisions of the Draft Laws and Decrees on Concessions and the Regulatory Regime. Presentation deliverables: Revised drafts (1) Law on Concessions and Regulation and (2) Presidential Decree Organizing the Regulatory Agency
A.2.A	Training Materials for EWRA Personnel
A.2.B	Twinning Implementation Plan for the EWRA and EWRA Training Plan
A.2.C	Orientation Materials on Sector Regulation for Senior Officials
A.3	Tariff Analysis Manual and Model for Government Owned Water and Wastewater Utilities in Egypt
A.4	Training Materials for Rate Application and Review, Financial Modeling and Rates Analysis
A.4 — SCPS[8]	Tariff Planning Guidelines and Model for Water and Wastewater Utilities in the New Urban Communities
A.4 — SCPS[8]	Survey Instrument for Data Collection on Egyptian Water And Wastewater Utility Service Levels and Cost Recovery
A.5 & A.6	EWRA Logistics and IT Plan, Five Year Budget and Financing Options
A.7.A	Tariff Study for Sixth of October and Sheikh Zayed Cities
A.7.B	Tariff Study for Beheira Water Supply Company
A.7.C	Tariff Studies for Alexandria Water and Wastewater Utilities
A.10	EWRA/CDPSP Program Coordination Concept Paper
A.7/10 — SCPS[8]	Provided Trainers and Training Materials on Legal Aspects, Tariff Structuring & Corporatization to DT2 Training Programs and Administrative/Operational Support for DT2 Sponsored Study Tours

[8] SCPS – Supplemental Consulting Product Submission (a delivered product not required by contract)

COMPONENT B — Support to Operationalize the Private Sector Participation Unit (Central Department for Private Sector Projects [CDPSP])	
B.1, B.2 & B.3	Strategy, Organization and Operations/Logistics Plans for the CDPSP
B.4	Strategic Framework of CDPSP Services & Guidelines on PSP and Proposed Implementing Rules and Regulations
B.5	Project Life Cycle Toolkit (3 Volumes)
B.5.A	Best Practices in Tariff Setting for Water and Wastewater Utilities Employing BOT/BOOT, Concessions or Other Forms of PSP
B.5.B — SCPS[9]	Paper for MHUUC on Foreign Currency Risks and BOT Projects
B.5.C — SCPS[9]	Private Sector Survey of Strategic Investor Attitudes Regarding Projects in the Egyptian Water Sector
B.6	PreFeasibility Study Development Fund (Project Development Fund [PDF]) Design
COMPONENT C — Transaction Support for Two Water and/or Wastewater Concessions (or other PSP Arrangement)	
C.1	Project Identification Guidelines and Screening Criteria
C.2	Project Screening Results
C.2.A	Prefeasibility Study Orientation Briefings
C.3.A	Sixth of October & Sheikh Zayed Cities Water and Wastewater Prefeasibility Study
C.3. B	Tariff Study for the Sixth of October & Shekh Zayed Cities Management Concession
C.3.C	Southern Beheira Water Supply Project Prefeasibility Study
C.3.D	Southern Beheira Water Supply Project Prefeasibility Study Supplement
C.3.E — SCPS[9]	Briefing Book for International Investors/Lenders on The Investment Environment in the Egyptian Water and Wastewater Sector

[9] SCPS – Supplemental Consulting Product Submission (a delivered product not required by contract)

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The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-Funded Project

EWRA STRATEGIC ORGANIZATION AND PERSONNEL PLAN

June 30, 2002

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

CHEMONICS EGYPT

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ACRONYMS

ARE	Arab Republic of Egypt
CD	Central Department
EWRA	Egyptian Water/Wastewater Regulatory Agency
GD	General Department
GM	General Manager
GOE	Government of Egypt
KPI	Key Performance Indicators
MIS	Management Information System
O&M	Operations and Maintenance
UFW	Unaccounted-for Water
PEA	Public Economic Authority

SECTION I

Introduction

This report sets out a strategic and organizational plan for the establishment and initial operation of a new national-level regulatory agency for the Egyptian water/wastewater sector.

The report includes:

- A strategic plan for the first five years of agency operation (Section II)
- An organization design with functional descriptions for all organizational units in the agency (Section III)
- Job descriptions for all 26 positions graded manager or higher (Section IV)
- Staffing charts for each position (Annex A)
- Five-year staffing total by grade and division (Annex B)

The strategic plan begins with a statement of the agency's mission and key objectives. The plan then identifies key opportunities and threats to the achievement of agency objectives. The plan then recommends some key strategies or "success factors" to maximize the opportunities and mitigate the threats. The strategic plan concludes with a formulation of priority actions to be implemented over the first five years.

The strategic plan has been developed with the Egyptian Water/Wastewater Regulatory Agency's (EWRA) founding decree and Egyptian sector conditions in mind. Nevertheless, it is recommended that the future Board of Directors engage in its own strategic planning process, since the process itself yields great benefits in terms of building a management team and developing a common understanding among the members of the team.

The next part of the report proposes an organization design for the agency. The organization structure features a division of principal operating functions into two central departments: a Central Department for Tariffs, responsible for the determination of utility tariff requirements and assistance to the utilities in the design of tariff structures, and a Central Department for Standards and Compliance, responsible for standards setting and monitoring, customer affairs, and legal affairs. A General Department for Finance and Administration is responsible for administrative functions. Functional descriptions are provided for all organizational units down to the section level.

Annexes A and B are associated with the organization plan. Annex A provides organizational staffing charts which show all positions and recommended staffing levels for each organizational unit. Annex B summarizes the staffing requirements by grade and department. A total of 105 staff is proposed. This total includes secretarial and clerical positions but not unskilled or semi-skilled positions.

The last section provides job descriptions for the 26 positions in the organization ranked manager or higher. Each job description includes the position's rank, role, principal duties, and key qualifications.

SECTION II

Strategic Plan for the Egyptian Water/Wastewater Sector Regulatory Agency, 2002-2007

This document presents a sample strategic plan for discussion and review by the Board and senior management of the EWRA. It includes:

- A formulation of a possible mission statement
- A statement of key objectives
- A review of strengths, weaknesses, opportunities, and threats facing the agency upon its inception
- An analysis of success factors the agency's leadership should consider in managing its internal and external affairs in order to exploit opportunities and avert threats
- A list of the powers granted to the agency in its founding decree
- Sets of priority initial actions needed to set the agency on course to achieve its objectives

One of the principal benefits of a strategic plan is the team-building and development of a shared management perspective that emerge from the *process* of developing a strategic plan. For this reason, the EWRA is recommended to view the present document as a starting point to launch its own strategic planning process soon after the Board of Directors is appointed.

A. Mission

The EWRA's mission is to develop and enforce standards for the quality, costs, and pricing of water and wastewater utility services throughout Egypt as a means to ensuring the sustainability and expansion of the service delivery system.

B. Vision

Within five years of its establishment, EWRA will be a fully functioning public authority, with all management and operational systems, procedures, and staff in place and tested. Within 10 years of its establishment, EWRA will be an internationally recognized leader in facilitating, promoting, and ensuring the availability of safe, reliable, affordable, and environmentally sound water and wastewater services.

C. Goals

Pursuant to the draft Presidential Decree, the goals of the agency are:

- To enable and encourage utilities to achieve a higher level of performance
- To enable and encourage utilities to achieve a higher level of cost recovery
- To enhance the capacity of the water/wastewater sector for self-finance

The municipal water/wastewater sector in Egypt is undergoing a process of transformation from a system in which agencies of government serve as owner-operators of utilities to one in

which utilities are operated and managed as regulated commercial entities authorized to provide public utility services. This shift is intended to promote the emergence of competitive utility service providers that are less dependent on government assistance and more dependent on customer satisfaction and good management. The regulatory agency is the prime mover of this transformation process. In order to play this role effectively, the agency will have to establish itself as a credible regulatory body. Accordingly, a fourth goal to this end is included in this plan.

D. The Initial Situation

This section reviews relevant sector conditions at the point of the EWRA's establishment and initial operations. Some of these conditions represent trends and forces that EWRA can harness to support achievement of its mission. Others represent challenges to be overcome.

D1. Potential Sources of Opportunity and Strength

D1a. Demand for Better Service

A growing and increasingly educated population is making demands for expanded and better service. The regulator can find broad popular support for its efforts to improve the quality of service. The government, for its part, has understood that increased internal income generation by utilities and increased use of market-based financing approaches are necessary to satisfy the growth in demand.

D1b. Breadth of EWRA Mandate

The EWRA founding legislation charges the agency with comprehensive regulation of the sector, covering technical, economic, and financial aspects. The scope of EWRA's mandate has not been limited to technical or financial regulation.

D1c. Emergence of Private Sector Water Industry

Conditions for the introduction of the private sector into water sector management and investment are good. Local private engineering capacity and interest are growing, international water companies are eager to enter new markets, and capital markets worldwide are eager for investments that promise a reliable stream of dividends. Provided that private sector involvement is properly structured, procured, and regulated, there is every reason that it will improve and expand service. The regulator can expect to share in the credit for these achievements.

D2. Potential Threats and Weaknesses

D2a. Historical Dominance of the Technocentric Paradigm in Sector Development

As in most countries, the early history of Egypt's water/wastewater sector development and management has been dominated by engineering perspectives. While engineering is, of course, an essential discipline in the water sector, the dominance of technological perspectives and the absence of economic and financial perspectives has led to investment without regard for the ability, or willingness, of customers to pay for service. Part of the regulator's mission is to establish a more integrated approach to sector development and management.

D2b. Popular Attitudes Toward Payment for Service

Although little systematic research on people's ability and willingness to pay for service has been conducted, the common view of government and utility officials is that the population is unwilling to pay the costs of service. Certainly people are unlikely to be willing to pay more for unreliable service. In any case, it may be true that citizens at large have been led to expect subsidized utility service. This is partly a result of the lack of attention paid to economic and financial aspects of the sector, as discussed above. In fact, people value what is costly more than what is inexpensive. Higher prices are a way to increase popular pressure on utilities to improve the quality and efficiency of service.

D2c. Imbalance Between Utility Rights and Responsibilities

For their part, Egypt's water authorities and companies do not have all the legal and administrative powers needed to carry out their mandates to perform as financially self-sufficient organizations, for they have limits on their powers to control costs and increase revenues. In fulfilling its objectives of promoting utility financial viability, the regulator is likely to be thrust into the role of advocate of increased utility autonomy in the face of various central and local authorities. While this is a challenge, it is also likely to win some utility support for the regulatory agency.

D2d. Private Sector Sophistication

As noted above, private sector participation holds the potential for great progress in the sector. Nevertheless, such participation must be carefully regulated, as the private sector is sophisticated and experienced in these matters and can afford to hire lawyers, financial advisors, and accountants who may seek to pass an undue share of risk to government and customers. To counteract this threat, the regulatory agency should be staffed with highly qualified, committed, and well-paid personnel whose skills and knowledge can be supplemented as necessary by contracting certain functions or assignments out to private sector firms or specialists unrelated to the regulated entities.

E. Success Factors

In view of EWRA's mission, goals, and initial situation, the following strategies are likely to contribute to the agency's success.

E1. Support of Executive Authorities

The regulatory agency was established as the highest Government of Egypt (GOE) authority in matters concerning the performance of providers of water and wastewater service to the public. Because the agency is new and its mission unique in the sector, its leadership should work zealously to maintain the powers and prerogatives of the agency and to expand these powers insofar as expansion of authority enables it to move quickly and effectively to transform the sector. This will require the agency's leadership to keep higher authorities regularly appraised of progress and constraints in achieving the agency's objectives as well as the broader objectives of sector reform.

E2. Management of Intra-Governmental Relations

The introduction of a new organization into a pre-existing set of organizations always creates frictions and uncertainties until the appropriate accommodations in role and responsibility have been achieved. To ensure that these accommodations are made in an atmosphere of trust and mutual understanding, it is advisable for the agency to pro-actively educate several ministries, as well as the governors, on the agency's objectives, perspectives, powers, and responsibilities.

E3. Effective Decision-Making

The Board of Directors is composed of governmental and nongovernmental members. This mixture is somewhat unusual in the government context. The relations between governmental and nongovernmental members should be characterized by respect for the complementary knowledge and perspectives each member brings to the decision-making process. A good internal Board dynamic is crucial to developing progressive and sensible policies and providing clear direction to agency managers and staff.

E4. Staff Selection and Development

Agency staff should be highly qualified, committed to agency objectives, and well remunerated. Moreover, they must be prepared to continuously advance their knowledge and skills. "Best practice" in utility regulation is constantly evolving. This reflects the diversity of situations with which regulators in different countries are confronted and the emergence of new arrangements for service delivery, as well as new technologies (for both service delivery and regulatory work), *et cetera*. Regulatory agency managerial personnel must have a firm grasp of the objectives and principles of regulation, as well as the conceptual agility to apply the principles of their disciplines to the field of utility regulation. Staff should be encouraged to broaden their knowledge by exploring the resources available on the Internet and from professional regulatory associations worldwide. This research, which should be shared throughout the organization, should be supplemented by technical training in specialized areas and general skills such as the design of spreadsheets and databases.

E5. Balancing Consistency and Flexibility in Systems Design

All the systems by which the agency regulates the utilities are related to one of two broad regulatory functions: tariff setting, and the monitoring and enforcement of standards. These systems should be designed to reflect Board policies regarding goals and expectations of levels of improvement in the areas of quality of service, efficiency improvement, cost recovery, and sector restructuring. However, the utilities are at different levels of performance and accountability. The availability and quality of data in particular is variable. Therefore, a principal challenge facing EWRA is to develop systems that reflect a single set of policy objectives, but are flexible enough to be customized to each utility's capacity to respond to system data and analysis requirements.

E6. Perceived Independence

The perceived independence of the regulatory body from political influence is critical to assuring private investors of a fair chance to earn a reasonable return on invested capital. It also indicates to customers that the regulator protects their interests. The independence of the

regulator will be judged by all parties in terms of the perceived fairness of its decisions. Several factors are critical in establishing a reputation for fairness, including:

- Well-reasoned, consistent, and well-documented decisions
- Effective communications with interested parties and the general public to explain the reasoning behind decisions
- Consistent policies and transparent procedures
- Diversification of funding sources to prevent dependency on one source

E7. Customer Orientation

Customers are the intended beneficiaries of regulation. They are also the ones who ultimately pay the costs of regulation through taxes, tariffs, *et cetera*. This has several implications for the agency. First, the agency should be managed and operated in a cost-conscious manner. Second, the agency must pro-actively educate the public as to what the agency does and how regulation benefits the public. Customers may need at first to be persuaded that higher tariffs will lead to improved services. Ultimately, the costs of regulation must be justified through improvement in service.

E8. Use of Outsourcing

Any organization will confront routine or special tasks that are, for one reason or another, better contracted out than done in-house. Reasons may include the difficulty of hiring persons with the necessary knowledge, experience, and skills, requirements for equipment that the organization does not need to own on a long-term basis, the lower cost of contract services, *et cetera*. Outsourcing need not entail loss of control over the work process or result, provided that what is expected of the contractor is well-defined, the contracting process has been carried out properly, and the contractor's work is supervised.

F. EWRA's Authority to Effectuate Change in the Water/Wastewater Sector

The draft Presidential Decree provides the EWRA with several "levers" with which to influence the behavior and performance of utilities. They include:

- Regular reviews and approvals of changes to utility tariffs
- Regular reporting from utilities comparing actual to planned performance
- Review and approval of standard contracts executed between utilities and their customers
- Review of major projects planned by utilities
- The authority to impose penalties on utilities for violation of performance standards
- Determining the procedural and executive steps necessary for initiating the transformation of Public Economic Authorities (PEAs) and utilities working in the sector into joint-stock companies

G. Key Objectives, Strategies, Measures, and Actions

G1. Goal 1: Establish the Credibility of the EWRA as a Regulatory Agency

Strategies:

- Influence the development of sound public policy by participating in local, governorate, and national forums and inter-agency working groups concerning issues affecting water/wastewater utilities
- Establish channels of communication with all stakeholders and use these channels regularly to stay informed, respond to requests and inquiries, and express agency positions
- Become a valued source of information to decision-makers and the public
- Exercise the powers granted to the agency under the draft Decree to carry out its duties, and seek authority that would help the EWRA attain the goals of the Decree where the agency does not presently have the authority

Measures (to determine if goal is met):

- Completion of the action steps for all goals within established timeframes
- Stakeholder survey of the effectiveness of the EWRA

Action Steps (required to attain goal):

1. Adopt the EWRA organizational plan (Month 3)
2. Develop a tentative five-year staffing plan (Month 4)
3. Adopt a tentative five-year budget (Month 6)
4. Recruit staff (Month 11)
5. Provide initial orientation to the EWRA staff on the EWRA's Mission and Strategic Plan (Month 12)
6. Provide technical training to the EWRA staff consistent with their positions in the organization (Month 14)
7. Prepare and obtain approval of internal regulations that promote sound agency personnel and financial management practices (Month 19)
8. Prepare and obtain approval of executive regulations that provide the legal basis for the agency to both reward and sanction utilities (Month 21)
9. Make an annual report to the Minister on regulatory achievements, policy issues, and constraints to better water/wastewater service delivery (Beginning Month 23)

10. Provide ongoing training and professional development as needed, continually assessing the skills, interests, and abilities of EWRA employees to match the needs of the agency. Make assignments and structure job units to best utilize existing resources and agency goals. (Month 12 and ongoing)

11. Implement Internet-enabled computer applications to improve access to information for EWRA staff and the public, including customer contact information, annual report information, and case information (Month 23)

12. Conduct comprehensive workforce and vacancy reviews and ensure that positions and other resources are deployed where most needed (Beginning Month 23 and annually on June 30 thereafter)

13. Establish an agency intranet site for more efficient communication of internal agency information and for workgroup collaboration (Month 35)

14. Evaluate EWRA authority and recommend enhancements as needed (Month 47)

G2. Goal 2: Enable and Encourage Utilities to Achieve a Higher Level of Performance

Strategies:

- Develop systems and procedures that compel utilities to provide regular and reliable information on key performance indicators
- Involve customers in monitoring the quality of utility service
- Develop a system of warnings, penalties, and sanctions to apply to utility managements whose utilities consistently fall short of achieving performance targets

Measures (to determine if goal met):

- Percentage of households with water/wastewater service
- Number and duration of unplanned service interruptions
- Percentage of water customers with functioning meters
- Percentage of households receiving service within X days of requesting it

Action Steps (required to attain goal):

1. Identify key quality-of-service performance indicators for water and wastewater utilities (Month 3)
2. Collect this data from all water and wastewater utilities in Egypt (Month 9)
3. From the data collected and assessment of exogenous variables, develop a set of performance benchmarks (Month 11)

4. Draft regulations regarding types and application of sanctions for utility under-performance, and obtain Board approval (Month 13)

5. Design performance monitoring and reporting procedures (Month 13)

6. Develop performance monitoring plans (Month 15)

7. Disseminate the performance monitoring plans and methodology to utilities (Month 17)

8. Follow-up implementation of the reporting system (starting Month 18)

9. Develop and publicize Internet- and phone-based systems for customer reporting of service problems, and develop techniques for analysis and investigation of complaints (Month 20)

G3. Goal 3: Enable/Encourage Utilities to Achieve a Higher Level of Cost Recovery

Strategies:

- Base the rate level that a utility receives on the *assumption* that the performance levels planned for a given year will be met. Hence, revenue requirements and any rate increase that might be authorized could be based upon imputed revenues and/or a level of expenses that the EWRA considers reasonable. This would serve as both an incentive for a higher level of performance as well as a sanction in that if, for example, revenue-enhancing performance targets were not met, rates would not be increased commensurately to make up the difference.

- Require certain efficiency improvements to be made in utility operations

- Authorize rate increases as a supplement to efficiency improvements

Measures (to determine if goal met):

- Number of utilities that have submitted tariff studies to EWRA

- Percentage of cost recovery in utilities with adjusted tariffs

Action Steps (required to attain goal):

1. Develop the agency's general policies regarding allowable revenue requirements and expectations regarding efficiency improvements, affordability, level of cost recovery, and rates design (Month 5)

2. Develop tariff-setting models, field-test them in selected utilities, and revise the models as appropriate. Prepare guidelines and instructions for utilities. (Month 17)

3. Select first series of utilities for annual tariff reviews. Train and assist pilot utilities in rate case preparation. (completed in Month 17)

4. Hold first series of Board rate case reviews (completed in Month 20)

5. Evaluate policies, procedures, and models, and revise as necessary (completed in Month 23)

6. Initiate second series of annual tariff reviews (started in Month 24)

G4. Goal 4: Enhance the Capacity of the Water/Wastewater Sector for Self-Finance

Strategies:

- Implement the tariff rate adjustment system to increase levels of current cost recovery
- Act as advocate for increased managerial and financial autonomy of utility managers
- Conduct economic feasibility assessments on large projects to ensure that capital resources are allocated efficiently and the utilities do not jeopardize their financial positions
- Support debt restructuring as an aid to utilities' self-financing goals
- Support the creation of private joint-stock utility companies in the water/wastewater sector
- Create an environment that encourages private sector participation in the sector

Measures (to determine if goal met):

- The number of utilities attaining the level of self-financing ratio articulated in their business plans (Self-Financing Ratio = net income divided by the average capital expenditures for three years [previous, current, and projected years])
- The percentage of utility capital expansion projects that have been at least partially self-financed
- The number of utilities attaining the debt service coverage ratios that have been established in their rate reviews
- The number of joint-stock utilities created
- The percentage of capital invested in water and wastewater utility systems in each year by new joint-stock utilities

Action Steps (required to attain goal):

1. Prepare a report on legal and administrative constraints to managerial and financial autonomy of government-owned utility managers, including estimates of the tariff implications of increased autonomy. Sponsor a workshop for concerned

central authorities to agree on strategies to enable and compel more commercialized utility management. (Month 14)

2. Prepare a report and recommendations on legal and administrative requirements and regulatory conditions for restructuring public utility debt (Month 38)

3. Prepare a report and recommendations on legal and administrative requirements and regulatory conditions for restructuring qualified public water/wastewater authorities into companies (Month 50)

4. Develop policies and regulations regarding tariff rate adjustments for private providers, and make these materials available to interested parties (Month 14)

SECTION III

EWRA Organization Plan and Functional Descriptions

A. Mandate

The Egyptian Water/Wastewater Sector Regulatory Agency (EWRA) is the supreme GOE authority on the regulation of the quality, cost, and price of water and wastewater utility services in Egypt. Its mandate extends to governmental and private service providers and to governmental agencies responsible for water and wastewater service provision at the central and local levels. In fulfilling its mandate, the EWRA will comply with all GOE laws.

B. Mission

The EWRA's mission is to develop and enforce standards for the quality, costs, and pricing of water and wastewater utility services throughout Egypt as a means to ensuring reliable, sustainable service and expansion of the service delivery system.

C. Functions

The statutory responsibilities of the EWRA are to:

1. Develop criteria for utility technical, economic, and financial performance; determine the procedures and periodicities of reports submitted by entities working in the sector; and control and audit procedures by the agency

2. Provide technical assistance to the utilities in terms of preparation of studies on the basis of which target performance levels are determined

3. Set principles and controls for preparing cost studies; tariff setting and procedures for submission and evaluation of tariff adjustment applications; and send the same to the economic authorities and companies for preparation of tariff proposals

4. Examine, review, and approve tariff adjustment applications submitted by water/wastewater utilities; and determine the economic cost of service at the level of each utility

5. Review and approve five-year plans prepared by each utility, which shall specify the annual target percentage of cost recovery

6. Review and approve wording of standard contracts and agreements which structure the reciprocal relationships between service providers and customers

7. Monitor compliance of utilities with target technical, economic, and financial performance criteria mentioned in Item 1 above; and with the application of their respective tariff schedules as approved by the agency

8. Review the financial and economic feasibility of new projects to evaluate expected impacts on the cost and price of the water and wastewater service delivery

9. Issue required operating licenses for water and wastewater facilities

10. Determine procedural and executive steps necessary for initiating the transformation of Public Economic Authorities (PEAs) and companies working in the sector into joint-stock companies

D. Organizational Form and Affiliation

The EWRA is constituted as an independent juridical entity of the public economic authority forum. The EWRA is affiliated with the Minister of Housing, Utilities, and New Urban Communities in his capacity as the designate of the President of the Arab Republic of Egypt (ARE) for the planning and control of water and wastewater sector development in Egypt. In this capacity, the Minister serves as Chairman of the EWRA Board.

An Executive Director, who holds the rank of First Undersecretary, manages the agency.

E. Organizational Structure

The basic organizational units of the EWRA are:

- Office of the EWRA Executive Director
- Central Department for Tariffs, which comprises:
  - General Department for Economic Regulation
  - General Department for Rates Analysis
- Central Department for Standards and Compliance, which comprises:
  - General Department for Standards and Monitoring
  - General Department for Customer Affairs
  - General Department for Legal Affairs
- General Department for Finance and Administrative Affairs

The functional responsibilities for these units and their sub-units are set out in the following sections.

F. Office of the EWRA Executive Director

The office of the Executive Director provides technical support to the Executive Director in agency-wide matters, and administrative support in the Director's dealings with external authorities.

F1. Secretariat of the Executive Director

Functions:

- Maintain minutes of all EWRA board meetings and archive of all Board agendas, presentation materials, and decisions
- Assist the Executive Director in collection and review of material prepared by agency staff for presentation to the Board, upon the Executive Director's approval
- Maintain a file of issues requiring board decisions and of board decisions requiring agency action

F2. Planning and Monitoring Department

Functions:

- Assist the Executive Director in preparing the agency's strategic plan and annual work plans
- Prepare quarterly and annual progress reports
- Keep minutes of all meetings of central department heads and other intra-agency meetings as requested by the Executive Director
- Follow-up implementation of recommendations and intra-agency orders as requested by the Executive Director

F3. Department for Public Relations

Functions:

- Maintain archive and pending issues files on agency plans, decisions, and investigations pertaining to each utility
- Serve as the focal point for agency communications with utility managers

F4. Information Center

Functions:

- Provide technical assistance to the central departments in the design of databases, spreadsheets, and data collection instruments to ensure their suitability for computerization
- Ensure integration of the agency's computerized information systems
- Promote the development of computer use skills by agency staff
- Participate in computer system procurement and computer service contracting committees

G. Central Department for Tariffs

The Central Department for Tariffs provides expert assistance to the head of the regulatory agency on the costing and pricing of utility services.

The Central Department for Tariffs' principal functions are to:

- Prepare criteria for accepting requests for tariff adjustments from private utility service providers, criteria for prioritizing government-owned utilities for tariff reviews, and criteria for requiring price review of private providers
- Set the methods of cost analysis, price review, and rates design, and inform regulated entities of these methods
- Follow up the process of tariffs study submission and prepare draft final determinations for review by the agency's Executive Director
- Conduct special cost and rates studies and research into regulatory topics of national importance
- Coordinate with the Central Department for Standards and Compliance to ensure that utilities comply with the cost and price determinations of the agency

G1. General Department for Economic Regulation

The General Department for Economic Regulation is responsible for the determination of utilities' revenue requirements or price limits. The general department (GD) designs the agency's approaches to the economic regulation of service providers and provides the agency's draft determinations of utility revenue requirements or price limits (depending on the mode of regulation applicable to the utility). In setting cost levels for utility services, the GD performs comparative and case-specific operational and financial analyses of projects and utility systems. Additionally, the GD/Economic Regulation collects and analyzes data for use in the projection of trends on matters such as general economic conditions, price indices, and productivity, and for assessment of required rates of return where applicable. This GD also conducts special studies regarding the economic status of utilities in the water and wastewater sectors. The General Department for Economic Regulation is responsible for the determination of utilities' revenue requirements or price limits.

The General Department for Economic Regulation's chief functions are to:

- Suggest the most appropriate methods of economic and financial regulation of a utility (cash needs, rate of return, price cap, *et cetera*)
- Prepare the methods and tools of determining a utility's actual and planned costs of service and follow up preparation of required studies and plans
- Prepare the draft final determinations of revenue requirements or price limits in rate cases
- Conduct research and special studies on economic regulatory topics of national importance

A General Manager heads GD/Economic Regulation. The GD has two departments: operations analysis and investment analysis.

G1a. Department for Operations Analysis

Duties include conducting special studies regarding state-of-the-art/best practices in operational efficiencies in the water and wastewater sectors. The department identifies the historical costs of utility service and develops techniques for cost projection. The department develops efficiency improvement targets for individual utilities and identifies cost determinants beyond the control of utility managements. In addition to theoretical and comparative research on utility economic performance, the department collects and analyzes data on relevant national and regional trends related to the costs of operational inputs, *et cetera*.

G1a1. Water Supply Operations Section

Functions:

- Review and evaluation of historical operations and maintenance (O&M) costs relative to a utility's level of service delivery and physical assets
- Development of guidelines on O&M cost projections and review of cost projections submitted by utilities
- Recommendation of efficiency improvement targets for utilities

G1a2. Wastewater Service Operations Section

Functions:

- Review and evaluation of historical O&M costs relative to a utility's level of service delivery and physical assets
- Development of guidelines on O&M cost projections and review of cost projections submitted by utilities
- Recommendation of efficiency improvement targets for utilities

G1a3. Utility Commercial Operations Section

Functions:

- Evaluation of collection efficiency of regulated utilities
- Evaluation of metering programs of regulated utilities
- Evaluation of efficiency improvements proposed by regulated utilities

G1b. Department for Investment Analysis

The department is responsible for review of large project proposals with respect to the likely impact of the proposed investments on the utility's overall costs and revenue requirements.

G1b1. Technical Feasibility Review Section

Functions:

- Technical evaluation of new projects to assess the quality of demand assumptions, the appropriateness of proposed technologies, and engineering cost estimates

G1b2. Economic Feasibility Review Section

Functions:

- Review of cost estimates and economic feasibility of proposed large new projects
- Evaluation of impacts of proposed projects on the utility's overall costs
- Analysis of interrelationship of economic factors influencing the national economy and specific regional areas
- Interpretation and translation of economic trends (e.g., rural to urban migration, housing, employment, land use needs, *et cetera*) as they relate to demand forecasting and investment planning
- Conducting in-depth studies of specific markets, industries, and regions, with reference to changes in water resource/wastewater service demands

G1b3. Financial Feasibility Review Section

Functions:

- Review new projects for financial feasibility and price impacts
- Review new projects in terms of the financial effects of subsidies; tax policies; population trends; employment and income; availability of water resources, both short-range and long-range in the aggregate and in particular impact areas

G2. General Department for Rates Analysis

The General Department for Rates Analysis is responsible for assisting utilities in the design of appropriate service charges and tariff rate structures to recover approved revenue requirements.

The general department's principal functions are to:

- Prepare policy analyses for the agency on the objectives and methods of service pricing and on local and foreign "lessons learned" in rate design
- Advise the agency on technical matters in customer type classification and customer block setting
- Prepare the methods and tools needed to develop systems of charges and specific tariff rate structures
- Assist utilities in preparing rate designs and prepare rate design evaluation reports for review by the head of GD/Tariffs

A General Manager heads GD/Rates Analysis. The GD has two departments: cost of service analysis and rate design.

G2a. Department for Cost-of-Service Analysis

This department develops data requirements and analytical methods for determining differences in utility costs-to-serve types of customers with different patterns of demand.

G2a1. Water Cost-of-Service Analysis Section

Functions:

- Develop functional cost classifications and methods of cost allocation
- Work with water utilities in establishing cost-based tariff rates
- Review and approve cost-of-service studies performed by water utilities

G2a2. Wastewater Cost-of-Service Analysis Section

Functions:

- Develop functional cost classifications and methods of cost allocation
- Work with water utilities in establishing cost-based tariff rates
- Review and approve cost-of-service studies performed by wastewater utilities

G2b. Department for Rate Design

This department is responsible for providing guidance to utilities on the selection and development of appropriate tariff rate structures and for evaluating the rate designs submitted by water and wastewater utilities against criteria recommended by it and approved by the Executive Director.

G2b1. Water Rates Design Section

Functions:

- Prepare and disseminate general guidance to utilities on types of service charge and tariff rate structure, and on the conditions under which the various types and structures are appropriate
- Review and conduct research relevant to the assessment of the ability and willingness of various types of users to pay for service
- Review and conduct studies on the impacts of price changes on service usage
- Assist utilities in rates design and modeling
- Review the rates designs submitted by utilities

G2b2. Wastewater Rates Design Section

Functions:

- Prepare and disseminate general guidance to utilities on types of service charge and tariff rate structures, and on the conditions under which the various types and structures are appropriate
- Review and conduct research relevant to the assessment of the ability and willingness of various types of users to pay for service
- Review and conduct studies on the impacts of price changes on service usage
- Assist utilities in rates design and modeling
- Review the rates designs submitted by utilities

H. Central Department for Standards and Compliance

The Central Department for Standards and Compliance is responsible for monitoring and enforcing the compliance of public and private water/wastewater service providers with GOE service standards. The central department uses a variety of means to achieve this purpose, including the publication of standards, the development of reporting systems, the involvement of customers in service monitoring, and the development of contractual and other legal mechanisms for establishing and enforcing rights and responsibilities between service providers and beneficiaries. The Central Department for Standards and Compliance also coordinates with the Central Department for Tariffs to ensure that utility compliance with performance targets set out in the course of rate adjustments is monitored and enforced.

The principal functions of the Central Department for Standards and Compliance are to:

- Issue public health and environmental health performance standards to all service providers, and develop standards for service reliability and customer service
- Develop and disseminate regulatory accounting guidelines to facilitate the determination of revenue requirements and costs of service, and to compare the economic and financial performance of service providers with their performance commitments
- Develop reporting quality assurance standards and reporting formats, review reports submitted by service providers, and maintain a database on utility performance
- Develop guidelines regarding the content and enforcement of standard customer service agreements, and review the customer contracts prepared by utilities
- Receive and classify customer complaints and comments on utility service and conduct investigations of serious shortcomings in utility performance
- Review all existing and proposed utility service charges from the standpoints of legality and fairness
- Review existing and proposed contracts related to the provision of basic utility service by one utility or service provider to another from the standpoints of legality, customer protection, and best practices in risk allocation
- Develop and implement effective systems of dispute resolution between service providers and beneficiaries
- Develop and implement effective systems of penalties for persistent violations by service providers of regulatory and contractual agreements
- Provide legal review of agency initiatives and decisions
- Provide legal expertise in matters in which the agency is involved in legislative or judicial processes

H1. General Department for Standards and Monitoring

The General Department for Standards and Monitoring is responsible for the development, publication, and monitoring of performance standards for service providers. Standards relate to the operational performance and operational performance measurement and reporting and to utility accounts design and reporting.

A General Manager heads GD/Standards and Monitoring. The GD has two departments: technical standards and monitoring, and accounting standards and monitoring.

H1a. Department for Technical Standards and Monitoring

This department is responsible for the establishment of standards of performance with which utilities must comply. It also monitors the technical performance of utilities, including their Key Performance Indicators (KPIs). It establishes systems and inspection procedures and protocols, and prescribes the frequency and methodology to be used in those inspections. The department prescribes reporting requirements and schedules for utilities to ensure compliance with water and wastewater standards established by the appropriate line ministry. It reviews utility compliance with the service improvement commitments set out in the approved utility business plan. In addition, the department sets benchmarks for utilities on frequency of inspection, frequency and duration of outages due to pipe and main bursts, and response and repair time.

H1a1. Technical Standards Section

Functions:

- Collect and maintain a library of GOE public health and environmental health standards and regulations
- Develop utility operational performance standards related to product quality, service quality, and reliability in all utility functional areas, and define standards for performance measurement and reporting
- Develop utility performance monitoring report formats

H1a2. Technical Compliance Monitoring Section

Functions:

- Train utility managers in EWRA performance monitoring and reporting requirements
- Receive and review periodic utility performance monitoring reports
- Prepare an annual report on utility service delivery performance and on levels of utility compliance with EWRA performance measurement and reporting standards
- Assist the utilities in developing compliance plans

H1b. Department for Accounting Standards and Compliance

This department is concerned with ensuring that water and wastewater utilities follow the prescribed chart of accounts and appropriate accounting procedures. It will assist the utilities in complying by providing manuals and training. The department will also be responsible for preparing annual reports on utility compliance with these standards.

H1b1. Accounting Standards Section

Functions:

- Develop chart of utility regulatory accounts and regulatory accounting manuals

H1b2. Accounts Monitoring Section

Functions:

- Train utilities in regulatory accounting requirements
- Receive and review periodic utility accounts
- Prepare an annual report on utility accounting compliance
- Assist utilities in developing accounting compliance plans

H2. General Department for Customer Affairs

The General Department for Customer Affairs is the primary point of contact for customers of the water and wastewater utilities. It seeks to resolve problems or disputes that were unable to be resolved by direct contact between the customer and the utility. It is also the department primarily responsible for explaining the role and function of the EWRA to the public. Finally, it has input into rate review matters in that it would generally have a member on the team analyzing a request for a rate change.

A General Manager heads GD/Customer Affairs. The GD has two departments, one for complaints reporting and follow-up, and the other for public information.

H2a. Department for Complaints Reporting and Follow-Up

This department develops and installs systems for recording customer views and concerns, including complaints about service delivery, billing and collection, response to problems about poor water quality, low pressure, outages, or other matters. It is responsible for coordinating customer issues and complaints with responsible utility officials, as well as monitoring and evaluating programs of utilities for responding to and effectively dealing with customer complaints and ensuring their timely and appropriate resolution.

H2a1. Complaints Receiving and Classification Section

Functions:

- Develop and install systems for recording customer views and concerns, including complaints about service delivery, billing and collection, response to problems about poor water quality, low pressure, and outages. System should include complaints received by EWRA as well as complaints received and resolved by the utility. This system should also include ultimate disposition of complaints.
- Produce annual report on each utility describing and categorizing complaint history for previous year
- Provide EWRA management with reports on trends in utility service and complaints
- Evaluate utility complaint handling/resolution procedures
- Recommend sanctions against a particular utility for chronic non-compliance with EWRA rules
- Provide testimony or reports to Board through the Executive Director

H2a2. Complaints Investigation Section

Functions:

- Receive individual customer complaints about any of the above matters, and seek to resolve the complaints through contact with the utility, mediation, or other means
- Establish liaison with similar department in the regulated utility for resolving customer issues and complaints
- Ensure timely resolution of complaints by utility
- Recommend sanctions for egregious violations of EWRA standards
- Provide testimony or reports to the Board through the Executive Director on specific cases

H2b. Department for Public Information

This department provides the basic public relations function for the EWRA, including the design and conduct of a public awareness program on the agency and its functions.

H2b1. Communications Section

Functions:

- Development of brochures and similar collateral material describing the function of the EWRA
- Development of brochures and similar collateral materials describing how utility customers can avail themselves of EWRA services

H2b2. *Media Section*

Functions:

- Planning, design, supervision, and evaluation of public awareness programs on regulatory matters of concern to the general public, specific target audiences, or agencies of government, as identified by the Head of GD/Customer Affairs
- Identification, recruitment, and participation in selection of communications tools and service providers to support awareness/education programs
- Develop and maintain Web site

H3. General Department for Legal Affairs

The General Department for Legal Affairs advises the Executive Director and all EWRA general departments on legal matters across all fields of the agency's activities, including but not restricted to the determination of revenue requirements, types and levels of service charges, and the setting and enforcement of standards. It prepares advisory opinions and represents the EWRA in any legal proceeding in which it is a party or friend of the court. The GD/Legal Affairs decides whether to proceed, and directs any appeal by the EWRA against any adverse ruling or decision by a court of competent jurisdiction. It also recommends appropriate amendments or new legislation or draft decrees as required.

This general department is responsible for the form and final approval of operating licenses issued to regulated utilities and for alternative dispute resolution between a customer and a utility.

The General Department/Legal Affairs also reviews both the form and substance of contracts between customers and utilities, and prepares recommendations to the Executive Director on sanctions or penalties.

A General Manager heads GD/Legal Affairs. The GD has three departments: licensing and dispute resolution; customer contracts and penalties; and legal opinion.

H3a. Department for Licensing and Dispute Resolution

Functions:

- Develop format for operating licenses
- Issue operating licenses to water and wastewater utilities upon recommendation of GD/Compliance
- Involved in disputes that cannot be resolved by the GD/Customer Affairs
- Develop alternative dispute resolution procedures

H3b. Department for Customer Contracts and Penalties

Functions:

- Develop guidelines for standard contracts between customers and utilities
- Review customer contracts prepared by utilities
- Develop, in conjunction with operating GD, special contracts as needed for presentation to the Board for approval
- Draft penalties/sanctions for review by the head of the GD

H3c. Department of Legal Opinion

Functions:

- Review all draft and draft final official guidelines and decisions to be issued by the agency from the standpoint of conformity to GOE administrative and commercial law
- Provide advice on general matters of law to Executive Director and GDs
- Prepare advisory opinions and represent the EWRA in any legal proceeding in which it is a party or friend of the court
- Recommend amendments or new legislation or draft decrees, such as amendments removing legal or administrative constraints to improved performance by public utilities or removing unnecessary constraints and risks to private sector participation

I. General Department for Finance and Administration

The General Department for Finance and Administration is responsible for the planning, organizing, and directing of administrative and financial services within the EWRA. This GD generally provides the services that support the EWRA, including the establishment and enforcement of administrative policies and procedures.

A General Manager heads the GD/Finance and Administration. The GD has two departments: a department for financial affairs, and a department for administrative affairs.

I1. Department for Financial Affairs

This department prepares and administers the annual budget for the Executive Director's consideration, and administers the budget after approval by the Board. It directs purchasing activities; supervises and supports the Executive Director in the conduct of managerial studies as directed; establishes priorities and goals; enforces administrative policies and procedures; and supervises subordinate budget and administrative staff.

I1a. Budget Section

Functions:

- Prepare annual budget for Executive Director's consideration
- Responsible for budget allocation among operating GDs
- Responsible for overall budget control

I1b. Accounts Section

Functions:

- Prepare monthly budget status reports for the Executive Director
- Ensure collection of amounts due from utilities and other debtors
- Ensure timely payment to vendors

I1c. Payments and Receipts Section

Functions:

- Maintain records on accounts receivable and accounts payable
- Maintain financial archives

I2. Department for Administrative Affairs

This department plans, organizes, and directs administrative and staff services for the EWRA. Through its sections, it develops staff professional development programs, administers personnel matters, and manages the procurement and contracting function for the agency.

I2a. Logistics Section

Functions:

- Arrange for physical and material needs of the EWRA
- Administer travel arrangements, including purchase and issuance of ticket and distribution of travel advances and reimbursement
- Develop forms and procedures

I2b. Training Section

Functions:

- Develop in-house training programs for staff
- Coordinate outside training for staff
- Prepare and/or arrange for training materials
- Arrange training venue

I2c. Personnel Affairs Section

Functions:

- Develop job descriptions
- Investigate alleged infractions of policies and procedures
- Approve any personnel actions recommended by operating GDs
- Maintain payroll

I2d. Procurement and Contracting Section

Functions:

- Establish purchasing policies and procedures
- Approve purchases consistent with policies
- Administer contracts with service providers and vendors

Job Descriptions

EXECUTIVE DIRECTOR (FIRST UNDERSECRETARY)

Manager, Planning and Monitoring Department
Manager, Public Relations Department
Manager, Information Center
Manager, Secretariat of the Executive Director

Head, Central Department for Tariffs (Undersecretary)

General Manager for Economic Regulation
Manager, Operations Analysis Department
Manager, Investment Analysis Department

General Manager for Rates Analysis
Manager, Cost-of-Service Analysis Department
Manager, Rates Design Department

Head, Central Department for Standards and Compliance (Undersecretary)

General Manager for Standards and Monitoring
Manager, Technical Standards and Monitoring Department
Manager, Accounting Standards and Monitoring Department

General Manager for Customer Affairs
Manager, Complaints Reporting and Follow-up Department
Manager, Public Information Department

General Manager for Legal Affairs Department
Manager, Licensing and Dispute Resolution Department
Manager, Customer Contracts and Penalties Department
Manager, Legal Opinion Department

General Manager for Finance and Administration
Manager, Financial Affairs Department
Manager, Administrative Affairs Department

POSITION: EXECUTIVE DIRECTOR

Rank: First Undersecretary

Statement of Role

The Executive Director is appointed to lead, direct, oversee and ensure the smooth, effective, and efficient implementation of the agency's mandate.

Tasks

- Establish policies and standards for the effective and efficient operation of the agency
- Establish a policy framework for tariff-setting and other related issues
- Create sub-regional offices and other service units as necessary
- Exercise control and supervision over all officers, personnel and units of the agency
- Reorganize the agency as necessary for more efficient and effective implementation of its goals and objectives
- Review and approve five-year cost recovery plans prepared by each utility
- Review the financial and economic feasibility of new projects to evaluate expected impacts
- Determine procedural and executive steps necessary for initiating the transformation of PEAs and companies working in the sector into joint-stock companies
- Examine, review and approve tariff adjustment applications
- Perform such other functions as may be deemed necessary and proper to attain the objectives of the agency

Qualifications

- Must be a citizen and resident of Egypt
- Master's degree and proven competence in any of the following fields:
  - Water or utility economics
  - Public administration or management
  - Engineering
  - Law

POSITION: MANAGER, PLANNING AND MONITORING DEPARTMENT

Rank: Manager

Statement of Role

This position, which is under the Office of the EWRA Executive Director, is responsible for assisting the Executive Director in planning, coordinating and monitoring agency activities.

Tasks

- Assist the Executive Director to prepare the agency's strategic plan and annual work plans
- Keep minutes of all meetings of central department heads and other intra-agency meetings as requested by the Executive Director
- Follow-up implementation of recommendations and intra-agency orders as requested by the Executive Director
- Prepare letters, memoranda, reports, and assist in preparing agenda and related material for meetings

Qualifications

- Bachelor's degree in business administration, public administration or management
- At least five years of experience in the performance of responsible administrative work
- Knowledge of modern practices in strategic planning, operations management, work planning, and monitoring

POSITION: MANAGER, PUBLIC RELATIONS DEPARTMENT

Rank: Manager

Statement of Role

To assist the Office of the Executive Director in collecting and organizing pertinent information on each utility, as well as serve as liaison between the agency and the utilities.

Tasks

- Oversee pending issues files on agency plans, decisions and investigations pertaining to each utility
- Serve as the focal point for agency communications with utility managers
- Monitor background research, technical analysis, and identification of issues as they relate to utility performance and operations
- Participate in negotiations of issues between staff, utilities, and interested parties
- Assist utilities to understand and comply with agency orders and directives, and explains to utility companies the impact of agency policy on their operations

Qualifications

- Bachelor's degree
- At least five years of experience working with a government agency or a private utility. Good knowledge of the following is desirable:
  - Management practices, business and operating characteristics of utility companies, utility ratemaking theory and practice; relevant national and local laws
  - Negotiation and mediating disputes between parties with conflicting objectives
  - Writing technical reports

POSITION: MANAGER, INFORMATION CENTER

Rank: Manager

Statement of Role

The Information Center Manager directs the design, development, implementation and operation of information systems and data processing applications in support of the mission, goals, policies, procedures, and programs of the agency.

Tasks

- Provide technical assistance to the central departments in the design of databases, spreadsheets, and data collection instruments to assure their suitability for computerization
- Assure integration of the agency's computerized information systems
- Advise management and staff on current industry trends and information processing concepts, strategies, and products
- Assist/ inform managers and staff in evaluation and selection of information processing equipment, software and services
- Analyze information system needs and prepare bid specifications for equipment and services
- Provide for technical training and educational needs in information processing for agency staff

Qualifications

- Bachelor's degree in Management Information Systems (MIS)or equivalent
- At least four years of experience
- Must have considerable knowledge of industry trends, products, services in information systems, processing equipment and software

POSITION: MANAGER, SECRETARIAT OF THE EXECUTIVE DIRECTOR

Rank: Manager

Statement of Role

To provide technical support to the Executive Director in agency-wide matters and administrative support in the Director's dealings with external authorities.

Tasks

- Maintain minutes of all EWRA board meetings and archive all Board agendas, presentation materials, and decisions
- Assist the Executive Director in collection and review of material prepared by agency staff for presentation to the Board, upon the Executive Director's approval
- Maintain a file of issues requiring board decisions and of board decisions requiring agency action

Qualifications

- Bachelor's degree with at least five years of experience in similar capacity
- Background in public administration or management/ supervision of a business operation desirable
- Must possess the ability to understand and analyze agency rules and regulations and relevant Egyptian laws pertaining to utility regulation

POSITION: HEAD, CENTRAL DEPARTMENT (CD) FOR TARIFFS

Rank: Undersecretary

Statement of Role

Provide expert judgment to the Executive Director in the determination of utility revenue requirements and review of tariff rate structures.

Tasks

- Draft policies and procedures for the determination of revenue requirements (or price limits) and the design of tariff rate structures
- Supervise the development and dissemination of guidelines and models for tariff analysis
- Advise the Head of the agency on the revenue requirements and average tariffs required achieve by individual utilities to achieve various levels of cost recovery
- Advise the Head of the agency on the optimal mix of economic and social objectives for Agency utility service pricing policy
- Design and supervise studies and research to support decision-making in rate cases
- Manage the processing of tariff rate applications by government-owned utilities and price reviews or rate adjustments for privately owned or managed utilities
- Prepare draft final determinations on rate cases for review by the Head of the agency and submission to the agency's Board of Directors

Qualifications

- Certified public accountant
- Formal training in utility regulation and rate design
- Strong analytical writing, and communication skills
- Five years' practical experience in the Egyptian water/wastewater sector in either governmental or private employment

POSITION: GENERAL MANAGER FOR ECONOMIC REGULATION

Rank: General Manager

Statement of Role

To enable the agency to identify actual and "economic" costs of utility service delivery under given service targets, constraints, and opportunities.

Tasks

- Prepare studies guidelines, and training materials on utility financial and economic analysis and planning
- Prepare guidelines for design of financial and economic models for analysis of costs, revenue requirements, and price limits, and identify needs for customization of general models
- Plan and supervise the department's processing of cost and price reviews
- Develop draft rate case revenue requirement determinations for review by the Head of CD/Tariffs
- Advise the CD/Tariffs; Head on the data and analyses required of CD/Standards and Compliance to monitor utility performance vis-à-vis specified cost and revenue indicators

Qualifications

- Master's degree in finance, economics, or engineering
- Formal training in methods of economic and financial regulation of utilities
- Analytical skill in design of data collection and review methods
- Organizational skill in planning and managing the workload of rate cases

POSITION: MANAGER, OPERATION ANALYSIS DEPARTMENT

Rank: Manager

Statement of Role

To enable the agency to make well-documented and well-supported judgments about utilities' actual and achievable costs of operation.

Tasks

- Develop useful and meaningful lists, definitions, and classifications of utility cost and revenue items
- Develop detailed computer models for analysis and projection of revenue requirements
- Conduct or commission studies on constraints and opportunities for operational cost control and efficiency improvement
- Advise the GD/Economic Regulation on the appropriate levels of operational cost and performance in each rate case
- Prepare assessments of the quality of operational and financial data in each utility and recommendations for improvement for the Head of the CD/Tariffs for consideration by CD/Standards and Compliance

Qualifications

- BSc in production/operations management, operations research, or engineering
- Formal training in accounting or business administration
- Skill in designing spreadsheets
- Managerial experience in water/wastewater utilities

POSITION: MANAGER, INVESTMENT ANALYSIS DEPARTMENT

Rank: Manager

Statement of Role

To enable the agency to make prudent determinations regarding the need for, and cost of, large water and wastewater investments proposed by utilities, government agencies, or the private sector.

Tasks

- Review existing standards for water/wastewater sector master planning and feasibility analysis of water/wastewater investment proposals, and recommend improvements in these standards in accordance with the Agency's mandate to assure that customers are able and willing to pay the costs or that the project provide public benefits which justify central government financial support
- Review large project plans submitted in rate cases to assure that demand for the project exists, that the proposed designs use the most appropriate technology, that proposed costs are reasonable, and that the project is consistent with the utility's overall performance objectives, strategy, and implementation capacity
- Review the project's financing strategy and assumptions to assure that they conform to the Ministry's policies regarding utility infrastructure financing and that they are most appropriate to the financial circumstances of the utility
- Advise the General Manager of GD/Economic Regulation on the expected costs and benefits of approved investments, including impact on operation cost, operating revenue, public and environmental health, economic and social development, *et cetera*

Qualifications

- BSc in sanitary engineering
- Formal training in water sector planning
- Formal training in infrastructure project feasibility analysis
- Formal training in methods of infrastructure project financing

POSITION: GENERAL MANAGER FOR RATES ANALYSIS

Rank: General Manager

Statement of Role

To enable the agency to advise local utilities on the tariff rate structures most appropriate to agency water/wastewater service pricing objectives.

Tasks

- Conduct studies and research on economic, financial, and social objectives of service pricing, and prepare recommendations on the design of appropriate tariff rate structures
- Direct and supervise the design and modeling of appropriate tariff rate structures
- Prepare guidelines and training materials on rate design for use by local utilities
- Prepare memoranda on utility proposed rate designs for review by the Head of the CD/Tariffs
- Monitor and evaluate the impact of rate structures on service demand and utility revenues
- Advise local utilities on how to educate the public in the objectives and impact of the tariff rate structure

Qualifications

- Master's degree in economics
- Formal training in tariff rate design

POSITION: MANAGER, COST OF SERVICE ANALYSIS DEPARTMENT

Rank: Manager

Statement of Role

Develop methods to identify differences in utility cost to serve classes of water/wastewater service users as the latter are differentiated by characteristics of their service use or customer service requirements.

Tasks

- Prepare guidelines on the preparation of cost-of-service studies to identify the composition, size, and accurate allocation of utility operating and capital costs to functional areas (such as treatment, distribution, customer accounting, *et cetera*)
- Prepare guidelines on the allocation of costs to types of customer
- Prepare or supervise the preparation of cost-of-service studies for individual utilities
- Advise the General Manager of GD/Rates Analysis on the data collection and analysis requirements of cost-of-service studies
- Cooperate with the Manager of Rates Design in the development of tariff rate designs which optimally balance the economic and social pricing policy objectives of the agency

Qualifications

- BSc in sanitary engineering
- Five years experience in a managerial or accounting position in a water or wastewater utility
- Formal training in economic theory

POSITION: MANAGER, RATE DESIGN DEPARTMENT

Rank: Manager

Statement of Role

Develop methods and data to enable the agency to judge the fairness, efficiency, and affordability of water and wastewater charges proposed by local utilities.

Tasks

- Prepare guidelines and training materials on the objectives of utility service pricing and the rate structures appropriate to achieving specific pricing objectives
- Develop definitions of the various types of utility charges and methodologies for the design of charges
- Develop spreadsheets to support rate modeling efforts of local utilities, and provide assistance in rate design as required
- Identify data requirements for tariff rate design
- Review and/or conduct studies to establish the affordability of water services and the likely demand response to adjusted tariffs
- Prepare memoranda and recommendations for the General Manager for the GD/Rates Analysis on the rate design proposals of local utilities

Qualifications

- BSc in economics
- Formal training in tariff rate design
- Spreadsheet design and management skills

POSITION: HEAD OF CD/ STANDARDS AND COMPLIANCE

Rank: Undersecretary

Statement of Role

Responsible for providing expertise in the development, publication, and monitoring of performance standards for service providers.

Tasks

- Spearhead the development of criteria for utility technical, economic, and financial performance and determine the procedures and periodicities of reports submitted by entities working in the sector, and control and audit procedures by the agency
- Assist in the review and approval of five-year plans prepared by each utility
- Spearhead the monitoring of compliance of utilities with target technical, economic and financial performance criteria
- Provide leadership by being in charge of recruiting, supervision and management of the staff of the Central Department for Standards and Compliance
- In charge of ensuring that properly qualified staff are assigned, and perform their work in efficient and timely manner
- Ensure that work schedules, reports, task assignments and studies are conducted and reviewed, and that all work performance of key professional staff is periodically evaluated, to confirm satisfactory performance of assigned duties
- Approves or disapproves all decision documents and policy recommendations produced by the staff
- Recommends to the Executive Head policies and programs related to technical performance standards to be applied to utilities

Qualifications

- Master's degree in engineering
- Formal training in accounting
- Fifteen years of experience in increasingly responsible engineering positions doing technical design, review, and construction supervision of public works capital investment projects; or
- Alternatively, a bachelor's degree in engineering and 20 years of experience

POSITION: GENERAL MANAGER, STANDARDS AND MONITORING

Rank: General Manager

Statement of Role

Responsible for the establishment of Standards of Performance with which utilities must comply.

Tasks

- Supervise and direct all tasks performed by the professional and support staff of the General Department for Standards and Monitoring, including establishment of Standards of Performance with which utilities must comply
- Monitor technical performance of utilities, including Key Performance Indicators (KPI)
- Establish systems and inspection procedures and protocols, prescribe frequency and methodology, reporting requirements and schedules for utilities to ensure compliance with water and wastewater standards
- In charge of performance monitoring to include determining water and effluent quality such as purity; pressure maintained and fluctuation measured during peak demand periods; ph levels; turbidity; volume of output per hour; and 24-hour service compliance
- Review utility estimates for unaccounted-for-water (UFW) and compare to industry benchmarks and EWRA orders
- Set benchmarks for utilities on frequency of inspection, frequency and duration of outages due to pipe and main bursts, and response and repair time
- Serve as staff senior expert on technical matters, and as expert witness in hearings

Qualifications

- Master's degree in engineering
- Ten years of experience in increasingly responsible engineering positions doing technical design, review, and construction supervision of public works capital investment projects; or
- Alternatively, a Bachelor's degree in engineering and 15 years of experience

POSITION: MANAGER, TECHNICAL STANDARDS AND MONITORING DEPARTMENT

Rank: Manager

Statement of Role

This position is responsible for managing the Technical Standards and Monitoring Department, consisting of planning, organizing and directing the department's work.

Tasks

- Collect and maintain a library of GOE public health and environmental standards and regulations
- Develop utility operational performance standards related to product quality, service quality, and reliability, in all utility functional areas; and define standards for performance measurement and reporting
- Develop utility performance monitoring report formats
- Train utility managers in EWRA performance monitoring and reporting requirements
- Receive and review the periodic utility performance monitoring reports
- Prepare an annual report on utility service delivery performance and on levels of utility compliance with EWRA performance measurement and reporting standards
- Assist the utilities in developing compliance plans
- Provide input, when necessary, on investigations of utilities when disputes arise

Qualifications

- Bachelor's degree with at least four years of experience in the review and analysis of relevant laws and regulations
- At least two years of supervisory experience

POSITION: MANAGER, ACCOUNTING STANDARDS AND MONITORING DEPARTMENT

Rank: Manager

Statement of Role

This position is concerned with ensuring that water and wastewater utilities follow the prescribed chart of accounts and appropriate accounting procedures.

Tasks

- Develop chart of utility regulatory accounts and regulatory accounting manuals
- Train utilities in regulatory accounting requirements
- Receive and review periodic utility accounts
- Prepare an annual report on utility accounting compliance
- Assist utilities to develop accounting compliance plans

Qualifications

- Bachelor's degree in accounting with at least five years of experience in supervising accounting operations of a public agency or business
- Must have good knowledge of relevant laws, regulations and procedures pertaining to water/wastewater utility management

POSITION: GENERAL MANAGER, CUSTOMER AFFAIRS

Rank: General Manager

Statement of Role

To enable the agency to address the needs of the customers of water and wastewater utilities and to inform the public about the roles and responsibilities of the EWRA. To act as intermediary between consumers and utilities by investigating and resolving consumer disputes, and to develop and advocate consumer service policies and procedures.

Tasks

- Provide leadership by being in charge of recruiting, supervising and managing staff of the GD/Customer Affairs
- Establish internal and external information and public relations standards, goals, priorities, and operational plans, policies and procedures
- Assess public reaction to management policy and program decisions
- Advise management on public information strategies, legislative activities, media presentations and publications
- Ensure that customer services functions are performed in a responsive way; that utility management promptly respond to customer complaints, whether received directly by the utility or transmitted to the utility by the GD/Customer Affairs
- Develop communication programs/ activities to address critical issues facing the agency
- Manage relations with news media through news releases, press conferences, briefings, interviews, media appearances, correspondence and reports
- Handle emergency communication involving crisis or unforeseen circumstances
- Make certain that staff work performance, especially those dealing directly with the public or coordinating customer complaints with utility managers, are periodically evaluated to confirm satisfactory performance of assigned duties

Qualifications

- Bachelor's degree, majoring in communications, journalism, social sciences, or comparable field of study plus
- At least five years of program development or supervisory experience in a large business or non-governmental organization or public agency
- Thorough knowledge of principles of effective communications and mass media, publicity, and advertising
- Ability to plan, organize and effectively present ideas and concepts to groups
- Experience in consumer/customer service desirable

POSITION: MANAGER, COMPLAINTS REPORTING AND FOLLOW-UP DEPARTMENT

Rank: Manager

Statement of Role

To enable proper coordination of customer issues and complaints with responsible utility officials. Also responsible for monitoring and evaluating programs of utilities for responding to and effectively dealing with customer complaints and ensuring their timely and appropriate resolution.

Tasks

- Develop and install systems for recording customer views and concerns including complaints about service delivery, billing and collection, response to problems about poor water quality, low pressure, and outages. System should include complaints received by EWRA as well as complaints received and resolved by utilities. This system should also include ultimate disposition of complaints.
- Produce annual report on each utility describing and categorizing complaint history for previous year
- Provide EWRA management with reports on trends in utility service and complaints
- Evaluate utility complaint handling/resolution procedures
- Recommend sanctions against a particular utility for chronic non-compliance with EWRA rules
- Mediate complaints informally before referring them to the formal level, if needed
- Perform site visits to problematic water companies and make recommendations
- Establish liaison with similar department in the regulated utility for resolving customer issues and complaints
- Ensure timely resolution of complaints by utility
- Recommend sanctions for egregious violations of EWRA standards
- Provide testimony or reports to Board, through Executive Director, on particular cases

Qualifications

- Bachelors degree
- At least three years of experience in an investigatory position (e.g., in investigation of industrial safety or environmental protection violations)
- Alternatively, at least five years of experience in interviewing which included obtaining, providing and evaluating information
- Ability to learn and understand utility tariffs, agency regulations and national laws as they pertain to public utilities
- Ability to learn and understand existing policies and procedures and incorporate the information into assigned duties

POSITION: MANAGER, PUBLIC INFORMATION DEPARTMENT

Rank: Manager

Statement of Role

To enable the EWRA to reach out to the public through a broad and sustainable awareness and customer relations program, and to perform public information activities in support of the Agency's operations and public relations strategies.

Tasks

- Responsible for spearheading the design and conduct of a public awareness program on the existence of the agency and its functions
- Provide input for agency internal and external public relations goals and priorities
- Develop brochures and similar collateral materials describing how utility customers can avail themselves of EWRA services
- Responsible for planning, design, supervision, and evaluation of public awareness programs on regulatory matters of concern to the general public, specific target audiences, or agencies of government, as these matters are identified by the General Manager of the GD/Customer Affairs
- Responsible for identification, recruitment, and participation in selection of communications tools and service providers to support awareness/education programs
- Initiate and maintain a variety of media contacts and coordinates submission of news stories and photographs from unit employees
- Develop and maintain agency website
- Help develop and edit speeches and media scripts for management

Qualifications

- Bachelor's degree in a field such as journalism or communications/media
- At least five years of experience in a similar capacity
- Must possess good knowledge of and experience in methods of planning, composing, editing, and presenting informational and educational material; writing and editing news stories and feature articles; and developing and making oral presentations to groups
- Must be experienced in the uses of a wide range of media and possess good knowledge of the types of media to select in communicating to diverse types of audiences

POSITION: GENERAL MANAGER, LEGAL AFFAIRS DEPARTMENT

Rank: General Manager

Statement of Role

Directs the staff in the Legal Affairs Department and provides advice to the Executive Director and all other divisions on legal matters.

Tasks

- Provide leadership by being in charge of recruiting, supervising, and managing the staff of the Legal Affairs Department
- In charge of planning work, assigning tasks to the proper personnel or recommends engaging outside counsel if necessary
- Ensure that all work is completed on schedule, and that all reports and task assignments are conducted to meet the standards of accuracy, clarity, and conformity with existing laws, decrees and EWRA Orders
- Prepare advisory opinions and represent EWRA in any legal proceeding in which it is a party or friend of the court
- Decide whether to proceed, and direct any appeal by the EWRA against any adverse ruling or decision by a court of competent jurisdiction
- Recommend appropriate amendments or new legislation or draft decrees as needed
- Recommend alternative dispute resolution measures between consumers and utilities
- Responsible for overseeing the form and final approval of operating licenses issues to regulated utilities and for alternative dispute resolution between a customer and a utility
- Review both the form and substance of contracts between customers and utilities, and prepare recommendations to the Executive Director on sanctions or penalties
- Serve as counsel to the agency and to agency prosecutory staff on difficult, complex, and novel legal matters, including administrative litigation and rulemakings addressing all facets of utility rates and service as well as competition issues
- Advise department employees and heads, including the Executive Director, other agency employees, government officials, utility officials and private persons on water and wastewater related matters

Qualifications

- Degree in law
- Member of the Egyptian bar; certified to practice law in Egypt
- Six years experience as a government lawyer, or as a member of a private law firm
- Experience preparing cases, conducting legal research, drafting legal memoranda, drafting pleadings, preparing appeals, and supervising the work of subordinate lawyers, including review and approval of their work products

POSITION: MANAGER, LICENSING AND DISPUTE RESOLUTION DEPARTMENT

Rank: Manager

Statement of Role

To set the conditions under which and by which utilities obtain operating licenses, and to act as intermediary between service providers by investigating and resolving disputes brought on a formal level.

Tasks

- Develop format for operating licenses
- Issue, upon recommendation of GD/Standards and Monitoring, operating licenses to water and wastewater utilities
- With the support of staff, interview concerned officials and utility representatives to determine and discuss the basis of disputes between service providers and beneficiary utilities, and advise them of agency procedures relating to dispute resolution
- Evaluate information obtained and determine scope of investigation
- Research laws, orders, tariffs and rules to determine appropriateness of utility actions
- Suggest equitable solutions and mediate disputes
- Review formal applications, testimony and related documents and determines data needs
- Liaise with the Standards and Monitoring Department in drafting orders, and canceling applications and permits for failure to comply with conditions of approval or statutory requirements

Qualifications

- Bachelor's degree
- At least five years of experience in similar capacity
- Background in law, engineering and/or utility operations and management desirable
- Must possess some knowledge of investigative and research methods and documentation procedures; dispute resolution including negotiation, mediation and arbitration; utility operational characteristics and services; interviewing methods
- Experience in interpreting and reviewing information for compliance with laws and regulations is also desirable
- Must have a demonstrated ability to supervise staff and to communicate effectively verbally and in writing

POSITION: MANAGER, CUSTOMER CONTRACTS AND PENALTIES DEPARTMENT

Rank: Manager

Statement of Role

To ensure that the reciprocal rights and obligations of service providers are formulated clearly and in terms capable of monitoring and enforcement. and that appropriate penalties are applied to non-compliant utilities.

Tasks

- Develop guidelines for standard contracts between customers and utilities
- Review customer contracts prepared by utilities
- Develop, in conjunction with operating GD, special contracts as needed, for presentation to the Board for approval
- Draft penalties/sanctions for review by the head of the GD
- Coordinate with other departments within the GD to assure that means are available to monitor and enforce compliance with customer-contractual obligations
- Review statistical and narrative reports on customer complaints

Qualifications

- Law degree required
- At least five years of experience in developing, administering, and evaluating contracts and interpreting and applying laws, regulations and policies

POSITION: MANAGER, LEGAL OPINION DEPARTMENT

Rank: Manager

Statement of Role

To provide advice on general matters of law to the Executive Director and other top-level management staff.

Tasks

- Review all draft and draft final official guidelines and decisions to be issued by the agency from the standpoint of conformity to GOE administrative and commercial law
- Recommend amendments or new legislation or draft decrees, such as amendments removing legal or administrative constraints to improved performance by public utilities or removing unnecessary constraints and risks to private sector participation
- Represent the agency in difficult and complex cases before the courts, by researching and evaluating the relative merits of legal positions, preparing briefs, memoranda and relevant correspondence, and by making oral argument before the court
- Represent the agency in litigation of major importance or complexity before trial courts, acting as trial counsel, by gathering facts, preparing witnesses, and preparing pleadings, briefs and memoranda for the purpose of trial, as well as drafting and filing of all necessary documents such as motions, briefs, comments, petitions and other pleadings
- Advise management and other agency employees on various matters through verbal and written communications including preparation of reports, recommendations and proposed Orders
- Supervise the preparation of memoranda, reports, legal opinions, statutory interpretations, suggested orders and proposed regulations for the Executive Director, the General Manager (GM) of Legal Affairs, unit heads and the general public
- Provide, in response to inquiries, both internal to the Agency and external, informal legal advise and information, both written and verbal, on matters relating to the regulation of water utilities
- Represent the Agency at various meetings with utility executives, top government officials and the public

Qualifications

- Law degree
- At least five years of experience in a private practice or as Counsel in a public agency
- Must have knowledge of water/ wastewater sector laws and regulations

POSITION: GENERAL MANAGER FOR FINANCE AND ADMINISTRATION

Rank: General Manager

Statement of Role

The General Manager is responsible for the planning, organizing, and directing of administrative and financial services within the EWRA. The GM also oversees the provision of services that support the EWRA including the establishment and enforcement of administrative policies and procedures.

Tasks

- Prepare and administer the annual budget for consideration by the Executive Director and administer same after approval by the Board
- Direct purchasing activities, supervises and supports the Executive Director in the conduct of managerial studies as directed
- Establish priorities and goals
- Enforce administrative policies and procedures
- Supervise subordinate budget and administrative staff
- Direct the establishment of internal financial controls and ensure that the financial/ audit operation and reporting requirements are in compliance with applicable laws, policies, standards and regulation, and generally accepted accounting principles and practices
- Direct the development of financial and administrative documents used in executive decision-making and provide technical consultation and advice

Qualifications

- Master's degree in business or public administration
- At least ten years of experience in operating and managing a business or government office
- Alternatively, an undergraduate degree in business or public administration with at least 15 years of experience in operating and managing a business or government office
- Experience managing the staff and activities of a financial operation; designing and implementing accounting or auditing systems; preparing financial management documents and statements; writing narrative reports setting forth conclusions and recommendations for consideration by top-level management

POSITION: MANAGER, FINANCIAL AFFAIRS DEPARTMENT

Rank: Manager

Statement of Role

The Manager of Financial Affairs manages the budget and finances of the agency. This position is responsible for analyzing program and public policies, issues and needs; developing, implementing, and coordinating policy information initiatives; and, planning and recommending structure and controls for financial management and related operations.

Tasks

- Prepare annual budget for Executive Director consideration
- Responsible for budget allocation among operating GDs
- Responsible for overall budget control
- Prepare monthly budget status reports for the Executive Director
- Ensure collection of amounts due from utilities and other debtors
- Ensure timely payment to vendors
- Create and apply fiscal controls and procedures within the accounting section
- Maintain communication with the Executive Director's Office and other top-level management, providing relevant fiscal information
- Responsible for all financial procedures and records, including:
  - Maintenance of checking accounts and invoices
  - Responsible for subsidiary ledgers: cash disbursements, case receipts, accounts payable, payroll summaries, accounts receivables, and journal entries for adjustments to the general ledger
  - Responsible for current and capital fund general ledgers, trial balances, financial report, and balance sheets

Qualifications

- Bachelor's degree in accounting, economics, or finance
- At least five years of experience in developing and/or monitoring budgets to include allocating expenditures and reconciling accounts
- Must possess good knowledge of management practices, public policy process, fiscal operations

POSITION: MANAGER, ADMINISTRATIVE AFFAIRS DEPARTMENT

Rank: Manager

Statement of Role

This department plans, organizes, and directs administrative and staff services for the EWRA. Through its sections, it develops staff professional development programs, administers personnel matters, and manages the procurement and contracting function for the agency.

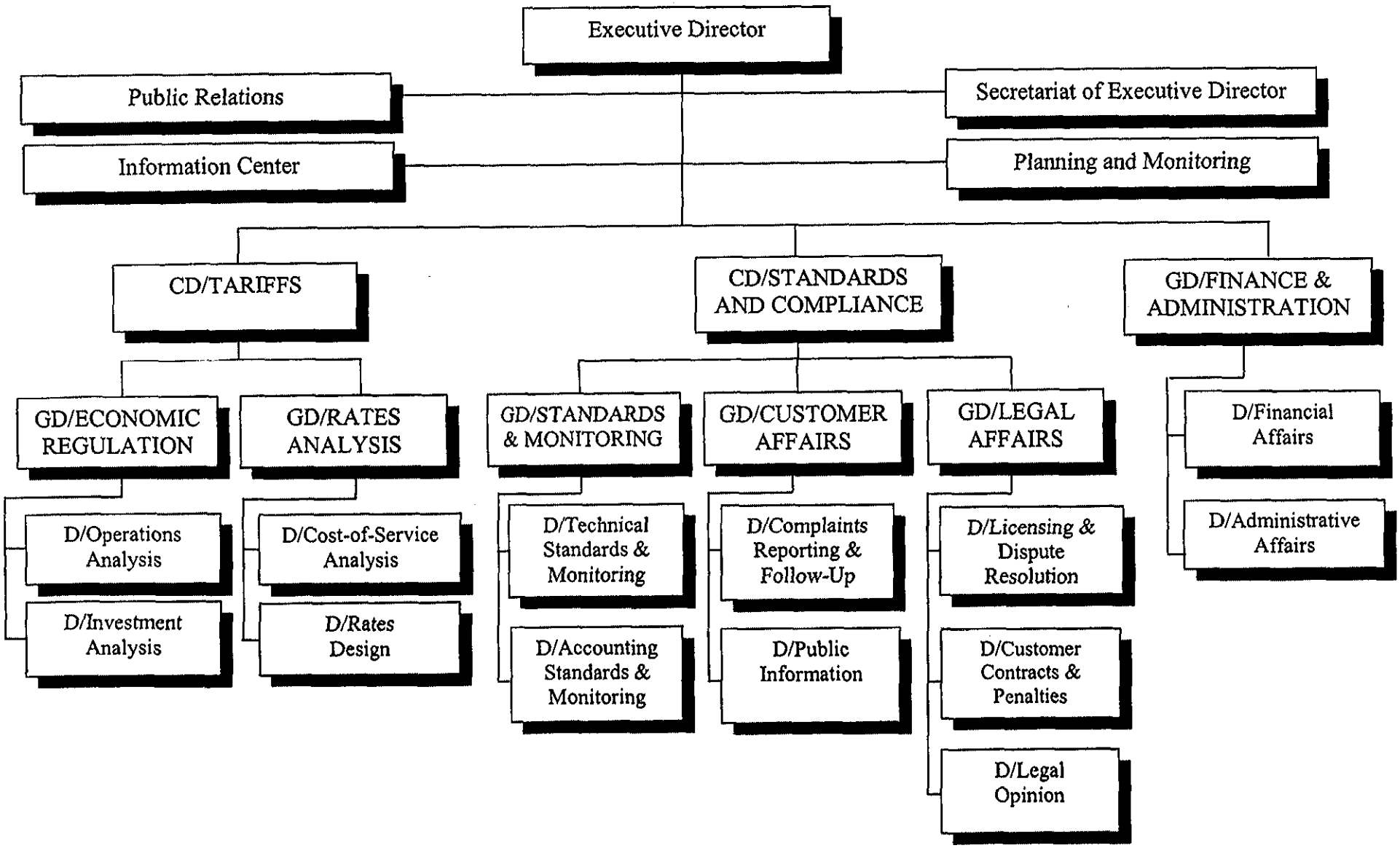
Tasks

- Arrange for physical and material needs of the EWRA and ensure that all equipment, furniture and the like are in good working order and properly maintained
- Administer travel arrangements including purchase and issuance of ticket and distribution of travel advances and reimbursement
- Plan, organize, direct, and control operations and support services involving central records and postal service, printing and microfilming, word processing, telecommunications, and building and grounds maintenance
- Conduct cost analyses and recommends lease or purchase of equipment, contract terms, building repair and space utilization
- Develop specifications and contracts for equipment and services vendors
- Write/ revise administrative manual
- Develop in-house training programs for staff
- Coordinate outside training for staff
- Develop job descriptions
- Recommend additions or reductions of permanent and/or temporary staff
- Investigate alleged infractions of policies and procedures with regard to administrative matters
- Approve any personnel actions recommended by operating GDs
- Assist in payroll maintenance
- Establish purchasing policies and procedures and approves purchases consistent with those policies

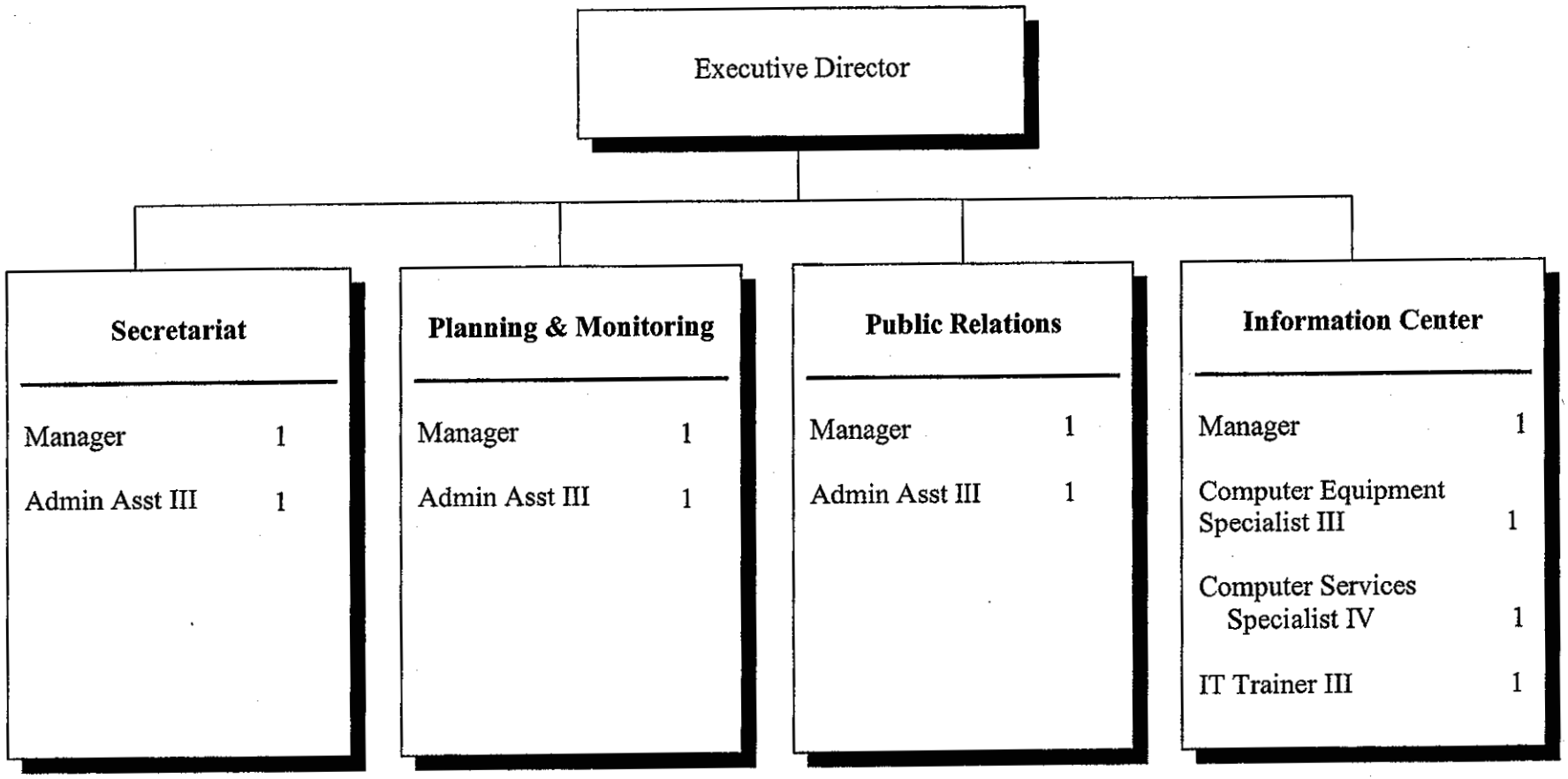
Qualifications

- Bachelor's degree in business or public administration
- At least five years of experience in supervising one or more technical support operations and developing operating policies and procedures
- Must possess good knowledge of management practices

Organization Chart for Water/Wastewater Sector Regulatory Agency



Office of the Executive Director



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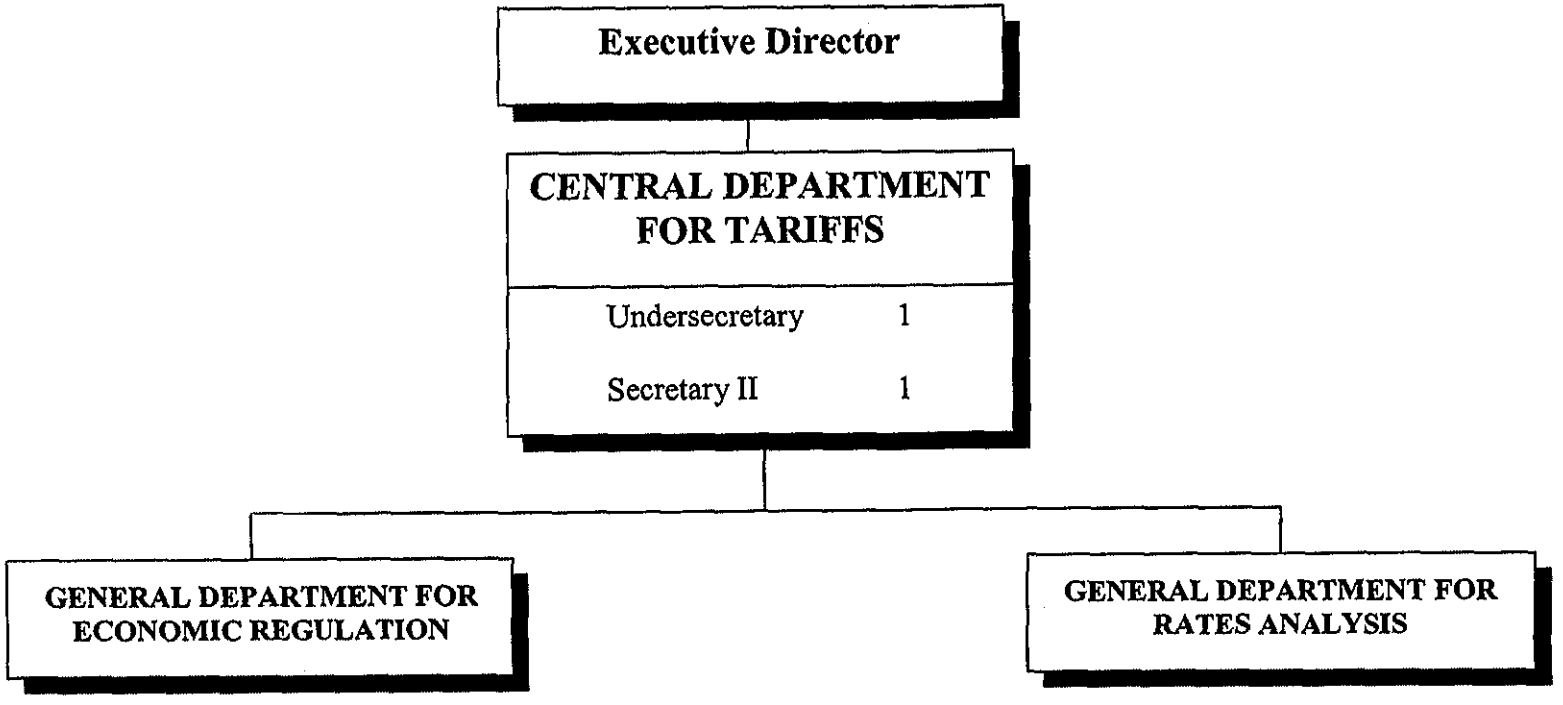
Central Department for Tariffs



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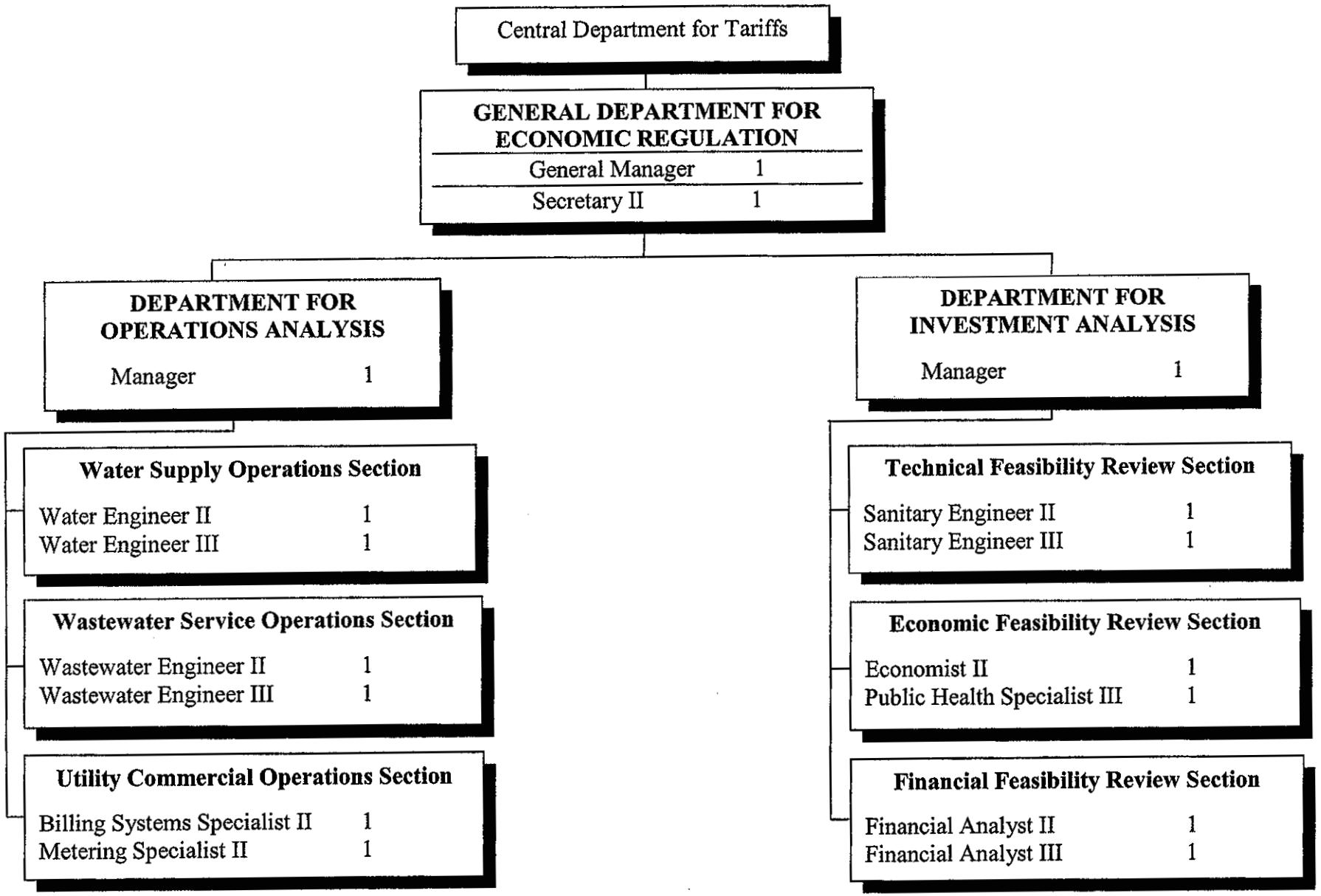
General Department for Economic Regulation



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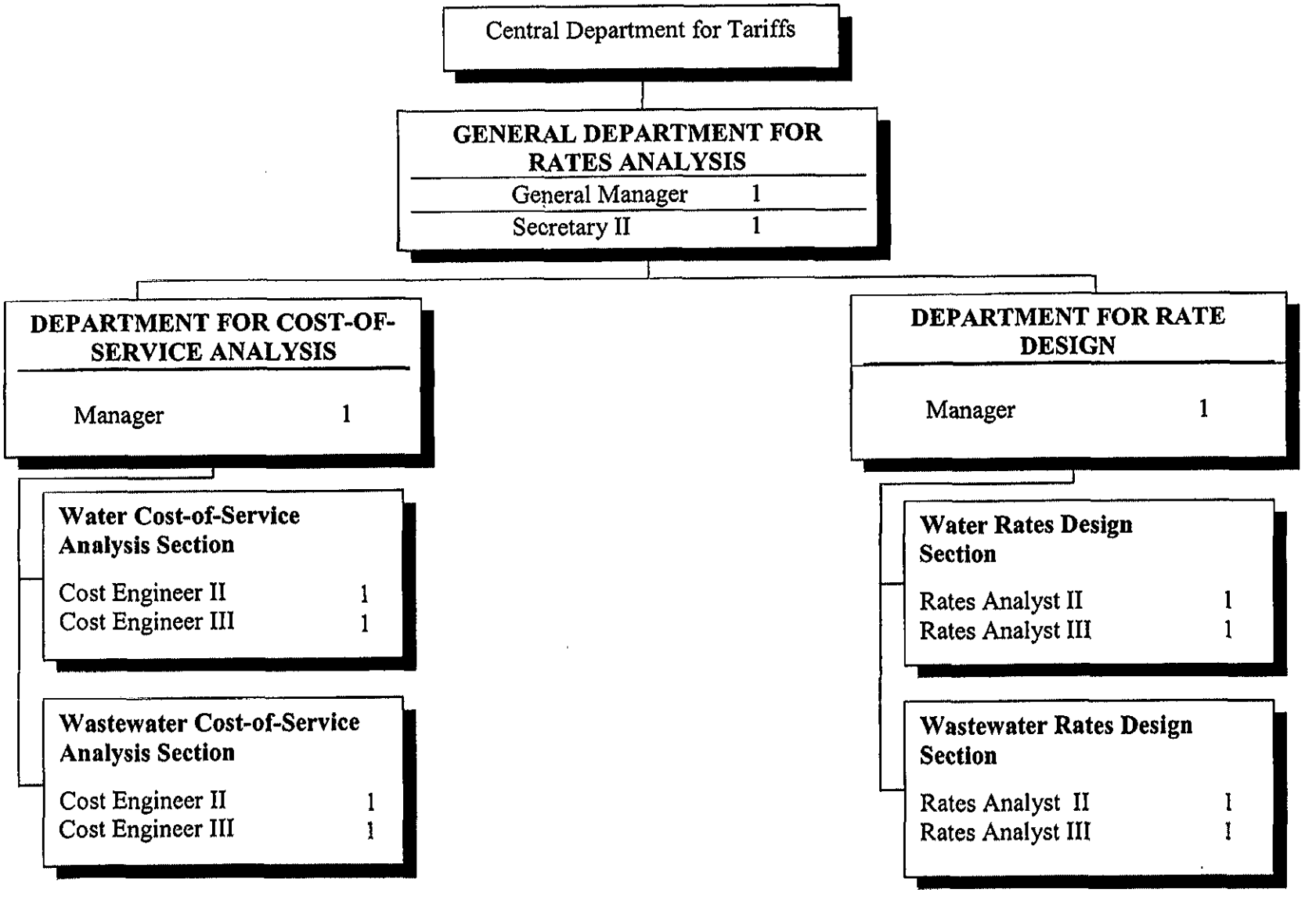
General Department for Rates Analysis



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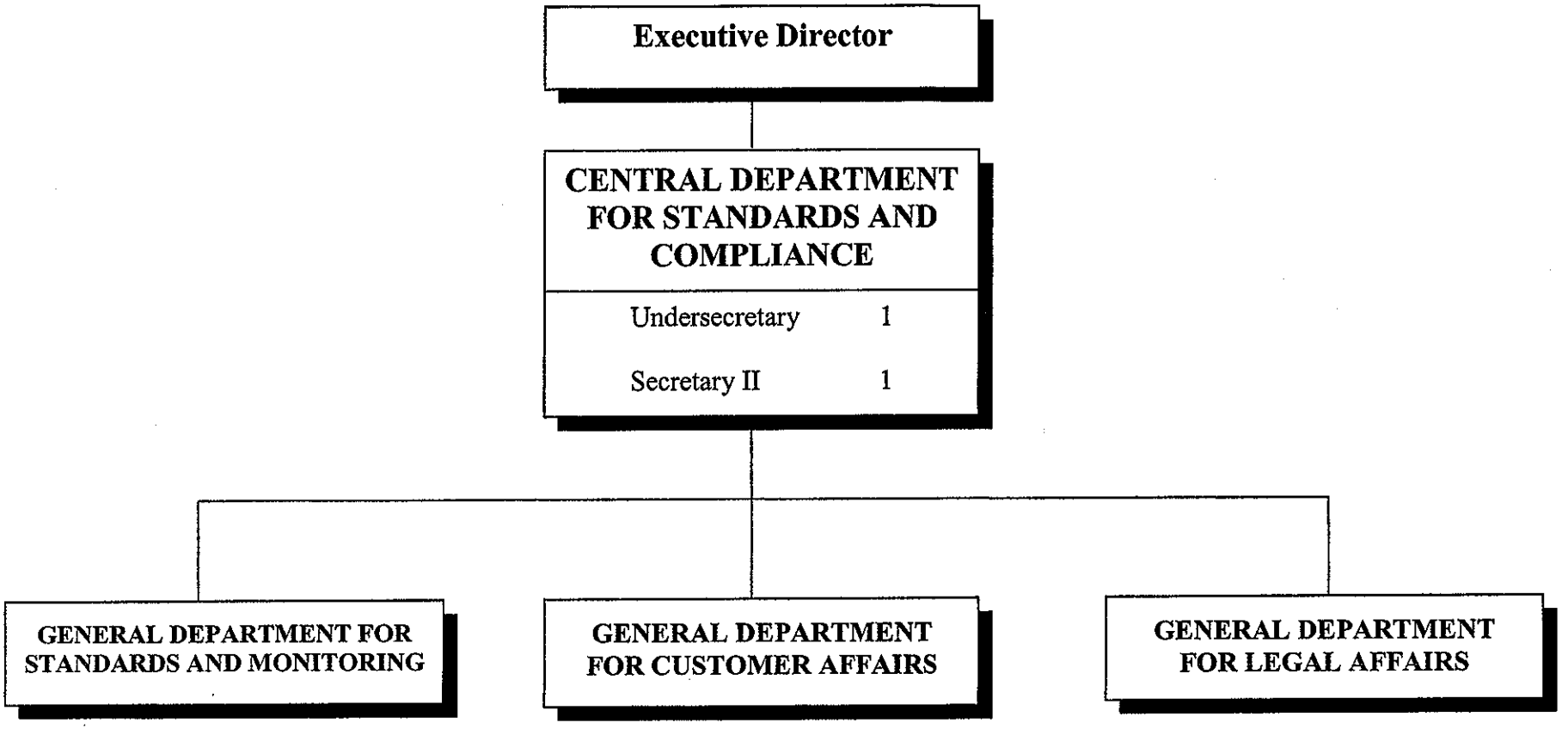
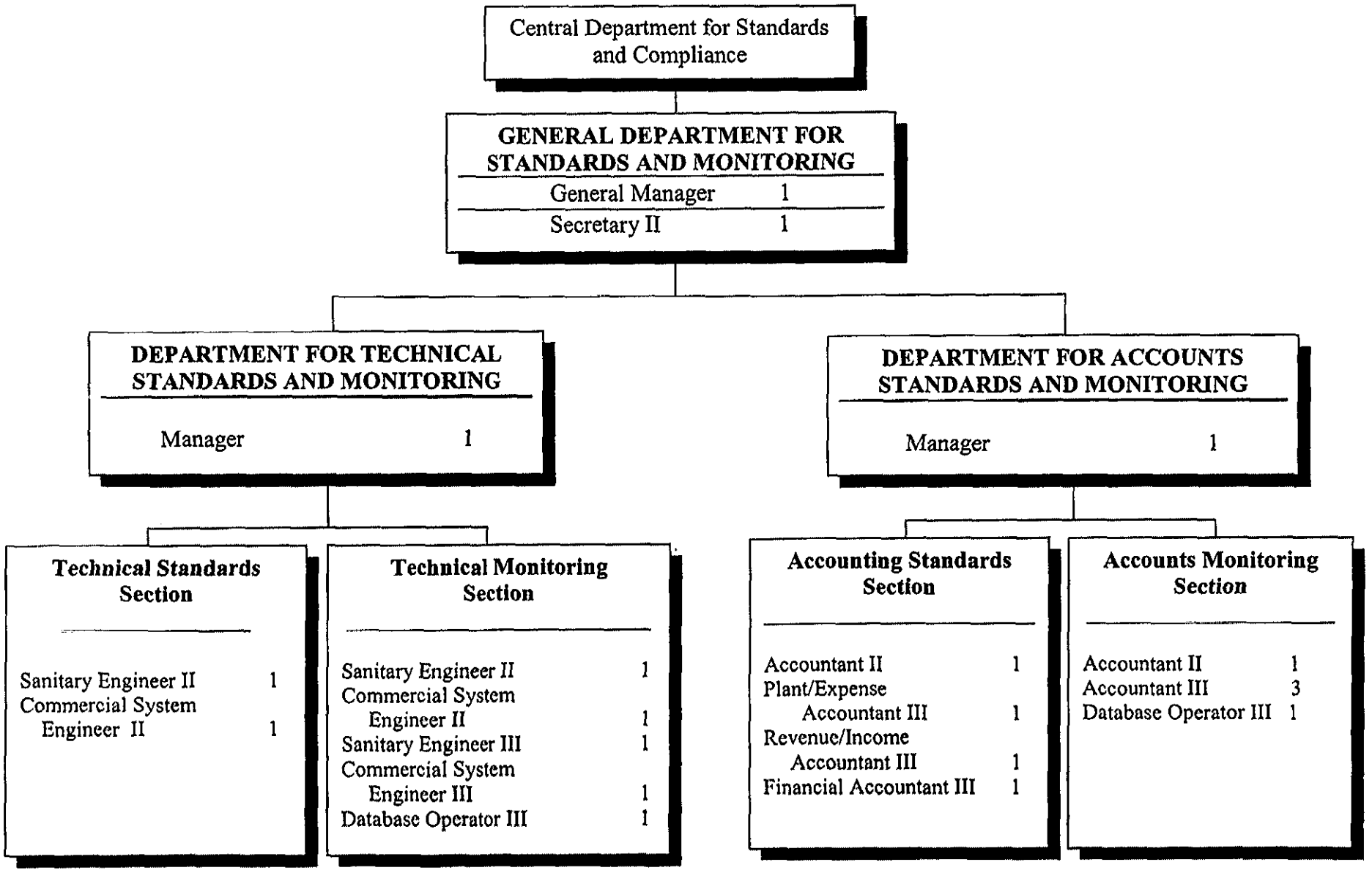
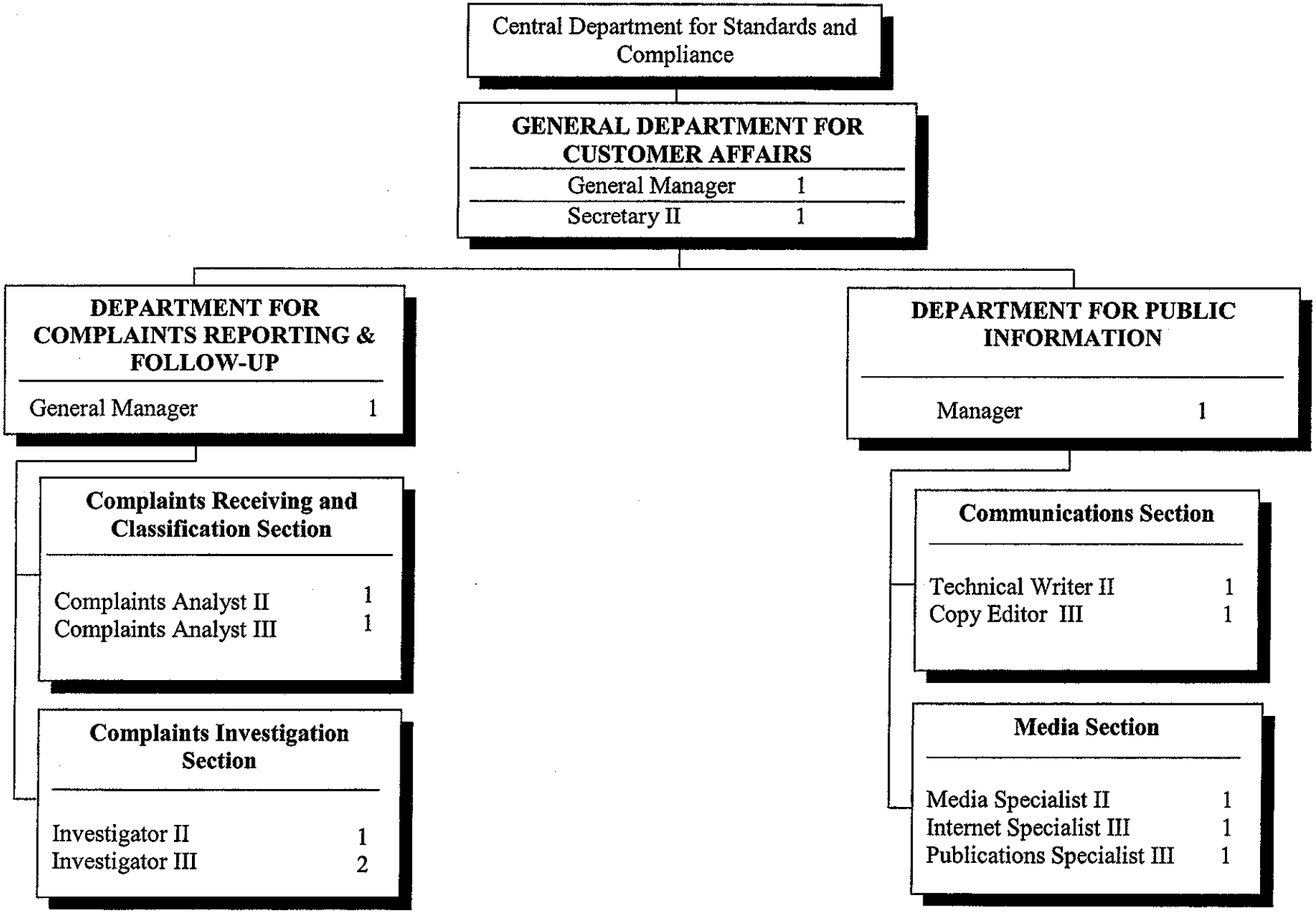
Central Department for Standards and Compliance



General Department for Standards and Monitoring



General Department for Customer Affairs



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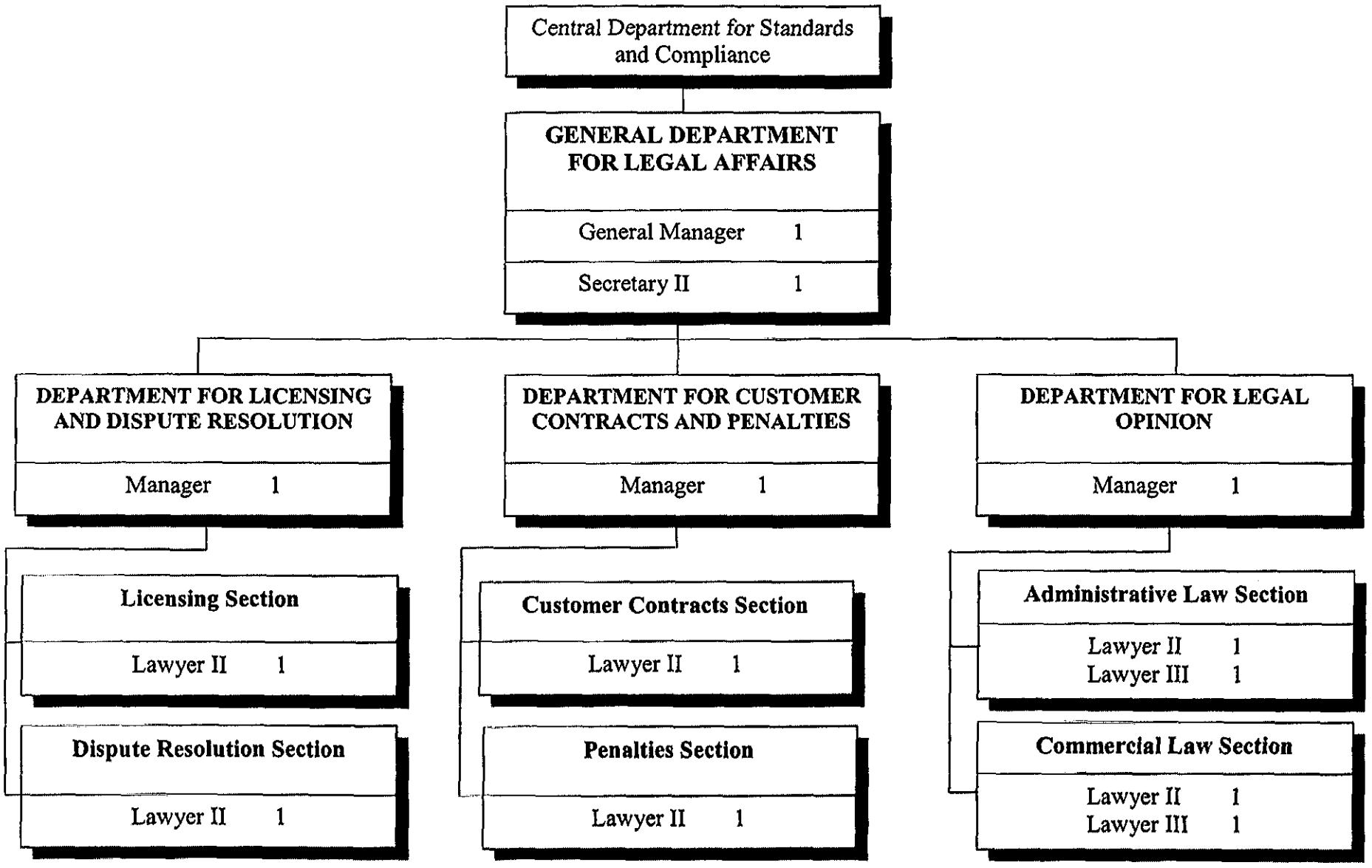
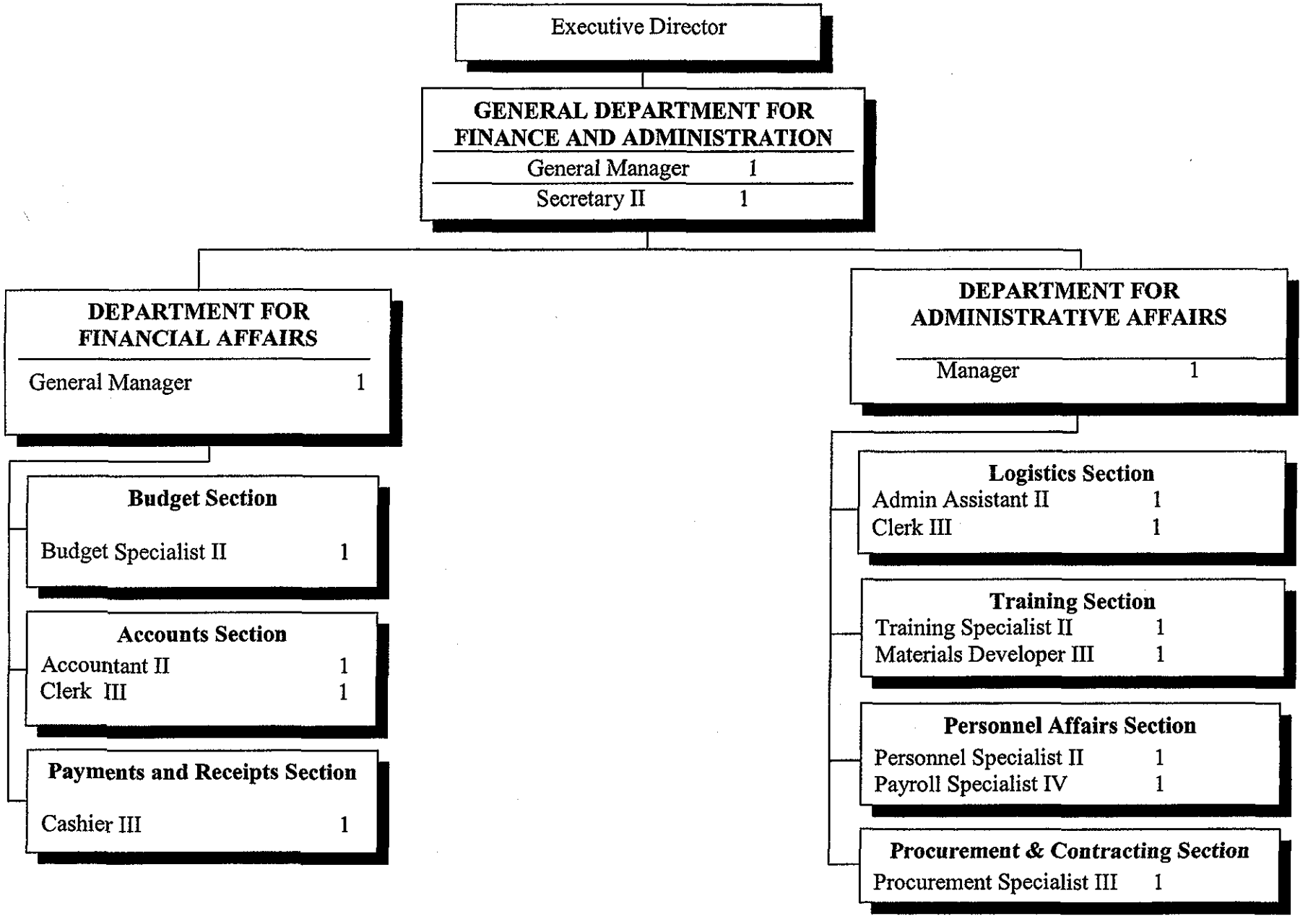
General Department for Legal Affairs



General Department for Finance and Administration



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ANNEX B

EWRA Staffing Table

EWRA Staffing Table

		CD Tariffs			CD Compliance					
	Office of Executive Director	Under-secretary's Office	GD/ Economic Regulation	GD/ Rates Design	Under-secretary's Office	GD/ Standards & Monitoring	GD/ Customer Affairs	GD/ Legal Affairs	GD/ Fin. & Admn.	Total
1US	1									1
US		1			1					2
GM			1	1		1	1	1	1	6
1st	4		2	2		2	2	3	2	17
2nd		1	8	5	1	7	5	7	6	40
3rd	5		5	4		10	6	2	5	36
4th	1								1	2
5th										
6th										
Total	11	2	16	12	2	20	14	13	15	105

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The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-funded Project

ACTION PLAN FOR EWRA OPERATIONALIZATION

February 19, 2001

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

CHEMONICS EGYPT

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SECTION IV	SUMMARY JOB DESCRIPTIONS FOR KEY EWRA PERSONNEL	IV-1
SECTION V	OPERATIONALIZING THE EGYPTIAN WATER/WASTEWATER REGULATORY AGENCY Slide Presentation: Retreat On Near- And Medium-Term Program January 25, 2001	

SECTION I

GOE Actions for Operationalizing EWRA

GOE Actions For Operationalizing the Water/Wastewater Sector Regulatory Agency

1. *Agency Establishment*
1.1 Presidential decree establishing the EWRA issued.

2. *Initial Organization Development*
2.1 Approve organization chart.
2.2 Appoint key personnel.
2.3 Appoint board members.
2.4 Identify requirements for headquarter facilities and equipment.
2.5 Submit FY 2002/03 staffing plan for CAOA approval.
2.6 Submit FY2002/03 budget for MOF approval.

3. *Pilot Rate Analyses*
3.1 Define types and nature of utility costs and revenues to be included in rate analyses.
3.2 Develop, in consultation with MOF and NOPWASD, quality-of-service standards.
3.3 Define operational and financial performance data elements and monitoring requirements.
3.4 Develop methodology for setting targets for utility efficiency improvements.
3.5 Approve guidelines for cost and rates studies
3.6 Request updated NOPWASD five-year plans for provincial pilots.
3.7 Develop, in consultation with MOF, MOP, and MOSA, policies on affordability of basic use and agree on criteria and procedures for allocation of capital and operating subsidies to utilities.
3.8 Develop policies for allocation of costs of service among customers in rate design.
3.9 Develop, in consultation with MOF, policies for relating utility Bab I incentive allocations to utility performance criteria.
3.10 Initiate a working group with CAOA, MOF, and MLD to develop strategy for corporatization of local water authorities.
3.11 Initiate a working group with NOPWASD to develop economic and financial feasibility criteria for screening public capital project proposals.

4. *Regulation Of Private Providers*
Adopt policies on regulation of private providers:
4.1 Monitoring
4.2 Penalties
4.3 Rate adjustments

5. *Long-Term Planning*
5.1 Develop EWRA strategic plan
5.2 Develop five-year EWRA budget and self-financing plan.

Pilot Rate Applications Work Plan

Task — System Design (Jan-Mar 2001)		
LIRR • Draft guidelines on rate application and review process (DJ) • Draft policy issues paper (GP) • HRD/training plan (DJ, PL, TS) • Draft utility performance indicators and reporting standards (DJ) • Templates and instructions (TS coordinator) –Current operational and financial data (TS, DR)) –Benchmarking methodology and business planning guidelines (TS) • Rate modeling spreadsheets (DR)	**GOE** • Appoint key EWRA personnel	**UTILITIES**
Task — Training and EWRA Logistics (Apr-Jun 2001)		
LIRR Training courses (DJ, DR, TS, PL): • Rate-setting policies and procedures (4d, EWRA) • Revenue requirements (4d EWRA, 4d utilities) –data requirements –revenue requirements –business planning –modeling revenue requirements • Service pricing (4d, EWRA, utilities) –cost of service studies –affordability analysis –rate design Logistics/IT: • Arabize spreadsheets (AS, DR) • Install Excel workbooks at EWRA (DR, AS)	**GOE** • Provide EWRA office space and computer hardware	**UTILITIES** • Assemble working group • Develop work plan
Task — Draft Rate Applications (Jul-Sep 2001)		
LIRR Technical assistance in data collection, analysis, planning, and forecasting (DR, TS, AS, MH) • Arrange twinning program	**GOE** • EWRB appointed	**UTILITIES** • Prepare current and historical operational and financial data • Prepare capital plans • Prepare technical compliance plans and budgets • Develop unadjusted revenue requirements • Develop business plans • Develop adjusted revenue requirements • Prepare cost-of-service study data • Prepare affordability analysis data • Model implications of different rate structure options • Prepare draft application

Task — EWRA Policy Analysis and Rates Modeling (Oct-Dec 2001)		
LIRR • EWRB training (DJ, GP) • Technical assistance in rates modeling under different quality, efficiency, cost recovery, and affordability assumptions (DR, DJ, TS) • Policy paper (GP) • Monitoring program guidelines (DJ, TS) • Start up twinning program	**GOE** • EWRB sets benchmarking, cost recovery, and pricing policies • EWRA and MOF negotiate subsidy policy • EWRA sets benchmarks and cost recovery targets for pilot utilities • EWRA drafts monitoring plans	**UTILITIES**
Task— Final Applications and Rate Reviews (Jan-Mar 2002		
LIRR • Assistance to utilities to finalizing applications (DR, TS) • Assistance to EWRB/EWRA in rate review (DJ, DR)	**GOE** • EWRB/EWRA reviews final applications • MOF subsidies budgeted	**UTILITIES** • Utilities adjust rate applications to conform with EWRA targets and develop monitoring plans
Task— Evaluation of Pilot Process (Apr-Jun 2002)		
LIRR • Evaluate pilot process (TS) • Revise guidelines, templates, policies as appropriate (TS, DR) • Prepare EWRA budget and financing plan • Prepare for second tranche of rate applications (TS)	**GOE**	**UTILITIES** • Restructure billing systems to reflect tariff adjustments • Prepare public information programs

SECTION III

EWRA Initial Staff Deployment for Pilot Rate Studies

EWRA Initial Staff Deployment

Stage	EWRA Tasks	Rate Analyst	Engineer	Economist	Customer Affairs Specialist	Rate Analysis Technician
System Design (Jan-Mar 2001)	• Review rate application guidelines and instructions.	•				
	• Review rate application training plan	•				
Training And EWRA Logistics (Apr-Jun 2001)	• Participate in rate applications training	•	•	•		
	• Help prepare utility rate application work plans	•	•	•		
Draft Rate Applications (Jul-Sep 2001)	• Follow up collection of utility operational and financial data	•	•			
	• Assess compliance with EWRA accounting standards	•				
	• Assess compliance with technical reporting standards		•			
	• Help utilities in compliance planning and budgeting		•			
	• Help utilities set quality improvement targets and plans		•			
	• Help utilities set efficiency improvement targets and plans		•	•		
	• Help utilities estimate revenue requirements	•				
	• Help utilities prepare cost-of-service studies	•	•	•		
	• Assess ability and willingness of customers to pay for various levels of service			•		
	• Help utilities in preliminary rate design	•				•
Ewra Policy Analysis And Rates Modeling (Oct-Dec 2001)	• Organize and participate in local customer consultations	•			•	
	• Help EWRB assess utility assumptions and modeling cost and rate implications of alternative assumptions	•	•	•		•
	• Help EWRB formulate pricing policies	•	•	•		
	• Prepare monitoring program guidelines		•		•	

Stage	EWRA Tasks	Rate Analyst	Engineer	Economist	Customer Affairs Specialist	Rate Analysis Technician
Final Rate Applications And Review (Jan-Mar 2002)	• Develop monitoring program plan and budget	•	•	•	•	•
	• Help utilities finalize rate applications	•	•	•		
	• Help EWRB in rate hearings	•	•	•	•	•
Pilot Evaluation And Preparation For Second Tranche Of Applications (Apr-Jun 2002)	• Evaluate pilot exercise	•	•	•	•	•
	• Revise policies, procedures, and guidelines as appropriate	•	•	•	•	•
	• Develop work plan for second cycle of applications	•	•	•		•
	• Prepare EWRA strategic plan and 5-year budget	•	•	•	•	
	• Calculate regulatory assessment surcharge and develop EWRA financing plan	•				•
	• Establish customer committees in pilot utilities				•	

SECTION IV

Summary Job Descriptions for Key EWRA Personnel

A. Rates Analyst

A1. Duties

- Coordinate the rate application and review process. Responsible for final assembly of the rate filing for EWRB review purposes.
- Review rate applications and supporting documentation for compliance with GOE and regulatory accounting standards. Develop and monitors implementation of utility plans for compliance with accounting standards.
- Provide specialist assistance to utilities in rate design.
- Supervise EWRA rates modeling exercises.

A2. Qualifications

- University degree in accounting.
- Mastery of both governmental accounting system and unified accounting system.
- Familiarity with Egyptian water/wastewater sector institutional issues.
- Skill in development and use of computerized spreadsheets is highly desirable.

B. Engineer

B1. Duties

- Assure comprehensiveness and reliability of utility operational performance data and projections. Design and monitor implementation of plans to upgrade utility compliance with operational performance reporting standards.
- Advise EWRB on operational performance standards, review utility business plans, and advise EWRB on five-year performance targets for each utility. Continuously improve EWRA's capacity to benchmark utility performance.
- Assess the cost-effectiveness of operational and managerial *versus* capital solutions to performance improvement objectives.
- Develop operational performance monitoring guidelines, review utility monitoring plans, and prepare periodic monitoring reports.

B2. Qualifications

- Degree in engineering.
- At least ten years experience in a senior management position in an Egyptian water or wastewater authority or company.
- Knowledge of water/wastewater facility performance standards

C. Economist

C1. Duties

- Assess cost-effectiveness of utility performance improvement strategies and programs.
- Develop models for benchmarking utility performance and efficiency.
- Assess the economic feasibility and tariff implications of proposed large capital projects.
- Advise Chief Rates Analyst on inflation, depreciation, and debt service factors for use in projecting utility revenue requirements.
- Collect and review studies on poverty and income levels in urban and rural Egypt. Advise the EWRB on customers' willingness and ability to pay for various levels of water and wastewater service.

C2. Qualifications

- Doctorate in economics.
- Familiarity with econometric modeling techniques.
- Experience in economic and financial analysis of infrastructure projects.

D. Customer Affairs Specialist

D1. Duties

- Advise EWRB on customer service standards. Develop customer service monitoring guidelines and programs.
- Advise EWRB on the organization and management of customer consultations. Organize customer consultations and keep minutes of proceedings.
- Design and organize customer service committees in the governorates and follow up their work.
- Develop public information and education programs on the objectives and activities of the EWRA.

D2. Qualifications

- Advanced degree in sociology, social anthropology, or organizational development.
- Excellent team-building, communications, and meeting skills.

E. Rate Analysis Technician

(Note: This position is required only if the Chief Rates Analyst lacks computerized spreadsheet skills.)

E1. Duties

- Enter rate application data on EWRA rate analysis spreadsheets.

- Manipulate rate analysis spreadsheets to show the implications of various efficiency, cost, affordability, and pricing assumptions.
- Maintain spreadsheets on actual utility operational and financial performance to indicate compliance or with or variance from approved rate assumptions and targets.

E2. Qualifications

- High level of skill in design and use of Excel spreadsheets and workbooks.

SECTION IV

Operationalizing the Egyptian Water/Wastewater Regulatory Agency

Slide Presentation: Retreat on Near- and Medium-Term Program

January 25, 2001

LIRR Project

Operationalizing the Egyptian Water/Wastewater Regulatory Agency

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Regulatory Functions

- Sets performance standards for service providers
- Monitors and enforces compliance with standards
- Regulates prices
- Promotes utility corporatization and competition.

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Regulatory Levers

- Review of requests for rate adjustments
- Monitoring and reporting requirements
- Penalties for noncompliance
- Assessment of capital project viability
- Licensing
- Review of proposed mergers and divisions

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EWRA Functions and Staffing, June 2002

Rate Analysis	Economics	Compliance/ Customer Affairs	Administrative	Legal
▪Approve utility revenue requirements ▪Set utility targets for cost recovery and subsidy reduction ▪Guidelines & review of cost and rates studies ▪ Annual review of utility performance	▪Set benchmarks for utility efficiency (opex, maintex, capex) ▪Assess cost-effectiveness of utility business plans ▪Review utility capital plans	▪Promulgate quality standards ▪Monitor quality of service ▪Investigate complaints ▪Enforce reporting standards	▪Information center ▪Records ▪Finance ▪Public relations ▪Personnel ▪Contracting	▪Identify and quantify constraints on corporatization and suggest legal reforms ▪Formulate competition policies and review proposals for leasing, division, merger, and acquisition of utilities.
1 Chief rates analyst 2 Caseworkers	1 Utility economist 1 Planning engineer 1 Design and construction engineer 1 Cost accountant	1 Metering/customer service specialist 1 Sanitary engineer 1 Finance/MIS specialist	1 IT specialist 1 Office manager	1 Administrative Law Specialist 1 Commercial Law/ Antitrust Specialist

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LIRR II Assistance to EWRA

- Organization development
- Pilot rate application and review exercise for four governmental utilities
- Guidelines on regulation of private providers
- Corporatization strategy

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Strategies of Cost Recovery

- Utility efficiency improvements
- Mitigation of legal and administrative constraints on commercial management of utilities
- Private sector participation
- Rate increases

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Beheira Rates Study Methodology

1) ***Estimate five-year revenue requirements***

- Assess current operational and financial performance
- Set quality and efficiency targets
- Project costs and revenues
- Set cost recovery target

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Beheira Rates Study Methodology

2) Design rates

- Allocate cost of service among customer classes
- Consider affordability factors
- Set rate structure to achieve cost recovery target

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Performance Targets

Quality

- Increased supply
- Improved pressure
- Improved water quality
- Billing accuracy
- Compliance with EWRA technical standards

Efficiency

- Production cost control
- Water loss reduction
- Collection efficiency
- Waste reduction
- Pricing efficiency

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Revenue Requirements (Beheira Water Supply 2000-2005)

	1999 (actual)	2005 (projected)
Operation and Maintenance	47.7 m	72.1 m
Rehabilitation (depreciation)	13.3 m	20.0 m
Capital expansion (debt service)	49.4 m	44.7 m
TOTAL revenue requirements	109.4 m	136.8 m
Current revenue	42.2 m	
Shortfall	67.2 m	

Average Revenue Requirement, Beheira water supply 2000-2005

Cost Recovery Target	m^3 price
O&M	LE 0.47
plus Rehabilitation	LE 0.58
plus Expansion	LE 0.91

Data Required for Estimating Revenue Requirements

- Operational and financial performance data
  --facilities and operations
  --financial statements
  --commercial and customer data
- Performance targets and business plans
- Capital projects underway and planned
- Socioeconomic data
- Cost and revenue projections

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Issues in Setting Tariff Revenue Requirements

- Appropriate levels of service
- Operational *vs* capital solutions
- Treatment of non-economic costs
- Expectations about efficiency gains
- Utility data reliability
- Incentives for performance
- Politically acceptable magnitude of rate increases
- Manner of scheduling the increase

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Cost Allocation Factors (Water Supply)

PERCENT OF CAPITAL COST ASSOCIATED WITH:	AVERAGE USE	PEAK USE	CUSTOMER SERVICE
Production and Treatment	80%	20%	-
Booster Pump Stations	40%	60%	-
Storage Tanks	30%	70%	-
Distribution Network	50%	50%	-
Meters	-	-	100%
Services	-	-	100%
G&A	53%	40%	7%
PERCENT OF O&M COST ASSOCIATED WITH:			
Production	80%	20%	-
Production Services	80%	20%	-
Distribution	50%	50%	-
Customer Service	-	-	100%
Electric Power	50%	50%	-
G&A	57%	30%	13%

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Rate Structure Options (Beheira Water Supply)

Tariff (LE/m³)

Formula	Domestic 0-10 m³	Domestic 10-30 m³	Domestic over 30	Service	Commercial
Across the board increase	0.36	0.36	0.55	0.71	1.18
Cost-based rates	0.55	0.55	0.72	0.54	0.56
Uniform Rate	0.58	0.58	0.58	0.58	0.58
Partially cost-based, with lifeline rate	0.28	0.54	0.85	0.68	1.13
CURRENT RATES	**0.23**	**0.23**	**0.35**	**0.45**	**0.75**

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Average Monthly Water Bills for Domestic Use in Beheira

(partially cost-based rates, with a lifeline rate)

Consumption	Water Tariff Charge
10 m³	LE 2.80
20 m³	LE 8.20
30 m³	LE 13.60

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Lifeline Service Policies (example)

- National minimum service standard: *65-100 lcd (10-15 m³/mo)*
- Affordability criterion: *2-3% of income* of the poorest quartile of *households*
- Beheira lifeline rate: *LE 0.28*
  - Monthly charge for 10 m³: *LE 2.80*
  - Household income needed to afford lifeline supply (at 2.5% criterion): *LE 112*
- All MOSA aid recipients are exempted from user charge.

If an approved rates study demonstrates that adequate cross-subsidization cannot be achieved without risk of reduced sales to subsidizing customers, the utility may apply for a special subsidy.

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Data Requirements for Pricing Studies

- "Audit of fixed assets"
- O&M cost accounts
- Bill tabulations
- Household budget surveys

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Pricing Issues

- Optimal blend of economic and social objectives
- Affordability criteria for lifeline (minimum) consumption levels

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LIRR I Inputs

- Organization and staffing plan
- Job descriptions for managers
- Board member issues
- Draft technical standards
- Comparison of types of economic regulation
- Beheira cost and rates study
- Constraints analysis

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LIRR II Inputs

- EWRA training and twinning
- Rate application and review procedures
- Rate application guidelines
- Guidelines on economic regulation of private providers
- Tariff policy research

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Next Step: Initiate Studies of Utility Revenue Requirements

- Prepare rate application guidelines
- Draft rate application and review procedures
- Workshop for all PEAs and PWCs on estimation of revenue requirements
- Preliminary policy studies

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GOE Actions

- Review Beheira cost and rates study methodology
- Review process options
- Sponsor workshop
- Select pilots

The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-funded Project

MANUAL ON STRATEGIC PLANNING FOR THE WATER/WASTEWATER SECTOR REGULATORY AGENCY

April 2001

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

CHEMONICS EGYPT

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Executive Summary

Successful regulatory agencies need to be:

- *Outwardly focused.* Many utility regulatory agencies have historically focused on their internal processes and dynamics (e.g., cases, investigations, hearings). However, the environment has shifted from a "command and control" paradigm to one in which a measure of cooperation is sought in the public interest. Regulatory entities, therefore, need to turn their attention toward their interactions with key players on the outside. The ministries, the economic development community, and most importantly, consumers of utility services.

- *Multidimensional.* In many countries, quasi-judicial processes effectively sustained utility regulation in an environment in which rate cases were the principal means of interaction between utilities and regulators. Now, policy making, consensus building, dispute resolution, the provision of information, and consumer interaction are sharing the regulatory stage. As a result, the EWRA, in its strategic planning process, needs to build an array of regulatory methods suited to Egyptian circumstances and changing conditions.

- *Environmentally aware.* Environmental sensitivity is one of the key determinants of organizational success. Others often cited are a strong sense of identity, tolerance, and conservative financing. The organizations that have been able to survive for extended periods remained in harmony with the world around them and managed to react in a timely fashion to the conditions of society around them. Dynamic regulatory agencies will recognize that they exist in concert with their environments, a recognition that was clouded in the past by attempts to achieve effective command and control regulation. In order to develop links to their external environments, and to maximize regulatory efficiency, the EWRA will need to establish alliances with other ministries with partial regulatory purview.

- *Constantly learning.* In order to maintain the flexibility to reinvent itself as circumstances change, the EWRA must be constantly involved in and committed to a process of constant learning. Today's regulatory solution in Egypt will not fit tomorrow's circumstances, and this adaptation for tomorrow will not fit the circumstances of the day after. If the EWRA is to remain optimally effective, relevant and vital, it needs to engage in an open dialogue with stakeholders to identify trends, expectations, threats, and opportunities. Organizational learning is based on five "learning disciplines" which are: 1) personal mastery (learning to expand our personal capacity to create the results we most desire); 2) mental models (reflecting upon, continually clarifying, and improving our pictures of the world); 3) shared vision (building a sense of commitment in a group by developing shared images of the future we seek to create); 4) team learning (transforming controversial and

collective thinking skills); 5) system thinking (a way of thinking about, and language for describing and understanding the forces and interrelationships that shape the behavior of systems).

- *Outcome oriented.* Organizations exist in order to accomplish purposes. The EWRA is no exception. Without the ability to measure the performance against outcomes clearly linked to those purposes, the EWRA will not have the ability to maximize the deployment of resources or defend itself against critics who attempt to argue that it does not accomplish the necessary public interest outcomes. Making an organization accountable can be frightening to the staff and those that manage the organization. This is a serious undertaking that requires the collection of performance data and the application of judgement, in that few government agency performance measures lie entirely within the the control of the agency. Nonetheless, accountability is mandatory for the EWRA if it is to seek optimal performance. Performance evaluation for regulatory entities has been an imperfect art that has relied on measures of balance, efficiency, or regulatory failure. Effective regulatory agencies must be able to justify their worth to the government and to citizens. Outcome measures of performance are the key.

- *More collaborative.* In any endeavor, including economic, social, or administrative regulation, the exercise of power is always met by a responsive exercise of power. Therefore if the EWRA relies predominantly on the flexing of its muscles it will be met with a response from those it regulates, a response that will seek to either challenge or subvert its authority. In some instances, punitive action against those who clearly violate rules for example, the exercise of regulatory power is mandatory. For the most part, however, regulatory agencies rely on the consent of those who they govern, and establishing consensus on regulatory outcomes and regulatory methods is imperative for long-term success of a regulatory regime. Just as power begets power, collaboration begets cooperation. Wherever possible, successful regulatory agencies hold power in reserve.

- *Information based.* Even now, the stock in trade of regulatory agencies is the exchange of information with regulated entities, the public, and other affected parties. Given the increasing speed with which information can be processed and transmitted and the ability of organizations and people to gather and assimilate information, the EWRA must rely extensively on information exchange to not only streamline processes but to accomplish its mission. Regulatory agencies of the future will be knowledge-based, composed largely of specialists who direct and discipline their own performance through organized feedback from colleagues and customers. The key to the ability of those feedback loops to direct regulatory action will be a continual dialog between the EWRA and its customers and constituents. To use a telecommunications metaphor, the EWRA will need to ensure the bandwidth of information flows.

- *Vision driven.* No endeavor can achieve spectacular results without engaging both the hearts and minds of those involved. In organizations, the tool best suited for

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> mobilizing hearts and minds is the organization's vision, a concept no more complex than the identification of the result that the organization most deeply desires to achieve, described in the present tense. Unlike the organization's mission, which is often externally prescribed by law or decree or defined in terms of basic purposes, articulation of the organization's vision allows for more creativity by those who currently reside in or are responsible for the organization. The EWRA vision, to be effective, should be doable, yet a "stretch," understandable, and motivating.

Ensuring that the EWRA embodies these characteristics will be a challenge complicated by the fact that regulatory agencies are complex, specialized entities, facing changing environments. For these attributes to be deeply embedded in the organization, and long lasting, it cannot merely focus on one or two elements of regulatory operations. Its strategic plan will need to address human resources, the organization of the agency, information systems, performance assessment, process and regulatory method, enabling instruments and rules, and strategic alliances. It will need to be informed by strategic intelligence, and as a by-product of evolution in the other elements, it will need to drive the organization's culture. The key for evaluation of each of these elements is the context provided by the unique strategic vision established by the EWRA. The key question for each element is: How does this element help the EWRA to achieve its vision?

In addition to being a complex task, a strategic plan for an agency that meets the criteria listed above cannot be imposed from the outside but must be self-generated, though outside facilitation can be useful.

The recommended strategic planning process that follows recognizes that environments always change. Therefore planning and change implementation must be iterative and, to a degree, never-ending, though periods of intense planning activity can be offset with periods of less-intense activity. Ultimately, however, any regulatory and organizational "answer" must be regarded as temporary, to be adjusted or replaced when feedback is gathered about its successes and as circumstances change.

This planning process begins with an environmental assessment. That assessment may include stakeholder (and consumer) interviews or surveys, scenario planning, and identification of EWRA strengths, weaknesses, opportunities, and threats. Too often, environmental assessment begins and ends with a short exercise involving those internal to the organization. No private sector enterprise would launch a product based only on the opinions of the product developers; prior to product introduction, products are tested on real consumers.

Similarly, the EWRA if it is to successfully interact with its stakeholders needs to gather data from those that are impacted by its activities and spend time questioning assumptions. Historically regulatory commissions around the world have not been commonly engaged in an open and active dialogue with their external environments; they were instead internally process focused. The creation of a dynamic regulatory agency requires an active, intentional, and ongoing dialogue with stakeholders to identify current conditions and future trends.

With that assessment of the EWRA's environment, the development of a compelling vision can begin. That vision provides the basic context in which all strategy, change, and organizational

health can arise. There is no more powerful engine driving an organization towards excellence and long-range success than an attractive, worthwhile and achievable vision of the future, widely shared.

Ultimately, the development of a compelling agency vision relies on the strength of its leadership, which must be the source of vision, its principal voice, and a force that focuses the EWRA's energies in pursuit of the vision.

Once the vision is in place and the strategic planning process in place and teams created, the development of specific tangible strategic initiatives can begin. As noted earlier, the activities required by this planning process could be aided by outside facilitation.

EWRA Strategic Planning Process

A. The EWRA Strategic Planning Model

Strategic planning is managing for results. It is a participatory process requiring the full support of the EWRA Board and Executive Director as well as the involvement of employees at all levels of the agency. As noted however, strategic planning considers the needs and expectations of customers, stakeholders, and policy makers in defining agency missions, goals, and performance measures. A strategic plan guides agencies by asking and answering five basic questions:

- Where are we now?
- Where do we want to be?
- How do we measure our progress?
- How do we get there?
- How do we track our progress?

These questions and the corresponding strategic planning components make up the recommended process that follows. This recommended process is intended to serve as a reference document for the EWRA. It is a user-friendly guide with non-technical language.

A strategic plan is a practical, action-oriented guide based on an examination of internal and external factors, that directs goal-setting and resource allocation to achieve meaningful results over time. The EWRA's strategic plans should incorporate its key functions, including process improvement or quality efforts, information technology, and human resources and budgeting.

Despite the level of detail contained in this recommended process, readers should note that strategic planning is evolutionary; no one develops a perfect plan the first time. However as plans are updated and experience gained, they will improve.

B. Managing For Results

- Strategic management
- Introduction to strategic planning
- Successful strategic planning
- Participants in the process
- Components of the process

B1. Strategic Management

Strategic management is the process of positioning an organization so it can prosper in the future. Strategic management integrates strategic planning with quality (or continuous improvement) efforts, budgeting, resource planning, program evaluation, and performance monitoring and reporting. In practice, strategic management may not be sequential, but there are strong interrelationships between the various key components.

B1a. Quality Management

Strategic planning works best in an atmosphere of quality management. Ideally, strategic planning is integrated with quality concepts; however, strategic planning can also be successfully employed as the vehicle to introduce quality concepts and efforts.

Quality management is an approach that values customer satisfaction and is based on participation of all members of an organization in improving the processes, products, services, and culture in which they work. The emphasis is on continuous improvement rather than a one-time fix. Other terms that are synonymous with Quality Management include business process improvement, continuous quality improvement, and process management, to name a few.

The fundamental elements of quality management and strategic planning are the same. Both are systematic approaches to identifying problems and opportunities that:

- Promote customer-focused services and products
- Emphasize employee involvement and teamwork
- Use performance measurements to focus on results
- Rely on data collection and interpretation
- Support management that is based on facts
- Involve efficient and effective resource allocation and management

Successful implementation of quality management and strategic planning requires a vision, planning and active involvement from top management. In addition, it needs support through continuous training and education, time, money, and personnel. Quality management efforts improve work quality, customer satisfaction and employee morale, as well as increase productivity, empower employees, and reduce bureaucracy by eliminating duplication and streamlining work processes.

B1b. Budgeting

Good management practices always include budget considerations when conducting strategic planning. The strategic plan charts an agency's direction, while the budget provides the resources to implement the plan. A strategic plan that ignores fiscal reality will not be realized. Conversely, resource allocation without strategic thinking is shortsighted and will be unresponsive to future conditions.

Strategic planning guides the budget process. It establishes priorities and affords management an opportunity to reevaluate existing allocations of funds. The EWRA should develop strategies and action plans that detail what will be accomplished to achieve goals and objectives each year. These action plans, together with performance measures, provide the strongest links between the strategic plan and the budget.

Planning and budgeting are interactive. The Internal/External Assessment component of the strategic planning process, previously noted, can be valuable in identifying trends, demand factors, and strategic issues to support budget development. Assumptions about available resources affect what can be achieved and help set priorities for resource allocation. Since

funding continues to be limited, strategic planning can help the EWRA as it strives to do more with less while remaining focused on results.

B1c. Information Technology (IT) or Resource Management

Resource planning is an essential component of strategic planning. As with all other necessary resource needs, the information resource needs of an agency should be determined during the strategic planning process. IT planning should be compatible with the strategic plan.

B1d. Performance Monitoring and Reporting

A critical component of the strategic management cycle is the monitoring and reporting of progress in achieving strategic goals. The EWRA should develop monitoring and reporting systems that collect data continuously and report, at a minimum, annually. The performance information provides a basis for reporting progress to external stakeholders including the public. Results, good or bad should be used to evaluate programs and to determine whether any corrective action needs to be taken.

B2. Introduction To Strategic Planning

Why should the EWRA engage in strategic planning?

It is **planning for change in increasingly complex environments.** Perhaps the one constant in regulation today is the notion of change. Increasing demands for services, shrinking resource bases, and greater expectations for service all combine to form a dynamic environment. However, strategic planning is proactive: in developing plans, organizations are encouraged to seek change, instead of simply reacting to situations.

It is **managing for results.** It is a process of diagnosis, objective setting, and strategy building that is an essential part of results-oriented management. It relies on careful consideration of an organization's capacitates and environment, and it leads to resource allocation decisions.

It is **an essential managerial tool.** The EWRA is expected to focus on achieving and improving outcomes each year. In other words, results should begin to focus on the efficiency and effectiveness of the agency's operations. Strategic planning enables the agency to develop a system to institute continuous improvement at all levels.

It is **future-oriented.** It involves a disciplined effort to help shape and guide what an agency becomes, what it does, and why it does it. Strategic planning requires broad-scale information gathering, an exploration of alternatives, and an emphasis on the future implications of present decisions.

It is **adaptable.** Although planning takes a long-range approach, the use of regular reviews and updates to determine progress and reassess the validity of the plan – based on strategic issues uncovered in the internal/external assessment – keeps planning flexible. The plan can then be updated to make the adjustments necessary to respond to changing circumstances and take

advantage of emerging opportunities. It sets targets for performance, incorporates ways to check progress, and provides guidance for ongoing operational and capital plans and budgets.

It is **essential for customer support.** Strategic planning determines the things that the EWRA can do to address customer expectations. Regulatory agencies have customers and stakeholders. Hence identification of customers and their needs and wants is basic to a well-functioning agency.

It **promotes communication.** It facilitates communication and participation, accommodates divergent interests and values, and fosters orderly decision making and successful implementation of goals and objectives. Strategic planning improves communication not only from the front-line employees to the Executive Director and back, but also among divisions. Finally,

If you fail to plan you plan to fail. The EWRA will be constantly challenged to manage complex and changing programs with limited resources. Further, over time it may need to address new, as well as ongoing, responsibilities, while containing and even reducing costs.

B3. Successful Strategic Planning

A successful strategic planning process:

- Has the full support of the EWRA Board and the Executive Director;
- Is participatory and not solely left to planners. It involves as many staff as possible. Such a process helps to ensure that the plan has "buy-in" from everyone in the agency.
- Is flexible, fits the organization and is user-friendly.
- Clearly defines responsibilities and timetables, and establishes and ensures accountability and results.
- Galvanizes and produces understanding and common purpose throughout an organization.
- Stays aware of the environment in which it functions and is politically sensitive.
- Is realistic about goals, objectives, resources, and outcomes, while taking personnel issues, overall fiscal conditions, and budgetary trends into account.
- Develops and conveys compelling evidence for its recommendations.
- Has a method or strategy for resolving conflicts among stakeholders.

- Leads to resource decisions and acknowledges the reality of sometimes having to do more with less, often requiring tradeoffs or the redirection of resources.

- Is fresh and continuous, not stale and static. Both the plan and the planning process are reviewed and modified regularly.

- Finally, as noted earlier, a successful strategic planning process asks and answers the following:

  – Where are we now?

  – Where do we want to be?

  – How do we measure our progress?

  – How do we get there?

  – How do we track our progress?

B4. Participants In The Process

Strategic planning is a team effort. Although strategic planning begins at the top, the Executive Director should seek the input of division directors and those employees who know the services and customers best. Any strategic planning team should include knowledgeable individuals from all of the organization's program or services, yet not be so large as to be cumbersome.

As a rule of thumb, the people who bear the responsibility for accomplishing a part of the strategic plan should participate in developing that part of the plan.

Successful strategic planning may include the following team participants:

Executive Director — provides the leadership necessary to craft the vision, define the mission, and express the principles of the organization. For the process to be successful, the Executive Director must provide active leadership and support.

Division Directors — whose knowledge of services and functional areas can contribute to developing the agency-wide vision, mission, and principles; help set agency-wide goals; and monitor overall progress and results.

Strategic Planner — provides the coordination, timetable and tools for moving the organization through the planning process. This could be a member of the Administrative Staff and/or an outside facilitator.

Employees to the extent possible — who have direct program involvement and can carry the planning process into the divisions. These individuals can assist in defining missions and principles, and setting goals and specific objectives, developing courses of action or strategies to

achieve objectives, implementing action plans, establishing and maintaining performance measures, and determining needed resources.

Administrative Staff — analyze fiscal impacts of potential strategies, provide technical support (including possibly strategic plan facilitation), and use the strategic plan to guide development of capital plans and budgets. Additionally, Human Resource personnel can analyze the impact of implementing potential strategies on the organization's information resource systems.

Members of the EWRA Board — can assist in developing the vision, mission, and principles of the agency and can also provide valuable feedback during the planning process. The Board would give the ultimate approval to any strategic plan.

B5. Components Of The Process

This recommended strategic planning model leads the EWRA through a process of asking and answering where the agency is currently, where the agency wants to be, how the agency will measure its progress, how the agency will get to where it wants to be, and how the agency will monitor its progress. These components are discussed in greater detail throughout the rest of this document.

Where are we now?

Strategic planning helps determine an agency's current status and evaluate its environment. It helps define the agency's services, as well as who the customers and stakeholders of the services are.

Internal/External Assessment: an analysis and evaluation of internal conditions and external data and factors that affect the organization.

- Internal Assessment (or Situation Inventory): an evaluation of an organization's position, performance, problems, and potential.
- External Assessment (or Environmental Scan): an analysis of key external elements or forces that affect the environment in which an organization functions.

Customer/Stakeholder identification: formal definition of those directly or indirectly using agency services or those directly or indirectly affected by the agency's actions.

- Customer: anyone whose best interests are served by, or who receives or uses the services of the EWRA.
- Stakeholder: any person or group with a vested interest in or with expectations of a certain level of performance or compliance from the EWRA.

Where do we want to be?

Use the results of the internal and external analysis and customer identification to formulate the mission, vision, principles, goals, and objectives.

- Mission: a brief, comprehensive statement of purpose of the EWRA and possibly each of its divisions.
- Vision: a compelling, conceptual image of the desired future.
- Principles: the core values and philosophies that describe how the EWRA will conduct itself in carrying out its mission.
- Goals: the desired end results, generally after three or more years.
- Objectives: specific and measurable targets for accomplishing goals.

How do we measure our progress?

Strategic planning builds accountability into the process.

- Performance Measures: used to measure results and ensure accountability.

How do we get there?

Strategic planning will help the EWRA ascertain how to get from where it currently is to where it wants to be, as well as the resources that will be needed to implement the plan.

- Action Plan: a detailed description of the strategies and steps used to implement a strategic plan.
- Resource Allocation: the determination and allotment of resources or assets necessary to carry out strategies and achieve objectives, within a priority framework.

How do we track our progress?

Finally, the EWRA must monitor implementation of goals and objectives and use the results to periodically evaluate "Where are we now?" thereby beginning the strategic planning cycle again.

- Tracking Systems: monitor progress, compile management information and keep goals on track.

A key point to remember for purposes of this document is that it concerns the process of strategic planning, not a strategic plan. Strategic planning is more than filling out forms, or compiling a document. Most of the value of strategic planning is realized during the process of planning itself.

Strategic Planning Process

Ask:	To Get The Answer:
Where are we now?	Perform an ***Internal/External Assessment that*** consists of a situation inventory and environmental scan. Perform a ***Customer/Stakeholder Identification***, that consists of a formal definition of those directly or indirectly using the EWRA's services.
Where do we want to be?	Develop a ***Mission***, which is a brief, comprehensive statement of purpose. Develop a ***Vision Statement***, which is a compelling, conceptual image of the desired future. Develop ***Principles***, which are the core values of the agency. Develop ***Goals***, which represent the desired end results after 3 or more years. Develop ***Objectives***, which are specific, measurable targets to accomplish goals.
How do we measure our progress?	Develop ***Performance Measures***, which measure results, ensure accountability, and encourage the use of targets that are linked to continuous improvement and allow benchmarking against best practices.
How do we get there?	Develop ***Action Plans*** that embody the strategies and steps to implement the strategic plan and lead to resource allocation.
How do we track our progress?	Develop a ***Tracking System*** that measures progress and compiles management information.

The next five sections explore each of the components of the strategic planning process in detail.

C. Where Are We Now?

- Internal/External Assessment
- Customer and Stakeholder Identification

C1. Internal/External Assessment

Before the EWRA attempts to chart its future, it must determine where it currently stands, even as a new organization. The mechanism used to gauge conditions inside and outside the organization, answering the question "Where are we now?" is the internal/external assessment.

Internal/External Assessment: an analysis and evaluation of internal conditions and external data and factors that affect the EWRA. Although the EWRA is a new organization, the internal/external assessment is a valuable tool in that it assesses the environment in which the EWRA will operate.

An internal/external assessment is a basic management tool that is used not only in strategic planning, but also in policy development and problem solving. It provides a baseline assessment of the organization. The process of conducting an assessment is often referred to as a SWOT analysis because it involves reviewing an organization's internal Strengths and Weaknesses

(again, even new organizations have strengths and weaknesses) and external Opportunities and Threats. The data gathered during the assessment will often lead to the identification of strategic issues. The last component of the SWOT analysis is the identification and surveying of customers and stakeholders.

The SWOT analysis can be completed in any order. Management will need to determine how to best organize and conduct the internal/external assessment.

C1. Conducting the Internal Assessment

The internal assessment, also called a situation inventory, would identify the EWRA's strengths and weaknesses and will evaluate its capacity to respond to issues, problems and opportunities. It will also reveal the paradigms (patterns or beliefs) and values that comprise the EWRA's principles that will drive current operations. It will also throw light on potential administrative or managerial policies and procedures that could help or inhibit quality.

Internal Assessment: an evaluation of the EWRA's position, problems, and potential.

As noted, since the EWRA is a new organization, the internal assessment would basically be the strengths and weaknesses of any new entity. In the case of the EWRA, we recommend evaluating the following questions:

- What is the organization's capacity to act?
- What disadvantages or strengths exist? How can strengths be built upon?
- What disadvantages or weaknesses exist? How can weaknesses be overcome?
- What are the constraints in meeting the customers' and stakeholders' needs and expectations?
- How might the needs and expectations of customers and stakeholders change? What opportunities for positive change exist? Does the plan accommodate that potential change?

C2. Conducting the External Assessment

The external assessment, or environmental scan, identifies the opportunities and threats present in the current environment and anticipates changes in the future environment. This portion of the SWOT provides an essential backdrop for strategic planning and policy development.

External Assessment: an analysis of key external factors or forces that affect the environment in which the EWRA will function.

The first step in conducting the external assessment is to analyze the environment.

1. What is the current environment?

- What are the elements of the current external environment that are relevant to the EWRA? How?

- What elements are most critical? Which are likely to facilitate or impede the EWRA's maturation?

- What are the major current issues or problems? Are these local, Governorate, regional, national, or global in scope? Why are these issues or problems of such importance?

- What current events or policy issues have captured the attention of the public? How do these affect the EWRA?

Next, look at the horizon—play "what if" with the environment.

2. How may the environment differ in the future?

- What are the EWRA's estimated revenues and expenditure estimates next year, for the next five years?

- What forces are at work that might affect or alter key elements of the environment? Are trends likely to continue or are changes forecast?

- What major issues or problems are anticipated? What effects could they have on the EWRA?

- What implications do those future forces and environmental changes (trends and issues) hold for the EWRA? Which is most critical?

- What are the most likely scenarios for the future?

By gaining an understanding of both internal and external factors, the EWRA will be in an excellent position to respond to the environment.

When preparing a SWOT analysis, consider that the strategic plan could become a public document and people form outside the organization may someday review this information. Although it is important to be factual in listing a new organization's weaknesses, care should be taken in how these statements are worded so that this information will not be misunderstood. For instance, statements summarizing problems or weaknesses can be written to stress opportunities for improvement.

C3. Customer And Stakeholder Identification

How does the EWRA identify its customers and stakeholders?

Customer/Stakeholder Identification: formal definition of those directly or indirectly using EWRA services or those directly or indirectly affected by the EWRA's actions.

Organizations have many different customers. Internal customers include units or employees in an organization whose work depends upon another unit or person within the same organization. External customers include the end users of the organization's services.

Customer: anyone whose best interests are served by, or who receives or uses the services of an agency.

In general, an agency may leave with a specific clientele as well as the public interest generally. For example the EWRA has a specific clientele in the utilities it regulates as well as looking out for the public interest.

One organization may be the customer of another, or may be dependent upon the services of another. For example the EWRA will have much interaction with the Central Department for Private Sector Participation and the Ministries of Health (or Environment) and Finance, among others. A customer that would use the EWRA's decisions on cost recovery would be the Ministry of Finance as it provides subsidy levels for utilities during their transition to full cost recovery.

Stakeholder: any person or group with a vested interest in or expectations of a certain level of performance or compliance from the EWRA.

Stakeholders may not necessarily receive the services of the EWRA; they may be advocates or have an interest in, for example, the EWRA's decisions on wastewater matters, even though the stakeholder may not receive wastewater services from a regulated utility.

C3a. Customer/Stakeholder Identification Process

1. To identify and understand customers and stakeholders, ask:

- Who receives or uses the services produced by the EWRA?
- Whose best interests are served by the actions of the agency?
- Who are the external customers; are they specific clientele as well as the general public?
- What do customers need from the EWRA? What do they want?
- Do customers have other choices to obtain similar services? If so, what are the other choices?
- Who are the stakeholders and what results do they expect from the EWRA?

- Who are the internal customers? (An example would be the Rate Analysis personnel being customers of the EWRA's Information Technology personnel.)

Once customers and stakeholders have been identified it is important to find out what they think. The best way to gather this information is to solicit it, either formally or informally.

2. To determine what customers and stakeholders think and want, the EWRA can use:

- Written or telephone surveys.
- Focus groups.
- One-on-one interviews.
- Comment forms.
- Customer advisory meetings.
- Public meetings.

3. Incorporate customer and stakeholder feedback.

A common mistake made by agencies is gathering and then ignoring input from external or internal customers. Once customer and stakeholder feedback has been obtained, it must be used. Problems that have been identified need to be addressed in the strategic plan.

In addition, it is crucial to continue communicating with customers by keeping them informed about how their input is being used and what the results are.

C4. Summary

The results of the internal/external assessment become the basis for all the other phases of the strategic planning process. The situation inventory and environmental scan may also be reviewed or repeated as part of the periodic updates of the EWRA's strategic plan.

D. Where Do We Want To Be?

- Mission Statement
- Vision Statement
- Principles
- Goals
- Objectives

D1. Mission Statement

A mission statement identifies what agencies do, and for whom they provide services.

Mission: a brief, comprehensive statement of purpose of an agency.

The mission statement is an invaluable tool in directing, planning, and implementing the EWRA's efforts. The mission describes customers and services. The mission is part of the organization's identity, is all encompassing and rarely changes, and is the ultimate rationale for the existence of the EWRA.

When writing a mission statement, consideration should be given to these fundamental questions:

- What is the EWRA?
- What does it do?
- For whom does the EWRA perform its services?
- Why does the EWRA exist?

These questions should be addressed by looking at the agency from the outside – from the customer and stakeholder point of view.

D1a. Mission Statement Criteria

A good mission statement will:

- Identify the overall purpose for the existence of the EWRA as established in the presidential decree.
- Identify the basic needs or distinct problems that the EWRA has been designed to address.
- Identify clients, customers, or users (both internal and external) of the EWRA.
- Help identify client, customer, and stakeholder expectations, requirements, and services provided to meet these requirements, and processes and resources used to satisfy the requirements.
- Lead to the development of performance measures that reflect customer and stakeholder requirements.

D1b. Defining the Mission

To facilitate the development of the EWRA mission, we recommend the following process:

1. Identify the original purpose for the agency.

- Why does the EWRA exist? What problem was the EWRA created to address?
- What mandates have been assigned to the agency by the decree or other enabling instruments?
- What functions or services are, or should be, provided?

2. Reflect the customer and stakeholder base in the statement.

- Use the customer/stakeholder identification completed during the SWOT.

3. Identify current trends or distinct problems.

- What are the primary needs that have to be addressed?

Example: A sample mission statement for a Ministry of Health, for example, could be: "To assess and ensure the physical and behavioral health of all Egyptians through education, intervention, prevention, delivery of services, and the advancement of public policies that address current and emerging health issues in a manner that demonstrates our efficiency, effectiveness, integrity, and leadership.

D1c. Descriptions

Besides mission statements, it is helpful to develop an overall agency description for the EWRA. The description should be written so that someone unfamiliar with the EWRA will have a general understanding of what it does whom it serves why it is needed and how it works. Whenever possible the use of technical terminology, abbreviations and acronyms should be avoided.

One way to develop an EWRA description would be:

- Review the information developed for the mission statement.
- Imagine giving a five-minute explanation of the agency to the general public or a community group. Assume your audience knows nothing about the EWRA and think about how to best describe what is being done in terms they can understand.
- Develop a paragraph that clearly summarizes the purpose of the agency by including language that further explains the mission.

The description of an agency should be clear and understandable to anyone reading it, regardless of the technical aspect of the work being done or the services being provided.

D2. Vision Statement

Government is faced with the challenge of delivering services with greater efficiency, effectiveness, and quality, yet it must operate within resource constraints. Creating a vision can help state agencies redefine how services are provided and prepare the organization to meet the demands of the future.

Vision: a compelling, conceptual image of the desired future.

Great visions are conceived through a partnership between top management and all levels of the organization – in other words, those who will be implementing the vision. The vision becomes a focal point for everyone in the EWRA. Ideally, the values of each employee become part of the organization's vision. By sharing the vision, management establishes commitment to the overall vision from employees at all levels.

A great vision, one that will inspire and challenge, is purposefully created and will provide more than a picture of the organization's ideal future.

- It is a critical ingredient for change.
- It represents a global, continual purpose for the organization.
- It electrifies and invigorates.
- It is the ultimate standard toward which all progress is measured.
- Its structure is less important than its effect on the values and behaviors of every member of the organization.

When developing the vision statement, the following criteria should apply.

A great vision statement will be:

- Brief and memorable.
- Inspiring and challenging.
- Descriptive of the ideal.
- Appealing to employees, customers and stakeholders.
- Descriptive of future service levels.
- Idealistic, standing above the commonplace.
- Enduring.

In addition, a vision statement should answer the following questions.

- What does the EWRA want, what are its expectations?
- How does the agency wish to be known by customers, employees, and the community?
- How will the EWRA enhance the quality of life for those who use its services?

D3. Principles

Principles are factors that drive the conduct of an organization and guide the development and implementation of all policies and actions. Although an organization's principles may be implicitly understood, it is often helpful to explicitly state them.

Principles: the core values and philosophies that describe how an agency conducts itself in carrying out its mission.

Principles are often associated with a quality management culture. They include "getting it right the first time," satisfying customers and continuous improvement. Principles also…

- Serve as criteria to guide decision-making at all levels of an agency.
- Express common values that can be embraced by the whole organization.
- Are powerful instruments for changing the organizational culture.
- Motivate employees.
- Express basic beliefs about the conditions under which people work best.
- Steer leaders toward putting in place the structures, systems, and required skills needed to make the vision a reality.

Articulating Principles

Describing the organization's principles represents a challenge for management. Principles should reflect the values and philosophy of the director and the executive management team, as well as organization-wide values and assumptions. The principles should be compatible, comfortable and convincing for everyone inside the organization and for consumers and stakeholders.

Sometimes principles are expressed in terms of responsibilities – to customers, employees, stakeholders, and the community in which it operates or the physical environment as a whole. Sometimes principles are expressed in terms of quality or excellence in management and the provision of services.

Generally, the best statements of principles express the organization's attitude and values about three things:

- People: The way employees are treated.
- Processes: The way the organization is managed, decisions are made, and services are provided.
- Performance: The expectations concerning the organization's responsibilities and the quality of its services.

Principles summarize the philosophies or core values that will be utilized in fulfillment of the vision and mission. Thus principles help form a bridge between where the organization is and where it wants to be.

D4. Goals

Goals provide a framework for more detailed levels of planning. Goals are more specific than the mission statement, but remain general enough to stimulate creativity and innovation. Goals are the "to be" state.

Goal: The desired end result, generally after three or more years.

EWRA goals will represent the strategic direction for the organization as a whole and, therefore, will be broad. Collectively, agency goals will clearly chart the direction of the EWRA and provide a unifying theme for programs and activities.

Goals will also represent immediate or serious problems or high-priority issues that merit special attention. These critical or strategic issues, that are often uncovered during the internal/external assessment, might be described as the "make or break" type of issues.

D4a. Strategic Issues

Strategic issues do not necessarily fall neatly within the boundaries of a particular program; instead, they often impact several programs or the entire agency. However, an agency may be able to consolidate these issues into key results areas, that can be a combination of many different operational or programmatic concerns. The following may help further identify strategic issues:

- **Strategic issues may arise as the result of an agency's internal assessment.** For example, low customer approval ratings may result in customer service as a strategic issue for the agency.
- **External forces may generate strategic issues.** For example, if extensive media coverage has been received about a certain aspect of the EWRA" operations and the public is demanding action the subject would be a strategic issue.

- **Strategic issues may lead to strategic planning goals.** However, just identifying a problem or opportunity as a strategic issue is not the same as determining the goal or desired end result. For example, a strategic issue may be a problem with unfavorable media coverage. The goal may be to foster better relationships with the press.

Strategic issues may emerge in an unexpected manner and become important after the strategic plan is completed and approved. However, a strategic issue plan identified after the plan has been completed and approved should not pose a problem. The EWRA can more easily address new strategic issue when the direction of an agency has been identified through the strategic planning process. Knowing what will be needed to accomplish an agency's mission, goals, and objectives will ensure a quick, effective reallocation of existing resources to handle any unexpected events.

D4b. Criteria for Goals

The following criteria will help with evaluating goals:

- Goals will be in harmony with, and clarify, the agency vision, mission, and principles.
- Goals that are achieved will fulfill, or contribute to fulfilling, the mission of the EWRA.
- Goals will address priorities and the results of the internal/external assessment and may be developed in response to strategic issues.
- Goals will tend to remain essentially unchanged, until there is a shift in the environment under which they were created, or, as in the case of a strategic issue, the desired outcome has been achieved.
- Goals will normally encompass a relatively long period; i.e., at least three years or more. Keep in mind that if a goal can be accomplished in fewer than three years, it may be an objective.
- Goals will address the gaps between the current and the desired level of service.
- Goals will represent a desired result.
- Goals will chart a clear direction for the organization, but will not set specific milestones or strategies; objectives and action plans will do that.
- Goals will be within the authority granted to support them.
- Goals will be challenging, but realistic and achievable.

D4c. Making the Process Work

The EWRA executive director's assertive leadership is essential to ensure that the goals will facilitate meeting the agency's mission. These steps should be followed to develop goals:

1. Establish the process

- Identify participants
- Define terminology
- Establish time frames
- Clarify expectations.

2. Review Internal and External Assessment Data

- Prior to beginning the actual goal-setting exercise, background information should be distributed and reviewed by the participants. Compilation and distribution of the information will set the stage for formulating goals.

- Consider all the information from the internal/external assessment, including:
  – Strengths and weaknesses
  – Opportunities and threats
  – Customer/stakeholder analysis

- Incorporate all identified Strategic Issues

3. Incorporate Customer and Stakeholder Feedback

- Identify customer and stakeholder needs
- Analyze customer and stakeholder comments and complaints to identify further need for improvement
- Track, measure, and benchmark the "as is" process
- Set targets for the "to be" process
- Implement improvements
- Gather and measure customer and stakeholder satisfaction with improved products and services.

4. Analyze Gaps in Service

A **gap analysis** is the identification of the difference between the desired and current state. After examining the data gathered in the internal/external assessment, questions, concerns and/or an awareness of significant deficiencies may emerge. Some essential piece of information may be missing, or some vital need may not be met at this time. Once the difference between the desired and current state has been identified, priorities and goals are developed for closing or eliminating each gap.

To perform the gap analysis, review all of the problems identified during the internal/external assessment, questions, concerns and/or an awareness of significant deficiencies may emerge. Some essential piece of information may be missing, some valuable information may not be accessible, or some vital need may not be met at this time. Once the difference between the desired and current state has been identified, priorities and goals are developed for closing or eliminating each gap.

To perform the gap analysis, review all of the problems identified during the internal/external assessment, then determine what will be needed to eliminate complaints and gaps. Then ask:

- How does the desired state of the EWRA compare with the current state?
- Are current services meeting or exceeding the primary customers' needs and expectations? If not, can any current service levels be redirected, reduced, or eliminated?
- Has the gap analysis identified the need to plan for new services?
- Have tradeoffs in assuming new services been considered?
- Would planned services compete for resources with existing ones?

5. Set Directions to Achieve Desired Results

Based on the results of the internal/external assessment, determine if the EWRA is headed in the right direction, or if minor or major changes will be necessary. By asking questions like the following, a new course can be set.

- If the organization embarks in a particular direction, will identified issues or problems be addressed; will identified strengths continue to be strengths?
- If the organization embarks in a particular direction will needs of external and internal customers be met? Will service to customers be maximized?
- What programs need to be initiated?
- What lines of communication, coordination and cooperation should be developed among programs and activities and with other organizations?

6. Draft and Refine Goals

- Based on the internal/external assessment and the discussion on direction, develop proposed goal statements for the planning cycle.
- Determine whether the goals meet the criteria. Revise goal statements as necessary.

- If it is not obvious who the intended recipient is or who will benefit, add language to the goal statement to clarify.

- Determine if the goals are feasible. Consider the factors or conditions that will facilitate or hinder goal achievement. Revise goal statements as necessary.

- Reach consensus among all participants on the goal statements and be committed to the completion of the goals.

- ***Optional:*** Consider ranking the goals in terms of their relative importance and the allocation of resources necessary to achieve them. Ranking goals:

  – Provides guidance to managers and key staff members in developing the EWRA.
  – Sets priorities for resource allocation.
  – Provides an overall framework for implementing, tracking, and evaluating performance and progress.

7. Select Goals to Include in External Strategic Planning Documents

- Review all the goals developed.

- Select those key goals that represent the most important activities.

- Consider what would be most important to an external policymaker. For example, a strategic goal of improving internal communications is important for an organization's internal strategic direction; however, it might not be reported in external documents.

Goals will usually relate to the major components of an agency's mission. However, each agency will vary in the number and scope of the goals set. Agencies may develop goals for distinct programs or goals that cross program lines.

The next step in planning is to develop objectives. Objectives are more specific, quantifiable, and time-bound than the goals they support. The next section will introduce the criteria for developing objectives.

D5. Objectives

The development of objectives completes the "Where do we want to be?" part of the strategic planning process.

Objectives: specific and measurable targets for accomplishing goals.

In contrast to goals, objectives are specific, quantifiable, and time-bound statements of desired accomplishments or results. As such, objectives represent intermediate achievements necessary to realize goals.

D5a. Criteria for Objectives

Good objectives will be:

Specific. Objectives should reflect specific accomplishments that are desired, not ways to accomplish them. Objectives should generate specific strategies or actions and be detailed enough to be understandable and give clear direction to others.

Measurable. Objectives must be measurable to determine when they have been accomplished. Accountability should be built into the planning process. A method for measuring an objective must be in place before work actually begins.

Aggressive but Attainable. If objectives are to be standards for achievement, they should be challenging, but should not demand the impossible. For example, it would be reasonable to reduce highway accidents but not to eliminate them. Objectives should also be consistent with available resources.

Results-oriented. Objectives should specify a result; for example, "Respond to 75% of all correspondence within 30 days with an average annual response of 21 days or less." An example of an activity might be, "To increase service to the public through improved correspondence turnaround."

Time-bound. Specify a relatively short time frame for meeting objectives, from a few weeks to no more than a year. Objectives are generally more manageable and better integrated with the budget process if they coincide with the fiscal year.

D5b. Formulating Objectives

Objectives can be developed in many ways, and the EWRA should use the process that best suits its organizational style. One recommended process follows:

1. Review the mission and goals.

- Has a clear mission for the EWRA been established?
- Have customers and stakeholders been identified?
- Is the intent of the goals understood?

2. Decide what results are wanted.

- Decide, given current human, technological, and financial resources, how much can be accomplished within the planning period.
- What specific, manageable parts should be achieved? Are there different results, customers, or services implied within a goal?

- What variables or factors may influence the result?
- Are specific levels of achievement or solutions already mandated by external elements, such as laws or decrees?
- Are the proposed results consistent with organizational policies, values, and priorities?

3. Set a time frame for achieving results.

- What is a reasonable period of time for achieving the desired results?
- How critical is immediate action?
- What are the opportunities to act now versus later?
- What are the consequences of action now versus later?
- Do laws or decrees already mandate specific time frames or deadlines?

4. Build in accountability.

- Review performance measures and targets already set for goals.
- Identify additional performance measures for objectives, if appropriate.
- Determine performance targets for each objective.
- Assess how progress will be measured.
- Organize to gather appropriate information.

D5c. The Stretch Factor

The real art of setting objectives is to create a challenging but achievable target. The best objectives are those that stretch the capacities of people and programs but are, nonetheless, possible. This not only results in genuine improvement in programs and services, but also builds employee pride and confidence. Impossible performance targets, on the other hand, discourage employees, kill initiative and stifle innovation.

E. How Do We Measure Our Progress?

- Why Measure Performance?
- Categories of Performance Measures
- Measuring Progress
- Benchmarking
- Summary

E1. Why Measure Performance?

After the mission, vision, goals, and objectives are in place, a method for measuring the progress and success of implementation will be needed. Choosing a balanced set of results-based performance measures to gauge the success in meeting goals and objectives is one of the most important and difficult aspects of the strategic planning process.

Performance should be measured because:

Measuring performance is good management. It provides accountability for results.

Measuring performance can enhance the quality of services. Performance measures inform program staff of customer needs and levels of satisfaction and make it possible to identify actions to improve quality and reduce costs.

What gets measured gets done. Most people want to do a good job. Performance measurement helps managers and employees focus on what is important. By comparing actual with expected results, it enables managers and policymakers to evaluate progress toward goals and objectives.

Measuring performance aids in budget development and review. Performance measures are valuable in the budget development process. They allow a more accurate assessment of resources needed to support activities. They also help identify what level of product or service will be provided for the amount of funding available.

E2. Categories Of Performance Measures

Performance Measures: used to measure results and ensure accountability.

A typical strategic planning model incorporates five common performance measures: *input, output, outcome, efficiency,* and *quality*. Each category is designed to answer a different question and must often be used in combination to analyze agency results.

Inputs measure the amount of resources needed to provide particular products or services.

Inputs include labor, materials, equipment and supplies and can also represent demand factors, such as target populations. Input measures are useful in showing the total cost of providing a service, the mix of resources used to provide the service, the demand for services, and the amount of resources used for one service in relation to other services.

Outputs measure the amount of products or services provided.

Outputs focus on the level of activity. Workload measures, which are designed to show how staff time will be allocated to respond to service demand, are most commonly reported. Outputs are useful in defining what an agency produces. However, they are limited because they do not reveal anything about the quality or efficiency of the service provided.

Outcomes measure whether services are meeting proposed targets.

Outcomes reflect the actual results achieved, as well as the impact or benefit, of agency programs. Both intermediate and long-term outcomes can be evaluated. Policymakers are generally most interested in outcome measures. Yet information about the ultimate result is not always available or practical to measure. In those instances, it may be necessary to use proxy or surrogate measures.

Output measures are often mistaken for outcome measures. Outcomes assess how effective or successful the agency has been. Outputs alone cannot tell management how successful the agency has been. How much work an agency does is different from how well an agency is working.

Efficiency measures are also known as **productivity** measures.

Efficiency can be measured in terms of the cost per unit of output, the ratio of outputs per unit of input and the ratio of outputs per unit of time. Ratios help express the relationships between different performance measures to convey more information about the productivity and cost effectiveness of an agency.

Quality measures reflect the effectiveness in meeting the expectations of customers and stakeholders.

Measures of quality include reliability, accuracy, courtesy, competence, responsiveness, and completeness associated with the service provided. Lack of quality can also be measured: the resources devoted to rework, correcting errors or resolving customer complaints. Both the positive and negative sides of measuring quality can be important to track.

The next step in the planning process is to determine which set of measures will provide agencies, customers and external policymakers with the information necessary to gauge progress.

E3. Measuring Progress

E3a. Choosing Performance Measures

One of the most difficult aspects of strategic planning is picking a balanced set of results-based performance measures to gauge the success in meeting goals and objectives. Once measures are decided on, the EWRA needs to define the performance measures, determine data requirements, identify current baselines, set realistic performance targets based on benchmarking, and compare actual performance with expected results.

A comprehensive set of performance measures: will be linked to mission; will measure intermediate and final outcomes; will rely on measurability; will be valid and reliable; will delineate clear responsibilities; will address multiple priorities; and will be useful to staff, internal and external customers, stakeholders, and policymakers.

It is important to ensure that performance measures do not lead to wrong incentives. For example, if the focus is on the number of cases processed, employees might have the incentive to rush through the cases in order to generate the highest ratings. A balance of measures can help

overcome this potential shortcoming. Another approach is to separate measures for internal purposes such as by type of client, customer, or geographic area to reflect workload difficulty.

1. Select Initial Performance Measures

Review the mission, vision, goals, and objectives for the EWRA. Keep the intermediate and final outcomes in mind.

Ideally, performance measures will be chosen with input from relevant staff at all levels of the agency, as well as input from customers and policymakers. The most effective measures are those which represent a consensus of what is intended and expected.

2. Evaluate the Performance Measures

The following criteria can be used to evaluate performance measures:

- **Meaningful** – significant and directly related to the mission and goal.
- **Valid** – represents what is being measured.
- **Responsibly linked** – matched to an organizational unit responsible for achieving the measure.
- **Customer focused** – reflect the point of view of the customers and stakeholders.
- **Comprehensive** – when taken together, the set includes all key aspects of EWRA performance.
- **Balanced** – the set includes several types of measures, i.e., outcome, efficiency, and quality measures.
- **Credible** – based on accurate and reliable data.
- **Cost effective** – based upon acceptable data collection and processing costs.
- **Compatible** – integrated with existing financial and operational systems.
- **Comparable** - useful for making comparisons with data over time.
- **Simple** – easy to calculate and interpret.
- **Useful** – accurately captures progress over time.

3. Select the Key Performance Measures

Once the entire set of performance measures has been chosen, a subset of key measures needs to be selected. While internal management will need programs to collect enough measures to capture all aspects of performance, external policy makers will be interested in the success of the EWRA.

Therefore, for external planning documents, one should focus on the desired results, the primary measure of achievement and a balance between external and internal focus. The complete list of measures for the EWRA should be reviewed and those selected that are most important based upon the mission and goals. Identify the key or vital few measures to report on external planing documents. Recognize that outcome, efficiency, and quality measures will be most useful to decision-makers. Also consider which measures could be aggregated to the next level of management for reporting purposes.

4. Determine Data Requirements

Once all measures have been chosen, the data needs of the EWRA will need to be determined.

To determine what data you need to collect, ask:

- What information is currently being gathered? Does it meet agency needs?
- What new information needs to be collected?
- Do any data collection problems exist?
- Can needed data collection efforts be incorporated into existing efforts?
- What new (or modified) forms will be needed to collect data?
- What resources will be needed to manage performance data?
- What computer hardware and software exist to assist data collection and analysis?
- Are there any constraints to changing data collection? (For example, money, technology, tradition, politics, privacy, etc.)
- How often will data be collected: monthly? Quarterly? Annually?

Performance data should be collected, verified and analyzed at the source of service because:

- Those closest to providing the service know it best.
- Service deliverers can identify collection problems quickly.
- Service deliverers often have the best solutions to solving collection problems.
- It may be too costly to train someone else to collect the data.

Data analysis will be most useful to those monitoring performance when:

- The data is in a usable and meaningful format.
- Adequate time exists to collect, analyze and report the results.
- Training is instituted to help managers use performance data.
- Managers know what kinds of performance data to request for reports.

5. Define Performance Measures

Good performance measures need to be clearly defined, including exactly what is being measured, the source of the data and how the value is being calculated. Definitions that are clear and specific are not open to interpretation and this ensures that staff will be able to provide accurate and consistent information over time.

6. Determine Baseline Performances

The next step is to assess current performance (where are we now?) This information is then compared with future data to measure progress and improvement. The baseline is usually derived from the most recent one-year period. If no data is available, as is the case with new agencies, sometimes industry averages have to be used. Otherwise, data will need to be collected to establish the initial baseline.

E4. Benchmarking

E4a. Use Benchmarking to Establish Performance Targets

Benchmarking involves seeking out best in-class performers inside or outside of the organization, studying them to determine why they are the best at what they do, and applying what is learned.

Potential benchmarking partners can be identified through:

- Previous studies,
- Literature from international organizations,
- Awards given to organizations,
- Business/government press literature,
- The Internet.

Benchmarking data may represent: international standards as well as quality practices; the highest or lowest rating (whichever is most desirable) in a given issue or field; or performance or workload levels set in international guidelines.

In a world class organization, benchmarking is not viewed as a one-shot study, but rather as an ongoing process. The benchmarking process consists of four stages:

1. Planning Stage

- Establish the scope of the study.
- Form a team and obtain resources.
- Document and analyze the process you want to study. This decision will be based on the process and partner organizations you have selected for your study.
- Develop preliminary methods for gathering information.
- The process does not necessarily have to be sequential, but this is a good checklist to be sure that you are not overlooking important factors.

2. Data Collection Stage

- Use the first round of information you collected to identify benchmarking partners.
- Plan a new data collection instrument and strategy.
- Complete a second round of data collection.

3. Analysis Stage

- Gauge the similarities of the data between the benchmarking partners and the EWRA before you decide to adopt or adapt any measures or a new process.
- After comparing baseline status and the data discovered in the benchmarking process for a particular organization, managers and staff know how far the organization must go to equal the best performers. The difference or "gap" between the expected

performance and actual performance represents room for improvement. Benchmarking offers an organization a chance to aim for the top and to provide ideas on what it needs to do to get there.

4. Setting Performance Targets

Performance targets are quantifiable estimates of results expected for a given period of time. Setting performance targets is an art. The following criteria may help.

Performance targets:

- Should be developed by those who will be held accountable.
- Should include input from customers and stakeholders.
- Should include final and annual incremental targets.
- Should be derived from benchmarking, where available.
- Should represent realistic expectations toward meeting goals and objectives.
- Should be adjusted based on experience and expectations.
- Will enhance productivity.

E4b. Pitfalls in Benchmarking Projects

When properly used, benchmarking has numerous rewards. However, there are pitfalls in benchmarking as well.

- **Scope.** When a project scope is too broad, there is no focus. This makes it hard to determine what companies would be comparable and what data to collect.

- **Time.** The greater the amount of time spent in the planning stage3s, the better the benchmarking project. Allow enough time for data collection.

- **Funding.** Funding for a project includes time, administrative support, research and expenses for data collection.

- **Measures.** Public sector organizations often do not have commonality in reporting measures. Different organizational structures, accounting policies and regulations can all affect the performance information that is reported.

- **Commitment.** To enhance commitment, it is important to have EWRA staff see the benchmarking project as part of their normal job activities. A specific amount of time should be allocated for participation in the project.

- **Communication.** Everyone involved must know the time expectations from project start to implementation.

- **Confidentiality.** Some partner organizations will allow their names to be used and others will want to remain confidential – always accommodate their wishes and keep in mind the sacrifice that they are making in assisting you with the project.

- **Context.** Be aware of the political and legal environment in which the partner organizations operate. The political realities of each jurisdiction shape many of the processes of government.

- **Blame.** Do not use comparisons to benchmarks to find fault with staff. For meaningful changes to occur, it is important to have commitment, not compliance, from people.

- **Preconceived notions.** Finally, remember that if you go into a project deciding what should be done, innovative ideas should be difficult, if not impossible, to find. **Think outside the box.**

E5. Summary

E5a. Review and Update Performance Measures

Developing good performance measures is an evolving process that improves with time. The following questions can be used to review and update performance measures, as well as goals, objectives and any other component of the model.

- What developments in the past year will influence performance, measures?
- Have their been any problems in measuring performance in similar organizations?
- How should data be collected and analyzed?
- Is the management information useful to management and staff, the EWRA's Administrative Unit, customers, and stakeholders?
- How could performance reports be enhanced?
- Are additional measures necessary?

The process of developing, updating, and reporting performance measures is dynamic and likely requires ongoing attention. Accept that the process is evolutionary, and that measures will likely improve with experience.

F. Getting There

F1. Action Plans

Action plans make up the "How do we get there?" part of the strategic planning process.

Action plan: a detailed description of the strategies and steps used to implement a strategic plan.

Action plans spell out the details of the methods, or strategies, that will be used to accomplish the objectives, goals, and mission of the EWRA. Tasks and responsibilities are outlined in steps. Action plans should contain as much detail as management feels is important.

Planning assumptions are often included. Planning assumptions clarify expectations about future conditions upon which the strategic plan is based. If these conditions significantly change, planning assumptions and, possibly, the strategic plan may need to be amended. This part of the process builds upon past experience, current activities and projected trends, which could significantly impact future performance. In short, the planning assumptions help the staff chose the relevant strategies for implementing objectives.

F1a. Formulating Strategies

To build an action plan, key staff members must determine how to achieve the desired results. The costs, benefits and possible consequences of alternative courses of action, or strategies, must be evaluated. The most effective and efficient strategies should be selected. Researching successful programs in other regulatory agencies internationally can prove helpful. Private sector organizations are also a good source of information.

Before a decision is made regarding the course of action that will be taken, each strategy must be weighed. The following questions can be used as a test of each suggested alternative.

- If this course of action is implemented, is it plausible that the objective will be reached?
- What are the anticipated costs and benefits of this course of action?
- Will this course of action have a positive or negative impact on any other objectives?
- Is this objective dependent upon the successful implementation of any other objective?
- Is the EWRA organized to implement this course of action? If not, what must be changed to accommodate implementation?
- If changes are necessary, how long will they take? Are there other constraints that will occur as a result?
- Once implemented, will procedural changes be required? If so, what impact will they have on the agency?
- What are the steps necessary to implement this course of action and how long will each step take?

The resources that will be needed to implement various strategies must also be considered. **Resource Allocation:** the determination and allotment of resources or assets necessary to carry out strategies and achieve objectives, within a priority framework. To avoid creating unrealistic expectations, planning decisions must be grounded in fiscal reality.

The following questions can be used to test the resource needs of each strategy.

- Are the resources required to implement this course of action—the budget, personnel, training, facilities, hardware, software, and other equipment available? If not, how will needed resources be obtained? Can resources be reallocated within the agency?
- If information resources (hardware, software, etc.) will be required, will these needs be reflected in the Information Technology Plan?

- What will the fiscal impact of this course of action be? Will additional funding be needed?

Once the costs, benefits, possible constraints, time frames, and resources have been analyzed, select the best strategy. Next, identify the steps necessary to successfully implement the strategy in order to achieve the objective. These are the action steps that will appear in the action plan.

F1b. Putting the Action Plan Together

The action plan is the level where the actual production of a program occurs. Action plans are geared toward operations, procedures, and processes. The action plan describes who performs each step and when the step is scheduled for4 completion.

The following process is one way of managing the action plan.

1. Assign responsibility for implementation of the action plan.

- Who is in charge of implementing all steps of the action plan?
- Who will be accountable?

2. Detail the action plan in steps.

- The responsible party for completion of the action plan should define the steps that must be finished in order to fully complete the action plan.
- Steps should be briefly described, indicate who is responsible for completion of the step, and have an expected start date and finish date.

3. Set a time frame for completion of the action plan.

- In the overall context of the strategy, when should the action plan as a whole be completed?
- Does the person or team responsible for the action plan think it can be completed within the desired time?
- Is the time frame for the action plan as a whole consistent with individual time frames projected for steps within the action plan? If not, how can differences be reconciled?

4. Determine the fiscal impact of the action plan and the resources necessary to carry it out.

- The individual or team responsible for completion of the action plan should determine the fiscal impact and identify the resources necessary to carry out the plan.
- The action plan becomes the basis for developing requests for capital and operating budgets, as well as to support human and information resource management.
- IN practice, it may be necessary to detail the steps of the action plan—including intermediate dates—before the time frame for the action plan as a whole is set.

F1c. Organizing the Action Plan

A numbering or lettering system is recommended for ease in identifying each particular goal, objective, and action step. A typical method for organizing a strategic plan is to devise a numbering system. For example:

- Goals could be numbered 1, 2, 3, etc.
- Objectives could be numbered to correspond to each goal: 1-1 or 1.1 would represent the first objective under the first goal.
- Finally, action steps could be numbered to identify which goal and objective they are under: 1.1.2 or 1-1-2 would be the second step required under the first objective, first goal.
- The numbering system does not necessarily have to represent the importance of the goal or objective, unless the agency has decided to prioritize elements of the plan.
- Since much of the information included in the action plan will also be used for the tracking and monitoring document, the EWRA may want to design one format to accomplish both purposes.

G. Tracking Progress

- Tracking Systems
- Monitoring Performance Measures

G1. Tracking Systems

Tracking systems monitor progress, compile management information, and keep the plan on track.

Tracking the implementation of objectives and goals will normally be the responsibility of the individual or team responsible for completion of the action plan. Ideally, monitoring should follow a regular schedule—quarterly or monthly.

G1a. Developing a Tracking Document

Elements for a workable tracking document should include:

- Goals
- Objectives
- Performance measures
- Action plans, including the identification of the position, unit, section and/or division responsible for implementation
- Room for comments and an explanation of the actions taken to date
- Information on current status

Progress and non-progress should be reported. Report progress to date on steps in the action plan that are contemplated ahead of schedule and that are on schedule. If things are not progressing

according to plan, report the reasons, as well as what is being done to get implementation back on track.

The EWRA will need to develop a method for tracking implementation of its goals, objectives, and action plans. The document created needs to track the status of each action step. For example, is it on schedule, delayed, cancelled, ahead of schedule, or in the planning stages? Use of short, easy-to-recognize codes will facilitate usage of the report. Managers should be encouraged to give as much comment as is necessary to provide complete information to the Executive Director.

G2. Monitoring Performance Measures

In addition to tracking progress on goals, objectives and action plans, performance measures should also be monitored. Data should be collected for each performance measure and reported at a regular interval. Progress reports on performance measures could be in the form of data tables or presented in charts or graphs.

Comparison of actual performance, as reported in the monitoring document, to the "planned" performance (i.e., target) provides the basis for periodic evaluation of the strategic plan and the planning process. Management should use the results of the quarterly or monthly reports to identify reasons for not meeting expected results and use this information to review and revise policies, procedures, goals, and objectives, as necessary.

Tracking performance and reporting results is an important way to measure progress toward meeting the goals in the strategic plan. Staff can be assisted by having senior management articulate some boundaries, such as:

- Designating specific cut-off times for reporting
- Paying special attention to the continuity of data collection and calculation during personnel changes. New staff should be trained on how to calculate the measures in accordance with previous methods
- Ensuring there are effective internal controls to be sure the information is properly collected and accurately reported. It is difficult and embarrassing to take back information once it leaves the organization

For each performance measure, compare actual performance with the proposed performance level, and report the results. The following questions should be asked about variances:

- How does the reported performance compare to previous periods?
- Is the variance relevant to successful achievement of the goal?
- Do external factors affect performance to the extent that targets may not be met?
- Is the variance due to a faulty projection of performance?
- Are there unanticipated effects resulting from the variance?
- How frequently and in what form will the performance information be prepared?
- What kinds of explanatory data do you think will be needed to explain trends and results?

- How will the data/information be checked and verified for accuracy? What kinds of controls, tests and/or audits are appropriate?
- What kinds of unintended results can you expect from implementing the strategies? How can you avoid them?
- How will you use the data to evaluate, improve, and change your programs?
- How will you know if your program is inefficient or ineffective? What will you do to fix it?

G3. Reporting the Results

The EWRA should establish guidelines concerning how often performance information is to be collected and reported. At a minimum, data for each measure will have to be collected annually, but some measures may be calculated more frequently.

For example, internal management reports on key volume/caseload indicators should be generated monthly and aggregated to the Executive Director on a quarterly, or semi-annual basis. For other indicators (especially if the month-to-month changes are nominal), the data reporting period may be semi-annually.

External Reporting. External stakeholders, policymakers, providers, contractors, and utilities will want to know how well the EWRA and its programs are performing. If performance measurements show a continuous improvement process with a positive impact on results, some of the stakeholders' concerns may be allayed.

Reports for policymakers should be clear and concise. Reports are often easier to read if the data are presented graphically. Reporting performance measures can also be aggregated and incorporated in annual reports.

Explanatory information should be used when reporting results. Rarely can all of the variables be measured or true causal relationships established. To do so would require a rigorous experimental design that would probably be impossible or prohibitively expensive. Multiple factors can influence outcomes and many will be beyond the control of the EWRA. It must be recognized that some measures will have these limitations.

The following may help in the communication of results:

- Including targets as well as actual results;
- Including explanations where performance varies significantly from previous levels or targets;
- Developing reports that are user-friendly and that citizens and other stakeholders will be able to understand.
- Ensuring that the information will enable readers to assess the level of [performance;
- Deciding how aggregated or desegregated the reported information should be;
- Determining if too much information is being communicated;
- Deciding how feedback on the reported information will be gathered.

Internal Reporting. Internal reports can take various forms. Chief among these are program performance evaluation, planning and budgeting activities, and implementation of improvement activities. These reports for program managers can be more detailed and are usually more frequent than those for policymakers. They may also include more process information. Sometimes the data may be separated in order to clearly convey patterns. For example, results may be more meaningful if reported by geographic area.

The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

USAID Funded Project

TRAINING MATERIALS FOR EGYPTIAN WATER/WASTEWATER SECTOR REGULATORY AGENCY PERSONNEL

July 2002

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

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Program of Initial Orientation Sessions for New EWRA Staff

	Topics	Materials
Week 1.	**THE REGULATORY FRAMEWORK** • Overview of the water/wastewater sector • Proposed GOE regulatory framework • EWRA formal characteristics	• Sector Overview • Draft EWRA decree • The Regulatory Framework
Week 2.	**THE REGULATORY AGENCY** • Objectives of regulation • EWRA functions and levers • Organization structure • LIRR assistance • Strategy and stages of operationalization	• Operationalizing the Regulatory Agency
Week 3.	**ECONOMIC REGULATION** • Price and quality regulation • Rate-setting: regulation vs. competition • Types of economic regulation	• Quality of Service Regulation • Price-Cap Regulation
Week 4.	**RATES ANALYSIS** • Revenue requirements • Rate design • Beheira rate case • Cash needs vs. utility basis approaches to developing revenue requirements	• Setting Water Tariffs for Egyptian Utilities • Sixth of October City Case Study

SECTION I

The Regulatory Framework

A. Sector Overview

A1. Current Sector Organization

The current sector is composed of service providers, design and construction managers, central agencies, and other sectoral ministries.

Service Providers

- Local public authorities (11) and companies (3): 12 governorates
- Local administration: 12 governorates
- Suez Canal Authority (w) and local administration (ww): Canal governorates (3)
- New urban community local agencies

Design and Construction Managers

- Local public authority: Cairo and Alexandria utilities, SCA
- NOPWASD: provincial utilities

Central Agency Involvement

- National Investment Bank: provides loans for capital investments to utilities, directly or through MOF
- Minister of Planning: approves utility capital investment plans, subject to availability of funds
- Ministry of Finance: provides financial support for operations, maintenance, and NIB interest
- Central Agency for Organization and Administration: sets position classification and pay levels for all public entities, reviews organization and staffing plans and job description, approves requests for new staff.

Involvement of Other Sectoral Ministries

- Ministry of Water Resources: approves utility requests for water abstractions
- Ministry of Agriculture: sets standards governing effluent reuse in agriculture
- Ministry of Health: sets standards for drinking water quality and monitors compliance

A2. Responsibilities of Local Water Authorities

Local water authorities are responsible for: operations, maintenance, house connections, rehabilitation, expansion, billing and collection, and customer service.

Table I-1 below illustrates standards for water authorities. Table I-2 provides efficiency indicators for select utilities.

Table I-1: Performance Standards for Water Authorities

Quality

- Coverage
- Consumption
- Water quality
- Continuity
- Reliability
- Billing accuracy
- *Request response time*
- Response to complaints

Efficiency

- Unit cost of production
- Unaccounted-for water
- Collection efficiency
- Return on assets

Financial Viability

- Operating ratio
- Current ratio
- Debt service coverage ratio
- Return on equity

Table I-2: Efficiency Indicators for Selected Utilities (1999/2000)

	Alex Water	Alex Wastewater	Beheira Water	Gharbiya W & WW	Minya W & WW	Aswan W & WW
Estimated Leakage	36%	-	35%	60%	40%	30%
Staff/1000 Connections	5.0	9.8	8.5	15	14	17
Arrears as % of annual revenues	84%	-	198%	43% (?)	42% (?)	n/a
Operating ratio[(a)]	0.69	3.07	1.24	1.36	1.64	2.24[(b)]

(a): O&M expenses plus depreciation expense (but not including interest), divided by revenues
(b): Aswan operating ratio doesn't include depreciation

A3. Operational Problems Resulting from Institutional Problems

- Utility managers subject to conflicting mandates
- MOF "regulates" expenses but cannot increase tariffs. Utilities cut back on maintenance in order to be able to pay increasing labor costs.
- Responsibilities for capital works and for O&M are often divided between central and local level
- Low tariff levels and bureaucratic administrative systems → utilities don't think of users as customers
- No profit motivation to stimulate commercial management
- Dependence on central funding for capital works → under investment
- No central agency responsible for utility performance regulation

A4. GOE Sector Reform Objectives

The Government of Egypt has three reform objectives for the water/wastewater sector:

- Enable utilities to meet service and performance standards

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- Enable utilities to achieve cost recovery
- Expand capacity for investment finance

Reform strategies include subjecting utilities to performance standards, restructuring utilities as (regulated) businesses, encouraging and facilitating (regulated) private participation, and basing capital and operating subsidies on objective criteria of need and performance.

A5. Central-level Reorganization

- Establish an *Interministerial W/WW Policy Committee* to
  - set overall service targets
  - set capital financing policy and strategy
  - set criteria for allocation of subsidies
  - set Bab III investment priorities

- Establish a W/WW Sector *Regulatory Agency* to
  - set and enforce performance standards
  - review utility plans and budgets
  - approve tariffs and tariff adjustments
  - assess viability of large investment project proposals
  - promote competition and corporatization

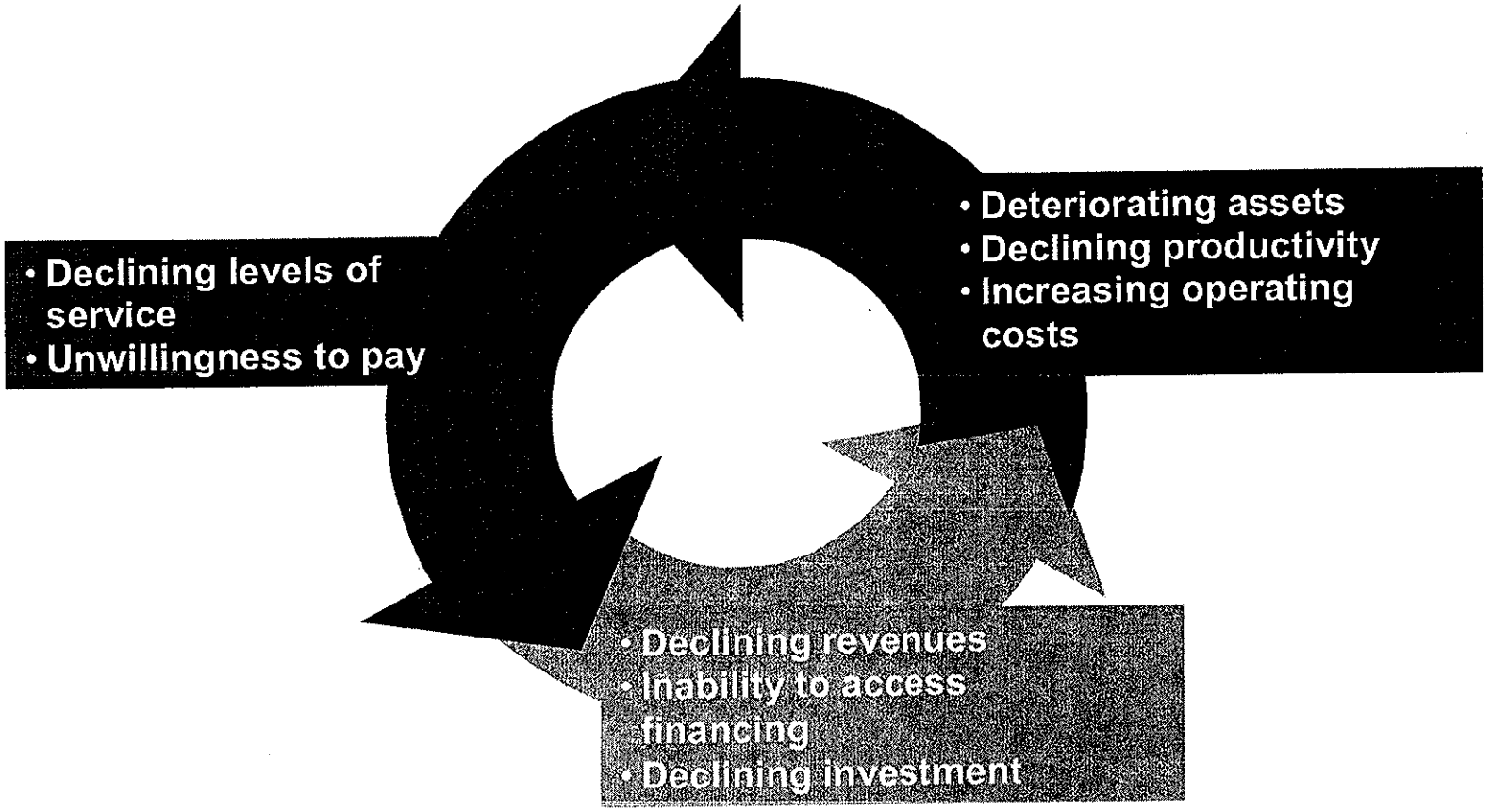
- Establish a *Central Department for Private Sector Projects* to
  - Advise on PSP strategy
  - Assist local utilities and national authorities to identify, develop, and tender PSP projects
  - Facilitate international entry into Egypt's water PSP market

- Restructure NOPWASD to
  - Act as IPC technical secretariat
  - Manage national w/ww grants program
  - Build local utility capacity for project planning and implementation

A6. Local-level Reorganization

- Establish public authorities in all governorates
- Develop strategy to remove legal and administrative constraints

Value Destruction Cycle



B. Draft Presidential Decree Organizing the Water/Wastewater Sector Regulatory Agency

The President of the Republic

Having reviewed the constitution,
Law 308/1955 concerning administrative sequestration,
Law 93/1962 concerning discharge of liquid wastes,
Law 44/1965 concerning organization of accounts control departments in authorities, public sector establishments and affiliated companies, units and associations,
Law 53/1973 concerning the public budget,
Law 47/1978 promulgating law on the civil service,
Law 48/1978 promulgating law on public sector personnel,
Law 43/1979 promulgating law on local administration system and its executive regulations,
Law 59/1979 concerning establishment of urban communities,
Law 48/1982 concerning protection of the Nile and other waterways from pollution,
Law 97/1983 promulgating law concerning public sector authorities and companies,
Law 5/1991 concerning senior civil service positions in government administration and public sector,
Law 4/1994 concerning environmental protection,
Law 8/1997 promulgating law on investment guarantees and incentives,
PD 118/1964 on the establishment of the Central Agency for Organization and Administration,
PD 4723/1966 on adoption of the Uniform Accounting System,
PD 1638/1968 concerning the establishment of the Greater Cairo Water Authority,
PD 1639/1968 concerning the establishment of Alexandria Water Authority,
PD 262/1979 concerning the establishment of Alexandria Wastewater Authority,
PD 96/1994 concerning amendments to some provisions of PD 262/1979 on the establishment of Alexandria Wastewater Authority,
PD 133/1981 concerning the establishment of Greater Cairo Wastewater Authority,
PD 95/1994 concerning amendments to some provisions in PD 133/1981on the establishment of Cairo Wastewater Authority,
PD 197/1981 concerning the establishment of the National Organization for Potable Water and Sanitary Drainage (NOPWASD),
PD 30/1986 concerning amendment of PD 197/1981,
PD 281/1995 concerning the establishment of public economic authorities for water/wastewater in some governorates,
PD 164/1996 concerning the organization of the Ministry of Housing, Utilities and Urban Communities,
Beheira Governor's Decision No. 198/1981 concerning the establishment of Beheira Water Company,
Kafr El-Sheikh Governor's Decision No. 201/1983 concerning the establishment of Kafr el-Sheikh Water and Wastewater Company,
Damietta Governor's Decision No. 357/ 1984 concerning the establishment of Damietta Water Company,
Decree of the Minister of Housing and Land Reclamation No. 497/1981 on the establishment of the Executive Agency for the Greater Cairo Wastewater Project, with the consent of the Cabinet,
and on the basis of the view of the State Council,

ARTICLE 1

An agency called "The Water/Wastewater Sector Regulatory Agency" shall be established, reporting to the Minister of Housing, Utilities, and Urban Communities.

The goal of the Agency is to regulate water/wastewater sector in such a way so as to enable and encourage concerned utilities to achieve a higher level of performance and cost recovery and enhance their capacities for self-finance. In particular, the Agency shall seek to:

1) ensure the satisfaction of demand for water and wastewater services and the needs of all consumers, including those of the various state sectors, at the most reasonable prices;
2) promote and regulate private sector participation in investment in water/wastewater sector;
3) ensure that water/wastewater production entities and service providers in the sector comply with definite quality and performance standards.

ARTICLE 2

The Agency shall be responsible for the regulation of the water/wastewater sector and the enhancement of the technical, economic and financial performance of all utilities. To this end, it shall have the following regulatory and control responsibilities:

1) develop criteria for utility technical, economic, and financial performance; determine the procedures and periodicities of reports submitted by entities working in the sector, and control and audit procedures by the Agency;
2) provide technical assistance to the utilities in terms of preparation of studies on the basis of which target performance levels are determined;
3) set principles and controls for preparing cost studies, tariff setting and procedures for submitting and evaluation of tariff adjustment applications according to the policies developed by the Interministerial Policy Coordination Committee and send the same to the economic authorities and companies for preparation of tariff proposals;
4) examine, review, and approve tariff adjustment applications submitted by water/wastewater utilities; and determine the economic cost of service at the level of each utility;

5) review and approve five-year plans prepared by each utility, which shall specify the annual target percentage of cost recovery. These plans should aim for the highest degree of cost recovery compatible with the economic conditions of each utility. The achievement of each utility shall be evaluated annually and the target percentage shall be amended as deemed fit by the Regulatory Agency. An annual report to that effect shall be submitted by the Head of the Regulatory Agency to the Interministerial Policy Coordination Committee to consider in arranging for necessary subsidies;
6) review and approve wording of standard contracts and agreements which structure the reciprocal relationships between service providers and customers;
7) monitor compliance of utilities with target technical, economic, and financial performance criteria mentioned in item (1) of this article and with the application of their respective tariff schedules as approved by the Agency;

8) review the financial and economic feasibility of new projects to evaluate expected impacts on the cost and price of the water and wastewater service delivery;
9) issue required operating licenses for water and wastewater facilities;
10) determine procedural and executive steps necessary for initiating the transformation of PEAs and companies working in the sector into private joint-stock companies.

ARTICLE 3

The Board of Directors shall be formed for a renewable term of five years by a decree from the Prime Minister. It shall be headed by the Minister of Housing, Utilities, and Urban Communities, with a membership of:

- The Executive Head of the Water/Wastewater Sector Regulatory Agency, as Deputy Chairman of the Board, to be appointed by a decree from the Prime Minister upon nomination by the Minister of Housing;
- Head of the Housing and Utilities Sector, Ministry of Housing, Utilities, and Urban Communities;
- The Chairman of the National Organization for Potable Water and Sanitary Drainage;
- Head of the relevant legal opinion (*fatwa*) department in the State Council;
- Representative of the Ministry of Finance
- Representative of the Ministry of Local Development;
- Four persons with technical experience but not employed by the government, public institutions, public sector companies or public enterprises sector companies, to be appointed by the Prime Minister upon nomination by the Minister of Housing, Utilities and Urban Communities; and
- Two customer representatives, to be appointed by a decree from the Prime Minister upon nomination by the Minister of Housing, Utilities and Urban Communities.

Representatives of other concerned ministries shall be invited for the discussion of issues related to their respective jurisdiction, but shall not have voting powers. Also, other experts may be invited as deemed appropriate, but shall not have voting powers.

The Board may create advisory committees of experts for the study of specific issues (e.g., technical, financial, economic, or legal). It may also authorize one (or more) of its members to carry out a specific assignment.

The Agency may set up regional branches in governorates and cities, with mandates and functions to be determined by the Board.

ARTICLE 4

The Board of Directors is the highest authority in charge of the Agency. It shall discharge its business, develop its policies, and make decisions, as it deems proper to fulfill its mandate. In particular, it shall have the capacity to:

1) develop policies for technical efficiency and performance measurement for various water/wastewater services; regularly monitor the results of application of these policies; review and propose principles to enhance the performance level; and approve systems for periodic reporting on administrative and financial performance of authorities and companies;
2) examine, review and approve tariff adjustment applications by water/wastewater utilities; and determine the economic cost of service per utility and classify it into categories while considering ability of low income citizens to pay for lifeline consumption;
3) approve the issue of permits for the operation of water/wastewater plants, and set conditions for licensing. Permits shall be issued by a decision from the Executive Head of the Agency;
4) develop a system of incentives to encourage authorities and companies working in the sector to enhance their performance; and develop rules on penalties to be applied in case of non-compliance of these authorities or companies with the decisions of the Agency or their violation of target performance criteria or the tariff schedule;
5) take necessary procedures and measures in case of a violation of licensing conditions. The Board shall have the powers to withdraw or amend licenses pursuant to the conditions therein;
6) develop systems for examining complaints of customers, investors, and entities operating in the sector to protect their interests; and set rules for resolving disputes arising among various water/wastewater service providers;
7) look into and decide upon objections to decisions of the Executive Head of the Agency;
8) adopt fees to be collected against permits and licenses, as well as charges for services provided by the Agency;
9) approve the organizational structure of the Agency, including its branches in governorates;
10) adopt the executive regulations of the Agency, to be issued by a decree by the concerned minister;
11) approve the internal regulations of the Agency and its personnel regulations;
12) approve the draft annual budget of the Agency.

The Board of Directors shall, upon invitation by its Chairman, meet at least once a month, or as necessary. It shall have a quorum of at least five members. Its decisions shall be made by a majority of the votes of present members. In case of a tie, the Chairman of the Board shall have a casting vote.

ARTICLE 5

The Executive Head of the Agency shall be responsible for the implementation of the policies developed to achieve the goals of the Agency and decisions of the Board. In particular, his functions shall include the following:

1) prepare programs and plans to ensure development of the performance of the water/wastewater sector and expansion of its services, and submit the same to the Board;
2) propose draft financial, technical, and administrative regulations of the Agency and submit the same to the Board for approval;

3) propose the organization structure and staffing plan of the Agency;
4) supervise functioning of the Agency and its branches and coordinate work with other entities related to water/wastewater services;
5) prepare the draft annual budget and the closing account to be submitted to the Board;
6) propose charges for licenses and services offered by the Agency;
7) monitor licensees' compliance with terms and conditions of licenses; take necessary measures to enforce compliance and adherence to the general policy of the water/wastewater sector;
8) determine levels of service to be provided by licensees to customers;
9) look into customer complaints against licensees and take necessary measures for remedy;
10) look into disputes among licensees concerning technical, administrative, and operational; and
11) perform any other works or tasks assigned thereto by the Board of Directors.

ARTICLE 6

The Agency shall have an independent budget to be adopted, together with the closing accounts, by the Board and approved by the Cabinet. Revenues of the Agency shall consist of:

1) charges for licenses and services offered by the Agency, and any other relevant charges, according to its regulations;
2) a percentage of the approved water/wastewater tariff of each authority, to be determined by the Board;
3) funds allocated in the Public Budget; and
4) grants received by the Agency according to the prevailing rules in the State.

The fiscal year of the Agency shall start July first and end June 30. Funds of the Agency and any amounts due thereto are considered public funds to be protected and collected according to the provisions of relevant laws. In pursuit of its rights, the Agency may undertake procedures of administrative sequestration according to the provisions of the Law on Administrative Sequestration.

ARTICLE 7

An executive committee, to be chaired by the Minister of Housing, Utilities and Urban Communities, shall be formed to undertake the establishment of the Agency; develop its organizational structure, financial and administrative regulations, technical and legal systems; complete recruitment of cadres required for the same; and perform, upon a decision by the Board of Directors, priority tasks that are submitted thereto. It shall also perform the planned functions of the Agency until the organizational structure, personnel regulations, and financial and internal regulations of the Agency are established, no later than two years from the date of the issue of this Decree.

C. The Regulatory Framework

The following slides discuss the regulatory framework.

The Regulatory Framework

Presentation on the
Water/Wastewater Sector in Egypt

October 1999

Defining Regulation

- Regulation is a tool used by governments to protect consumers from "Monopoly Pricing" while simultaneously encouraging investors to risk capital in water sector investments
- Regulation is used to enforce standards in quality and performance
- Regulation is used to control unreasonable prices and to limit unsustainable subsidies
- Regulation can be applied by governments at all levels: National, Governorate, and municipal
- Economic regulation refers to setting and adjusting tariffs
- Other forms of regulation include quality, performance, health and safety

Rationale for Regulation of Water Service Providers

- In competitive markets, regulation is not required, the public has choice
- In natural monopolies, prices should be regulated and based on cost of service and risk/reward ratios
- Well designed regulation promotes competitive utility management and encourages efficiency
- Regulation allows for consumer representation
- Regulation provides investors with confidence that large capital investments will yield reasonable returns and that tariffs will be transparently set and adjusted

Requirements for Successful Regulation

- Regulation requires accurate and reliable information
- In the absence of competition, regulators must determine both the costs of producing water and the "fairness" of its price
- By introducing competition "for the market", regulators can use "auctions" to promote price efficiency and improve value
- Regulatory procedures must be transparent in order to be effective

A Regulatory Framework for the Water Sector in Egypt Would:

- Promote cost recovery and commercial tariffs
- Compel performance "benchmarking"
- Improve operations and maintenance and reward competitive utility management
- Foster financial management and customer relations
- Reduce financial drain and leverage resources
- Encourage private investment in the sector

Fundamentals

- Political economy of utility regulation
  - **Tariffs tend to be political**
    - Consumers = voters
    - Strong short-term pressures to hold below costs (unsustainable)
  - **Investments are large and immobile, with long pay-back periods**
    - Investors require credible commitments about tariffs and other rules of the game
    - Risk of government reneging on commitments raises the cost of capital
      - Risks are perceived as being greater in emerging markets
      - Compare opportunity costs, i.e. investing in water vs. blue chip stocks--US Dow Jones 1998, up 40%, Indonesia water, down 20%

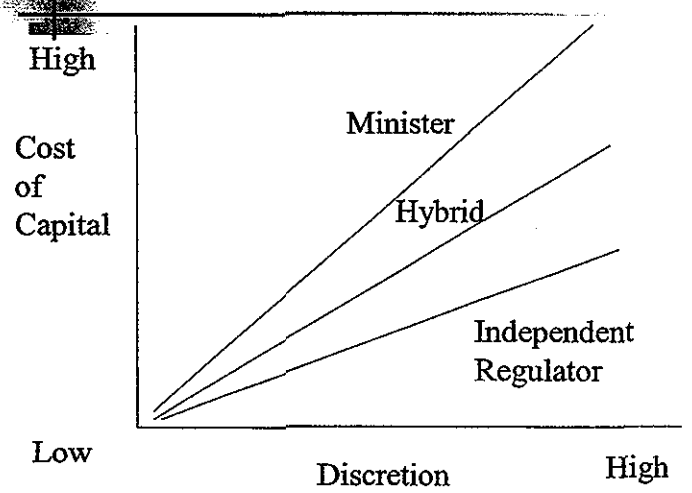
Fundamentals *(cont.)*

- Certainty vs. Flexibility
  - Very specific, detailed rules that cannot be changed unilaterally
    - Certainty will lower cost of capital, BUT
    - Difficult to adapt to changing circumstances, and
    - Difficult to provide incentives for efficiency
  - More flexible approaches
    - Easier to adapt to changing circumstances, and
    - Easier to provide incentives for efficiency, BUT
    - Uncertainty and potential for misuse can increase cost of capital, especially in countries just beginning to develop

Importance of Regulator's Independence

- Attract investors at lowest possible cost of capital
- Take politics out of price setting
- Surrogate for competition in order to get least cost services
- Provide credibility vis-à-vis the consumer
- Set standards that are technically sufficient
- Unbiased, even-handed decisions and enforcement

Independence and Cost of Capital



How to Achieve Independence?

- A clear mandate excluding Ministerial direction established in law.
- Appointed on basis of professional criteria with restrictions on conflicting interests, often involving Executive and Legislative.
- Protected from arbitrary removal during fixed terms, not co-extensive with the Government.
- Fixed salaries.
- Ear-marked funding.
- Independent minded appointees.
- Skillful strategic management.

U.S. Regulatory Framework

- State regulatory commissions (3 to 7 members)
- Responsible for all economic regulation, including rate setting, prudence review, territorial certificates, monitoring, rule making, enforcement, cost review, and financial and managerial auditing as well as deciding disputes between utilities and utilities and customers
- Consults with other regulators of quality and resources
- Commissioners are appointed or elected, serve for specified terms, and are removed only for cause
- Decisions are final with a right to appeal to the appellate Court
- Primarily use rate base/rate of return regulation, although some alternate methodologies are used in some states
- High investor confidence/capital is available to well run utilities
- Rates provide full cost recovery for prudently incurred costs and expenses, plus the opportunity to earn a reasonable return on investment.

United Kingdom Regulatory Framework

- The Director General of the Office of Water Services
- Responsible for setting price caps, providing incentives, monitoring financial and managerial functions, settling disputes, protecting the consumer, setting performance standards, promoting economy and efficiency, enforcing standards and license conditions, and facilitating competition. Not responsible for granting licenses, setting the legal structure for the industry, water quality or controlling profits.
- Director General is appointed for a fixed term by the Secretaries of State, subject only to dismissal for cause or incapacity
- Decisions are final subject to appeals to the High Court
- Price caps are set every 5 years and only the performance is regulated. Profits come from achieved efficiencies. Costs are recovered within the price cap.
- Failure to meet specific performance standards requires the firm to pay penalties to the affected consumer

Functions of the EWRA

- Examine, review, & approve tariff rate requests
- Develop performance criteria in conjunction with local utilities
- Provide technical assistance & guidelines on cost of service studies & rate applications
- Review financial & economic feasibility of new projects
- Issue required operating licenses for w/ww utilities
- Monitor compliance of utilities on performance improvements & corporatization

Structure of the EWRA

- 11 Commission members appointed by Prime Minister for staggered terms
- Chaired by the Minister of Housing, Utilities, & Urban Communities
- Headed by an Executive Director and Technical Secretariat
- Divisions: Rate Analysis, Technical Compliance, Consumer Service, Economics &Research, Legal
- Budget of the EWRA would be independent & partly financed from fees, surcharges, & fines

EWRA Economic Regulation Methodology

- Public & Private utilities subject to Economic Regulation
- Incentive-based regulation will be utilized in most cases
- "Price Cap" reviews will be held every 5 years with compliance reviews held annually
- Contract monitoring of PSP concessionaires will be institutionalized
- Appeals process & dispute resolution procedures will be developed in the EWRA Executive Regulations

SECTION II

The Regulatory Agency

The following slides present an overview of the Regulatory Agency and its operations, including:

- Objectives of regulation
- EWAR functions and levers
- Organization structure
- LIRR assistance
- Strategy and stages of operationalization in detail

Orientation for New EWRA Staff:
Session 2

THE REGULATORY AGENCY

7 June 2001

Regulatory Functions

- Sets performance standards for service providers
- Monitors and enforces compliance with standards
- Regulates prices
- Promotes utility corporatization and competition.

Regulatory Levers

- Review of requests for rate adjustments
- Monitoring and reporting requirements
- Penalties for noncompliance
- Assessment of capital project viability
- Licensing
- Review of proposed mergers and divisions

EWRA FUNCTIONS AND STAFFING, JUNE 2002

Rate Analysis	Economics	Compliance/Customer Affairs	Administrative	Legal
▪Approve utility revenue requirements ▪Set utility targets for cost recovery and subsidy reduction ▪Guidelines & review of cost and rates studies ▪ Annual review of utility performance	▪Set benchmarks for utility efficiency ▪Assess cost-effectiveness of utility business plans ▪Review utility capital plans	▪Promulgate quality standards ▪Monitor quality of service ▪Investigate complaints ▪Enforce reporting standards	▪Information center ▪Records ▪Finance ▪Public relations ▪Personnel ▪Contracting	▪Identify and quantity constraints on corporatization and suggest legal reforms ▪Formulate competition policies and review proposals for leasing, division, merger, and acquisition of utilities.
1 Chief rates analyst 2 Caseworkers	1 Utility economist 1 Planning engineer 1 Design and construction engineer 1 Cost accountant	1 Metering/customer service specialist 1 Sanitary engineer 1 Finance/MIS specialist	1 IT specialist 1 Office manager	1 Administrative Law Specialist 1 Commercial Law/ Antitrust Specialist

LIRR I Inputs

- Organization and staffing plan
- Job descriptions for managers
- Board member issues
- Draft technical standards
- Comparison of types of economic regulation
- Beheira cost and rates study
- Constraints analysis

LIRR II Inputs

- EWRA training and twinning
- Rate application and review procedures
- Rate application guidelines
- Guidelines on economic regulation of private providers
- Tariff policy research

LIRR Project

Operationalizing the Egyptian Water/Wastewater Regulatory Agency

LIRR Project

Regulatory Functions

- Sets performance standards for service providers
- Monitors and enforces compliance with standards
- Regulates prices
- Promotes utility corporatization and competition.

LIRR Project

Regulatory Levers

- Review of requests for rate adjustments
- Monitoring and reporting requirements
- Penalties for noncompliance
- Assessment of capital project viability
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LIRR Project

EWRA FUNCTIONS AND STAFFING, JUNE 2002

Rate Analysis	Economics	Compliance/Customer Affairs	Administrative	Legal
▪Approve utility revenue requirements ▪Set utility targets for cost recovery and subsidy reduction ▪Guidelines & review of cost and rates studies ▪ Annual review of utility performance	▪Set benchmarks for utility efficiency (opex, maintex, capex) ▪Assess cost-effectiveness of utility business plans ▪Review utility capital plans	▪Promulgate quality standards ▪Monitor quality of service ▪Investigate complaints ▪Enforce reporting standards	▪Information center ▪Records ▪Finance ▪Public relations ▪Personnel ▪Contracting	▪Identify and quantify constraints on corporatization and suggest legal reforms ▪Formulate competition policies and review proposals for leasing, division, merger, and acquisition of utilities.
1 Chief rates analyst 2 Caseworkers	1 Utility economist 1 Planning engineer 1 Design and construction engineer 1 Cost accountant	1 Metering/customer service specialist 1 Sanitary engineer 1 Finance/MIS specialist	1 IT specialist 1 Office manager	1 Administrative Law Specialist 1 Commercial Law/ Antitrust Specialist

LIRR Project

LIRR II Assistance to EWRA

- Organization development
- Pilot rate application and review exercise for four governmental utilities
- Guidelines on regulation of private providers
- Corporatization strategy

LIRR Project

Strategies of Cost Recovery

- Utility efficiency improvements
- Mitigation of legal and administrative constraints on commercial management of utilities
- Private sector participation
- Rate increases

Beheira Rates Study Methodology

1) ***Estimate five-year revenue requirements***

- Assess current operational and financial performance
- Set quality and efficiency targets
- Project costs and revenues
- Set cost recovery target

Beheira Rates Study Methodology

2) Design rates

- Allocate cost of service among customer classes
- Consider affordability factors
- Set rate structure to achieve cost recovery target

LIRR Project

Performance Targets

Quality

- Increased supply
- Improved pressure
- Improved water quality
- Billing accuracy
- Compliance with EWRA technical standards

Efficiency

- Production cost control
- Water loss reduction
- Collection efficiency
- Waste reduction
- Pricing efficiency

LIRR Project

Revenue Requirements (Beheira Water Supply 2000-2005)

	1999 (actual)	2005 (projected)
Operation and Maintenance	47.7 m	72.1 m
Rehabilitation (depreciation)	13.3 m	20.0 m
Capital expansion (debt service)	49.4 m	44.7 m
TOTAL revenue requirements	109.4 m	136.8 m
Current revenue	42.2 m	
Shortfall	67.2 m	

Average Revenue Requirement, Beheira water supply 2000-2005

Cost Recovery Target	m^3 price
O&M	LE 0.47
plus Rehabilitation	LE 0.58
plus Expansion	LE 0.91

Data Required for Estimating Revenue Requirements

- Operational and financial performance data
  --facilities and operations
  --financial statements
  --commercial and customer data
- Performance targets and business plans
- Capital projects underway and planned
- Socioeconomic data
- Cost and revenue projections

LIRR Project

Issues in Setting Tariff Revenue Requirements

- Appropriate levels of service
- Operational *vs* capital solutions
- Treatment of non-economic costs
- Expectations about efficiency gains
- Utility data reliability
- Incentives for performance
- Politically acceptable magnitude of rate increases
- Manner of scheduling the increase

LIRR Project

Cost Allocation Factors (Water Supply)

PERCENT OF CAPITAL COST ASSOCIATED WITH:	AVERAGE USE	PEAK USE	CUSTOMER SERVICE
Production and Treatment	80%	20%	-
Booster Pump Stations	40%	60%	-
Storage Tanks	30%	70%	-
Distribution Network	50%	50%	-
Meters	-	-	100%
Services	-	-	100%
G&A	53%	40%	7%
PERCENT OF O&M COST ASSOCIATED WITH:			
Production	80%	20%	-
Production Services	80%	20%	-
Distribution	50%	50%	-
Customer Service	-	-	100%
Electric Power	50%	50%	-
G&A	57%	30%	13%

Rate Structure Options (Beheira Water Supply)

Tariff (LE/m³)

Formula	Domestic 0-10 m³	Domestic 10-30 m³	Domestic over 30	Service	Commercial
Across the board increase	0.36	0.36	0.55	0.71	1.18
Cost-based rates	0.55	0.55	0.72	0.54	0.56
Uniform Rate	0.58	0.58	0.58	0.58	0.58
Partially cost-based, with lifeline rate	0.28	0.54	0.85	0.68	1.13
CURRENT RATES	**0.23**	**0.23**	**0.35**	**0.45**	**0.75**

Average Monthly Water Bills for Domestic Use in Beheira

(partially cost-based rates, with a lifeline rate)

Consumption	Water Tariff Charge
10 m³	LE 2.80
20 m³	LE 8.20
30 m³	LE 13.60

LIRR Project

LIFELINE SERVICE POLICIES (example)

- National minimum service standard: *65-100 lcd (10-15 m^3/mo)*
- Affordability criterion: *2-3% of income* of the poorest quartile of households
- Beheira lifeline rate: *LE 0.28* .
- o Monthly charge for 10 m^3: *LE 2.80*
- o Household income needed to afford lifeline supply (at 2.5% criterion): *LE 112*
- All MOSA aid recipients are exempted from user charge.

If an approved rates study demonstrates that adequate cross-subsidization cannot be achieved without risk of reduced sales to subsidizing customers, the utility may apply for a special subsidy.

LIRR Project

Data Requirements for Pricing Studies

- "Audit of fixed assets"
- O&M cost accounts
- Bill tabulations
- Household budget surveys

LIRR Project

Pricing Issues

- Optimal blend of economic and social objectives
- Affordability criteria for lifeline (minimum) consumption levels

LIRR Project

LIRR I Inputs

- Organization and staffing plan
- Job descriptions for managers
- Board member issues
- Draft technical standards
- Comparison of types of economic regulation
- Beheira cost and rates study
- Constraints analysis

LIRR Project

LIRR II Inputs

- EWRA training and twinning
- Rate application and review procedures
- Rate application guidelines
- Guidelines on economic regulation of private providers
- Tariff policy research

LIRR Project

Next Step: Initiate Studies of Utility Revenue Requirements

- Prepare rate application guidelines
- Draft rate application and review procedures
- Workshop for all PEAs and PWCs on estimation of revenue requirements
- Preliminary policy studies

LIRR Project

GOE Actions

- Review Beheira cost and rates study methodology
- Review process options
- Sponsor workshop
- Select pilots

SECTION III

Economic Regulation

The following slides discuss price and quality of service regulation, rate-setting (regulation vs. competition), and types of economic regulation, such as price-cap regulation.

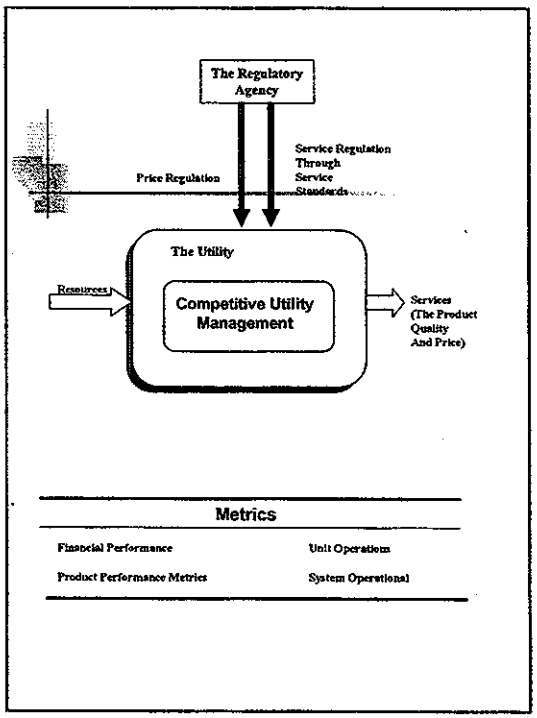
Quality of Service Regulation

Example of methods used to assess overall service to customers

October 1999

Utility Obligation

- he utility has *"the obligation" to* render safe and adequate service.
- reduction in the quality of output or service standards is equivalent to an increase in price.
- ithout adequate quality of service regulation, price regulation may be rendered ineffective; "buyers can be exploited just as effectively by giving them poor or unsafe service as by charging them excessive prices"



Definitions:

Standards:

The definition according to ISO is:

"Document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context."

Standards could be:

- A "specification; standard
- A guidance standard

A specification is a detailed set of requirements to be satisfied by a product, material, process or system, indicating the procedures for checking conformity of these requirements.

Metric Examples:

Financial Performance Metrics:

- Unit cost of product: LE/m³
- Percent LE billed actually collected
- Total revenue as percent of O&M costs

Product Performance Metrics:

- Water pressure (% property at risk)
- Service interruptions (hrs/year/zone)
- Sewer flooding incidents (% of connected properties flooded)
- Water quality (deviation from a standard)

Unit Operations Metrics:

- Labour hours per unit process
- Energy use per unit process
- Equipment utilization rate

System Operational Metrics:

- Speed of response to customer complaints
- Speed of response to a new service connection

Regulatory Instruments for Service Quality Control

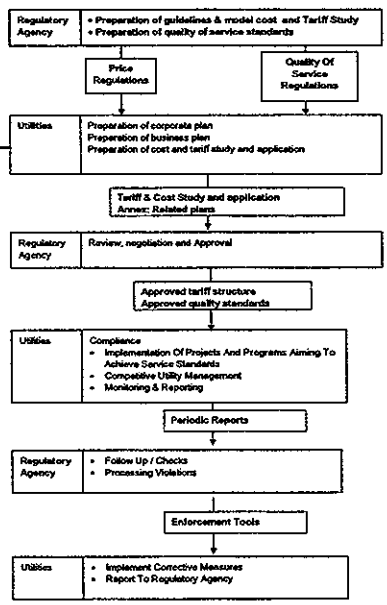
- Aspects mainly determined by managerial efficiency (e.g. speed for response to leaks or other complaints, timely connections and repairs)
- Aspects that primarily depend on capital expenditure (e.g. drinking water and effluent quality, adequate capacity)

Service Quality Regulation Modes:

1. Utility is obliged to monitor, report and publish information on quality performance. The water utility have the legal responsibility to notify the public of any serious deterioration in water quality.

2. Utility is liable and responsible for nuisances and losses to customers caused by poor service.

3. Regulator will incorporate quality measures in price controls.



How Standards Work

- **Regulator or Technical Group** sets standards
- **Utility** decides how best to comply
- **Utility** collects measures and reports
- **Regulator** audits for accuracy of reporting and determines if there has been a violation
- **Utility** decides on corrective action when violations occur
- **Regulator** reviews and enforces the corrective action

Standard Setting

- Setting standards is a complex and demanding task
- It involves cost-quality trade-offs
- Standards must be: realistic, attainable, well defined, technologically sound and enforceable
- Standards must be in line with social and economic reality

What Does It Take to Make Standards Work

- Basing standards on comparable processes
- Standardized charts of accounts and rules
- Regular, reliable performance measurement and reporting
- Follow-up audits
- Corrective action when standards are not maintained
- Incentives and penalties based on performance

Standards Development and Administration Would Require the Regulatory Body to Acquire Skills in:

- Technical areas such as maintenance, utility operations, management, and financial management
- Defining and setting standards
- Setting appropriate measures
- Monitoring and auditing
- Review of corrective action plans and enforcement
- Information processing
- Contract monitoring

Effective Enforcement Requires

- **Utility** measurement and reporting of their performance against the standard
- **Utility** identification of the causes of failure to meet standards
- ***Utility*** *planning and execution* of corrective action
- **Regulator** monitoring and auditing of reports
- **Regulator** review of corrective actions

To Make Standards Work:

- Raise the overall levels of utility personnel professional training by providing:
  - Technical assistance in problem identification and corrective action planning.
  - Training and resources to help utilities carry out corrective actions
- Promote technology transfer perhaps through strengthening existing water and wastewater professional associations.

Price Cap Regulation

Overview

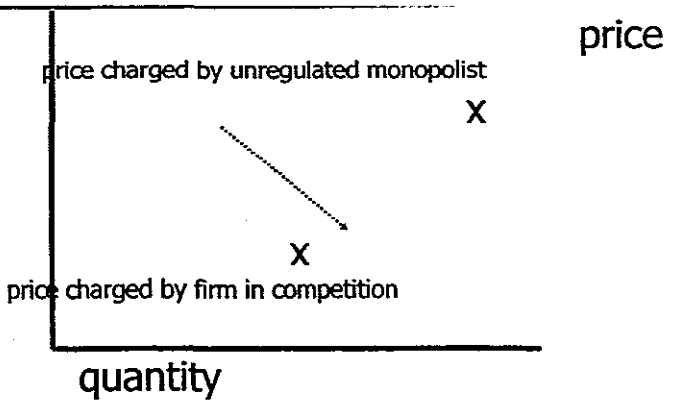
- Economic Goal of price regulation
- Rate of return regulation
- RPI-X Price cap regulation
  - Incentives
  - Setting X factors
  - Regulatory lag
  - Cost Passthrough
  - Regulatory commitment
  - Sliding-scale price cap regulation
  - Quality and technical standards
- Case studies

Economics of Regulation

- From an economic perspective, what is regulation of a monopolist trying to achieve?
  - decrease price and increase output of monopolist to levels of a firm in a competitive environment
  - improve the quality of the services of monopolist to the level of firms in a competitive environment (or better!)
  - integrate economic goals of society into monopolist's performance?

3

The economic goal of regulation



4

Forms of Price Regulation

- Rate of Return (ROR) Regulation*
- Price Cap Regulation*
- Sliding-Scale Price Cap Regulation*
- Benchmark Approaches, Yardsticks, etc.

5

Rate of Return Regulation

- Involves 2 steps:
  - determine revenue requirement

    what level of rates in the aggregate will ensure that total revenues will cover all operating expenses, including a fair return on invested capital?
  - determine rate structure

    how should we allocate total costs among different classes and categories of service?

6

Revenue Requirement

$$RR = O\&M + D + T + P$$

where: RR = revenue requirement
O&M = operating and maintenance costs
D = depreciation
T = taxes
P = reasonable profit

Goal: cost recovery plus fair profit for utility

7

Income Statement: Firm in a Competitive Environment

Revenue	500	
Operating Expenses		200
Depreciation		100
Income before tax		200
Tax	80	
Net Income		**120**

- Net Income is the *residual* outcome from the firm's operations.
- *Competition* drives net income to a fair level.

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Income Statement: Regulated Firm in Non-Competitive Environment

Revenue	500
Operating Expenses	200
Depreciation	100
Income before tax	200
Tax	80
Net Income	**120**

- regulator begins by setting "allowed" net income
- work backwards up the income statement, estimating costs to arrive at the needed revenue requirement.

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Problems with ROR Regulation

- poor incentives for cost reduction
- heavy regulatory burden: costly and time-consuming process
  - frequent reviews
  - all utility costs must be carefully scrutinized
  - revenue requirement and fair profit must be established at each review
- incentive to over-invest in capital, under-invest in labor

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Price Cap Regulation

- the *price increases* of services of monopolist are regulated (capped):
  - profits are not regulated
  - multiple services
  - RPI-X price cap regulation

- If the firm can lower its costs, it gets to keep the additional profit:

Revenue	500	500
Operating Expenses	200 →	150
Depreciation	100	100
Income before tax	200	250
Tax (40%)	80	100
Net Income	**120** →	**150**

- Like a firm operating in a competitive environment, a firm's profits are a *residual* outcome: the firm has incentive to lower costs in order to make more profit!

Year	RPI	X	RPI-X	Allowed Price
1999	-	-	-	LE1.000
2000	20%	3%	17%	LE1.170
2001	18%	3%	15%	LE1.346
2002	16%	3%	13%	LE1.520
2003	15%	3%	12%	LE1.703
2004	12%	3%	9%	LE1.856

note: RPI-X is the allowed % price increase each year.

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Retail Price Index, RPI

- The RPI is the primary index of consumer prices in Great Britain
- for water sector: RPI + K system was established in the 1986 privatization of water industry:
- real prices were allowed to rise
  - may be interpreted as: RPI-X+Q

    where Q is the cost of investments to meet quality targets

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X-Factor

- The X factor can vary from year to year, but is fixed in advance
- X factor is set based on expected productivity increases by utility
- Positive X factors imply that prices must decrease in *real terms*

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Incentives Under Price Cap Regulation

- Under price cap regulation the firm has incentives:
  - to minimize its production costs
  - to find the optimal mix of capital and labor
  - to make investments to reduce its costs
- between reviews, the financial goals for a firm under price cap regulation are similar to the financial goals of a firm operating in a competitive environment.

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Setting X Factors

- Regulators take into account many of the following factors when setting X factors:
  - value of existing assets
  - cost of capital
  - expected rates of growth of productivity and demand
  - progress of competition
  - past performance of utility and financial condition of utility

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Iterative Procedure to Determine X

Initial values of X are input into financial model

Financial model projects accounting statements and pre-tax cash flows based on the X-factor inputs

The acceptability of X factor is determined by the resulting cash flows to the utility

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Other Issues in Price Cap Regulation

- Regulatory Lag
- Cost Passthrough
- Commitment
- Sliding Scale Price Caps
- Establishing Initial Prices
- Regulating Quality
- Case Studies

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Optimal Regulatory Lag

The *optimal regulatory lag* is a tradeoff between:

Gain in the incentive to reduce costs ⟷ The loss of economic efficiency

both increase as the regulatory lag is increased

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Regulatory Lags in UK Privatizations

British Telecom	initially 5 years, then 4 years
Water Companies	**10 years, 5 years if requested by Ofwat or utility**
British Gas	5 years
Electricity:	
Transmission	initially 3 years, then 4 years
Distribution	5 years
Supply	4 years

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Sliding-Scale Price Cap Regulation

- adds a rate of return constraint to the price ceiling:
  - a utility is allowed to retain all earnings under the specified cap as long as its earned rate of return is less than some specified amount.
  - the utility is allowed to keep a portion of any further earnings for a rate of return between that level and some higher specified level.
  - the utility may have to refund all additional earnings for a rate of return above some upper ceiling.
  - some regulators may revise price caps if the rate of return falls below some specified level.

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SECTION IV

Rates Analysis

The section discusses revenue requirements and rate design for an effective and successful water/wastewater sector regulatory agency. Two examples are provided as models: setting water tarriffs for Egyptian utilities in Beheira and the Sixth of October City case.

A. Setting Water Tariffs for Egyptian Utilities in Beheira

The slides on the following page present information on the Beheira water rates study:

- Methodology
- Performance targets
- Operating assumptions
- Revenue requirements
- Cost allocation
- Rate design
- Evaluation of rate adjustment formula
- Rate structure options
- Average monthly water bills
- Lifeline service policies
- Magnitude of water rates increase

LIRR Project Phase II: Technical Assistance for Regulatory Reform and Private Participation in the Water and Wastewater Sector

Setting Water Tariffs for Egyptian Utilities

14 June 2001

Beheira Rates Study Methodology

1) ***Estimate five-year revenue requirements***

- Assess current operational and financial performance
- Set quality and efficiency targets
- Project costs and revenues
- Set cost recovery target

Beheira Rates Study Methodology

2) Design rates

- Allocate cost of service among customer classes
- Consider affordability factors
- Set rate structure to achieve cost recovery target

Performance Targets

Quality

- Increased supply
- Improved pressure
- Improved water quality
- Billing accuracy
- Compliance with EWRA technical standards

Efficiency

- Production cost control
- Water loss reduction
- Collection efficiency
- Waste reduction

Operating Assumptions and Performance Targets: Beheira Water

6% annual inflation of O&M input costs
Population grows at 2.1% annually
Capital improvements increase production by 12.6%
Leakage reduced from 20% to 10% of production
Nonphysical losses reduced from 13.4% to 8%.
Collection rate increased from 70% to 90%.

Revenue Requirements (Cash-Needs Approach): Definitions

Operations and maintenance (O&M	=	Projected O&M costs, based on historical data with modifications for inflation, O&M of new works, and efficiency gains
Renewal and replacement	=	Depreciation expense
Capital expansion	=	Interest and repayment of principal on old and new debt

Data Required for Estimating Revenue Requirements

- Operational and financial performance data
  --facilities and operations
  --financial statements
  --commercial and customer data
- Population and demand projections
- Inflation estimates
- Capital projects underway and planned
- Performance targets and business plans

Revenue Requirements: Beheira Water Supply

	1999 (actual)	2005 (projected)
Operation and Maintenance	47.7 m	72.1 m
Rehabilitation (depreciation)	13.3 m	20.0 m
Capital expansion (debt service)	49.4 m	44.7 m
TOTAL revenue requirements	109.4 m	136.8 m
Current revenue	42.2 m	
Shortfall	67.2 m	

Average Revenue Requirement, Beheira water supply 2000-2005

Cost Recovery Target	m^3 price
O&M	LE 0.47
plus Rehabilitation	LE 0.58
plus Expansion	LE 0.91

Data Required for Estimating Revenue Requirements

- Operational and financial performance data
  --facilities and operations
  --financial statements
  --commercial and customer data
- Population and demand projections
- Inflation estimates
- Capital projects underway and planned
- Performance targets and business plans

Cost Allocation Concept

Different patterns of water use entail different cost profiles for the utility.

A fully cost-based tariff structure communicates the true cost of service to the customer and communicates the true demand for service to the utility.

Cost allocation studies aim to distinguish costs associated with satisfying peak demands from average costs, and to allocate peak costs to peak users.

The LIR study indicates that in Beheira the main source of peak demands is luxury domestic use(> 30 m^3/month) rather than commercial use, which costs little more than average domestic use.

Cost Allocation Formulas and Beheira Results

Type of Cost	Formula
Average use costs	Class's proportion of total water sales
Peak use costs	Class's proportion of maximum day demand
Customer service costs	Class's proportion of total connections

Beheira Custome Class	% of COS	Revenue Requirement	Current Burden
Domestic	62.6%	50,581,284	47%
Service	34.0%	27,472,262	46%
Economic	3.4%	2,747,227	7%

Rate Design

WHAT: Determining how the cost burden of the average revenue requirement should be distributed among users

HOW:
1) Identify rate design policy objectives
2) Set priorities
3) Select preferred option
4) Calculate rates

Rate Design Policy Objectives

- Continuity with current rate structure
- Fairness (rates reflect cost of service)
- Affordability to the poor
- Simplicity/understandability

Evaluation of Rate Adjustment Formulas

Formula	Objectives Weighting			
	Continuity	Fairness	Affordability	Simplicity
Increase all classes by the same percentage	+	-	-	+
Cost-based rates	-	+	-	-
Uniform rate	-	+	-	+
Partially cost-based, with lifeline rate	+	+	+	-

Rate Structure Options

Tariff (LE/m³)

Formula	Domestic			Service	Commercial
	0-10 m³	10-30 m³	over 30		
Across the board increase	0.36	0.36	0.55	0.71	1.18
Cost-based rates	0.55	0.55	0.72	0.54	0.56
Uniform Rate	0.58	0.58	0.58	0.58	0.58
Partially cost-based, with lifeline rate	0.28	0.54	0.85	0.68	1.13
CURRENT RATES	**0.23**	**0.23**	**0.35**	**0.45**	**0.75**

Average Monthly Water Bills for Domestic Use in Beheira

(partially cost-based rates, with a lifeline rate)

Consumption	Water Tariff Charge
10 m^3	LE 2.80
20 m^3	LE 8.20
30 m^3	LE 13.60

LIFELINE SERVICE POLICIES (example)

- National minimum service standard: *65-100 lcd (10-15 m^3/mo)*
- Affordability criterion: *2-3% of income* of the poorest quartile of households
- Beheira lifeline rate: *LE 0.28*
  - Monthly charge for 10 m^3: *LE 2.80*
  - Household income needed to afford lifeline supply (at 2.5% criterion): *LE 112*
- All MOSA aid recipients are exempted from user charge.

If an approved rates study demonstrates that adequate cross-subsidization cannot be achieved without risk of reduced sales to subsidizing customers, the utility may apply for a special subsidy.

Magnitude of Increase: Beheira water rates

	Current Rate	Proposed Rate		Factor of Increase
Domestic:				
0-20 m^3	0.23	0-10 m^3	0.23	x 1.2
		10-30 m^3	0.54	x 2.4
> 20 m^3	0.35	> 30 m^3	0.85	x 2.4
Service	0.45		0.68	x 1.5
Commercial	0.75		1.13	x 1.5

B. Sixth of October City Water Supply Tariff Studies

Here we provide the results of city water tariff studies. Spreadsheets containing data from the studies follow the operational and financial projections, and information on the cost-of-services study offered below.

B1. Operational Projections (2001/02-2005/06)

- Total Water Supply (production) increases from 8,277,764 m^3/yr (FY 98/99) to 12,597,696 m^3/yr in FY 2005/06.
- Water Losses reduced by 1% of total production each year beginning FY 2002/03.
- Sales (m^3) projections for the four current tariff classes:
  - *Industrial/investment class.* Truck sales increase by 20,000 m^3/yr starting FY 2001. Bulk sale to Sheikh Zayed City ends in December 2001. All other industrial/investment demand increases by 6% annually.
  - *Commercial and service classes*: Demand by religions establishments increases 10% annually. All other demand in this class increases by 8% annually.
  - *Residential class*: 10% increase in demand annually.
  - *Irrigation use:* Backwash water use increases by 300,000 m^3/yr starting FY 2001/02. Municipal irrigation demand increases by 500,000 m^3/yr starring FY 2001/02.
- Total m^3 sales from FY 2001/02 to FY 2005/06: 252,013,931 m^3.

Question

What would total m3 sales be if unaccounted-for water losses were reduced by 2% annually beginning in FY 2002/03?

B2. Financial Projections (Revenue Requirements)

- Unit costs of O&M inputs (labor, materials, services) increase by 6% annually (Schedule 2-1)
- Revenue requirements for capital maintenance (R&R = renewal and replacement) estimated at 2.5% of the total annual value of plant-in-service.
- Cost recovery for expansion capital (debt service) will not be sought over the 2001-2006 rate term. Total revenue requirement (Schedule 2-3) = O&M costs plus R&R costs.
- "Other revenues" (from connection charges, see Schedule 2-2) are subtracted from Total Revenue Requirements to arrive at Net Revenue Requirement on Schedule 2-3.
- Net revenue requirement must be increased to compensate for a percentage of bad debt (non-payment). *Rate revenue requirement* = (Net revenue requirement) x (1/collection rate) = LE 134,178,708 (FY 2001/02-2005/06)
- "Equivalent Billed Revenues (current rates)" (on Schedule 2-3) shows the utility's expected tariff revenue *if* production is increased, losses are decreased, and the collection rate is improved, *but* tariffs stay at their current rates. (LE 92,630,578).
- Schedule 2-4 shows the rate revenue required for a higher level of cost recovery (O&M, plus R&R, plus interest payments on debt).

Questions

1) What is the average percentage of tariff increase needed to recover costs of O&M and R&R?
2) What is the average tariff required to recover O&M and R&R costs?

B3. Cost-of-Service Study

Purpose

A cost-of-service study (COSS) attempts to determine if and by how much utility costs are determined by different characteristics of users and user demand. If tariff rate design were shaped by economic considerations only, the COSS would define the customer classes (and blocks) and their tariff rates.

Method

1) Classify fixed asset values according to cost center (or "function" (Schedules 3-1A and 3-1B). Classify O&M costs according to cost center or function (Schedule 2-1C and Schedule 3-4).

2) Categorize fixed asset values (using allocation factors set out in Schedule 3-3) the apportion functional costs to *commodity costs* (associated with capital costs of average water usage), *demand costs* (associated with capital costs of peak water demand), and *customer service costs* (associated with number of customers). See Schedule 3-2.

3) Apportion O&M costs among commodity, demand, and customer service costs (Schedule 3-5), using the O&M cost allocation factors shown in Schedule 3-6.

4) Allocate commodity, demand, and customer service costs to customer classes (Schedule 3-7, 3-8 and 3-9).

Question

Calculate cost-based tariff rates for each class.

6TH of October City - Water Demand Projection										
Water Consumption, by Type of Use	**Growth**	**FY 98**	**FY 99**	**FY 00**	**FY 01**	**FY 02**	**FY 03**	**FY 04**	**FY 05**	**FY 06**
Billed Usage	Rate/Incr.	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)	(m^3)
Industrial/Investment										
Factories	6.0%	9,000,000	9,514,394	10,527,399	11,159,043	11,828,586	12,538,301	13,290,599	14,088,035	14,933,317
Construction (temporary)	6.0%			1,579,799	1,674,587	1,775,062	1,881,566	1,994,460	2,114,127	2,240,975
High Class Res./Amusement Parks	6.0%			2,133,716	2,261,739	2,397,443	2,541,290	2,693,767	2,855,393	3,026,717
Investment Companies	6.0%			904,129	958,377	1,015,879	1,076,832	1,141,442	1,209,929	1,282,524
Bulk Supply to Sheik Zayid	Phase-Out	862,216	1,355,000	973,151	1,000,000	500,000	0	0	0	0
Truck Sales	Incr./Yr	98,545	70,000	101,296	120,000	140,000	160,000	180,000	200,000	220,000
(After '00 - add 20,000 m3/yr)										
Subtotal		12,566,360	14,372,965	16,219,490	17,173,746	17,656,970	18,197,989	19,300,268	20,467,484	21,703,533
Commercial/Service										
Shops, Stores, etc.	8.0%	532,232	914,425	1,402,418	1,514,611	1,635,780	1,766,643	1,907,974	2,060,612	2,225,461
Raw Water (from supply line)	8.0%		907,400	407,004	439,564	474,729	512,708	553,724	598,022	645,864
Services (Incl. Gov't)	8.0%		984,550	1,414,515	1,527,676	1,649,890	1,781,882	1,924,432	2,078,387	2,244,658
Religion	10.0%			150,210	162,227	175,205	189,221	204,359	220,708	238,364
Subtotal		532,232	2,806,375	3,374,147	3,644,079	3,935,605	4,250,453	4,590,490	4,957,729	5,354,347
Residential										
Domestic	10.0%	6,146,908	6,632,716	8,199,900	9,019,890	9,921,879	10,914,067	12,005,474	13,206,021	14,526,623
Irrigation										
Backwash Water Sales (Dreamland)	Incr./Yr	2,920,000	2,920,000	4,105,000	4,405,000	4,705,000	5,005,000	5,305,000	5,605,000	5,905,000
(After '00 - add 300,000 m3/yr)										
Municipal Irrigation (Greening Prog.)	Incr./Yr	5,789,330	6,379,000	6,900,000	7,400,000	7,900,000	8,400,000	8,900,000	9,400,000	9,900,000
(After '00 - add 500,000 m3/yr)										
Subtotal		8,709,330	9,299,000	11,005,000	11,805,000	12,605,000	13,405,000	14,205,000	15,005,000	15,805,000
TOTAL SALES		27,954,830	33,111,056	38,798,537	41,642,714	44,119,454	46,767,509	50,101,231	53,636,234	57,389,503
					7.3%	5.9%	6.0%	7.1%	7.1%	7.0%
Unaccounted-for-losses		6,988,708	8,277,764	9,699,634	10,410,679	11,029,864	10,970,156	11,752,141	11,773,807	12,597,696
Assumed Annual % losses	20%-18%	20%	20%	20%	20%	20%	19%	19%	18%	18%
TOTAL WATER SUPPLY (m3/year)		34,943,538	41,388,820	48,498,171	52,053,393	55,149,318	57,737,665	61,853,372	65,410,041	69,987,199
AVERAGE DAILY SALES (m3/day)		76,589	90,715	106,297	114,090	120,875	128,130	137,264	146,949	157,232
AVERAGE DAILY SUPPLY (m3/day)		95,736	113,394	132,872	142,612	151,094	158,185	169,461	179,206	191,746
					247	Liters/c/d	(Assumed population - 100,000 in 2001)			

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6TH OF OCTOBER CITY WATER UTILITY - RATE CASE 2001

Schedule 2 - 1C

SUMMARY OF OPERATING COSTS - FY1997

Cost Item	Production	Production Services	Distribution	Customer Services	Administrative & Financial	Total Cost
Wages	566,539	849,808	128,746	154,523	0	1,699,616
	33%	50%	8%	9%	0%	
Materials						
Raw Materials	1,138,721	0	0	0		1,138,721
Chemicals	0	0	0	0		0
Elec. Power	4,079,245	543,899	815,849			5,438,993
Fuel Oil	107,972	0	0	0	0	107,972
Spare Parts	0	0	0	0	0	0
Remnants			0	0		0
Supplies	0	0	0	0	0	0
Water	0	0	0	0	0	0
Illumination	0	0	0	0	0	0
Subtotal	5,325,938	543,899	815,849	0	0	6,685,686
Services						
Maintenance	515,481	475,672	570,911		0	1,562,063
Other Services	0	0	0	0	0	0
Subtotal	515,481	475,672	570,911	0	0	1,562,063
Water Supply Purchases	0					0
Taxes and Duties	0	0	0	0	0	0
Total O&M	6,407,958	1,869,379	1,515,505	154,523	0	9,947,365

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6TH OF OCTOBER CITY WATER UTILITY - RATE CASE 2001

Schedule 2 - 1C

SUMMARY OF OPERATING COSTS - FY1998

Cost Item	Production	Production Services	Distribution	Customer Services	Administrative & Financial	Total Cost
Wages	633,363	959,641	153,543	172,735	0	1,919,282
	33%	50%	8%	9%	0%	
Materials						
Raw Materials	1,148,757	0	0	0		1,148,757
Chemicals	0	0	0	0		0
Elec. Power	3,599,177	479,890	719,835			4,798,903
Fuel Oil	143,053	0	0	0	0	143,053
Spare Parts	0	0	0	0	0	0
Remnants			0	0		0
Supplies	0	0	0	0	0	0
Water	0	0	0	0	0	0
Illumination	0	0	0	0	0	0
Subtotal	4,890,987	479,890	719,835	0	0	6,090,713
Services						
Maintenance	638,801	589,469	707,492		0	1,935,762
Other Services	0	0	0	0	0	0
Subtotal	638,801	589,469	707,492	0	0	1,935,762
Water Supply Purchases	0					0
Taxes and Duties	0	0	0	0	0	0
Total O&M	6,163,152	2,029,000	1,580,870	172,735	0	9,945,757

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6TH OF OCTOBER CITY WATER UTILITY - RATE CASE 2001

Schedule 2 - 1C

SUMMARY OF OPERATING COSTS - FY1999

Cost Item	Production	Production Services	Distribution	Customer Services	Administrative & Financial	Total Cost
Wages	365,965	548,947	83,165	99,817	0	1,097,894
	33%	50%	8%	9%	0%	
Materials						
Raw Materials	1,145,587	0	0	0		1,145,587
Chemicals	0	0	0	0		0
Elec. Power	6,415,808	855,441	1,283,162			8,554,410
Fuel Oil	106,732	0	0	0	0	106,732
Spare Parts	0	0	0	0	0	0
Remnants			0	0		0
Supplies	0	0	0	0	0	0
Water	0	0	0	0	0	0
Illumination	0	0	0	0	0	0
Subtotal	7,668,127	855,441	1,283,162	0	0	9,806,729
Services						
Maintenance	0	1,409,107	1,300,286	1,560,629	0	4,270,022
Other Services	0	0	0	0	0	0
Subtotal	0	1,409,107	1,300,286	1,560,629	0	4,270,022
Water Supply Purchases	0					0
Taxes and Duties	0	0	0	0	0	0
Total O&M	8,034,092	2,813,495	2,666,613	1,660,446	0	15,174,645

6TH OF OCTOBER CITY WATER UTILITY - RATE CASE 2001

Schedule 2 - 1C

SUMMARY OF OPERATING COSTS - FY2000

Cost Item	Production	Production Services	Distribution	Customer Services	Administrative & Financial	Total Cost
Wages	530,380	803,606	128,577	144,649		1,607,211
Materials						
Raw Materials	379,320	0	0	0		379,320
Chemicals	690,481	0	0	0		690,481
Elec. Power	4,649,620	619,949	929,924			6,199,493
Fuel Oil	78,035	0	0	0	0	78,035
Spare Parts	0	0	0	0	0	0
Remnants			0	0		0
Supplies	0	0	0	0	0	0
Water	0	0	0	0	0	0
Illumination	0	0	0	0	0	0
Subtotal	5,797,456	619,949	929,924	0	0	7,347,329
Services						
Maintenance	0	657,455	606,681	728,151	0	1,992,287
Other Services	0	0	0	0	0	0
Subtotal	0	657,455	606,681	728,151	0	1,992,287
Water Supply Purchases	0					0
Taxes and Duties	0	0	0	0	0	0
Total O&M	6,327,835	2,081,010	1,665,182	872,800	0	10,946,827

6TH OF OCTOBER CITY WATER UTILITY - RATE CASE 2001

Electricity Bill	1997					
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total	
Intakes	272,944	287,373	218,634	689,286	1,468,237	19.37%
Booster 1	212,890	369,376	217,973	643,162	1,443,401	19.04%
Booster 2	490,470	487,891	561,018	1,132,813	2,672,192	35.26%
WTP	346,526	681,530	169,295	798,048	1,995,399	26.33%
Network						
	1,322,830	1,826,170	1,166,920	3,263,309	7,579,229	

Electricity Bill	1998					
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total	
Intakes	389,633		334,348	416,501	1,140,482	21.05%
Booster 1	304,915		326,745	349,271	980,931	18.10%
Booster 2	703,866		727,499	738,182	2,169,547	40.04%
WTP	383,957		436,433	307,250	1,127,640	20.81%
Network						
	1,782,371	-	1,825,025	1,811,204	5,418,600	

Electricity Bill	1996					
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total	
Intakes	286,665	242,211	281,970	352,149	876,330	21.56%
Booster 1	218,600	99,330	274,689	238,585	612,604	15.07%
Booster 2	759,494	349,649	533,665	533,755	1,417,069	34.86%
WTP	584,935	321,364	411,605	426,520	1,159,489	28.52%
Network	1,849,694	1,012,554	1,501,929	1,551,009	4,065,492	
Water Treatment plant three year average						25.22%

6TH OF OCTOBER CITY - RATE CASE 2001

Schedule 2 - 3

SUMMARY OF REVENUE REQUIREMENTS - FY1997 THROUGH THE RATE PERIOD
(O&M Expenses plus R&R Cost Recovery Only)

Major Cost Items	1997 (Historic)	1998 (Historic)	1999 (Historic)	2000 (Historic)	2001 (Budget)	2002 (Forecasted)	2003 (Forecasted)	2004 (Forecasted)	2005 (Forecasted)	2006 (Forecasted)
Wages	1,699,616	1,919,282	1,097,894	1,607,211	1,541,462	1,657,072	1,781,352	1,914,954	2,058,575	2,212,969
Materials Required	6,685,686	6,090,713	9,806,729	7,347,329	7,748,257	8,329,376	8,954,079	9,625,635	10,347,558	11,123,625
Services Required	1,562,063	1,935,762	4,270,022	1,992,287	2,732,690	2,937,642	3,157,965	3,394,813	3,649,424	3,923,130
Water Supply Purchases	0	0	0	0	0	0	0	0	0	0
Taxes & Duties	0	0	0	0	0	0	0	0	0	0
Subtotal (O&M Costs)	9,947,365	9,945,757	15,174,645	10,946,827	12,022,410	12,924,090	13,893,397	14,935,402	16,055,557	17,259,724
Maintenance Capital (R&R)										
Current System	4,416,635	4,460,070	4,460,070	4,605,070	4,805,070	5,343,522	7,268,369	7,268,369	7,268,369	7,268,369
Future Additions	0	0	0	0	0	0	0	200,000	600,000	1,000,000
Subtotal (R&R Costs)	4,416,635	4,460,070	4,460,070	4,605,070	4,805,070	5,343,522	7,268,369	7,468,369	7,868,369	8,268,369
Expansion Capital (Debt Serv.)										
Existing Debt - Principal	195,371,655	295,543,997	357,347,461	364,597,461	374,597,461	470,839,791	567,082,121	567,082,121	567,082,121	567,082,121
New Debt - Principal							10,000,000	20,000,000	20,000,000	30,000,000
Existing Debt - Annual Interest	8,386,005	8,386,005	8,386,005	8,386,005	8,386,005	8,386,005	8,386,005	8,386,005	8,386,005	8,386,005
New Debt - Annual Interest							500,000	1,500,000	2,500,000	4,000,000
Plant In Service	152,187,029	153,683,767	153,683,767	160,933,767	170,933,767	267,176,097	363,418,427	363,418,427	363,418,427	363,418,427
Plant Additions (Current Projects)			7,250,000	10,000,000	96,242,330	96,242,330				
Future Plant Additions							10,000,000	20,000,000	20,000,000	30,000,000
Subtotal (Debt Service - Int. only)	8,386,005	8,386,005	8,386,005	8,386,005	8,386,005	8,386,005	8,886,005	9,886,005	10,886,005	12,386,005
Portion to be recovered	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Amount to recover	0	0	0	0	0	0	0	0	0	0
TOTAL REVENUE REQUIREMENTS	14,364,000	14,405,827	19,634,715	15,551,897	16,827,480	18,267,612	21,161,766	22,403,770	23,923,926	25,528,092
Net Other Revenues	801,832	857,980	824,872	1,060,600	1,134,842	1,214,281	1,299,281	1,390,230	1,487,546	1,591,675
NET REVENUE REQUIREMENTS	13,562,168	13,547,847	18,809,843	14,491,297	15,692,638	17,053,331	19,862,485	21,013,540	22,436,379	23,936,418
Estimated Collection Rate (CR)	64.0%	65.0%	66.0%	67.5%	70.0%	72.5%	75.0%	77.5%	80.0%	82.5%
RATE REVENUE REQUIREMENTS	21,190,888	20,842,842	28,499,762	21,468,588	22,418,054	23,521,836	26,483,313	27,114,245	28,045,474	29,013,840
Rate Revenue from Current Rates	7,802,521	12,217,651	11,161,159	13,780,558	12,386,456	13,005,779	13,656,068	14,338,871	15,055,815	15,808,605
Equivalent Billed Revenues (Current Rates)	12,191,439	18,796,386	16,910,847	20,415,641	17,694,937	17,939,005	18,208,090	18,501,769	18,819,768	19,161,946
NET RATE REVENUE SURPLUS/(DEFICIT)	(8,999,448)	(2,046,455)	(11,588,915)	(1,052,947)	(4,723,117)	(5,582,831)	(8,275,223)	(8,612,476)	(9,225,706)	(9,851,894)
Cummulative Surplus/(Deficit)	(8,999,448)	(11,045,904)	(22,634,819)	(23,687,766)	(28,410,882)	(33,993,713)	(42,268,937)	(50,881,413)	(60,107,119)	(60,733,307)

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6TH OF OCTOBER CITY - RATE CASE 2001

Allocation of Fixed Assets to Functional Categories

	(FY 2000)	LE	% of Total
Function			
Production and Treatment		75,259,347	46.76%
Distribution Pump Station		6,440,000	4.00%
Storage Tanks		7,500,000	4.66%
Distribution Network		51,699,536	32.12%
Meters		236,218	0.15%
Services		12,784,884	7.94%
General & Inventory		7,013,782	4.36%
		160,933,767	100.00%

Schedule 3 - 1B

6TH OF OCTOBER CITY - RATE CASE 2001

Allocation of Fixed Assets to Functional Categories

Function	(Rate Perioc	LE	% of Total
Production and Treatment		138,259,347	24.74%
Booster Pump Stations		16,440,000	2.94%
Storage Tanks		27,500,000	4.92%
Distribution Network		344,699,536	61.67%
Meters		3,236,218	0.58%
Services		21,784,884	3.90%
General & Administrative		7,013,782	1.25%
		558,933,767	100.00%

6TH OF OCTOBER CITY - RATE CASE 2001

Schedule 3 - 2

Allocation of Fixed Assets to Capital Service Cost Components

Function		Allocation Factor	Cost Element: Commodity	Demand	Customer
Production and Treatment	75,259,347	PT1	60,207,478	15,051,869	0
Distribution Pump Station	6,440,000	PS1	2,576,000	3,864,000	0
Storage Tanks	7,500,000	ST1	2,250,000	5,250,000	0
Distribution Network	51,699,536	DN1	25,849,768	25,849,768	0
Meters	236,218	M1	0	0	236,218
Services	12,784,884	S1	0	0	12,784,884
General & Inventory	7,013,782	GA1	4,141,342	2,279,098	593,342
			95,024,587	52,294,736	13,614,444
			59.05%	32.49%	8.46%

6TH OF OCTOBER CITY - RATE CASE 2001

Schedule 3 - 3

Fixed Asset Allocation Factors

Function		Allocation Factor	Cost Element: Commodity	Demand	Customer
Production and Treatment	75,259,347	PT1	80.0%	20.0%	0.0%
Distribution Pump Stations	6,440,000	PS1	40.0%	60.0%	0.0%
Storage Tanks	7,500,000	ST1	30.0%	70.0%	0.0%
Distribution Network	51,699,536	DN1	50.0%	50.0%	0.0%
Meters	236,218	M1	0.0%	0.0%	100.0%
Services	12,784,884	S1	0.0%	0.0%	100.0%
General & Administrative	7,013,782	GA1	59.05%	32.49%	8.46%
	160,933,767				

Service Cost Allocation Factors			Schedule 3 - 4
	5,358,847	4,715,180	872,800
Allocation Factor	Commodity	Demand	Customer
P1	80.00%	20.00%	0.00%
P1	80.00%	20.00%	0.00%
D1	50.00%	50.00%	0.00%
C1	0.00%	0.00%	100.00%
E1	40.00%	60.00%	0.00%
AF1	48.95%	43.07%	7.97%

6TH OF OCTOBER CITY WATER UTILITY - RATE CASE 2001

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Allocation of O&M (Functional) Expenses to Service Cost Categories

Total by Cost Center		Allocation Factor	Cost Categories: Commodity	Demand	Customer
Production	1,678,216	P1	1,342,573	335,643	0
Production Services	1,461,060	P1	1,168,848	292,212	0
Distribution	735,258	D1	367,629	367,629	0
Customer Services	872,800	C1	0	0	872,800
Electric Power	6,199,493	E1	3,719,696	2,479,797	0
Admin. & Finance	0	AF1	0	0	0
	10,946,827		6,598,746	3,475,281	872,800
			60.28%	31.75%	7.97%

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6TH OF OCTOBER CITY WATER UTILITY - RATE CASE 2001

O&M Service Cost Allocation Factors

	Allocation Factor	Commodity	Demand	Customer
Production	P1	80.00%	20.00%	0.00%
Production Services	P1	80.00%	20.00%	0.00%
Distribution	D1	50.00%	50.00%	0.00%
Customer Services	C1	0.00%	0.00%	100.00%
Electric Power	E1	60.00%	40.00%	0.00%
Admin. & Finance	AF1	60.28%	31.75%	7.97%

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6TH OF OCTOBER CITY WATER UTILITY - RATE CASE 2001

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Allocation of Capital Cost Categories to Customer Classes

Cost Element	Allocation Factor	Customer Class: Residential	Commercial/ Service	Industrial	Irrigation	
Commodity	CM2					
2,633,483		556,575	229,023	1,100,911	746,973	
Demand	D2					
1,449,281		329,724	120,602	507,266	491,689	
Customer	C2					
377,307		269,553	83,292	23,114	1,348	
		1,155,852	432,917	1,631,291	1,240,010	
4,460,070		25.92%	9.71%	36.58%	27.80%	100.00%
						200.00%

	Allocation Factor	Residential	Commercial/ Service	Industrial	Irrigation
38,798,537	CM2	8,199,900	3,374,147	16,219,490	11,005,000
		21.13%	8.70%	41.80%	28.36%
222,177	D2	50,547	18,488	77,765	75,377
		22.75%	8.32%	35.00%	33.93%
27995	C2	20000	6180	1715	100
		71.44%	22.08%	6.13%	0.36%

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Allocation of O & M Cost Components to Customer Classes

Cost Element	Allocation Factor	Customer Class: Residential	Commercial/ Service	Industrial	Irrigation	Religious	Standpost
Commodity 6,598,746	CM2	1,394,616	573,865	2,758,565	1,871,699	0	0
Demand 3,475,281	D2	790,658	289,196	1,216,390	1,179,038	0	0
Customer 872,800	C2	623,540	192,674	53,469	3,118	0	0
10,946,827		2,808,814	1,055,735	4,028,424	3,053,855	0	0
		25.66%	9.64%	36.80%	27.90%		100.00%
							200.00%

Allocation Factors for Separating O&M Service Costs to Customer classes

	Allocation Factor	Residential	Commercial/ Service	Industrial	Irrigation
38,798,537	CM2	8,199,900	3,374,147	16,219,490	11,005,000
		21.13%	8.70%	41.80%	28.36%
222,177	D2	50,547	18,488	77,765	75,377
		22.75%	8.32%	35.00%	33.93%
27995	C2	20000	6180	1715	100
		71.44%	22.08%	6.13%	0.36%

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Allocation of Total Revenue Requirements to Customer Classes

TOTAL		Residential	Commercial/ Service	Industrial	Irrigation
15,406,897	Total Capital & O&M Revenue Reqts.	3,964,666	1,488,652	5,659,715	4,293,865
		25.73%	9.66%	36.73%	27.87%

The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-funded Project

TRAINING AND TWINNING PLAN FOR THE EWRA

November 30, 2001 and July 15, 2002

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

CHEMONICS EGYPT

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ACRONYMS

ACC	Arizona Corporation Commission
BOD	Biological Oxygen Demand
CONAMA	National Commission of the Environment (Chile)
DGA	General Direction of Waters (Chile)
EBRD	European Bank for Reconstruction and Development
EWRA	Egyptian Water/Wastewater Sector Regulatory Agency
FCURIA	Flagler County Regulatory Interim Authority (Florida)
FWS	Florida Water Services
GOE	Government of Egypt
IP3	Institute for Public-Private Partnerships
IT	Information Technology
LIRR	Legal, Institutional and Regulatory Reform
LIRR-II	Legal, Institutional and Regulatory Reform II Project
MHUUC	Ministry of Housing, Utilities and Urban Communities
OCU	Ocean City Utilities Inc. (Florida)
OFWAT	Office of Water Services
OUR	Office of Utility Regulation (Jamaica)
PCUC	Palm Coast Utility Corporation (Florida)
PSC	Public Services Commission (Florida)
SISS	Superintendence of Sanitary Services (Chile)
TWSME	Tallinn Water and Sewerage Municipal Enterprise (Estonia)
USAID	United States Agency for International Development
WICS	Water Industry Commission in Scotland
W/WW	Water and Wastewater

Training and Twinning Plan for the Egyptian Water/Wastewater Sector Regulatory Agency

PART A: TRAINING PLAN

A. EWRA Training Plan

A two-track program is proposed to build institutional skills in water and wastewater sector regulation, and to train sector utilities to introduce technical, financial, and consumer service efficiencies in operations. Both programs will emphasis practical strategies and tools for performing requisite functions and responsibilities. Case studies and exercises will be used to reinforce strategies, procedures, and fundamental concepts. Each program comprises four modules.

Regulatory Training Program. The workshop's focus is on developing practical skills in utility regulation. Basic operating conditions of the water and wastewater sector will be reviewed to provide the context for sector regulation in Egypt. The program will introduce the fundamental concepts of competition, regulatory decision-making, and the economic regulation. Alternative forms of regulation will be discussed, with an emphasis on Egypt's adoption of the cash needs approach to economic regulation.

The role of utility regulators will be thoroughly examined. Statutory responsibilities and legal constraints will be studied, as well as how agency independence, accountability, credibility, and legitimacy affect regulatory discretion. Guidelines on how to effectively staff, operate, and manage a regulatory institution will be presented.

Participants will gain practical knowledge and skills needed to manage the regulatory process. Administrative procedures on regulatory authority will be presented, which includes transparency requirements, procedural and substantive restraints on regulatory discretion, and appeals procedures.

The workshop will establish principles for measuring costs and setting prices. A framework for understanding and using utility company financial statements to assess performance, and to make revenue and cost recovery projections will be presented to guide regulators in the review of rate applications. Tools will be presented for assessing the impact of regulation of various stakeholders.

Training Program for Utilities. The workshop will review the role and function of the regulator to help utilities understand its responsibilities and authority. The program emphasizes regulation as an instrument for driving greater efficiency, improving cost recovery, and protecting consumer interests.

Strategies for improving utility operational efficiency, accountability, and financial management will be provided. Participants will learn to review financial statements -- cash flow statements, income statements, and operating expenses to forecast revenue and cost recovery. Guidelines on

how to obtain and manage financial information, specifically addressing knowing what to ask for and how to organize it, developing and using annual reports, and conducting management audits will be provided.

The workshop will examine the basics of how regulators evaluate rate structures. Rate application requirements will be presented and technical assistance will be provided to guide utilities in preparing the applications for rate review.

B. Regulatory Training Program

Target Audience: Regulation officials, managers, and staff

B1. Module I: Rationale for Regulation

Learning Objectives:

- Understanding elements of effective regulatory systems
- How to create a body of regulations and due processes that will guide a water regulatory body, utilities, and consumers
- How to enforce technical, finance, environment, operations, and consumer protection standards

Session 1 — Regulation Principles

- Natural Monopolies
- SOE Regulation & the New Paradigm of Attracting Private Sector Investment
- Rate Setting, Consumer Interest, and Cost Recovery
- Enforcement of Financial, Service, and Performance Standards

Session 2 — Legal and Institutional Basis for Water Sector Regulations

- Enabling Instruments
- Rules
- Tariffs
- Contracts

Session 3 — Regulation by Institution versus by Contract

- Regulation by Contract
- Regulation by Institution
- Advantages/Disadvantages of Each Approach
- Criteria for Decision-making

Session 4 — Roles and Functions of a Regulatory Commission in PSP Oversight

- Project Regulation v. System Regulation
- Project Approval to Avoid "White Elephants"

- Compliance Monitoring
- Rate Adjustments & Consumer Protection

B2. Module II: Constructing Regulatory Institutions

Learning Objectives:

- How to effectively staff, operate, and manage a regulatory institution
- What are the technical and management skill requirements?
- How to manage rate cases and understand task sequence and critical paths

Session 1 — Alternative Attributes of Regulatory Institution Designs

- Commission versus Czar
- Single versus Multi-Sectoral
- Degree of Independence
- Best Practices & Case Studies

Session 2 — Managing Regulatory Bodies and Regulatory Staff

- Election v. Appointment of Board
- Board Member Issues
- Organizational Structure
- Relationship of Board/Commission to Technical Staff/Secretariat

Session 3 — Attributes of Regulatory Institutions

- Protecting the Public Interest
- Fairness to Utilities
- Transparency
- Best Practices

Session 4 — Financing Regulatory Institutions

- Ministry of Finance
- Regulatory Assessment
- Transitioning to Self-Sufficiency
- Budgeting

B3. Module III: Role of the Regulator

Learning Objectives:

- Techniques for improving efficiency
- Basic principles of economic and incentive regulation

- How to compare tariff rate models
- How to prepare financial and economic analysis of utility projects

Session 1 — Setting Rates: Forms of Economic Regulation

- Cash Needs
- Price Cap Principles
- Other Forms of Economic Regulation (Rate of Return, Yardstick, & Hybrid Combinations)
- Effects on Utilities, Government, and Customers

Session 2 — Regulatory Financial Analysis

- Revenue Requirement
- Cost of Service Studies
- Rate Design
- Cost Recovery

Session 3 — Techniques for the Financial Analysis of PSP Projects

- Internal Rate of Return
- Debt versus Equity Financing
- Financial Sensitivity Analysis for Measuring Tariff & Cost Impact
- Computerized Financial Forecasting

Session 4 — Processing Rate Applications

- Contents of an Application/Request
- Role of Technical Secretariat and Board
- The Decision
- Regulatory Oversight/Follow-up/Contract Monitoring

B4. Module IV: Regulation and Stakeholder Relations

Learning Objectives:

- How to monitor consumer service quality
- How to implement strategies to protect customer rights
- Understanding the impact of regulation on stakeholders

Session 1 — Balancing the Interests of Stakholders

- Residential Customer Interests
- Commercial/Industrial Customer Interests
- Utility Interests

- The Government's Interest

Session 2 — Affordability

- Residential
- Commercial/Industrial
- Effect on Economic Development
- Conservation

Session 3 — Customer Protection and Participation Issues: Developing Standards for Responding to Common Consumer Complaints and Inquiries

- Organizational Structure for Taking Complaints
- Formal & Informal Complaint Procedures
- Recordkeeping & Performance Indicators
- Consumer Protection & PSP

Session 4 — Developing Quantitative Systems and Criteria for Evaluating Overall Consumer Service Levels

- Complaint Tracking
- Inquiry Tracking
- Measuring the Quality of Responses
- Case Study: OFWAT

C. Training Program for Utilities

Target Audience:

PEAs, PSCs, and NUCA - delivered to up to 30 participants on a regional basis

C1. Module I: The Transition to Privatization

Learning Objectives:

- How to use regulation to promote good public utility service
- How efficiency improvement goals can be achieved through regulation
- How to structure technical and operational performance standards

Session 1 — Types of Privatization

- The Corporitized Utility
- Service and Management Contracts
- BOT and Concessions
- Divestiture

Session 2 — The Need for Regulation

- Old v. New Methods of Regulation
- Regulating SOEs
- Regulating Different Types of Privatized Enterprises
- Regulating Privately-Owned Companies

Session 3 — Competition in the Water and Wastewater Industries Through Privatization

- Deciding Upon the Type of Privatization
- The Project Life Cycle
- Issues in Water/Wastewater Privatization
- Case Studies

Session 4 — Technical and Operational Performance Standards

- Specifying Technical and Operational Performance Indicators
- Financial Performance Indicators
- Data Gathering & Analysis Procedures
- Incentives & Sanctions

C2. Module II: Utility Financial Management

Learning Objectives:

- Benefits of maintaining a proper accounting system
- How to establish procedures and internal control so that all transactions of the utility can be properly recorded
- Understanding financial statements
- How to assess a utility's ability to cover its operating costs through tariff revenues

Session 1 — Setting Rates: Forms of Economic Regulation

- Cash Needs
- Price Cap Principles
- Other Forms of Economic Regulation (Rate of Return, Yardstick, & Hybrid Combinations)
- Effects on Utilities, Government, and Customers

Session 2 — Regulatory Financial Analysis

- Revenue Requirement
- Cost of Service Studies
- Rate Design
- Cost Recovery

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Session 3 — Techniques for the Financial Analysis of PSP Projects

- Internal Rate of Return
- Debt versus Equity Financing
- Financial Sensitivity Analysis for Measuring Tariff & Cost Impact
- Computerized Financial Forecasting

Session 4 — Processing Rate Applications

- Contents of an Application/Request
- Role of Technical Secretariat and Board
- The Decision
- Regulatory Oversight/Follow-up/Contract Monitoring

C3. Module III: Techniques for Preparing a Rate Application

Learning Objectives:

- How to project revenue and calculate cost of service
- Understanding strategies for effective rate setting
- What are the rate review process, and the regulator's role in rate adjustment
- How to prepare rate applications

Session 1 — Revenue Requirements

- Sources of Revenue
- Expenses
- Known and Measurable Future Events
- Operational and Financial Data Requirements

Session 2 — Cost of Service & Rate Design I

- Alternative Methodologies
- Data Requirements
- Cross-Subsidization
- Social Consideration

Session 3 — Cost of Service & Rate Design II

- Flat Rates
- Declining Block Rates
- Inclining Block (Conservative) Rates
- Lifeline Rates

Session 4 — Presenting the Rate Application

- Setting Priorities and Submitting Recommendations
- Documentation
- Expert Studies
- Tasks Sequence and Critical Paths

C4. Module IV: Customer Service and Public Awareness Strategies

Learning Objectives:

- Customer service planning and management strategies
- How to structure customer service committees of other formal structures as a first call for complaints against utilities
- Understanding the environmental impact of utility operations

Session 1 — How Regulatory Institutions Protect Consumers

- Collaborating with Regulators
- Service and Affordability Standards
- Customer Service Committees
- Sanctions and Incentives

Session 2 — Developing Public Education and Customer Outreach Strategies

- Defining the Public
- Determining Outreach Methods
- Stakeholder Consultation
- Transparent Standards for Responding to Complaints and Inquiries

Session 3 — Promoting Service Quality

- Performance Standards
- Public Participation
- Service Quality Compliance Monitoring
- Service Quality Case Studies

Session 4 — Techniques of Consumer Participation in Enforcement

- Informal Complaint Processing Mechanisms
- Formal Complaint Processing Mechanisms
- Inquiry Processing Mechanisms
- Case Studies

D. Twinning Program Framework

The Twinning Program is intended to reinforce what is taught in the training sessions by allowing the participants to see the concepts introduced in the workshops put to use in a real world setting and to provide interaction with regulators facing the same problems.

The ideal criteria for a twinning partner would be one with a regulatory agency that:

- Used a cash-needs approach for SOEs that have moved to corporatized status
- Uses a price-cap method of economic regulation for utilities owned by private sector interests
- Has determined what role it should play in PSP
- Is multi-dimensional in that it encompasses all the functions and processes involved in utility regulation, including consensus building, dispute resolution, information provision and consumer interaction
- Integrates its activities with those of the environmental ministries
- Has been reasonably successful at the above
- Is an emerging economy

Candidate partners should be able to adequately integrate delegates into its operational setting and provide hands-on work experience in the key organizational functions of legal compliance, financial performance and price monitoring, technical performance monitoring, and consumer affairs.

E. Candidate Countries

It is unlikely that any one country meets all of these criteria.

The United Kingdom essentially is the originator of the price cap paradigm. However, it is not an emerging economy. It's likely that the United Kingdom used a cash needs approach for the then-publicly owned water/wastewater utilities, just as municipal utilities do in the United States. Consequently, the U.K. probably fits all the criteria except the emerging economy condition. It also has the advantage of being easily accessible from Egypt. However, since OFWAT regulates a mature and developed marketplace, it might be too advanced to give Egyptian officials the fundamental skills needed to address the regulatory challenges of a new agency.

Jamaica fits the emerging economy standard. It has an Office of Utility Regulation, which seems to be reasonably successful. Since its office is relatively new the Egyptian officials can better understand the details of creating a regulatory agency from the ground up. Jamaica's major disadvantage is that it uses a rate of return method of economic regulation. It also does not have the geographical advantages of the U.K. There is also the possibility that Egyptian officials will perceive Jamaica to have a lower level of development than Egypt. Consequently, the delegation might not be inclined to twinning with Jamaica.

Other options, as this stage of preliminary investigation include Argentina, which has another relatively new regulatory law and body that was conceived as part of the Buenos Aires Water

Concession; and Mexico. Both countries have had success with utility regulation; however, the language limitations would likely present difficulties in working effectively in an operational setting.

The duration of the program can affect the substantive and practical experience gained in twinning. A two-week rotation in each of the key functional areas would give the Egyptian counterparts sufficient time to become immersed in day-to-day responsibilities and to have hands-on experience with a greater variety of regulatory decision-making. However, the cost implications and budget will largely dictate the scope and duration of the program.

Extensive planning and coordination required to design the program with the twinning partner and organize the logistically arrangements. A mentoring and advisory role will be structured with the twinning partner to provide guidance to EWRA officials during the first year of regulatory operations.

With a specific timeframe in mind, we can begin serious examination and discussion with potential twinning partners.

PART B. TWINNING PROGRAM

A. Introduction

An essential element of sector reform is the development of the capacity of the Egyptian Water and Wastewater Sector Regulatory Agency (EWRA) to:

- Set and adjust tariffs in a fair, reasonable and transparent manner
- Ensure quality of service is maintained by both pubic and private providers
- Protect the interests of consumers and investors alike
- Encourage economic and efficient operations of utilities through cost-recovery best practices.

To rapidly develop the capacity of the nascent EWRA, it is proposed that Twinning arrangements be in place to complement traditional management training method undertaken under the Legal, Institutional and Regulatory Reform II Project (LIRR-II) and in the future.

Thus, the LIRR-II team has developed a twinning plan for the Government of Egypt (GOE) to consider that emphasizes practical, hands-on experiences with other recognized regulators to support the development of select EWRA commissioners and staff.

"Twinning" is a concept practiced by developed and developing country institutions as a learning and capacity building tool. Twinning is accomplished by having two entities – one established, and the other, fledgling – agreeing to collaborate on a long-term basis (usually up to a year) to transfer knowledge and skills on technical, management and policy topics of concern. Many examples of twinning arrangements are environment-regulatory related (such as in the boxes below), but twinning has more recently been used in utility operations and price regulation.

The object of this proposed twinning consultancy described below is to work alongside the experts of a well-developed water regulatory agency so that improved practices are implemented and operational efficiency of EWRA is enhanced.

A select group of Egyptian officials (recommended to be 4-6 individuals) will be "twinned" with one or more regulatory bodies.

The nature of the proposed twinning is focused on short-term study tours/training as opposed to longer-term placements at institutions. The rationale for a study tour approach is simple: more focused knowledge transfer with minimal time commitments from counterpart institutions as well as the time availability of EWRA staff. Through the study tours, the Egyptian government officials will develop relationships with their twinning counterparts that will lay the foundation for sustained communication and collaboration over the long term as well as the development practical and valuable regulatory management skills such as rate-making, economic analysis, customer relations, and regulatory institution management.

Below are brief examples of twinning arrangements that serve as a useful model for the twinning plan proposed.

Kaunas Water and Environment Project

Kaunas is one of the five priority hot spots in Lithuania, locations where pollutant discharges are especially high. Swedish support to Kaunas was initiated in 1991. The twinning arrangement between Stockholm Water Utility and Kaunas Water began in 1994 and was concluded in 1999. Cooperation will, however, continue after this date. The aim of the twinning cooperation is to support Kaunas Water in various ways so that it becomes an independent, cost-effective and self-reliant company, which can fulfill the needs of its consumers - with the least possible environmental impact.

The major elements of the twinning project in Kaunas municipality are investments in improved water supply, construction of the wastewater treatment plant and the renovation of the town sewer system. The objective is to decrease discharge, thereby improving the environmental status of the Kuronic Lagoon (lying just by the river estuary to the Baltic Sea) and the rivers Nemunas and Neris. In the long run this will lead to a better environment for the entire Baltic Sea.

In 1995, Kaunas signed a loan agreement with the European Bank for Reconstruction and Development, EBRD. Procurement of equipment began in 1996. The project includes the installation of mechanical and chemical systems for the treatment of the city's wastewater. The intention is also that Kaunas wastewater should also undergo biological treatment; there are at present, however, no financial resources available to construct the necessary facilities.

The raw wastewater which was previously discharged from Kaunas directly into the river has a Biological Oxygen Demand (BOD) level of approximately 200 mg per litre. After the introduction of mechanical purification, this discharge was decreased to 50-60 mg per litre. Nitrogen levels have decreased by 10 per cent and phosphorus by 80 per cent. However, investments in biological treatment are necessary to achieve the levels as stated in HELCOM's requirements for a discharge level under 15 mg BOD per litre.

Source: *Swedish International Development Agency. http://www.sida.se/Sida/jsp/Crosslink.jsp?d=621&a=2896*

Estonia: Tallinn Water and Environment Project - Baltic Clean-up Programme

In September 1994, the EBRD approved a project in Estonia's capital city, Tallinn, to reduce pollution into the Baltic Sea. The ECU 23 million equivalent loan to the Tallinn Water and Sewerage Municipal Enterprise (TWSME) will be used to improve water supply and wastewater management.

This project was a landmark in several ways: it was the EBRD's first investment in environmental infrastructure; it was the first project by an international financial institution to reduce pollution to the Baltic Sea; and it was the first project in the region to combine financing from an international institution with substantial donor grant financing.

The investment programme financed under this loan will run from 1995 to 1998. It will address sustainable use of water resources, water quality improvement, pollution prevention and worker protection. In addition, it will restructure TWSME into a self-managed, self-financing water utility enterprise, independent of any state or municipal subsidies. To this end, a twinning arrangement has been established with Helsinki Waterworks, which will help TWSME become autonomous by providing long-term advice on enterprise development, and day-to-day advice on project implementation and streamlining the financial management of the company. Helsinki waterworks will host several officials from the Finnish side to demonstrate how to introduce competitive utility management techniques.

The completion of the biological wastewater treatment plant will reduce by about 1 per cent the total phosphorus and nitrogen load discharged to the Gulf of Finland, and by 2-3 per cent the proportion of the load originating in urban areas. Reliability of the entire wastewater collection and treatment system will be increased. The project will also improve the reliability of water supply services to supply safe drinking water in Tallinn.

Source: *European Bank for Reconstruction and Development. http://www.ebrd.com/opera/sector/muninfra/tallinn.htm*

Australia and Indonesia

The Australian National Committee of IAWQ has developed a proposal by which Australia will 'twin' with Indonesia in the area of water pollution control and water quality management. Following the positive response to the proposal from Indonesia, IAWQ Australia is proceeding to document the broad range of water quality related activities being implemented in Indonesia by Australian agencies.

The IAWQ concept of 'twinning' developed and developing nations can add significant value to water pollution control and water quality management activities already underway between two countries. For example, the twinning arrangement between the Netherlands and Egypt has contributed to the Dutch Government's program of financial assistance to Egypt for water-related research and development activities. A twinning arrangement between Australia and Indonesia will build on the very extensive range of water-related projects currently underway in Indonesia, which have significant Australian involvement.

In essence, it is proposed that the twinning arrangement will provide a formal mechanism to develop and maintain an overview of water pollution control and water quality management activities underway in Indonesia. The primary aim of compiling and disseminating information on these activities could be largely undertaken using the resources of the Australia National Committee. Additional support from the Governing Board would support publication and preparation costs, and could also enable some involvement of IAWQ in the activities with a view to providing ongoing technical advice.

Source: *Environment Industry Development Network. http://www.eidn.com.au/introiawa.htm*

B. Potential Twinning Arrangement Activities

The EWRA commissioners, executive director, and staff are not yet fully appointed and it will take months before the EWRA is operational and gains meaningful experience in regulation of Egyptian utilities. Thus, undertaking an intensive twinning engagement for a select group of commissioners (two); the executive director (one); and heads of key general departments (three) for customer affairs, rates analysis, and economic regulation departments, for a total of six participants, will allow the EWRA to gain invaluable exposure to regulatory best practices. The proposed twinning plan therefore is designed for six participants that will "rotate" to different twinning locations with each group focusing on its area of responsibility with the twinning partner selected based on its worldwide reputation and experience in its area of expertise, which is so necessary in Egypt.

There are a number of learning activities that could be undertaken under a twinning arrangement. These activities focus on:

- Review of organizational structure, operations and management of a regulatory body
- Analyzing economic and financial data of utilities
- Studying the accounting and auditing practices of utilities
- Diagnostic analysis of water utilities
- Improving customer relations function
- Developing tariff-setting principles and strategies
- Establishing a sound and predictable dispute resolution and arbitration method
- Consulting with key stakeholders.

LIRR-II in general, and the Institute for Public-Private Partnerships (IP3) in particular, enjoy excellent relations with a number of regulatory bodies worldwide. LIRR-II has selected the following twinning partners based on their expertise, experience and willingness to collaborate

with EWRA. Once the Ministry of Housing, Utilities and Urban Communities (MHUUC) and the United States Agency for International Development (USAID) review and approve this plan, the proposed twinning plan can be finalized and formalized. Of these activities based on potential partner agencies (to be described in the next section), it is recommended that the EWRA twinning focus on the following activities:

1. *Organizational review through institutional research.* Three representatives from EWRA (one or more commissioners and the executive director) will be sent to the Florida Public Services Commission (PSC) to research and understand its organizational history, mandate, staffing, and other organizational matters. This activity will take place in November and will be implemented over a three-week period. The Florida PSC was chosen because of its multi-sectoral nature, which will prove useful in gaining different perspectives on regulation. In addition, a visit to the Florida PSC may also pave the way for a visit with the Flagler County Utility Regulation Interim Authority, a "virtual" regulatory authority also located in Florida.

2. *Principles of rate setting.* Being one of the most difficult tasks in regulation, rate setting requires seasoned, advanced and thorough knowledge to meet the objective of sustainable service delivery. The Arizona Corporation Commission (ACC) is the suggested venue for the study of the principles of and strategies in rate setting, as well as the venue for witnessing public rate case hearings. Two or three EWRA representatives will spend two to three weeks at the ACC, which has a long history of structuring tariffs for various utilities and performing major rate hearings. Participants will be exposed to rate setting and hearings in not only water, but also electric and telecommunications cases to deepen their understanding of the process and procedures of regulation.

3. *Observing customer relations.* An important part of being a regulator is addressing the concerns of consumers while at the same time being fair to service providers. The Head of EWRA's Customer Affairs Department, along with one or two more representatives, will have the opportunity, through this activity, to observe how established regulators handle consumer complaints and deal with utilities. The site for this twinning activity will be the Scottish Water Industry Commission, which boasts of a comprehensive and sophisticated customer relations program. This activity will take place in the early part of 2003 and will last for two to three weeks.

4. *Communication and advice for future needs (Aftercare).* An agreement between EWRA and one or more agencies could be established to ensure a long-term exchange of ideas and practices. This will allow information sharing and possible consultancy services by the partner agencies. This arrangement will be negotiated between EWRA and any one of the regulatory bodies participating in the twinning experience. LIRR-II recommends that EWRA also establish a "window" of exchange with the Jamaican Office of Utility Regulation (OUR) and Chile's Superintendence of Sanitary Services (SISS). OUR is ideal given its already established relationship with LIRR due to IP3's alumni network and its reputation as a highly successful regulator that currently oversees private providers and public providers in the water, energy, transport, and telecommunications sector. SISS is suggested because it is one of the few well-developed and advanced water regulatory bodies in the world and has years of experience in cost-recovery, tariff reform, and competition and

is a model for emerging markets such as Egypt. Aftercare support can be an outstanding and affordable way to share information and problem solving regulator to regulator.

LIRR-II will assist EWRA in evaluating and selecting a suitable twinning partner(s). LIRR-II will also assist in formalizing the twinning arrangement, as well as coordinating the activities that will follow from such an arrangement.

C. Proposed Twinning Partners and their Unique Features

Below are potential institutions LIRR-II has identified for twinning. They have been classified them into three groups, namely, national/multi-sectoral, national/sectoral, and provincial/state. LIRR-II will be responsible for managing the overall coordination between EWRA and each institution chosen once MHUUC and USAID review and approve this twinning plan.

C1. National/Multi-Sectoral

Office of Utilities Regulation (OUR), Jamaica. The government of Jamaica established a regulatory agency in 1995, the Office of Utility Regulation (OUR), to regulate both public and privately operated utilities. Based on the British model in terms of its operational responsibility, it is an independent authority with jurisdiction over power and telecommunications, and just recently, the addition of the water sector. It has authority over general policy, issue regulations, the setting of technical and operating standards and norms, and oversees sector enterprises, sets rates and pricing guidelines and enforces regulations.

Office of Utilities Regulation, Jamaica

The **OUR**'s mission is to contribute to national development by creating an environment for the efficient delivery of utility services to customers.

The OUR is empowered to ensure that utilities granted licenses will provide services that:

- Meet the needs of the community
- Are efficiently provided in a manner designed to protect the health and well-being of users of the service and persons affected by its operations
- Take into account the need to protect and preserve the environment
- Are economical and reliable
- Are on terms, which allow for a reasonable return on capital invested in providing the service

The **OUR** will work with the utilities to ensure that customers enjoy high-quality service. Together the OUR and the utilities will develop standards by which the quality of consumer service can be quantified and incentives provided for continuous improvement.

The **OUR** will receive and review applications for licenses and rate reviews presented by the utilities and investigate possible breaches of licenses and take enforcement action where appropriate.

http://www.our.org.jm/

OUR was established following the promulgation of the OUR Act of April 1995. The OUR Act was amended in 2000 to provide the agency with the power to regulate all utilities. Under the Act, the OUR will have the power to regulate the following utility services: supply and distribution of electricity; provision of telecommunication services; provision of public

passenger transport by road, rail and ferry; supply or distribution of water; and the provision of sewerage services.

The benefit of working with OUR is two-fold: First, LIRR has already established an agreement with OUR regarding future twinning arrangement through IP3's alumni network. This was a result of a customized training course on water regulation that IP3 conducted in Jamaica early this year. Second, OUR, being a multi-sector regulator, will allow EWRA officials to learn about not only water sector regulation, but also regulation of other urban infrastructure services and the forms of regulation applied. Much insight could be gained by comparing lessons learned from a cross-sectoral perspective.

C2. National/Sectoral

Superintendence of Sanitary Services (SISS), Chile. Chile has restructured its legislative and institutional base in the water and sanitation sector over the last 12 years. This has seen the progressive development of regional public companies, private sector contracts and more recently, the encouragement of private concession companies. The private sector now accounts for 60 percent of the total sector investment. To ensure that the private companies properly meet their public service obligations, Chile has established a national regulatory authority, SISS, whose role is very similar to that of the Office of Water Services (OFWAT) in England and Wales. The SISS is a decentralized entity with financial independence, which reports to the President of the Republic via the Ministry of Public Works. In addition, other organizations regulate specific aspects of service companies' activities. For instance, the National Health Service and the General Direction of Waters (DGA) are charged with managing hydraulic resources at a national level and the formation of water rights. The National Commission of the Environment (CONAMA) applies state policy in relation to environmental issues.

Chile's SISS is considered one of the most well developed regulatory agencies in the world. The contribution that SISS can make to this twinning arrangement is their experience in regulating sanitation services and in developing a direct subsidy scheme for low-income consumers.

Water Industry Commission, Scotland

"Ultimately the best and only way of promoting customer interests in a public sector model is for the customer regulator to improve the economic efficiency of the industry, and thereby the value for money generated.

— *Commissioner's Corporate Plan (July 2000)*

Source: http:/www.watercommissioner.co.uk/index.htm

Water Industry Commission, Scotland. The office of the Water Industry Commissioner for Scotland was created by Part II of the 1999 Water Industry Act and was established on 1 November 1999. According to this Act, the commissioner is responsible for regulating all aspects of the economic and customer service performance of the three Scottish water authorities:

- East of Scotland Water Authority
- West of Scotland Water Authority
- North of Scotland Water Authority

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The primary role of the commissioner is to promote the interests of customers of the three Scottish water authorities. The commissioner is appointed by and is responsible to the Scottish ministers through the Scottish Executive Rural Affairs Department. The Water Industry Act enables Scottish ministers to guide the commissioner about how he should perform his functions. This does not mean ministers control the commissioner. There are statutory safeguards for his independence of view, and in practice he works closely with, yet independently of, the Scottish Executive. The commissioner can also attend and give evidence to Parliamentary committees.

The Commissioner's Office is organized into six teams. Although each team has clearly defined roles and responsibilities, they work closely together:

- *Comparative Efficiency.* The Comparative Efficiency team is responsible for all activity relating to the Scottish Water Authorities' operating expenditure. This includes:

  - Setting operating expenditure efficiency targets for the Scottish water authorities through a process of detailed benchmarking with public limited companies (plcs) in England and Wales using econometric modeling
  - Monitoring achievement of the operating expenditure efficiency targets
  - Development of an annual return and database (similar to that used by OFWAT, but adapted for Scotland) to collect the information required to assess the Scottish water authorities
  - Development of a financial model to be used to complete the strategic review for the period 2002-2006. The results of this model will be used to set revenue caps for the next four years

- *Capital Investment and Efficiency.* The Capital Investment and Efficiency team is responsible for all aspects of capital investment, its funding, and operation (including public private partnerships). Capital investment amounts to around £500 million per annum, to provide water services, wastewater services and support services and is a combination of infrastructure renewals, and new assets to maintain and enhance the provision of services to customers.

  - Approving the Scottish water authorities' proposed investment plans for the next four-year period, to ensure value for money and the satisfaction of quality and standards requirements
  - Developing and building the commissioner's information requirements for the economic regulation of capital investments and assets
  - Assessing the current and proposed positions of the Scottish water authorities as regards best practice strategic asset planning, management, the use of risk techniques and financial modeling
  - Developing and promoting investment appraisal processes that are consistent with best practice

Establishing capital efficiency targets for the Scottish water authorities through a process of:

- Industry consultation
- Benchmarking against English and Welsh plcs and other utilities
- Assessing required levels of efficiency in strategic planning, procurement and design
- Monitoring investment progress in each year in terms of outputs, expenditure and asset base and achievement of efficiencies

- *Customer Service and Revenue.* The Customer Service and Revenue team is responsible for the regulation of all aspects of the Scottish water authorities' service to their customers. This includes:

  - Developing and improving codes of practice and *guaranteed minimum standards* for customers
  - Developing customer service initiatives, e.g., tailored service packages and special needs register. This is completed through:
    - Benchmarking exercises
    - Research and *consultation* of domestic and non-domestic customers
    - Consulting with a wide range of customer groups
    - Analyzing the impact of competition on domestic and non-domestic customers through assessing the risk to the future revenues
  - Analyzing and approving the Annual Scheme of Charges. This includes:
    - Ensuring the accuracy of charges schemes
    - Monitoring changes in charging policies
    - Ensuring that policies are customer focused and cost reflective and
  - Analysis of customer revenue information on a quarterly basis

- *Licensing Development.* The Licensing Development team is responsible for researching and developing a licensing regime in Scotland for water and wastewater services. This includes:

  - Developing a licensing application system
  - Making recommendations on the system to be adopted by the commissioner (based on current Bill proposals, and assuming Parliamentary approval) and issuing a consultation document if/when the proposed Water Services Bill receives Royal Assent
  - Developing licensing conditions appropriate to the Scottish water industry
  - Organizational development - making recommendations on resources required by the commissioner for the operation of a licensing regime
  - Estimating likely volume of new entrants and demand for licenses
  - Responding to consultation papers issued by Scottish Executive
  - Investigating issues relating to common carriage, access codes and access pricing
  - Developing awareness and understanding of competition issues in regulated markets

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- *External Relations.* The External Relations team is responsible for all the official external communication of the office. The role includes:

  - Maintaining a good relationship with the Scottish Executive, Scottish Parliament, and Local Government
  - Continual development of professional media profile, communication of key messages and issuing press releases
  - Daily monitoring of media
  - Communication with other regulators and public relations departments
  - Coordination of a panel of academics
  - Meeting key stakeholders
  - Maintaining website
  - Producing presentation material
  - Producing corporate documents such as the annual report
  - Coordinating the Consultative Committees
  - Organizing public meetings
  - Graduate and intern recruitment
  - Maintaining reference library
  - Investigating complaints about the three Scottish Water Authorities
  - Taking enquiries and providing information.

Scottish Water Industry Commission Customer Service Regulation

Customer Service Regulation is ultimately about ensuring the water authorities provide their customers with *not only* the service they would like, but also service of the highest standard.

This requires the Commissioner to research what levels of service customers want through consultation. This applies to the relatively small, numerous domestic consumers and the largest multinational companies who use millions of litres at one location.

The Commissioner and the three Scottish water authorities have launched a set of guaranteed minimum standards. These standards represent the *minimum level of customer service* people should expect from their water authority. The standards of service provided by the water authorities are audited by the Commissioner to ensure the guaranteed minimum standards are met.

- *Corporate Support.* The Corporate Support team provides full organizational and practical support for the Office of the Water Industry Commissioner in terms of human resources, payroll, budget, and information technology (IT).

One of the strengths of the Water Industry Commission in Scotland (WICS) that could be imparted to the EWRA is their emphasis on customer service regulation (see box above). Thus, LIRR-II recommends that the EWRA team responsible for customer relations participate in twinning with the WICS.

C3. Provincial/State

Florida Public Services Commission. The law of the State of Florida requires the commission to set rates that provide utilities an opportunity to earn a return on their investment to provide

adequate and reliable service. However, utility rates must also be reasonable for the customer. The Florida Public Services Commission is the regulatory force that tries to maintain a balance between the utilities and the ratepayers in the state of Florida.

The PSC regulates the utilities providing electric, gas, telephone, and water and wastewater services to safeguard the interests of both consumers and utilities. The PSC plays a key role in guaranteeing that consumers pay fair rates for these services.

The PSC's main objectives include the following:

- Protect consumers from unreasonable rates and terms of service
- Encourage maximum efficiency in utility company operations and management
- Ensure public safety and help the public deal with regulated companies
- Establish regulatory standards and apply them in a fair and consistent manner

The Commission fulfills its objectives by pursuing a number of goals, which are as follows:

For economic regulation:

- To the extent possible, streamline regulatory requirements to provide an open, accessible and efficient regulatory process that is fair and unbiased
- Ensure that the regulatory process results in fair and reasonable rates while offering rate based-regulated utilities an opportunity to earn a fair return on their investments
- Where feasible, use incentive-based regulatory mechanisms to encourage efficiency and innovation among regulated utilities to ensure that customer needs are met in a cost-effective manner
- Encourage and facilitate responsible use of resources and technology in the provision and consumption of utility services

For regulatory oversight:

- Remove regulatory barriers, which impede the development of competitive markets, as directed by law
- Provide appropriate regulatory oversight to protect consumers
- Ensure that all entities providing utility services to consumers comply with all appropriate requirements subject to the Commission's jurisdiction

For service regulation and consumer assistance:

- Facilitate the provision of safe utility services at levels of quality and reliability that comply with established industry standards and practices
- Inform utility consumers regarding utility matters
- Expedite resolution of disputes between consumers and utilities

Whom Does the PSC Regulate? The PSC has rate and service authority over the following utilities:

- Five investor-owned electric utilities
- Eight investor-owned gas utilities
- More than 1,200 water/wastewater systems
- Ten incumbent local exchange telephone companies
- 346 alternative local exchange telephone companies
- More than 600 long-distance (interexchange) telephone companies
- More than 800 pay telephone providers
- 36 alternative access vendors
- 31 shared tenant service telephone providers

The PSC also has limited jurisdiction over the following utilities:

- 18 rural electric cooperatives
- 33 municipally owned electric utilities
- 27 municipally owned gas utilitie

Flagler County Utility Regulatory Interim Authority (FCURIA)

FCURIA is regulatory authority in Flagler County, Florida that boasts of a "virtual" structure. It is composed of an administrator/executive director, who works with engineering, legal, and accounting experts – all of whom are contracted as needed and who do not hold full-time positions with the Authority. FCURIA regulates for-profit water and sanitation companies that provide services entirely within the county. These include the Florida Water Service – Palm Coast Utility Corporation (FWS/PCUC), the Ocean City Utilities, Inc. (OCU), and two upcoming companies (one water and sanitation company in the southern part of the county; the other, a sanitation company in the northern part of the county). FCURIA provides a good example of the benefits of local regulation. It is responsible for issuing and modifying service certificates; setting tariffs and other charges; instituting legislation; monitoring utility performance; and other related tasks.

Collaboration with the Florida Public Services Commission will be ideal in that it regulates a huge number of entities across various sectors. Also, should a twinning arrangement be established with the Commission, there will be an opportunity to work with the Flagler County Regulatory Interim Authority or FCURIA, with which IP3 has a close relationship (see box for more details). Given FCURIA's unique structure, EWRA officials will be able to learn more about outsourcing tasks to outside individuals, an option that is given much consideration by other regulatory bodies around the world.

Arizona Corporation Commission. The Arizona Corporation Commission was created by the Arizona Constitution. Only seven states have constitutionally formed Commissions. Arizona is one of only 13 states with elected commissioners. In the 37 other states, either the governor or the legislature appoints commissioners.

The Arizona Corporation Commission has jurisdiction over the quality of service and rates charged by public service utilities. By state law, public service utilities are regulated monopolies given the opportunity to earn a fair and reasonable return on their investments. What is fair and reasonable in any particular case has been and always will be open to debate in rate hearings before the Commission. Generally, the Commission tries to balance the customers' interest in affordable and reliable utility service with the utility's interest in earning a fair profit.

The *Utilities Division* of the Commission makes specific recommendations to the commissioners to assist them in reaching decisions regarding public utility rates, utility finance and quality of service. The Division is responsible for researching and developing utility issues, providing information and evidence in Commission proceedings dealing with utility applications, and monitoring the quality of utility service, and the rates approved by the commissioners. Additionally, Division staff inspects gas pipelines for safety, operates a railroad safety program and maintains the official documents of proceedings before the Commission.

All rate changes require approval of the Commission in an open meeting. Staff preparation for a major rate hearing begins at the time of utility's initial filing, and takes approximately four to six months before the hearing takes place. Work efforts between the time of filing and hearing include a review of past Commission actions, a review of documents on file with the Commission, an audit of the books and records of the utility, discussions with utility personnel and other interested parties, formulation of the staff recommendation, an analysis of the impacts of the recommendation, and preparation of written testimony and schedules.

Such as in the case of Florida, LIRR-II can easily arrange for EWRA officials to twin with ACC staff and participate in the design and conduct of rate hearings as well as participate in rate making training by ACC staff and consultants. Participant from EWRA will also receive a ratemaking certificate granted by the ACC and its partner organization. ACC has also given preliminary agreement to participate as an "aftercare" partner with the EWRA.

LIRR-II recommends that believes that a combination of one agency from each category would give EWRA exposure to a range of issues and techniques in running a regulatory authority. The following implementation schedule illustrates the proposed twinning activities to be conducted over a 12-month period. The twinning plan envisages three separate twinning trips to the Florida Public Utilities Commission, the Arizona Corporation Commission, and the Industries Commission of Scotland. After the twinning arrangements and activities are completed in the field, LIRR-II will arrange for the aftercare twinning partnerships between the most appropriate regulatory bodies described in the plan.

D. Proposed Action Plan and Timetable

The implementation plan on the following page illustrates twinning for six EWRA staff that will rotate to different twinning events scheduled over a 12-month period. After the initial planning arrangements are conducted, the twinning will commence in November of this year and continue throughout 2003 subject to the agreement of MHUUC and USAID. LIRR-II will be responsible for Cairo and U.S.-based planning and implementation arrangements.

Exhibit I. Twinning for Six EWRA Staff Over a 12-Month Period

		Months												
	Activity	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Phase 1	Initial contact with potential twinning partners													
	Review of twinning implementation plan													
	Completion of agreements with twinning partners													
Phase 2	Start of "institutional research" into the operations and management of the Florida Public Services Commission; three EWRA representatives; duration three to four weeks													
	Studying principles and strategies in rate-setting and attending rate case hearings at the Arizona Corporate Commission; two EWRA representatives; duration two to three weeks													
	Observing customer relations techniques and stakeholder consultations at the Scottish Water Industry Commission; two to three EWRA representatives; duration two to three weeks													
	"After care" or long-term, long-distance information exchange to be done with Jamaica OUR and Chile SISS; all EWRA representatives to participate*													

* Could be continued beyond June 2003

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The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-funded Project

ORIENTATION MATERIALS FOR SENIOR OFFICIALS ON REGULATION OF THE EGYPTIAN WATER/WASTEWATER SECTOR

October 2001

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

CHEMONICS EGYPT

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Regulation and The Regulatory Agency

Regulation is First and Foremost a Governmental Mechanism of Customer Protection

Regulation of Quality

Quality regulation is common wherever the product or service has public health or safety aspects

Economic Regulation

Governments should regulate prices wherever the customer has little choice of whether to consume (public good) or whom to buy from (monopoly supply)

...But the Service Provider Has Legitimate Interests, Too.

- Provider needs sufficient revenue to operate, maintain, replace, and expand the facilities, or service will ultimately deteriorate
- Investors want a return equal to or better than investments with similar levels of risk, or they'll invest elsewhere

Good Economic Regulation Is a Balancing Act ...

- Quality/price tradeoffs
- Providers' interests/customers' interests
- Interests of different customers
- Interests of different providers

.....Carried Out Under Stressful Conditions.

- The regulated firm always has more information than the regulator
- Regulatory decisions attract public attention
- Competing pressures (politicians, lobbies)

Regulation Involves the Exercise of Discretion .....

- BOTs and concessions are long-term agreements, and not all contingencies are foreseeable.

... but discretion must be disciplined and impartial.

- The more discretionary the regulatory regime is, the higher the perceived risk, and risk has a price.

Success Factors for Regulatory Institutions

- Perceived independence from political and commercial interests
- Multiple sources of information
- Authority to make and enforce decisions
- Transparency in decision-making
- Consistency in decision-making and implementation
- Intergovernmental coordination

EWRA Functions

- Sets performance standards for service providers
- Monitors and enforces compliance with standards
- Regulates prices
- Promotes utility corporatization and competition

EWRA Levers

- Review of requests for rate adjustments
- Monitoring and reporting requirements
- Penalties for noncompliance
- Assessment of capital project viability
- Licensing
- Review of proposed mergers and divisions

Why Not Just Regulate by Contract?

- Concession agreement could specify:
  - > standards/targets, means of enforcement, monitoring responsibilities, appeals procedure
  - > indexation formulas, provision for periodic price review or conditions for utility request for rate adjustment
- RbC appropriate if regulatory agency is non-existent or weak
- RbC has drawbacks:
  - > inconsistency among projects → accusations of unfairness
  - > no third party → all disputes must go to arbitration
  - > over-specification → rigidity
  - > over-simplication → ambiguity

Regulation of Private Providers

Quality-of-Service Regulation

Mechanisms	Issues
Performance standards and targets	Which targets? How many targets? Indicator validity and reliability Who to monitor? How frequently to monitor?
Means of enforcement	Penalties or incentives? Tiers? Step-in capacity?

Modes of Economic Regulation

Rate-of-return	regulates profit level
Price cap	regulates price level
Revenue cap	regulates total revenue
Sliding-scale	hybrid mode

Pure Rate-of-Return Regulation

Mechanism: Utility tariffs set to cover O&M and capital costs, and to generate a rate of return adequate to attract capital

Intention: To assure the utility's financial health, but also to assure that profits are not exorbitant

Advantages:

- Virtually guarantees utility's financial stability
- Easy to standardize

Shortcomings:

- RoR determination can be contentious
- Incentive for utility to prefer capital solutions over efficiency improvements
- Incentive for utility to over-invest
- O&M cost pass-throughs

Pure Price-Cap Regulation

Mechanism: Utility tariffs set to allow for inflation and approved capital works, but prices are reviewed and compared every five years, and underperforming utilities may be required to reduce real prices

Intention: To use "comparative competition" (benchmarking) to simulate market forces, and use profit motive to encourage utilities to continually increase efficiency

Advantages:

- stimulates innovation and efficiency
- encourages conservatism in capital spending
- true economic regulation (holism, incentives)
- no cost pass-throughs in pure (RPI-X) form

Shortcomings:

- benchmarking effort is data-intensive
- can result in excessive profits

Convergence of RoR and Price Cap Modes

Actual RoR Regulation	Actual Price-Cap Regulation
▪ Regulators may dispute the rate of return	▪ Cost pass-through provisions
▪ Regulators may question the need for or cost of proposed investments	▪ Regulators take cost of capital into consideration
▪ Regulators may insist on efficiency improvements	▪ Increasingly, regulators are concerned to keep profit levels reasonable

Sliding-Scale Regulation

Combines RoR and Price-Cap principles

- A target rate of return or level of revenue is set
- Revenues in excess of the target are shared with government or customers

Key Issues Common to Design of Economic Regulatory Regimes

Conditions for initiating a price adjustment

- Degree of definition
- Who can initiate request?

Whether and which cost elements should be indexed

- (Cost indexing = cost pass-through)

Frequency of price reviews

- Should be long enough to enable and encourage efficiency improvements, but short enough that customers can benefit from gains

Regulation of Government-Owned Utilities

Challenges in Design of Regulatory Regime for GOUs

- Limited managerial autonomy → Limited capacity to control costs; Problem of non-economic costs; Limited accountability
- Financial dependency → Limited resources for improvements; Limited accountability; Increasing debt levels
- Weak legal/corporate identity → Powerless before free-riders; No or little profit motivation
- Low current tariff levels → Problem of establishing the current tariff; Full cost recovery would require large increases
- "Social dimension" concept → Mass subsidization; Non-economic tariff structures

Simulating Market Forces in the GOU Sector

- Cost and sales projections will incorporate commitments to definite, measurable efficiency improvements
- Subsidies will be capped
- "Excess" revenue from better-than-expected utility performance would be retained or "shared" with MOF
- Tariff structures will move toward cost-of-service pricing

Main Steps

1) **Determine total 5-year funding requirements**
   - O&M (historical, plus new works, inflation, and new efficiencies)
   - Replacement and renewal (depreciation)
   - Capital expansion (debt service)
2) **Determine tariff revenue requirement**
   - Affordability assessment
   - Funding requirement minus affordable tariff revenue equals subsidy
3) **Develop tariff rate structure**
   - Pattern of charges
   - Customer classes and blocks

Beheira Business Plan Assumptions and Targets

Assumptions:

Population growth	2.1% per year
O&M cost inflation	6% per year
New capital investment	LE 398 million
Debt repayment schedule	20 years

Performance Targets	**2000**	**2005**
Plant output (m^3)	174.4 mln	197.0 mln
Production O&M cost (LE/m^3)	LE 0.18	LE 0.176
Unaccounted-for water (%)	33.5%	16.8%
Billed consumption (m^3)	121 mln	164 mln
Revenue collection efficiency	70%	90%
Cost/m^3 sold (LE)	LE0.98	LE 0.83

Funding Requirements: Beheira Water Supply

	1999 (actual)	**2005 (projected)**
Operation and Maintenance	47.7 m	72.1 m
Rehabilitation (depreciation)	13.3 m	20.0 m
Capital expansion (debt service)	49.4 m	44.7 m
TOTAL funding requirements	109.4 m	136.8 m
Current revenue	42.2 m	
Shortfall	67.2 m	

Average Funding Requirement, Beheira water supply 2000-2005

Cost Recovery Target	m^3 price
O&M	LE 0.47
plus Rehabilitation	LE 0.58
plus Expansion	LE 0.91

Proposed Process/Step 1: Determine Funding Requirements

Step	Responsi-bility	Outputs	Duration
Prepare five-year business plan	Utility, with NOPWASD/ NUCA	▪ Quality, efficiency, and productivity targets ▪ Capital plan ▪ Cost projections	4 months
Review business plan	EWRA	▪ Assessment of adequacy, cost-effectiveness, realism, and well-preparedness of business plan	2 months
Finalize funding requirements	Utility	▪ Final business plan ▪ O&M, depreciation, and debt service requirements	1 month

Proposed Process/Step 2: Determine Tariff Revenue Requirements

Step	Responsi-bility	Outputs	Duration
Propose 5-yr target level of cost recovery	Utility	▪ Socioeconomic data and affordability assessment ▪ Preliminary tariff structure and revenue projection	1 month
Establish target level of cost recovery (and five-year subvsidy)	EWRA, with MOF	▪ Tariff revenue projection ▪ Out-performance incentive rate ▪ Subsidy allowance	1 month

Proposed Process/Step 3: Design Tariff Schedule

Step	Responsi-bility	Outputs	Duration
Cost-of-service study	Utility, with EWRA assistance	▪ Benchmark economic tariff structure	2 months
Assessment and modelling of tariff structure options	Utility, with EWRA assistance	▪ Rate design strategy statement ▪ Tariff structure options ▪ *Proposed tariff structure*	1 month
Review and approval of tariff	EWRA	▪ Final determination of performance targets, funding requirements, tariff revenues, and rate structures	2 months

Proposed Process/Step 4: Implement New Tariffs

Step	Responsi-bility	Outputs	Duration
Adapt billing system to new tariff structure	Utility	Updated billing database and bill format	3 months
Educate the public	Utility	Media campaigns and public meetings on performance targets, revenue requirements, and tariff structure	3 months (co-terminous with billing system adaptation)

Issues in Intergovernmental Coordination/1: Asset Expansion or Better Asset Management?

Capital investment in an inefficient utility yields less social, economic, and financial benefit than a similar investment in an efficient utility

- Is the source of the problem insufficient investment or a management problem?
- If the solution involves investment, what is the least-cost solution?

Issues in Intergovernmental Coordination/2: Capital Project Feasibility and Financing

	Financially Feasible	Not Financially Feasible
Economically feasible	▪ Approve ▪ Consider PSP	▪ Approve ▪ Consider grant/loan
Not economically feasible	▪ Restructure or reject	▪ Reject

Key Issues in Intergovernmental Coordination/3: Capital Project Costing, Scheduling, and Implementation

Capital costs are included in utility five-year funding requirements

- If project implementation is delayed…
  - … utilities will not meet business plan operational performance targets
  - … utilities may generate excess tariff or subsidy revenue

Five-year capital plans must be realistic

Key Issues in Intergovernmental Coordination/4: EWRA/MOF Coordination

Success of the proposed approach to regulation of GOUs requires modification in MOF/utility interaction:

- Utility budgets will be reviewed and approved by EWRA
- Subsidy allowances will be agreed between EWRA and MOF
- Any utility request for additional subsidies must be approved by EWRA
- Agreed MOF allocations to utilities should be disbursed on schedule

In addition, MOF and EWRA should work together to develop and implement a strategy for solving the problem of non-payment by governmental users.

Tariff Rate Design

Cost-of-Service Study: Rationale

- A cost-of-service study generates an efficient and equitable rate structure, in which rate differentials are based on differences in utility costs to serve different patterns of demand
- Cost-of-service pricing reflects fundamental economic characteristics of the water/wastewater industry
  - > high fixed/variable costs
  - > high peaking factors → high ratio of peak to average costs
  - > low ratio of peak to average sales
- Basic COSS principle: Allocate peak costs to peak users

Cost-of-Service Study: Methodology

- Functional classification of O&M and capital costs
  - ↓ production ↓ distribution ↓ G&A
  - ↓ pumping ↓ meters
  - ↓ storage ↓ services
- Categorization of costs
  - ↓ commodity costs
  - ↓ demand costs
  - ↓ customer service costs
- Allocation of costs to customer classes

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Matching Rate Design Structure to Policy Objectives

Objective	Rate Structure
Equitability/efficiency	Cost-based rates
Continuity with current rate structure	Increase all rates by the same percentage
Affordability to the poor	Use a lifeline rate
Simplicity/understandability	Uniform rate
Revenue stability	Fixed-charge element
Conservation (demand management)	Inclining rate structure
Utilization of excess capacity	Declining rate structure

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Rate Structure Options (Beheira Case)

Tariff Revenue Requirement: O&M costs plus depreciation

Structural Option	Tariff (LE/m³)				
	Domestic			Service	Commercial
	0-10 m³	10-30 m³	over 30 m3		
CURRENT RATES	**0.23**	**0.23**	**0.35**	**0.45**	**0.75**
Uniform Rate	0.58	0.58	0.58	0.58	0.58
Across the board increase	0.36	0.36	0.55	0.71	1.18
Cost-based rates	0.55	0.55	0.72	0.54	0.56
Partially cost-based, with *lifeline* rate	0.28	0.54	0.85	0.68	1.13

Issues in Affordability Policy/1: Who Pays the Subsidy?

Option 1: **Government:**

> Central-local transfer for difference between supply cost and sales price

Option 2: **Other Users**

> Build cross-subsidies into tariff structure

Issues in Affordability Policy/2: Who Receives the Subsidy?

Option 1: **Eligibility based on household characteristics**

> requires special registers or survey
> register needs periodic updating

Option 2: **Provide "lifeline" supply at reduced price**

> what is the lifeline level? (10 m^3/mo? 15?)
> how to determine the lifeline rate (% of income? Price of basket of goods of "comparable worth"?)
> needs meters

Maximum Affordable Monthly Water Bills (Beheira)

Average Household Size: 5.27

	Average Household	Poorest 40% of Households	Poor Households
Avg Monthly Income	LE 1787	LE 1215	LE 306
% of Households	100%	40%	28%
Maximum % of Income to Spend on Water:			
1.5%	LE 27	LE 18	LE 5
2.0%	LE 45	LE 30	LE 8
3.0%	LE 54	LE 37	LE 9
5.0%	LE 89	LE 61	LE 15

Average Monthly Water Bills for Domestic Use in Beheira

(partially cost-based rates, with a lifeline rate)

Monthly Consumption	Monthly Bill	% of Avg Income	% of Poor Income
10 m^3	LE 2.80	0.15%	0.9%
20 m^3	LE 8.20	0.45%	2.7%
30 m^3	LE 13.60	0.76%	4.4%

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Special Topics in Egyptian Rates Design

Provincial Utilities

- Lifeline level/rate
- Standpipe use
- Metering and meter reading
- Cross-subsidization potential is limited

> Fewer classes, more blocks

- **New Town Utilities**
- High fixed cost/demand
- Irrigation use
- Billing records

> fixed cost component
> cost-of-service pricing
> Irrigation charge?

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MHUUC Orientation Lecture Notes

Regulation and the Regulatory Agency

Regulation is an instrument of consumer protection …

Regulation can be concerned with the quality of a good or service and/or the price of a good or service.

Quality regulation is extensive in society. Some examples are: testing or sampling of new drugs, testing of cars and tires, driver licensing, requirements for environmental impact assessment of factories.

Price regulation, or economic regulation, is restricted, at least in market economies, to situations where the consumer of a public good or service has no choice of supplier. In the absence of competitors, a supplier has no incentive to control costs.

Water and wastewater services are the quintessential instances of natural monopoly.

… but the service provider also has legitimate interests.

The fact that a business is regulated doesn't mean the government should keep prices artificially low. Any business (including a utility) needs to be able to cover its *reasonable* costs of O&M, replacement, and expansion, or the service must deteriorate. Costs of private provision also include *costs of capital, that is, the cost of attracting finance.*

Whether the provider is private or governmental, the regulator faces the challenge of estimating the "reasonable" cost of service for a given utility.

Good economic regulation is a balancing act …..

Good economic regulation is always a matter of finding a sustainable balance between competing legitimate interests. We've discussed the tension between provider and consumer interests, but other types of tradeoff occur. Eg., between quality and price objectives (e.g., a utility may plan to provide a level of service which is largely unaffordable), or between customer interests (e.g., when a utility's interest in subsidizing residential customers leads it to set tariffs for commercial use at several times the actual cost of commercial service), or between different providers (e.g., a dispute between a BOT operator and the larger governorate utility).

…carried out under stressful conditions.

All regulatory agencies face the following challenges:

- the regulated firm always has more & better information about its quality & cost of service
- regulatory decisions are often subject to political and media attention.

To maintain their legitimacy in the face of these challenges, regulators must base their decisions on all the available information and points of view and must be articulate and meticulous in documenting the reasoning behind their decisions.

Regulation involves the exercise of discretion

The key supports of regulatory legitimacy are the perceived expertise and impartiality of the agency. Expertise is reflected in the quality of the agency's guidelines, models, data collection, analyses, and documentation of decisions. But expertise in itself is not enough, especially when the government wishes to attract private investment to the sector. Investment in w/ww facilities is long-term investment. It is impossible to predict all the regulatory issues which might arise during the life of a 25-year concession. Since a degree of uncertainty is inevitable in any long-term public/private partnership, regulators must have a degree of discretion or flexibility in their decision-making.

The private sector needs to trust the regulatory agency to be committed to balancing public and private interests fairly. The quality of past decisions is an *indicator* of regulatory capability, but not a guarantee that *future* decisions will be wise and balanced. The assurance the private sector wants is that regulatory decisions will be *impartial*, i.e., that even though the regulatory agency is a governmental agency, it has enough independence from governmental manipulation to recognize and respect legitimate private sector rights.

Success Factors

- *Perceived independence.* We've just discussed the importance of this factor. Here I must note that as proud as we are of the draft reform legislation, the agency's affiliation to the Minister starts it off with a handicap in private sector eyes. We can and need to mitigate this handicap in several ways. First, the nongovernmental members of the Board must be carefully chosen to include knowledgeable, experienced persons who represent diverse political views. Secondly, the nongovernmental members should have fixed terms of several years duration, so that they feel free to vote their opinions. Thirdly, the agency's financial basis should be as far as possible independent of the state budget.
- *Multiple sources of information.* I noted earlier that regulated entities always have more information than the regulator. One way to correct this imbalance is for the agency to set criteria for accuracy and reliability of utility data submissions. Another is to cultivate alternative sources of information. A British example is the institution of customer service committees in each company service area to collect and report on service levels, customer complaints, etc.
- *Authority to make & enforce decisions.* No matter how wise EWRA decisions are, they won't influence utility behavior if they can't be implemented or enforced. E. g., the regulator can't force the PEAs to comply with its financial targets if the MOF provides subsidies above what EWRA recommends.

- *Transparency*. Transparency means that the decision-making process is available for public scrutiny. This does not necessarily require that decisions be made in a public forum — though this does happen in many American states — but that at a minimum, the decisions should be made with reference to formal policies or procedures, based on evidence, and thoroughly documented. It also means that there should be a mechanism for appeal of decisions. As yet, our framework lacks a formal appeals mechanism.

- *Consistency*. Consistency means that the same policies, procedures, & criteria are applied to similar situations. It also means that decisions are consistently implemented.

- *Intergovernmental coordination*. The roles and responsibilities of the various agencies in the sector will need to adjust to accommodate the new regulatory agency. These adjustments are necessary in order for the regulatory agency to exercise its authority effectively---and here I remind you that the Minister's first objective for the sector reform is the unification of supervisory authority in the sector. Proper coordination is also needed in order for the various sector agencies to take advantage of the opportunities which the regulatory framework makes available. Issues of intergovernmental coordination will be raised throughout these workshops.

EWRA Functions

The Egyptian water/wastewater regulatory agency has a very broad regulatory mandate, covering both quality and price regulation.

In the interest of customer protection, the regulatory agency will also seek to promote competition in the sector, either through simulation of competition between GOUs through benchmarking or through stimulating actual market competition where possible. This may take the form of "managed competition"---in which the public sector is forced to compete with service contractors or management contractors. Or it may take the form of competition between utilities to supply particular service areas.

Corporatization of GOUs is a complex subject to which a separate workshop will be devoted. Corporatization means transforming a governmental entity into a business, regardless of whether the assets are publicly owned or publicly/privately owned. It means both *enabling* the entity to operate like a business and also *compelling* it to work like a business. In my third lecture, I will indicate ways in which EWRA will compel utilities to be more business-like. I should note here however that our regulatory framework was not able to incorporate all the reform measures necessary to fully *enable* the GOUs to operate commercially.

Note that there are important sector functions which are *not* regulatory agency responsibilities. First, the regulatory agency does not own, manage, or operate utilities, although it monitors them and may demand they take remedial actions. Second, it is not a sector investment or project planning agency, though it may review investment and project plans from the standpoints of economic and financial feasibility.

EWRA Levers

These are the mechanisms by which the EWRA can influence the behavior of service providers. You will notice that these mechanisms are largely *indirect* mechanisms; this is in keeping with my previous point that the regulatory agency regulates the businesses which provide sector services rather than managing the services itself. Yet even though the mechanisms are indirect, they are powerful, provided that: 1) the agency has the authority to enforce its decisions, and 2) the service providers (specifically the government-owned ones) have the autonomy necessary to be treated as accountable for their performance.

Why not regulate by contract?

Some countries in a hurry to obtain private investment in infrastructure or perhaps only interested in a single PSP project have thought to regulate projects through the concession contract itself, without establishing a permanent regulatory agency. The Ministry adopted this approach in the Suez Gulf water project. In principle, you can do this. And it may be more cost effective than establishing a regulatory agency especially if PSP is sought only for one or two projects. The contract can set out most of the regulatory parameters. But this approach has drawbacks. The first is that as we noted earlier, investment projects have such a long life that no contract could be expected to identify all the contingencies which may arise. The second is that without a dedicated regulatory agency, there's no third party to mediate disputes; one of the parties has to act as both customer and regulator. In this situation, the private sector will either insist on contract provisions which offload most risk onto the government, or else it will set a very high risk premium in its rate of return. Further problems will arise if subsequent projects are developed with different regulatory provisions.

REGULATION OF PRIVATE PROVIDERS

Regulation in the strict sense of the term implies that the regulated entity is a corporate entity with the rights and autonomy necessary to achieve its performance targets and other contractual obligations. Regulation in the strict sense therefore is regulation of private providers. Moreover, our project, we are adapting regulatory tools and models to the government-owned utility sector. So it is appropriate to begin our review of issues in the design of regulatory regimes with the regulation of private providers.

Quality-of-Service Regulation

There are 2 principal mechanisms of QOS regulation: the performance standards themselves and the means of their enforcement. Issues which surround standard-setting include the number and type of targets (the more targets, the more costly to monitor), the means of measurement, & the responsibility for operational monitoring. Enforcement issues include the types of penalties or incentives to apply and the performance areas in which application of penalties can/should be graduated (warnings, etc) or immediate. The government should consider whether it wants to have a step-in capacity in case of persistent noncompliance by a provider.

Modes of Economic Regulation

There are two basic models of economic regulation—the rate of-return approach & the price cap approach. In abstract, theoretical terms, they are very different approaches, you could almost call them opposites. In the next few slides, I will lay out the differences & the pros & cons of each approach, and then go on to show that actual regulatory practice usually involves features of both approaches. This will help us to identify the really important parameters in the design of regulatory regimes.

The other two approaches shown on this slide represent variants of the two main approaches. Revenue cap is a variant of price cap which we will return to in our discussion of GOU regulation. Sliding scale regulation is a mixture of rate of return and revenue cap approaches.

Pure ROR Regulation

The two approaches to regulation emerged about 100 years apart in historical time. ROR regulation is the original approach. It emerged in the USA in the late 19th century, as settlers in the expanding American West complained to the gov't about monopolist rail barons who were charging high prices to carry Western produce to Eastern cities. So the legislators saw the problem just as your State Council & BOT Committee are framing the issue in water, as a matter of capping profits.

The price cap approach is a product of the movement in the 1980s toward substituting market forces for command and control approaches as a means to achieve compliance with environmental standards. PC is cut from the same cloth as emissions trading and similar "economic instruments". The idea is to make environmental protection *profitable* for the private sector. Not only does this stimulate environmental industry, it also reduces the cost of regulation.

Under pure rate-of-return regulation, the regulator is concerned only with controlling the provider's profit, understood as the provider's cost of capital, which is the weighted average of the provider's cost of debt and his cost of equity. The return is the value of assets (rate base) times the approved rate of return. In pure ROR regulation, O&M costs are hardly reviewed at all; as soon as some O&M cost factor increases considerably, the utility would simply apply for a tariff increase.

The ROR approach in its pure form has the explicit objective of assuring the utility's financial soundness (indeed, ROR regulation is sometimes referred to as financial regulation rather than as economic regulation.) While this is great for the utility's shareholders, it may not always work to the benefit of customers. Since most O&M cost increases are passed through to customers, and since the total return is proportional to the size of the rate base, pure ROR regulation provides incentives for utilities 1) to prefer capital solutions to efficiency improvements, and 2) to "buy Mercedes" when Fiat would do just as well. These biases entail considerable allowances for inefficiency. Remember the original mind-set behind the ROR regulatory approach: the central concern is to determine some optimal profit level rather than to maximize efficiency, which wasn't an issue on the radar screen back then. Moreover, to some extent, ROR regulation could assure that the investors themselves would exert pressure on the utility management to be efficient, since gross inefficiency under a fixed rate of return would reduce their returns until

rates could be increased to reflect higher operating costs. This situation leads to one of the common features of ROR systems, namely, that rate adjustment applications, which can be initiated at the utility's initiative, can be very frequent.

Pure Price-Cap Regulation

Price-cap regulation in its pure form can be considered the opposite of the ROR approach insofar as it focuses almost entirely on providing incentives for efficiency and makes no effort to restrict profits to a specific level. The price cap regulator says to the utility: "I'm going to set a price maximum for you which I judge to reflect the fair business costs of an efficiently operated utility of your dimensions and I'll allow you automatic annual increases to reflect increases in the RPI. If you can operate 10, 20, 30% more efficiently than this, you can keep whatever surplus earnings you make. That is, until the next price review, when I the regulator will take the opportunity to pass some of the efficiency gains you've achieved back to customers in the form of lower (real) prices for the coming five years. By allowing you to keep the interim surplus earnings, I'm giving you a profit motive to become more efficient because in the end your efficiency will benefit customers in the form of lower prices, or at least prices rising less than the rate of inflation."

For the regulated utility, the key concerns are the frequency of the price reviews (the less frequent, the longer the efficient utility can generate surplus earnings) and the size of the X-factor (that is, the efficiency standard set for the utility in the price review).

The X-factor for each utility is determined by a benchmarking study conducted prior to the periodic price review (I should note here that the price reviews, which happen in the UK every five years, are held for all utilities at the same time). The benchmarking studies are very data intensive and require great statistical capability, as they try to establish a pure efficiency cost standard which is purified of all the variables in utility performance which are beyond management control, such as terrain, size and density of service area, etc. The less efficient the utility, the greater the X-factor, i.e., the more its expected to contain its price increases over the next five years, and catch up to the efficiency level of comparable utilities. This is called "comparative competition". The benchmarks and the price limits are being used to simulate customer choice in a competitive market, as if the more efficient utilities were exerting downward pricing pressure on the less efficient ones.

Advantages and shortcomings

Convergence of Modes of Regulation

I've repeated the terms "pure" & "pure form" so many times that you will all have inferred that we almost never find pure ROR or pure price cap regulation in the real world. ROR regulators are increasingly aware that their system entails unintended incentives toward over-investment, so ROR regulator in practice may demand a great deal of justification for new investment—the need for it, how much of it, how expensive---and may argue, as a price-cap regulator would—that more efficient utilization of existing assets or a focus on demand-side management may be more cost-effective than capacity expansion.

On the other hand, price cap regulators know that the utility must attract capital in order to replace & grow assets, so they take a cost-of-capital calculation into consideration. And although in theory price cap regulation doesn't control profit levels, British experience shows the regulator will take measures if profits exceed reasonable levels. Finally, the pure price-cap price adjustment formula (RPI-X) was always an over-simplification, since regulators allow the companies to virtually pass through several major categories of expenditure, such as investments associated with meeting higher standards for wastewater treatment and for developing new water sources and for meeting higher standards of quality of customer service.

Sliding Scale Regulation

The convergence of the two pure modes is reflected in the growing popularity of a hybrid mode of regulation called sliding scale regulation. Sliding scale regulation provides the utility a base rate of return or base revenue allowance, but also allows the utility to keep a percentage of the revenues it obtains in excess of the target level in order to provide an incentive for efficiency. The distinctive feature here is the notion of the sliding scale, which is that the more the utility exceeds the target revenue level, the smaller the percentage of the outperformance gains it retains as profit.

Key Issues Common to the Design of Economic Regulatory Regimes

In other words, a consensus is emerging on a common set of economic regulatory objectives, namely, to allow operators to recover "efficiency costs" of service and to enable utilities to attract sufficient capital to finance legitimate capital improvements. A regulatory review always boils down to some or all of the following three questions:

- what is the efficient cost level for a given utility?
- what & how much capital investment is desirable?
- What return on investment is adequate?

The key issues in design of regulatory regimes are increasingly detail/issues. One is the perennial question of which costs to index. Cost indexation always represents a cost pass through to customers. In general, the private sector likes costs to be indexed, not only for the obvious reason that is buffers the utility's income from increases in input costs, but also because the price increases are *regular* (yearly) and *automatic* (i.e., minimize the scope of regulatory discretion and investigation---i.e., the utility gets the benefits of a rate increase without the potential risks of a more extensive price review).

The second detail issue is the allowable conditions for price adjustment. Does the regime allow for utilities to request a review (as in the US)? If so, does the regime define in advance what are the conditions or circumstances under a utility can request a rate increase? On the other hand, does the regime *require* periodic price reviews, as in the UK system? If so, how frequently? This is a key issue in incentive-type regulatory regimes like price-cap, where the longer the interval between price reviews, the longer the private sector can retain gains from efficiency before it has to share them with customers in the form of revised price limits.

REGULATION OF GOVERNMENT-OWNED UTILITIES

Regulation emerged historically as a response to the perceived need for government to play a "referee" role in balancing the legitimate interests of customers and *private* providers of public goods. Governments felt no pressing need to regulate *public* providers, since governments believed they could protect the public interest through ordinary administrative and political controls over utility performance and investment decisions. To this date, the vast majority of government-owned utilities (GOUs) in the US do not go to the state regulation for rate increases, they go to their city councils.

This mechanism can achieve the regulatory objectives of ensuring utility financial soundness *and* efficiency, but it presupposes a strong tradition of municipal government. More specifically, it presupposes both elected local executive government and municipal financial autonomy. Elected local government assures that local utility customers are represented in local government decisions about level of service, efficiency, etc., and financial decentralization means that the local government can commit the community to tariff increases. Where municipal institutions are not strong, as in many developing countries, a more formal & disciplined approach to regulation of GOUs is desirable.

Challenges in Design of Regulatory Regime for GOUs

There are large challenges in adapting regulatory principles and methods to the GOU sector. Most of these challenges boil down to the basic problem that the GOUs are not fully accountable for their performance because they are neither managerially nor financially autonomous enterprises. Many performance determinants which would be assumed to be under management control in the typical "regulatory contract" are not under the control of utility managers in developing countries. Some examples:

- A local utility may claim with some justification that a major O&M cost like labor is not under its control. Should the regulation just take these non-economic costs as given & incorporate them into tariffs?
- On account of their financial weakness, most utilities fund new works through central government grants or loans, usually implemented by a central agency like NOPWASD or NUCA. This leads inevitably to accountability problems: the utility will claim a facility is costly to operate & maintain because it was poorly designed or constructed, while the central agency will claim it is because the utility does not O&M the facility properly.
- As part of government, the utility is often under pressure not to push too hard to collect arrears from one or another category of customer.

The cumulative result of these and other constraints have lead to an ever-widening gap between utility revenues and utility revenue requirements. Low tariffs have led to deferral of maintenance expenses, leading to early facility deterioration leading to poor service, leading to customer dissatisfaction and resistance to tariff increases at the same time as the need for revenue to invest in rehabilitation & expansion grows and grows more sharply.

Finally, there have been shortcomings in the design of the tariff structures themselves. I will discuss tariff structures separately in the following lecture.

Simulating Market Forces in the GOU Sector

The approach we propose to regulating GOUs adapts principles of economic regulation which we've reviewed earlier to the constraints we've just noted.

From the price cap or revenue cap approaches, we borrow several notions. First, the notion of a multi-year rate term; we are suggesting five years. The benefit of a multi-year rate term is that it will provide more or less predictable levels of funding which will enable the utility to plan, finance, & implement management and capital programs of sufficient magnitude to result in tangible improvements in the quality & efficiency of service. In developing their five year funding requirements, the utilities will be required to commit themselves to defined, measurable quality & efficiency targets. (These resemble the X factor.) These elements of the proposed approach are meant to institute a quasi-contractual relationship between the three principal players in the utility financial environment—the utility itself, the customers (who will pay the new tariffs), and the MOF (who will pay a fixed subsidy based on the difference between the utility's approved funding requirements and the level of tariff revenue the EWRA judges to be affordable by the utility's customers.) The hoped-for benefits are that on the one hand the utility will have a more or less predictable stream of funding for legitimate costs (by virtue of the guaranteed subsidy level), but on the other hand, the cap on the subsidy means that the utility must meet its performance targets in order for the tariff revenue to be sufficient to complete the funding requirements. In other words, the utilities will operate under a hard budget constraint.

Now the way I've just described the mechanism it sounds like the tariff revenue is merely a supplement to the subsidy revenue, but this is not the intention or even the expectation. It's the subsidy which is supposed to close the gap between the regulated funding level and the expected tariff revenue. In cases where the size of the tariff increase needed to achieve full cost recovery is not massive (such as Alexandria water) or where most customers are able to pay the full cost of service (like the new urban communities), no subsidy at all should be needed. At the other end of the spectrum will be the majority of the governorate utilities. In these cases, I would advise the EWRA to insist on full recovery of O&M costs at least. The gap between current tariffs & O&M cost recovery tariffs in these cases will be mainly a function of the current level of inefficiency of the utility. It is appropriate that the more inefficient utilities have both more demanding performance targets *and* higher tariffs. The customers will complain—yes. We expect this. They *should* complain, so that the local leadership has to pay attention and activate the utility boards of directors. It's part of the incentive structure we're trying to establish.

We are also recommending a performance incentive feature which we've adapted from the sliding-scale model. We propose that the incentive allowances which are currently routinely allocated to the utilities in their Bab I budgets be turned into a kind of performance-based award fee linked to the utility performance targets. In other words, the amount of the incentive allocation would be set as a percentage of additional revenues the utility has been able to collect by virtue of having done better

than their target performance levels. For instance, a utility which reduces UFW to 20% when its business plan target was 25% will find that it has surplus revenue. As with the subsidy cap, this feature would also be regulated to favor more efficient utilities, since the more efficient utilities will by definition have efficiency targets which are easier to achieve & surpass than those of less efficient utilities.

We will discuss the final "economic element" of the proposed system—namely, cost-of-service tariff structures---in the next lecture.

Main Steps

Adapting best practice for PSP regulation to the circumstances of GOUs in Egypt, our system includes the following features:

- a business plan or performance contract which sets out annual performance targets for a utility in relation to key outputs such as water produced, water sold, UFW, collection efficiency, & responsiveness to customer complaints
- a "cost cap", or expected level of funding
- a revenue floor, which sets expectations for a minimum level of tariff revenue to be generated by the utility as a result of improved performance
- a subsidy cap, where necessary to assure that the tariffs are generally affordable.

The funding requirements are derived from the business plan. In accounting terms, the full funding requirements cover:

- O&M costs. These will be based on historical trends but the trends will be modified to accommodate the O&M cost implications of new works to be implemented over the rate term, the rate of inflation of key O&M input costs, & most important, the cost & revenue implications of performance improvements
- Depreciation
- Debt service for existing & new works.

When we compare these projected costs with the projected revenues which would result from current tariffs under conditions of increased utility productivity, we can develop our initial assessment of the size of the tariff increase needed to achieve the various levels of cost recovery, from O&M cost recovery to full cost recovery. The estimated monthly bills can then be compared to income levels to assess their affordability (and we'll examine a specific application of this approach later). The EWRA in consultation with MOF will make a judgment about the level of costs to be recovered through tariff revenue and the corresponding subsidy requirement. Once the tariff revenue requirements is established, the EWRA will work with the utility to develop an appropriate tariff structure.

Beheira Business Plan: Assumptions and Targets

I'd like now to illustrate some of these concepts with a concrete example from our work with the Beheira water company. This first slide summarizes the main features of their 5-year business plan. I note that the expected capital investment is considerably less than called for in their

official 5-year plan, because there were some doubts as to whether all the planned projects would actually be completed according to schedule.

The key efficiency improvement targets are plant production cost control, UFW reduction, and improvements in collection efficiency. The complete business plan describes the various programs they will implement to achieve these targets. As you can see from the bottom line, the impacts of the improved efficiency and productivity on the funding requirement are substantial.

Funding Requirements: Beheira Water Supply

This slide shows the composition of the funding requirement. At current tariff levels, year 2005 tariff revenue would be only LE58 million, assuming that utility production and productivity targets are achieved, suggesting that tariffs would need to be increased by a factor of 2.4 to provide full cost recovery.

Average Funding Requirement

This table shows the average tariffs needed for successive levels of Beheira water supply cost recovery.

In the case study, we made an arbitrary assumption that an increase of the average tariff from the current LE0.35 to LE0.91 would be too extreme and possibly unaffordable, so we assumed that Beheira would aim to recover only O & M and rehabilitation costs through tariffs, leaving the debt service to be covered by subsidy. Since the study was completed, we have discovered socioeconomic data which suggest that a higher level of cost recovery might be affordable, and we'll look at this data in the next presentation.

Proposed Process

The following four slides provide a detailed outline of the proposed rate application process, showing the roles of the utility, the EWRA, and various other agencies such as NOPWASD/NUCA and the MOF. The rate application process takes 14 months from the start of utility business planning to EWRA approval, with another 3 months for utility preparation for implementation of the new tariffs. You will note that utilities which depend on NOPWASD or NUCA for capital finance will need to coordinate with these agencies to assume that their capital plans and budgets are updated, a subject to which I'll return in a few minutes.

Issues in Intergovernmental Coordination

- Assets. The systems need a proper eng'g assessment before new investment. Op efficiency measures should be considered first. If a capital solution is appropriate, what is the least-cost engineering solution? Central-local capital allocation should be part of the incentive structure: they conditional upon improved utility performance.
- This should be your financing matrix. Your difficulty now: 1) tariffs too low for any project to pass financial feasibility test. 2) Your LOS targets are so high that every project seems economically feasible.

- Planned new cap investment adds to the funding requirement. It's also an assumption in some of the output, cost, and sales projections in the BP & therefore RRs. So if the project doesn't materialize on time, something goes wrong financially too: the revenue will be either too much or too little.

Tariff Rate Design

95% of our discussion so far has dealt with how the regulator determines and/or adjusts the overall or average costs or revenue requirements of a utility. In this final presentation, we turn to the analytically distinct question of how the tariff revenue burden, once it has been determined, should be apportioned among the various customers of a utility.

In some views, tariff rate design and rate structure are not regulatory issues at all. The logic of this view is that once the regulator has ruled on the utility's performance and cost levels, the rate structure is a matter for local determination.

Our view is somewhere in the middle.

On the one hand, I agree that the local community is probably better positioned to assess the types of tariff structure that appropriate to local conditions. On the other hand, there are technical aspects to rate design which make it important to bring some expertise to rate design. Rate design isn't just a matter of increasing current rates by the same percentage. Nor is it a matter of minimizing residential rates by raising nonresidential rates. A rate, like any price, is a signal, it conveys information about supply and demand. If the prices changed are distorted, they communicate false information about supply to customers. False information induces non-economic behavior by customers, which in turn communicates misleading information about demand to utility planners and managers. This may lead to poor investment decisions.

There is a method for determining an economic price structure for a utility; it's called a cost-of-service study. My view is that the EWRA should require and assist all urban utilities at least (the 6 urban governorates plus the new urban communities) to prepare cost-of-service studies and generate an economic pricing structure as a benchmark or reference point for their tariff rate structures. I say "as a benchmark" because the locality may have other, legitimate rate design objectives which should be taken into consideration. In the presentation, I'll try to show how these various objectives can be balanced in actual rate design.

Cost-of-Service Study: Rationale

A cost-of-service study develops an economic pricing structure for a given utility. By this I mean it develops a set of prices which reflects the utility's costs of serving each of the different types of customer in the service area. The notion that different types of customers have different costs of service reflects fundamental economic characteristics of the water industry. First, as we all know, the water industry has a high fixed-to-variable cost ratio. In the second place, a significant percentage of the fixed costs, the capital costs, reflect the need for capacity to meet peak use demand, which as we also know is very pronounced in water use, both in terms of season and time-of-day. The pricing problem arises from the third feature, namely that while peak capacity costs constitute a large percentage of total costs, peak sales constitute a relatively small

percentage of total sales. In other words, each unit of peak usage is very expensive for the utility. The objective of the cost-of-service study is to identify the costs of peak vs. average use and to allocate the peak costs to the peak users.

The examples I'm using relate to water supply. The logic of wastewater cost-of-service studies is similar, but in wastewater, there is an additional cost-causative factor to be allocated to customers, namely the strength of their wastewater discharges, which add to the utility's treatment and sludge management costs.

Cost-of-Service Study: Methodology

There are three steps to a COSS. The first is to identify functional costs. We do this because each type of function will have its own composition of average and peak use-related costs. The analysis has to be done for both O & M & capital costs. These analysis require fairly detailed cost account data, and one of the challenges we're facing is that the unified accounting system doesn't provide guidance on how to functionally classify water and wastewater utility costs.

The second step is to determine what percentage of each functional cost item reflects costs of serving average use and what percentage reflects peak use requirements. These analyses often require engineering judgment. The result is an overall determination of the balance of average and peak costs in the total cost-of-service.

The final step is to allocate the average and peak costs to each customer class. Average costs are allocated according to each class' proportion of annual use. Peak costs are allocated on the basis of each class's percentage of peak day use. Dividing each class's cost to serve by its expected consumption gives us the cost-based tariff rate for each class. A challenge we face here is the utilities can usually tell us the peak month production, but not the peak day production, and this leads to underestimation of the peaking factor in general. A further challenge is that the billing data is not aggregated more frequently than once a month, which also understates class peaking factors. In fact, in Sixth of October we are finding that the utility doesn't generate any consumption reports at all.

Matching Rate Structure to Policy Objectives

Cost-based rates are equitable and efficient. They are equitable because each type of customer is charged according to his/her actual cost to serve. They are efficient because they inform the consumer of the costs of his pattern of usage and so enable him to modify his behavior appropriately. This in turn informs the utility of the level of service which its customers are willing to pay for.

But as I said earlier, either central or local government may have legitimate policy objectives other than or additional to equitability and efficiency which they wish to achieve. These other objectives can be met by other kinds of rate structure which can be combined with the cost-based structure.

For example, if the service area contain a substantial low-income population, cost based rates can be modified to include a lifeline rate, which would provide a certain minimum quality of consumption to all or selected residential asers at a reduced rate.

Another special situation would be a service area with a strongly seasonal pattern of use, like Alexandria. Here the utility may face a recurring financial problem that in the low season, tariff revenue may not be sufficient to cover costs. Here it may make sense to split the tariff into a fixed charge, based on fixed cost components, and a variable charge based on actual usage. This would assure the utility of an adequate revenue stream during the low season.

Declining and inclining rate structures set different prices for different volumes of consumption. The current residential tariff rates in the governorates have a moderately inclining structure where usage over $30m^3$/mo is billed at a higher rate than usage below $30m^3$. Inclining rate structures generally encourage conservation. Declining rate structures on the other hand give volume discounts. This may be appropriate where the utility has excess capacity, and it's an option we're exploring in Sixth of October.

Rate Structure Options

This table illustrates the types of rates generated by different rate structure alternatives as applied to the Beheira tariff revenue target of covering O & M and depreciation costs.

The uniform rate was included for reference purposes only. It is simply the average unit tariff requirement for the cost recovery target. Uniform rates do have the advantages of being easy to understand and administer. No classes, no blocks.

Across-the-board increases apply the same average rate income factor to each of the current classes and their rates. It therefore preserves all the pricing principles and differentials of the original tariff structure. The next row shows the cost-based rates for Beheira. There are a couple of interesting features. First, the cost-of-service differentials between the classes are virtually negligible. We are not sure whether this reflects simply the predominance of residential use in Beheira or shortcomings in the data. If it does reflect reality, then we could conclude that a uniform rate would represent class cos differentials more accurately than the current tariff structure does. That is, except for the high volume domestic use, which is where most of the peak costs are incurred.

The final row shows the alternative we recommended. This alternative modifies the cost-based rate structure to allow for lifeline consumption of 10m3/mo by all residential users at a reduced rate of LE0.28/m^3. You can see that in order to provide the cross-subsidies needed to keep the total revenue adequate, it was necessary to distort the cost-based structure severely. This is because in Beheira, as in most provincial governorates, residential use constitutes the vast majority of use.

Affordability

I will conclude my presentation with some policy issues and empirical data related to the question of affordability. I will focus on the relationship between affordability and subsidy policy, but we should keep in mind that the affordability issue isn't confined to setting tariffs and subsidies. The first and most important opportunity for decision makers to assure affordability is in sector and project planning, because the level of service you plan to provide has a major

impact on the future cost of service. If a level of service is more than the beneficiaries are able and willing to pay for, the government is committing itself to high tariffs and/or high subsidies. This brings me to my second point, which is that while government has every right to allocate subsidies to achieve social policy objectives, subsidies should never be used to compensate for and perpetuate inefficient, uncompetitive utilities. Subsidies have one primary purpose, that is to guarantee that a well-defined low-income or vulnerable population has access to the minimum level of consumption needed to sustain basic human needs for drinking, washing, and cleaning.

(A second possible application of subsidies might be to cover well-defined and carefully calculated non-economic costs incurred by a utility in meeting explicit non-commercial policy objectives like guaranteed employment, but it's easy to see how that road leads to transparency problems, non-competitiveness, and ultimately to financial difficulties.)
As far as social subsidies—ie, subsidies aimed to support minimum consumption—are concerned, there are two basic policy questions; who pays the subsidy and who receives it. As for the question of who pays it, there are basically two options: the government (ie, taxpayers) or other customers.

The Beheira study illustrates both approaches. First, a macro-subsidy was applied to the debt service requirement. This is a straight government-to-utility subsidy, applied when the average tariff for full cost recovery is considered beyond the ability of average customers to pay. Secondly, we had a customer-to-customer cross-subsidy in the rate design to cover a below-cost lifeline rate. In retrospect, an alternative approach might have been used. Instead of two levels of subsidy, we could have calculated the rates for the total funding requirement and then applied the macro-subsidy only to the difference between the lifeline rate revenue and the actual cost of the lifeline service.

This would make for a better targeted subsidy. But it would also result in higher rates for all the other classes and blocks. Still, it illustrates the government's option to directly subsidize lifeline service rather than compelling the utility to distort the price structure.

The government would be well-advised to consider adopting this approach for the provincial governorates. Cros-subsidies are difficult to engineer in the provincial governorates because non-residential water use constitutes a small percentage of the total water consumption in these governorates, in Beheira 81% of billed consumption is by residential and standpipe users. There are limits to how much non-residential rates can be increased.

The second policy issue is who gets the subsidy, or more precisely, how is eligibility for subsidized service defined? In our case study examples, we've been using a volumetric approach. In volumetric approaches, you don't bother with the characteristics of the user: whether he or she is rich or poor, whether the connection supports one person or ten, etc. Eligibility for the lifeline rate is based on the volume of consumption.

There are many detail issues that have to be decided in developing a volumetric approach. The first is, what is the lifeline consumption level? $5m^3$/mo? 10?15? The second is, how do you set the price for the lifeline level of consumption? The third is less an issue than a problem: how do you apply the volumetric approach to unmetered users? The alternative to the volumetric

approach is to base eligibility on the socioeconomic characteristics of individual users, such as actual income. This is by far the more effective way of limiting the subsidy to the needy. But it has its own challenges. First, what criteria will you use to define the needy. Who is poor? Second, how do you develop the roster of the eligible? This is not a problem if the locality has some registry of poor people as defined by some appropriate criterion. But if there is no such registry, then a very significant survey effort will be needed to develop one. Moreover, eligibility has to be periodically reviewed.

Maximum Affordable Monthly Bills

In the sector framework, the determination of the lifetime consumption level is the responsibility of the IPC. In our case study, we used $10m^3$/mo. This is equivalent to 65 LCD for a family of five. 65LCD is the target demand for piped water use in rural homes with a single tap in the several master plans commissioned by NOPWASD during the 1980s.

To estimate how much household are able to pay for lifeline consumption, the approach that has received the most exposure in the literature is to set a percentage of low-income household income as a limit on the monthly bill. A range of 3-5% is usually offered. These percentages are based on two types of data; first, the amount of low-income family income left over after expenditure on essential items like food, clothing, health care, and education, and secondly, observations of how much per month is spent for water by people who have no water source other than vendors.

Until recently, we had no source of data on incomes by governorate or by social class. We have now discovered the Egypt Human Development Report, published annually by the Institute of National Planning with technical assistance from UNDP. Among other data, the report provides a table with annual per capita income for each governorate, as well as an estimate of the percentage whose incomes fall below a defined poverty line of LE968/yr for urban areas and LE696 for rural areas. These are per person figures. The governorate income figures are based on the household budget survey conducted by CAPMAS in 1995/96, and are adjusted annually to compared with changes in MOP data on national per capita income.

These data are surprising. They suggest to me that some 70%of households in Beheira can afford up to $20m^3$/mo at the full cost recovery tariff of LE0.91 without exceeding 1.5% of their monthly incomes. There is no social need for mass subsidization of water rates. On the other hand, the situation of the poorest 30% of households, shown in the last column, indicates there is a need for some type of financial support or cross-subsidy. At full cost recovery rates, the poor families would have to spend 1.5% of their income for only $5m^3$/mo, which is too little consumption. To allow them a lifeline level of $10m^3$/mo, the rate should not exceed LE0.50/m^3. This is still higher than the lifeline rate of LE0.28 which we proposed in our initial study.

Special Topics in Egyptian Rate Design

Many of the rate design issues we've discussed are common to all Egyptian utilities. But each type of utility poses some special challenges. For instance, the provincial utilities face special challenges of designing rates for standpipe use, as well as the issue of lifeline service and cross-subsidies we've discussed. The problem of madequate metering and meter reading is more a

management problem than a regulatory problem, but it affects the quality of rate studies. Good, detailed, and regular consumption data are essential for rate design. We need to know not only how many consumers are in each class and how much each class consumes, but also what is the consumption frequency distribution, in the form of a table which shows for each class how many customers were billed and what is the total and cumulative consumption for a range of consumption blocks, like 0-10m3/mo, 11-20, 21-30, and so on. (a sample of a bill tabulation is included in your handout.) This kind of data is needed for all types of utilities, not just the provincial ones. Any decent computerized billing program will have the capacity to generate these kinds of tables, as well as other kinds of commercial data which are essential for modern utility management and which can provide information useful for many utility planning and management tasks, not just commercial ones.

If Sixth of October is representative, the new urban communities desperately need computerized billing systems. At the present time, Sixth of October has absolutely no reliable data on numbers of customers, volumes of consumption, or billings for service.

High fixed costs in Sixth of October pose a cost recovery challenge which may be common in new urban communities. The problem of high fixed cost in Sixth of October has 2 sources: 1) capacity exceeds demand by a high margin (excess capacity), 2) from the start, the treatment facilities were built to a high level of service—high consumption targets (280 LCD) and low density the towns are spread out, so there are high T&D costs. At the same time, the occupancy rates are so low that it's not cost-effective to T&D (esp. D) new areas. So either existing customers have to pay all the fixed (capacity) costs or NUCA should pay it. Another cost recovery challenge in Sixth of October is the large municipal water use for environmental and aesthetic benefit; currently charged to govt acct, but not collected. Who should bear these costs—why not property owners?

The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-funded Project

TARIFF ANALYSIS MANUAL FOR GOVERNMENT-OWNED WATER AND WASTEWATER UTILITIES IN EGYPT

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ACRONYMS

BOT	Build-operate-transfer
CAPMAS	Central Agency for Population Mobilization and Statistics
EHDR	Egypt Human Development Report
EWRA	Egyptian Water and Wastewater Sector Regulatory Agency
GIS	Geographic information system
GOE	Government of Egypt
I/I	Infiltration/inflow
MHUUC	Ministry of Housing, Utilities, and New Urban Communities
MOF	Ministry of Finance
NOPWASD	National Organization for Potable Water and Sanitary Drainage
NUCA	New Urban Communities Authority
O&M	Operations and maintenance
RR	Revenue requirements
R&R	Renewal and replacement
SWOT	Strengths, weaknesses, opportunities, and threats
UAS	Unified accounting system
UFW	Unaccounted-for water
WTP	Water treatment plant
WWTP	Wastewater treatment plant

Introduction

A. Sector Reform and the Regulatory Agency

A1. Foundations of Water/Wastewater Sector Regulation

Pursuant to the cabinet's approval on 17 June 1998 of the Ministry of Housing, Utilities, and New Urban Communities' (MHUUC) request to develop a framework for comprehensive regulation in the municipal water/wastewater sector to improve the technical, economic, and financial performance of utilities, a draft law on Water/Wastewater Concessions and Regulation has been submitted to the People's Assembly, to be followed by a Presidential Decree Organizing an Agency for Water/Wastewater Sector Regulation and Customer Protection.

The establishment of the regulatory agency marks the start of the conversion of the sector from an administrative framework, in which utilities are financially dependent on the state, to a regulatory framework, in which utilities are accountable to customers, owners, and lenders.

A2. Purposes of the Regulatory Agency

The purposes of the Egyptian Water and Wastewater Sector Regulatory Agency (EWRA) are to:

- Enable and compel utilities to achieve higher levels of performance
- Enable and compel utilities to achieve higher levels of cost recovery
- Guide the sector toward financial viability

A3. Responsibilities of the Agency

The responsibilities of the agency are set out in Article 2 of the draft Presidential Decree Organizing the Water/Wastewater Sector Regulatory Agency, as follows:

The agency is responsible for the regulation of the water/wastewater sector and the enhancement of the technical, economic, and financial performance of all utilities. To this end, it has the following regulatory and control responsibilities:

1. Develop criteria for utility technical, economic, and financial performance, determine the procedures and periodicities of reports submitted by entities working in the sector, and control and audit procedures by the agency.

2. Provide technical assistance to the utilities in preparation of studies on the basis of which target performance levels are determined.

3. Set principles and controls for preparing cost studies and designing tariffs and procedures for submission and evaluation of tariff adjustment applications according to the policies developed by the Interministerial

Policy Coordination Committee, and send the same to the economic authorities and companies for preparation of tariff proposals.

4. Examine, review, and approve tariff adjustment applications submitted by water/wastewater utilities and determine the economic cost of service in each utility.

5. Review and approve 5-year plans prepared by each utility, which will specify the target percentage of cost recovery. These plans should aim for the highest degree of cost recovery compatible with the economic conditions of each utility.

6. Review and approve the wording of standard contracts and agreements that structure the reciprocal relationships between service providers and customers.

7. Monitor compliance of utilities with target technical, economic, and financial performance criteria and with the application of their respective tariff schedules as approved by the agency.

8. Review the financial and economic feasibility of new projects to evaluate expected impacts on the cost and price of water and wastewater service delivery.

9. Issue required operating licenses for water and wastewater facilities.

10. Determine procedural and executive steps necessary for initiating the transformation of public authorities and companies working in the sector into private joint-stock companies.

A4. Structure of the Agency

The regulatory agency is organized as a public authority reporting to MHUUC. Its board of directors includes an executive head (appointed by the prime minister); six representatives of government from the ministries of HUUC, Finance, and Local Administration; four experts; and two customer representatives. The agency is expected to have divisions for operational and financial analysis, standards setting and enforcement, tariff analysis, and customer service.

A5. Powers of the Agency

The regulatory agency does not manage the utilities. It regulates them through incentives and penalties to be set out in its executive regulations. The regulatory agency's points of leverage over the utilities lay in its powers to:

- Require periodic tariff reviews
- Require regular performance reports

- Review standard customer service agreements
- Review planned major projects
- Exact penalties for violation of performance standards
- Support transformation of authorities into joint-stock companies

B. The Regulatory Agency and the Tariff Review

The rollout of agency operations will begin with tariff reviews. All government-owned water and wastewater utilities will be required to submit tariff analyses, consisting of an analysis of their 5-year revenue requirements and a revised tariff rate structure.

The regulatory agency expects to complete a first cycle of the tariff reviews for all public utilities in series over a 5-year period. The agency will provide 1 year's notification to the utilities in an annual group; thus it is estimated that the first cycle will be from FY 2003/04 to FY 2007/08.

C. Purpose and Structure of the Tariff Analysis Manual

This manual explains the requirements, methods, and procedures for first-cycle tariff analysis by government-owned utilities. It presents a methodology for setting performance targets and determining revenue requirements for water and wastewater utilities. It also provides guidance on the design of tariff rates that distribute the revenue requirement among users.

The methodology can be applied to all government-owned water and wastewater utilities. Certain data elements—particularly the customer classification—may need to be modified to suit the circumstances of individual utilities. Regulatory agency personnel will be available to assist utilities to customize the tariff analysis models to their local circumstances.

The tariff analysis regime will evolve with the sector. The first tariff review cycle is designed to induct utilities into the regulatory framework. To this end, the tariff review process will impose certain 5-year targets. First-cycle priority result areas are maintenance, efficiency, and accountability. The utilities are required to develop 5-year plans and budgets to achieve these goals. The first-cycle tariff review process requires the utility to prepare a financial model and a business plan for the rate term.

Section 2 of the manual describes the tariff review process. Section 3 describes the regulatory agency's approach to economic regulation of government-owned utilities and discusses the key concepts of the approach. Section 4 sets out the performance targets for the 5-year utility business plan. Section 5 provides guidelines on developing the business plan. Section 6 describes the structure and operations of the rate application Excel model. Section 7 contains instructions on completion of the revenue requirements model. Section 8 provides guidelines on rates design and modeling.

SECTION II

The Rates Adjustment Process

The Rates Adjustment Process

The tariff review process has five stages:

1. Preparatory activities
2. Draft revenue requirements analysis
3. Revenue requirements determination
4. Rates design
5. Implementation of new rates

The process is expected to take 1 year. A process schematic is provided in Exhibit II-1, with a detailed timeline in Exhibit II-2. Exhibit II-3 depicts the substance of the utility's three principal submissions to the regulatory agency during the process. Exhibit II-1 includes references to sections of the Tariff Analysis Manual which should be consulted during that stage.

A. Preparatory Activities

The Egyptian Water and Wastewater Sector Regulatory Agency (EWRA) will select a number of utilities each year for tariff review and notify them to begin to prepare their rate applications. The notice will include a date and venue for orientation training and a list of utility officers advised to attend the training, and will include a copy of the Tariff Analysis Manual for review by these officers prior to the orientation.

Utilities should begin immediately to generate and store bill tabulations (see Section VIII, "Consumption Blocks"). Though the bill tabulations support the rate design process (the fourth stage of the rate application process), the early start will assure that the utility has a good collection of consumption data by class and block by the time the rate design stage arrives.

B. Draft Revenue Requirements Analysis

The utility inputs the historical operational and financial data requirements to the revenue requirements model (discussed in Section VII, with a template provided in Annex D and an example of work-in-progress in Annex E). The utility meets with EWRA officers to review the historical data, and EWRA staff assist the utility to customize the model as necessary to reflect the existing customer classification and possibly other data elements.

The utility then begins to develop its 5-year business plan, which sets out the utility's forecasting assumptions for the rate term and explains how the utility will achieve its performance targets. These assumptions are then entered into the revenue requirements model to generate the draft revenue requirements for the rate term. The draft business plan and revenue requirements analysis are submitted to EWRA before the end of the third month of the process.

Included with this submission are the three most recent historical years' audited financial statements, including:

- Income statement (current operations account)
- Balance sheet
- Detailed breakdown of operations and maintenance (O&M) costs by unified accounting system line item
- O&M cost account
- Fixed assets account

C. Revenue Requirements Determination

EWRA reviews the utility's draft revenue requirements analysis and business plan for data adequacy, consistency, and practicality. EWRA may require additional consultations with the utility for the sake of clarifying data and assumptions. EWRA's comments from the initial review are sent to the utility chairman, with a copy to the governor.

Three months from the receipt of the EWRA's business plan review, the utility completes the revenue requirement projection. The completed revenue requirements model is submitted to EWRA, with:

- Revised business plan
- Affordability assessment

The EWRA reviews thus material with the utility and determines the utility's cost recovery target. The governor and the director of the budgeting sector of the Ministry of Finance are provided with the Summary of Operational and Financial Targets.

D. Rates Design

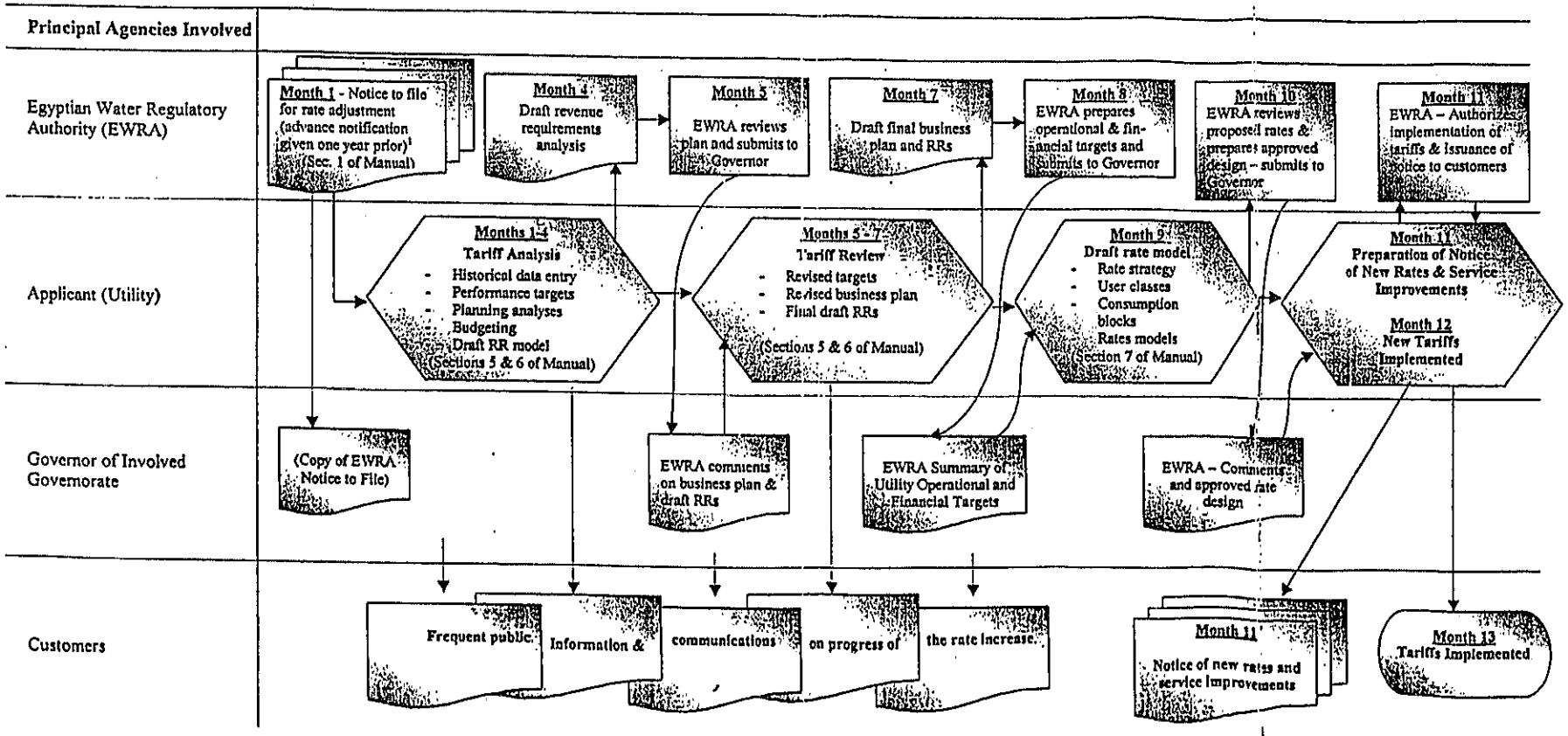
The utility has 2 months to set down its approach to pricing the services and a draft rate structure. The regulator can provide technical assistance in rates modeling. If the utility is proposing block rates, up to 1 year's worth of monthly or bimonthly bill tabulations should be attached to the draft rates structure.

The regulatory agency reviews the rates model from quantitative and equitability perspectives, and sends its comments and recommendations to the governor.

E. Implementation of the New Rates

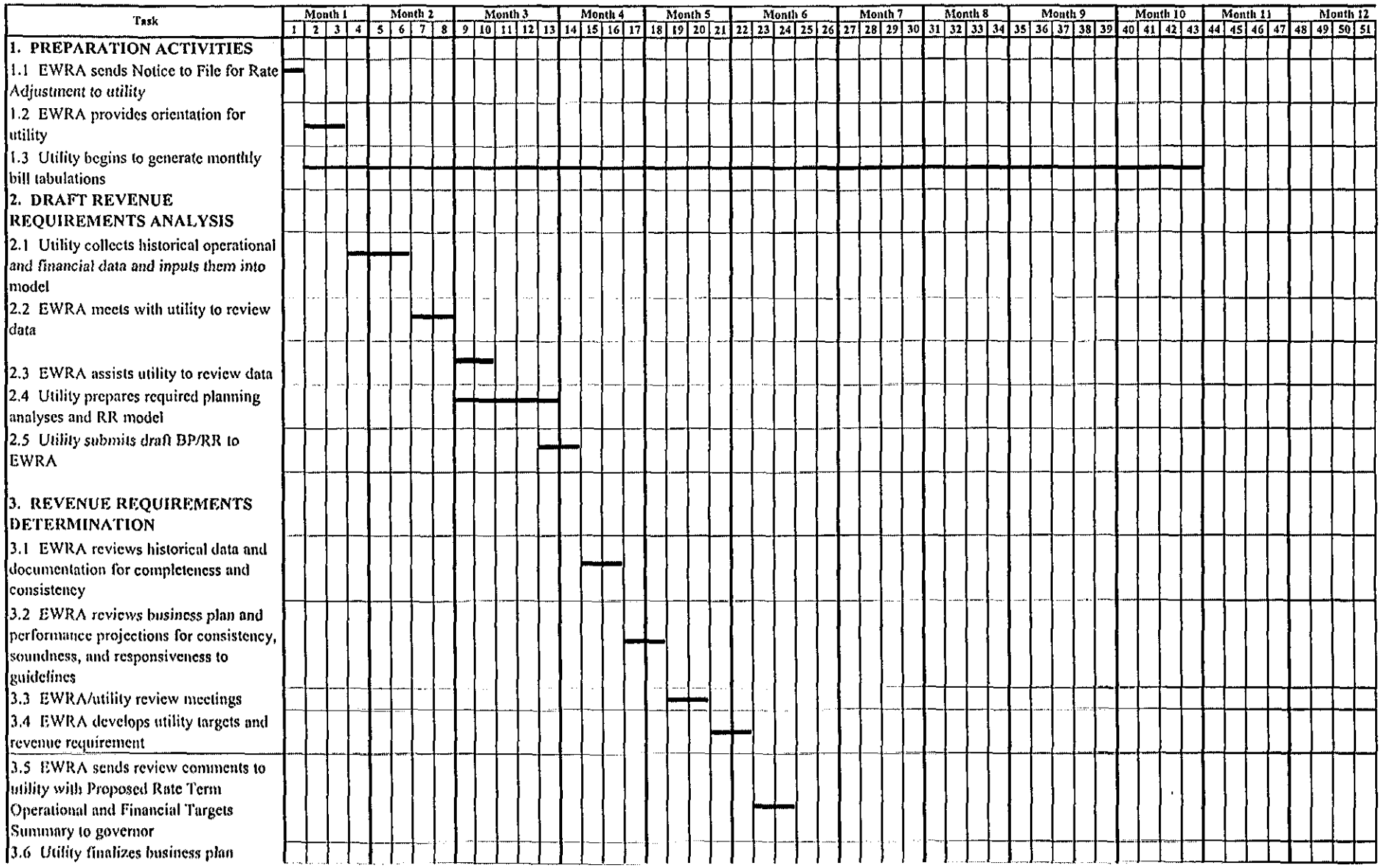
Within 1 month of the agency's review of the new rates structure, the utility submits its draft Notice to Customers of New Rates and Service Improvements to the regulatory agency for review and comment to the governor. The utility implements the new tariffs within 2 months of EWRA's approval of the draft notice.

Exhibit 2.1
RATE APPLICATION PROCESS FOR GOVERNMENT-OWNED WATER AND WASTEWATER UTILITIES IN EGYPT
20 April 2002



Note: 1. EWRA will provide training in the rate application and tariff modeling processes during the early months of the rate term.

Exhibit II-2. TARIFF ADJUSTMENT PROCESS TIMELINE (Government-Owned Utility)



Task	Month 1				Month 2				Month 3					Month 4				Month 5				Month 6					Month 7				Month 8				Month 9					Month 10				Month 11				Month 12			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
4. RATES DESIGN																																																			
4.1 Utility prepares rate design strategy statement with proposed customer classification and blocks																																																			
4.2 EWRA/utility review of rate design strategy																																																			
4.3 Rate design worksheets customized as necessary																																																			
4.4 Utility prepares draft rate schedule																																																			
4.5 EWRA reviews draft rate schedule for "robustness," equitability, practicability, etc. Rate design review comments sent to governor and utility chairman																																																			
4.6 Utility revises rate structure as necessary																																																			
4.7 Utility prepares draft Notice to Customers of New Rates and Service Improvements for EWRA review																																																			
4.8 EWRA comments on draft Notice to Customers																																																			
5. PREPARATIONS FOR IMPLEMENTATION																																																			
5.1 Utility publishes Notice to Customers																																																			
5.2 Utility modifies customer database and billing programs as necessary																																																			
5.3 Utility begins to apply new tariff rates																																																			

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Exhibit II-3. Structure of Utility Rate Application Submissions

1. Draft Revenue Requirements Analysis

1.1 Statement of 5-year objectives

1.2 Audited financial statements (3 years)

1.3 Draft revenue requirements model

1.4 Capital project plan summaries

1.5 Program plans

1.6 Regulatory compliance program budget

2. Final Revenue Requirements Analysis

2.1 Revenue requirements model (complete for historical and future years)

2.2 Revised business plan

2.3 Indicative affordability assessment

3. Rates Design

3.1 Rate design policy statement

3.2 Historical bill tabulations

3.3 Proposed rates structure and model

3.4 Draft notice to customers of new rates and service improvements

Economic Regulation of Government-Owned Utilities

The revenue requirements determination, which is the basis of the utility's cost recovery target and rates design, is understood as a 5-year "performance contract" between the utility, its customers, and (if subsidies are required) the Ministry of Finance. Subsequent utility performance in respect of the data elements and indicators in the approved revenue requirements determination will be monitored by the regulatory agency.

A. Cash Needs

The revenue requirements of a government-owned utility are essentially the utility's cash needs. Cash needs include operation and maintenance (O&M) costs and capital costs.

It is important for utilities to present their total 5-year cash needs even if they do not expect to achieve recovery of all costs during the 5-year rate term.

A1. O&M Cash Needs

O&M cash needs include:

- Wages and salaries
- Power
- Chemicals
- Materials and spare parts
- Oil and fuels
- Other commodities
- Maintenance
- Transportation
- Other services
- Purchases for the purpose of sale (specifically, bulk water purchases)
- Taxes and duties

Exhibit III-1 shows the correspondence between the O&M cash need categories and the expenditure categories of the unified accounting system.

A2. Capital Costs

Capital costs are classified into two main types: (1) capital expenditure to be funded through current revenue, referred to as renewal and replacement (R&R) projects, and (2) capital expenditure to be funded through debt service.

A2a. Renewal and Replacement Costs

Government-owned utilities are entitled to charge customers for the cost of small improvement projects. These are called renewal and replacement (R&R) costs.

Exhibit III-1. Correspondence of O&M Cash Need Items to Unified Accounting System Items

O&M Cash Need Item	New UAS Item/Code	Older UAS Item/Code
Wages and salaries	Wages (32) • Cash wages (321) • Fringe benefits (322) • Social insurance (333)	Wages (31) • Cash wages (31) • Wages in kind (312) • Social insurance (314) • Other (314)
Power	Part of Electricity (315)	Electricity (3224) Gas (3225) Coal (3221)
Chemicals	Chemicals share of raw materials and production inputs (311)	Chemicals share of raw materials (321)
Materials and spare parts	Spare parts and supplies (313)	• Raw materials (321) other than chemicals • Spare parts (323)
Oil and fuels	Fuel and oils (312)	Fuels, oils, and moving power other than electricity, gas, and coal
Other commodities	• Packing and wrapping materials (314) • Stationery (315) • Raw materials and production inputs (311), excluding chemicals	• Packing materials (324) • Stationery and books (326) • Water and lighting (327) • Remnants (325)
Maintenance	Maintenance expenditures (3311)	Maintenance expenditures (331)
Transportation	Transport, transportation, and communication expenditures	Transport and communications expenditures (335)
Other services	• All other items in the purchased services class (331) other than maintenance and transportation • Rental of fixed assets (3316) • Rental of real estate (334)	• All service inputs (33) other than maintenance and transportation • Actual rents (353)
Purchases for sale[a]	Purchases of goods for the purpose of sale (34)[a]	Purchases for sale (34)[a]
Taxes and duties	• Real estate taxes (335) • Indirect taxes (336) • Income taxes (359)	• Commodity duties (351) • Property taxes (368) • Income taxes (369)

[a] Bulk water purchases only.

Renewal and replacement projects are a diverse set of project types whose unifying characteristic is that they are small projects capable of implementation within one or 2 years. R&R expenditure may improve service, increase efficiency, and/or improve management and reporting. Typical R&R projects include:

- Localized replacement or extensions of branch-level water and sewer lines
- Repair or replacement of small mechanical or electrical components of treatment plants, sourceworks, and pumping stations
- Repair or replacement of vehicles
- Repair or replacement of meters
- Procurement and installation of smaller maintenance equipment, such as meter testing equipment, and backhoes, as well as tools
- Procurement and installation of office equipment, such as computer hardware and laboratory and materials testing equipment

The definition of R&R projects may include "spend-to-save" projects. A spend-to-save project is a project for which a simple financial analysis can demonstrate that the project's benefits in terms of O&M costs saved or revenues generated recover the project investment within the three or 4 years of implementation. (The installation of frequency controllers at pumping facilities in Beheira water treatment plants is an example of a project that quickly "paid back" its investment cost in O&M cost savings.)

R&R can be understood as a fund for small improvements in efficiency or quality of service. The funding level for normal R&R projects and spend-to-save projects can be set as a percentage of the value of the utility's fixed assets or estimated by the utility based on its own assessment of needs.

In addition, utilities may include in their 5-year R&R cash needs the capital costs associated with the procurement and installation of instrumentation and equipment required to achieve compliance with first-cycle regulatory requirements for quality assurance in utility operational and financial performance measurement and reporting (see Section IV, "Accountability Targets," and Annex B. The funding level for regulatory compliance capital needs will be based on the utility's compliance budget.

A2b. Debt Service

Major capital expansions are usually financed through grants or loans. Only debt service is considered to constitute a capital expansion cash need under the cash-needs definition of revenue requirements.

Debt service should be classified in the cash needs analysis as new debt service—that is, debt service obligations entailed by loans received during the rate term—and "existing" debt service, which refers to debt service obligations over the rate term that derive from loans received prior to the start of the rate term. Within each of these classes, the debt service obligation should be broken down into interest obligation and principal repayment obligation; the latter may include capitalized interest owed.

B. Total Revenue Requirement

In the rate application, the utility requests authorization from the regulator to recover from tariffs the cash the utility needs to meet its cost recovery target.

The cash needs are the basis of the revenue requirement. The revenue requirements model calculates the revenue requirements based on the utility's outputs and costs. Increases in most costs are indexed to increases in output and to inflation. On the other hand, the regulator will cap cost increases that derive from unaccounted-for water (UFW) and overstaffing.

In the fist cycle the regulator will also allow utilities to include in their revenue requirements a variable allowance for collection shortfalls, which are expected to decline over the rate term as collection efficiency improves. Increase in tariffs to compensate for weak collection efficiency should not be considered a normal revenue requirement, since paying customers are being made to pay the costs of service to users who don't pay. Utilities with high-collection-efficiency adjustment factors must expect dissatisfied customers. Where collection inefficiency is excessively high, the regulator may authorize a partial subsidy to mitigate the effect of the collection adjustment factor on paying customers.

C. Average Revenue Requirement

The average revenue requirement is the total revenue requirement divided by the expected number of m^3 billed (or, in the case of wastewater, the billable wastewater flow).

D. Average Tariff Increase Required

The total revenue requirement divided by the projected revenues under current tariffs gives the numerical average factor by which current tariffs should be increased.

Example: Current tariffs yield revenues of LE 1 million, while the cash-need revenue requirement is LE 2 million. On average, tariffs need to be doubled to assure that tariff revenue covers cash needs. (If the utility's collection efficiency is only 80 percent, the amount billed would base to be LE 2.5 million.)

E. Tariff and Nontariff Strategies of Cost Recovery

Utility efficiency levels have a significant impact on the revenue requirement. Given the regulatory agency's statutory authority to protect consumers, the utilities will be expected to make commitments to greater productivity and operating efficiency. In particular, utilities must reduce UFW, improve collection efficiency, and control the growth of input costs. The R&R

allowance is included in the revenue requirement in part to provide utilities with resources to achieve efficiency and accountability improvement targets.

Efficiencies can also be achieved through careful capital budgeting. First, major capital expansion projects should have feasibility studies to ensure that the planned works do not impose unnecessary excess capacity costs, works are properly staged, and technologies are appropriate. Second, implementation of new projects must be *scheduled carefully*, since loan disbursements increase the debt service requirement and because the operational and financial projections presuppose definite dates of operationalization.

Efficiency gains can often be achieved simply through improved operations planning and budgeting, management, maintenance, and customer relations.

F. The Rate Term

Although the model can be used to develop a utility's current revenue requirement, it has been designed to develop a 5-year revenue requirement for a tariff rate term beginning in the financial year following the year the rate application is submitted and reviewed. Under this approach, the average unit tariff is calculated as the total 5-year revenue requirement divided by the total expected 5-year water consumption. At the time of writing, this rate term would be FYs 2002/03 through 2006/07.

In adopting a 5-year horizon for revenue requirements, the regulatory agency wishes to:

- Allow sufficient time for a utility to implement improvements that control the increase in the revenue requirement
- Provide the utility with the revenue stability to implement its improvement programs
- Reduce the frequency of rate application and review to the utility and the regulatory agency

In the financial model, the rate term is the basis for the determination of the average revenue requirement—that is, the average tariff is calculated as the total expected (and collection factor adjusted) 5-year revenue requirement divided by the total expected 5-year billed consumption. This approach is preferable to one in which tariffs are increased gradually over the rate term because it avoids the need for subsidy in the early years.

G. Affordability and the Cost Recovery Target

All public water and wastewater companies and economic authorities in Egypt have a statutory responsibility to cover all their utility service revenue requirements through tariff revenue. At the same time, the regulatory agency is bound by Government of Egypt policy that a basic level of water and sewerage service should be affordable to any household with a connection. There can be tension between the two government policy objectives of utility financial viability and customer affordability. It is the regulator's responsibility to advise each utility and the Ministry of Finance on target tariff levels for domestic use and an overall cost recovery target for the rate term.

A rate application should include a brief indicative affordability assessment. Affordability assessment guidelines are provided in Annex A. In brief, the affordability assessment will show the average tariff rates that provide "basic" levels of service at monthly bill levels that would not exceed 3 percent of average household expenditure. The utility should further consider the greater ability and willingness to pay that can be found among its nondomestic users and high-volume domestic users.

Types and levels of use are important information for the rates design process, which begins when the regulator has set the utility's cost recovery target.

H. A Note on Wastewater Tariffs

Historically, Egyptian wastewater service charges have been assessed as a percentage of the water consumption charge. For example, if a customer's water bill shows an LE 10 charge for water and the customer's class wastewater surcharge rate is 10 percent, the customer would be billed LE 1 for wastewater service.

The methodology developed in this manual replaces this approach with one in which wastewater revenue requirements are determined in the same manner as water revenue requirements—that is, a cost per m^3 of wastewater collected and treated is developed and applied to the quantity of wastewater service used by the customer. The quantity of wastewater service used, referred to as the "billable wastewater flow," is assessed as a percentage, usually 80–90 percent, of the sewered user's water consumption. (Utilities may consider lower conversion rates for specific industrial subsectors or on a case-by-case basis.)

This approach establishes a closer relationship between wastewater tariffs and wastewater service revenue requirements. The new wastewater charge will continue to be posted on the water bill and collected together with water revenue.

Performance Targets

Government of Egypt water/wastewater sector regulatory policy, as expressed in the law and decree that establish the regulatory agency, calls for comprehensive regulation of the sector. That is, the regulatory agency will regulate both price and quality of service. Price-and-quality regulation has several dimensions. Quality will be regulated by the development, monitoring, and enforcement of service standards. Moreover, the agency will evaluate price (or, more precisely, cost) in *relation to the level of service.* For this latter reason, the regulatory agency will require utilities submitting applications for rate adjustments to commit themselves to definite performance targets. The particular performance areas to be targeted may evolve from one cycle of rate applications to the next, and the target values may vary from one utility to another.

In the current, first rate cycle, the regulatory agency will require performance improvements in three broad areas:

- Service delivery
- Efficiency
- Accountability

The respective first-cycle performance indicators for these improvement areas are shown in Exhibit IV-1.

The manner in which the 5-year target values are determined differs from one area to another:

A. Service Delivery Targets

The utility must commit itself to improvements in the service delivery area, but the utility itself determines the 5-year target values for service delivery improvement. The values offered should be based on the present values of the relevant indicators and the utility management's assessment of the need for improvement and the cost-benefit profile of improvements. Improvement in service generally results in greater customer willingness to pay higher tariffs.

Exhibit IV-2 provides a list of conventional quality-of-service indicators. Utilities are entitled to propose quality-of-service improvements *in addition* to those listed, if they believe the additional result areas reflect local customer satisfaction priorities; the utility will propose suitable indicators and means of verification for such improvement areas.

B. Efficiency Targets

Annualized efficiency targets will be set by the regulatory agency in consultation with the utility. Exhibit IV-3 shows an approach to target setting based on a sliding scale of improvement rates, with more aggressive rates of improvement expected from utilities with poorer current levels of efficiency. These improvements rates are comparable to the "X factor" concept used in the UK system of water utility regulation.

C. Accountability Targets

The accountability targets require the utility to develop and implement reliable systems of measurement, recordkeeping, and reporting on technical, economic, and financial aspects of utility performance that are of interest to the regulator and customers.

These systems will enable the regulator to monitor utility performance, set performance benchmarks, and enforce compliance. They will also increase the capacity of the utility to identify priority needs in the current and future rate cycles and respond cost effectively.

The regulatory compliance program targets for the first rate cycle relate mainly to the procurement, installation, and operationalization of performance monitoring systems. Annex B lists the regulatory compliance targets.

The level of expenditure required will vary from one utility to another in relation to the type and number of the facilities and the current level of compliance. Annex C provides cost estimates for some of the standard capital items likely to need budgeting.

Exhibit IV-1. First-Cycle Utility Performance Indicators

Result Area	Indicators/Outputs
	Water Supply
Service Delivery	
Water network coverage	• No. of water users • Population/residential users
Treated water consumption	• Residential consumption/connected population • Residential consumption/residential users • Consumption per user
Efficiency	
Unaccounted-for (UAF) water rate	• UFW as a percentage of treated water production
Staffing level	• Staff per thousand water users
Labor cost	• Wages and salaries as a percentage of total O&M costs
Accountability	
Plant performance measurement	• Flow metering program operational • Power efficiency audits conducted
Network performance measurement	• Water networks mapped • Service interruption reporting system operational • Leak detection survey completed • Distribution system evaluation completed
	Wastewater Service
Service Delivery	
Sewer network coverage	• No. of sewer users • Sewer users as a percentage of water users
Sewer system capacity	• Treated water consumption of sewered users as a percentage of total treated water consumption
Wastewater disposal	• Volume of wastewater treated • Volume of raw sewage discharges • No. of raw and combined sewer outfalls
Efficiency	
Staffing level	• Staff per thousand sewer users

Exhibit IV-1. First-Cycle Utility Performance Indicators (Continued)

Result Area	Indicators/Outputs
Labor cost	• Wages and salaries as a percentage of total O&M cost
Accountability	
Plant performance measurement	• Flow monitoring program operational • Power efficiency audits conducted
Network performance measurement	• Sewer networks mapped • Service interruption reporting system operational • Manhole survey completed • Sewer system evaluation completed
Billing and Collection	
Efficiency	
Revenue collection efficiency	• Tariff revenue collected as a percentage of tariff revenue billed
Accountability	
Customer accounting	• Customer information/billing system operational
Metering	• Metering improvement program plan and budget completed
Meter reading	• Meter reading quality assurance program operational
Finance and Administration	
Accountability	
Staffing planning and control	• Staffing plan prepared, with annual updates
Cost control	• Computerized cost accounting system operational
Capital planning capacity	• Master plan prepared

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Exhibit IV-2. Quality-of-Service Indicators

Quality-of-Service Indicators

Service area population

Population connected to main supply

Water Service

No. of water users (accounts)

Residential water users

Nonresidential water users

Persons per residential account

Billed consumption (m^3)

Billed consumption per residential users (accounts)

Consumption per person (m^3)

Kilometers of pipeline (km)

No. of pipeline breaks

Breaks per kilometer

Wastewater Service

No. of sewer users (accounts)

Residential sewer users

Persons per residential accounts

Sewer users/water users

Billable wastewater discharge

Billed water consumption of service area sewered users

Billable wastewater discharge/water consumption of sewered users

Kilometers of sewer

Volume of raw sewage discharges

No. of sewage backup/flooding incidents

Backup incidents/km of sewer

No. of raw sewage discharge outfalls

Customer Service

Total metered users

Metered nonresidential users

Total meters installed on sewered water accounts

Metered users/all water users

Metered nonresidential users/all nonresidential water users

Metered sewered users/all sewered users

Working meters

Working meters/total metered accounts

Total bills issued

Exhibit IV-2. Quality-of-Service Indicators (Continued)

Bills generated by computer
Bills generated by computer/total bills issued

Exhibit IV-3. Efficiency Improvement Rates and Representative Annual Targets

Unaccounted-For Water Reduction Targets

Current UFW (%)	Annual Reduction Rate	2003	2004	2005	2006	2007
50%	5%	48%	45%	43%	41%	39%
40%	4%	38%	37%	35%	34%	33%
30%	3%	29%	28%	27%	27%	26%
20%	2%	20%	19%	19%	18%	18%
10%	1%	10%	10%	10%	10%	10%

Collection Efficiency Improvement Targets

Current Collection Efficiency (%)	Annual Improve-ment Rate	2003	2004	2005	2006	2007
50%	10%	55%	61%	67%	73%	81%
60%	8%	65%	70%	76%	82%	88%
70%	6%	74%	79%	83%	88%	94%
80%	4%	83%	87%	90%	94%	97%
90%	2%	92%	94%	96%	97%	99%

Exhibit IV-3. Efficiency Improvement Rates and Representative Annual Targets (Continued)

Staffing Reduction Targets

Current Staff per 1,000 Connections	Year 2007 Staff per 1,000 Users[a]	2003	2004	2005	2006	2007
18	12	17	16	15	13	12
16	11	15	14	13	12	11
14	10	14	13	12	11	10
12	8	12	11	10	9	8
10	7	10	10	9	8	7
8	6	8	8	8	7	6

[a] In combined water/wastewater utilities, the total number of users is the sum of water users and sewer users.

Business Planning

A. The Business Plan

Each utility submitting a request for rate adjustment is required to include a 5-year business plan in its filing.

The business plan is the textual companion to the revenue requirements analysis model. The business plan provides:

- A Statement of the Performance Targets to be Achieved over the Rate Term
- A description of the strategies and programs to be implemented by the utility to achieve its targets
- A schedule of program activities and expected results
- An estimate of the cost implications of program implementation

The business plan document should be structured in the following manner:

- Summary of 5-year business objectives
- Service improvement strategies and program plans
- Efficiency improvement strategies and program plans
- Regulatory compliance program implementation schedule
- Summary capital investment program

A1. Strategic Objectives

The statement of strategic objectives is the basis of the 5-year business plan. Use the performance review and demand forecast to develop a list of the utility's most important service delivery and efficiency improvement goals for the 5-year period.

Exhibit V-1 provides a template for the summary presentation of 5-year performance targets.

A2. Service Improvement Strategies

Service improvement objectives and targets should reflect (1) the opportunities for improved service posed by capital works underway and planned and (2) the utility managers' understanding of the types of quality-of-service improvements that matter to their customers, who will, after all, be paying the higher tariffs.

A3. Efficiency Improvement Strategies

Efficiency targets and programs will be expected to address three areas:

- Unit costs of production, principally labor costs
- Unaccounted-for water
- Collection efficiency

A4. Regulatory Compliance Outputs

All utilities must commit themselves to achieving compliance with the accountability standards noted in Annex B.

Program plans should be prepared for the key service improvement and efficiency targets, especially where these entail capital expenditure, and appended to the business plan. Sample program plans are provided in Exhibits V-2a and V-2b. It will be noted that the program plan addresses the following basic planning questions:

- What benefits will be achieved?
- How much will be achieved?
- How will it be achieved?
- When will it be achieved?
- How much will it cost to achieve?

Note that a program may have both cost-causing and cost-saving implications. Broad guidance on assessing the cost implications of a program is provided in Section C below.

A capital investment program summary should be included in the business plan; Exhibit 5.3 presents a template. Note that the capital program summary requests the utility to link projects to performance indicators, and that utilities should classify their projects as capital expansion or renewal and replacement investment.

Exhibit 5.4 provides a template for a more detailed project-specific plan summary to assist in calculating debt service and fixed asset changes.

The business plan should provide a clear basis for the projections used in the revenue requirements model. Utilities can also use the model to test the output, revenue, and cost implications of different strategies and programs.

B. Developing the Business Plan

The historical data in the revenue requirements model should be input and analyzed before the business planning effort. This is to enable utility planners to assess the utility's current level of performance in relation to the key result areas.

Secondly, the utility should prepare its population projections and review its capital plan. Development of strategy is a matter of determining the most effective ways of achieving a target in light of the utility's strength and weaknesses and the predictable opportunities and threats of the rate term. Strengths, weaknesses, opportunities, and threats may inhere in the utility

organization and/or the operating environment of customers, the national 5-year plan, the physical environment, macro and regional economic trends, and so forth.

A capital investment plan is normally to be viewed as an opportunity for performance improvement, but when debt service is entailed, the current capital plan should be examined critically, with two questions foremost: (1) Are the proposed investments responsive to the priority needs of the service area? and (2) Is the proposed implementation schedule realistic (i.e., will the expected benefits and costs occur in the year proposed in the schedule)? An unrealistic capital plan virtually guarantees that the output, revenue, and cost projections in the revenue requirements model will be inaccurate, with the result that targets will not be met and/or revenues will greater or less than costs.

The next step in the business planning process is to set targets for the key result areas. As noted earlier, efficiency and accountability targets are set by the regulatory agency, but the utilities have latitude in setting service delivery improvement targets. The targets in the various result areas constitute the overall 5-year business objectives.

Once the targets are defined, develop the strategies and programs by which the targets will be achieved. The strategies should reflect the local configuration of strengths, weaknesses, opportunities, and threats. The program descriptions should describe the main steps in the program, their schedule, and their costs and benefits. The purpose of the program planning exercise is to assure the regulatory agency that the utility has thought carefully about how it will achieve its targets and how the program will affect the revenue and cost projections of the revenue requirements model.

C. Business Planning Guidelines

This subsection presents general guidance on business planning for the key result areas. More specific guidance may be requested from the regulatory agency, though the final responsibility for target achievement rests solely with the utility.

C1. Service Delivery Improvements Planning

As noted in Section IV, "Service Delivery Targets," utilities have the latitude to propose the types and levels of service improvement they expect to attain over the rate term. The improvements may be the result of improved management, operations, customer service, and/or capital improvements. At a minimum, the major capital works to be operationalized over the rate term should be examined with a view to their probable impacts on quality of service, revenues, and costs. Also at a minimum, the utility should explain its assumptions regarding the growth of connections and demand per connection.

C1a. Service Connections

The number of users (accounts, or *mushtarikin*) is a physical indicator. Valid indicators of water network coverage are difficult to find, but population per residential account is indicative, especially when viewed in the context of the governorate's ratio of urban/total population.

For sewer coverage, sewer users per water user is a valid measure, though it also must be assessed in the context of the urbanization level.

Although the regulatory agency will not set targets for coverage in this rate applications cycle, the agency inspects the utility's business plan to assess the need for expansion of coverage and to identify needs as diffuse (indicative of a need to increase house connections in already sewered areas) or localized (indicative of a need to expand collection systems to unserved areas). Solutions may vary according to the nature of the problem. Where the problem is localized, network physical expansion is needed, and this will normally require capital investment through loans or grants. Where the problem is diffuse, a combination of small local projects to "fill in" the network, combined with appropriate marketing strategies, may be parts of the solution.

Increases in connections usually translate into increases in revenue. For revenue projection purposes, it is important to consider the impact of planned network expansions on the class composition of demand, if the areas to be connected to the network are suspected of having a demand profile different from the historical average of the areas served.

For cost-projection purposes, the model projects increases in operations and maintenance (O&M) costs of spare parts, maintenance, and transportation costs proportional to the rate of growth of connections. Note also that the staff per thousand connections "automatically" falls when connections increase more rapidly than staffing levels.

C1b. Demand per Connection

Demand per connection is also a physical indicator. The indicators for water are domestic consumption per capita, domestic consumption per domestic account, and consumption per account. The regulatory agency has not set targets for these indicators in this rate cycle.

Capital investment in sourceworks, treatment plants, storage, and pumping stations is normally required to achieve increases in demand per connection at a higher rate than the historical average growth rate.

Increases in demand per connection signify an increase in capital efficiency (sales per unit of fixed cost), but have little effect on revenue per unit of service delivered (m^3 water sold, m^3 wastewater collected).

The model indexes increases in demand, whether as a result of change in connections or change in demand per connection, to increase in power and chemicals costs. However, utilities may propose to *reduce the rate of cost increase* by improved maintenance and process control (management measures) and/or power/chemicals efficiency improvement programs.

C1c. Wastewater Discharges

Wastewater utilities have some special indicators that reflect their environmental protection objectives. These indicators are the volume of wastewater treated and the number of raw wastewater discharges to the environment.

The volume of wastewater treated should be assessed in relation to the billable wastewater flow. Unfortunately, this ratio is of limited validity where infiltration/inflow in the collection system is high.

Increases in the percentage of flows treated increase power and chemicals costs and improve the utility's environmental health performance. Treatment improvements do not normally increase tariff revenue, but may—in conjunction with marketing—increase sales of residuals, an "other revenues" item.

The number of collection system outfalls discharging raw or combined (stormwater combined with wastewater) flows is another indicator of environmental health performance problems. A more informative indicator is the actual raw sewage discharge, which would require estimation or measurement through extensive metering in the collection system. The regulatory compliance program for wastewater utilities requires the utilities to implement an extensive flow-monitoring program during the rate term. Nevertheless, if a utility has the collection capacity, raw sewage outfalls should be reduced.

The primary cost implications of reducing raw wastewater discharge is to increase wastewater *treatment* chemical and power costs. Capital costs of new conveyance to carry the wastewater to the treatment plan will depend on the magnitude of the raw discharges in relation to collection system capacity and the distances of the problem outfalls to the nearest appropriate trunk sewer or pumping station. These factors—specific to each utility and even each city—will determine how much of the improvement will need major capital investment versus small mains improvement projects that can be funded through the renewal and replacement (R&R) allowance.

C2. Efficiency Improvements Planning

Program plans should be developed for economic efficiency programs, setting out the improvement strategy, the implementation plan, the costs (assumed to be funded though the R&R allowance), and the annual line item efficiency rate to be entered into O&M Projection 2 in the model.

C2a. Unaccounted-For Water Reduction

Unaccounted-for water (UFW) is the difference between the total treated water produced and the volume of treated water billed to customers. The sources of water "loss" may be physical or nonphysical. UFW is more a financial indicator than a physical indicator, since some part of UFW is probably consumed. In the model, UFW increases the water production requirement. Hence, UFW adds to production-sensitive O&M costs of power and chemicals, and UFW reduction restrains the growth of these costs.

UFW as a percentage of production is a regulated indicator. The annualized rate term UFW target levels are shown in Exhibit IV-3, along with the benchmark levels for the other two key efficiency areas (collection efficiency and staffing level). The exhibit shows that the higher a utility's current UFW rate, the higher the required rate of UFW reduction. This reflects the greater need for UFW control in these utilities and also the greater ease and cost-effectiveness of

"early" UFW reduction measures, such as meter maintenance, repair of poorly installed service lines, and detection of illegal connections. Such UFW reduction measures can be funded through the R&R allowance.

Utilities should not assume that the bulk of their UFW problems derive from mains leaks. Large-scale network rehabilitation projects are capital expansion projects and are likely to require new debt service. The Distribution System Evaluation component of the regulatory compliance program is intended to assist utilities to develop a cost-effective network rehabilitation plan for implementation in the later years of this rate term or in a subsequent rate term.

In their business plans, the utilities will present a brief analysis of the sources of their UFW, an estimate of the proportion of the UFW attributable to each source, and the utility's program for tackling each type of source.

Infiltration/inflow has effects on wastewater collection and treatment O&M costs that are almost identical to UFW effects on water utility O&M costs. An important difference is that infiltration/inflow (I/I) reduction almost always requires capital solutions. The regulatory compliance program requires the conduct, during the rate term, of a sewer system evaluation for all utility drainage basins in which subsurface water levels exceed mean sewer depth. This is to enable the affected utilities to prepare a cost-effective sewer rehabilitation plan for implementation in the later years of the rate term or in the subsequent one.

C2b. Revenue Collection Efficiency

Revenue collection efficiency is another performance indicator and, as such, the regulatory agency has set targets for it using a sliding scale similar to that used for setting UFW reduction rates.

The indicator is annual collection/annual revenue billed. The total annual collection will include collections from prior year billings, since few utilities are expected to be able at present to account for the aging of receivables. The regulatory agency recognizes that validity of the indicator is not very high, but it is would appear to be the most applicable and available to the majority of utilities at present.

The revenue billed includes water and sewer tariff revenue, since both services are billed together and since many utilities do not differentiate between water and sewer revenue collection. The model then assigns the overall collection efficiency rate to both services.

Collection efficiency has little impact on costs as such, but a great impact on the revenue requirement, since shortfalls in collection require upward adjustments to the revenue requirement so that actual cash inflows are adequate to cover the utility's cash needs.

As with UFW reduction, the business plan should analyze the utility's sources of revenue collection shortcomings. Collection efficiency should be analyzed in relation to each class and each revenue collection district to determine the absolute and relative magnitudes of the collection shortfall by source. The analysis should be the basis for the utility's collection-efficiency strategy and programs. An example of a collection-efficiency strategy/program plan

oriented to addressing a problem in collection from governmental users is presented in Exhibit V-2a; a utility with collection problems stemming from standpipes would likely propose a different strategy and programs.

C2c. Staffing Level

This is a performance indicator. The indicator is the number of staff per 1,000 users. Salaries are a major O&M cost for most Egyptian utilities, while reducing staffing levels is a virtually cost-free means of reducing unit cost. For wastewater utilities, it is one of the only ways the wastewater utility can directly improve operating efficiency in the short term.

Staffing per 1,000 connections appears to range from a high of 17 to a low of 8 in Egyptian utilities. It will be noted that the staffing level is partly determined by the number of connections, so an active new connections program may "reduce" a utility's staffing level.

The benchmark staffing-level reduction rates shown in Exhibit IV-3 will be evaluated by the regulatory agency with each utility's labor situation in mind. "New" utilities like the PD 281 utilities and the New Urban Communities Authority (NUCA) utilities are expected to have more latitude to reduce staffing levels than older utilities.

C3. Regulatory Compliance Planning

Annex B lists the outputs required for a utility to achieve compliance with the regulatory agency's accountability standards.

The regulatory compliance outputs are grouped into four areas:

- Water supply
- Wastewater service
- Billing and collection
- Finance and administration

Water-only utilities must prepare regulatory compliance budgets for the water supply, billing and collection, and finance and administration outputs. Wastewater-only utilities must prepare regulatory compliance budgets for the wastewater service and finance and administration outputs. Combined water/wastewater utilities must prepare budgets for all four regulatory compliance result areas. The business plan should provide the year in which each specific output will be completed.

Since the billing and collection outputs also serve wastewater utility needs, the costs of the billing and collection program should be prorated between the water utility and the associated wastewater utility. The share of the wastewater utility should assessed by the formula "sewer users/(total of water users and sewer users)." This formula should be applied to each type of billing and collection regulatory compliance cost (O&M and R&R), and the wastewater utility's shares should be included under the relevant cost items in the revenue requirements model.

All regulatory compliance outputs are expected to be funded through a combination of O&M and R&R funding. Many of the outputs merely require improvements in organization, management systems, and recordkeeping and reporting processes. Programs likely to require capital (R&R) expenditure include:

- Flow monitoring programs: meter procurement and installation costs
- Leak detection survey: portable leak detection equipment
- Computerization of customer and cost accounting systems: purchase and installation of hardware and software

Some of the special studies included in the outputs, principally the water distribution system evaluation, the sewer system evaluation, and the master plan will require specialized services. It is expected that most utilities will outsource these studies. These costs would be treated as "other service" costs in the O&M cash needs analyses in the revenue requirements model.

Unit cost estimates for some regulatory compliance program items that may require procurement, installation, or special services are provided in Annex C.

Exhibit V-1. Summary of 5-Year Performance Targets

Result Area	Indicators/Outputs	2002	2003	2004	2005	2006	2007
Water Supply							
Service Delivery							
Water network coverage	• No. of water users						
	• Population/residential users						
Treated water consumption	• LCD per person connected						
	• Residential consumption/residential users						
	• Consumption per user						
Efficiency							
Unaccounted-for water rate	• UFW as a percentage of treated water production						
Staffing level	• Staff per 1,000 water users						
Accountability							
Plant performance measurement	• Flow metering program operational						
	• Power efficiency audits conducted						
Network performance measurement	• Water networks mapped						
	• Service interruption reporting system operational						
	• Leak detection survey completed						
	• Distribution system evaluation completed						

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Wastewater Service							
Service Delivery							
Sewer network coverage	• No. of sewer users						

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Exhibit V-1. Summary of 5-Year Performance Targets (Continued)

Result Area	Indicators/Outputs	2002	2003	2004	2005	2006	2007
	• Sewer users as a percentage of water users						
Sewer system capacity	• Treated water consumption of sewered users as a percentage of total treated water consumption						
Wastewater disposal	• Volume of wastewater treated						
	• Volume of wastewater treated as a percentage of billable wastewater flow						
	• No. of raw and combined sewer outfalls						
Efficiency							
Staffing level	• Staff per 1,000 sewer users						
Labor cost	• Wages and salaries as a percentage of total O&M cost						
Accountability							
Plant performance measurement	• Flow-monitoring program operational						
	• Power efficiency audits conducted						
Network performance measurement	• Sewer networks mapped						
	• Service interruption reporting system operational						

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Exhibit V-1. Summary of 5-Year Performance Targets (Continued)

Result Area	Indicators/Outputs	2002	2003	2004	2005	2006	2007
	• Manhole survey completed						
	• Sewer system evaluation completed						
Billing and Collection							
Efficiency							
Revenue collection efficiency	• Tariff revenue collected as a percentage of tariff revenue billed						
Accountability							
Customer accounting	• Customer information/billing system operational						
Metering	• Metering improvement program plan and budget completed						
Meter reading	• Meter reading quality assurance program operational						
Finance and Administration							
Accountability							
Staffing planning and control	• Staffing plan prepared, with annual updates						
Cost control	• Computerized cost accounting system operational						
Capital planning capacity	• Master plan prepared						

Exhibit V-2a. Egyptian Water/Wastewater Sector Regulatory Agency

Program Plan Template

Date Prepared: _____

Name of Utility: _____Rate Term: _____

Result Area: Collection Efficiency

Objective: To increase collection efficiency from 75 percent of billed revenue to 90 percent by the year 2007.

Strategy: The objective will be pursued through persuasive, administrative, and engineering approaches.

Programs:

1. The utility will prepare a public communications campaign using radio, newsprint, and preparatory school lesson plans to show how free-riding increases the cost of selling water. The utility may publish the names of large users who are frequently delinquent in paying user charges. This campaign will be followed by circulation by utility representatives of the utility's Egyptian Water and Wastewater Sector Regualtory Agency (EWRA)-approved disconnection policies and issuing warnings on all bills more than 75 days due. By the second year of the rate term, the utility will have begun to regularly implement authorized disconnections.

   This program is expected to require a one-time outlay on services (media/advertising services) on the order of LE 15,000 mostly in FY 2002/03, along with an increase of approximately 2 percent in "other materials" costs. The program expects to incur no significant capital costs.

2. The utility will implement a metering program and water audit survey on the premises of governmental and service type users with the highest levels of water consumption to estimate water waste from shoddy or old plumbing, and will identify cost-effective projects for retrofitting facilities with high levels of waste and poor payment histories.

The survey will begin in FY 2002/03, and last for three years. The retrofitting program will begin in FY 2003/04 and is expected to continue through the rate term. An annual capital budget of some LE 500,000, which can be taken from R&R funds, is needed for the retrofit program, which is expected to show a positive net present value early by virtue of the sale of water saved to users with better payment histories.

	03	04	05	06	07
Program Indicators					
Connections program initiated (y/n)					
Disconnection policy approved by EWRA (y/n)					
Warnings issued (no.)					
Disconnections implemented (no.)					
Facilities audited (no.)					
Retrofits implemented (no.)					

	03	04	05	06	07
Program Costs					
O&M: other materials (LE)					
O&M: other services (LE)					
R&R: tools (LE)					

	03	04	05	06	07
Objectives Indicators					
Collection efficiency (%)					

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Exhibit V-2b. Egyptian Water/Wastewater Sector Regulatory Agency

Program Plan Template

Program: Sewer System Evaluation Date Prepared: _____

Name of Utility: _____ Rate Term: _____

Result Areas: Cost Management Collection System Reliability

Objective: The long-term objective is to reduce infiltration/inflow (I/I), thereby reducing unnecessary pumping and treatment costs. Also, the processes of preparation for the I/I survey will improve collection system performance by removing blockages.

The rate term objective is to prepare for and implement the I/I survey, prepare a list of cost-effective sewer rehabilitation projects, and begin to implement priority projects.

Implementation Plan

Task	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
Sewer mapping						
Pump station metering						
Flow monitoring						
GIS/hydraulic analysis						
Identification of problem basins						
Manhole inspection						
Sewer cleaning						
Closed-circuit TV inspection						
Identification of problem stretches						
Estimation of repair/replacement costs						
Cost-effectiveness analysis						
Project planning and budgeting						
Project implementation						

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Program Indicators

Program Indicator	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
Kilometers of sewer mapped						
Percentage of sewer network mapped						
No. of pump stations metered						
Percentage of pump stations metered						
Manholes inspected						
Sewers cleaned (km)						
No. of sewage flooding/backup incidents						
Sewers inspected (km)						
Sewers rehabilitated or relined						
I/I (m^3)						
I/I (percentage of total collection system inflow)						

Program Costs

Type of Expense (LE)	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
O&M: maintenance						
O&M: transportation						
O&M: services						
R&R:						
R&R:						

Objectives Indicators

Objectives Indicator	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007
Cost/m^3 collected						
O&M cost/m^3 collected						

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Exhibit V-3. Summary Capital Improvements Program[a]

	Project	Purpose	Indicators	Completion Date	Type	Funding	Cost (LE Million)
1	Regional Transmission System Upgrading (650 km, 200-700 mm)	- Improved pressure - Improved reliability in event of main plant failure	- Pressure - Hours of service interruption - No. of persons affected by service interruption	2005/06	Capital expansion	NOPWASD	330
2	Damanhour WTP Expansion (34,000 m^3/day)	- Increased supply to Damanhour, Itay il-Barud, Rahmaniya, and Shubrakhit districts	- m^3 produced - m^3 consumed	2002/03	Capital expansion	NOPWASD	31.5
3	Shubrakhit WTP Expansion (34,000 m^3/day)	- Increased supply to Damanhour, Itay il-Barud, Rahmaniya, and Shubrakhit districts	- m^3 produced - m^3 consumed	2002/03	Capital expansion	NOPWASD	31.5
4	Southern Area Wells and Pumping Stations (10 wells, total 20,000 m^3/day)	- Increased supply to Wadi Natrun and South Tahrir districts	- m^3 produced - m^3 consumed	2003/04	Capital expansion	NOPWASD	5
5	Abu Hummus WTP Expansion (34,000 m^3/day)	- Increased supply to Abu Hummus district	- m^3 produced - m^3 consumed	2005/06	Capital expansion	NOPWASD	40
6	Network Rehabilitation:	- Reduce leakage - Increase consumption	- Unaccounted-for water - Water consumed		Capital maintenance	NOPWASD	
	Damanhour City			2000/01			6
	Kafr il-Dawar City			2001/02			6
	Shubrakhit City			2002/03			2
	Itay il-Barud City			2002/03			2
	Abu Hummus City			2003/04			3
	Rahmaniya City			2003/04			2
	Rural areas (600 km)			120 km/year			24
7	Local Distribution System Extensions	- Increase coverage	- No. of connections - Persons per connection	Annual	Renewal	Utility	5

[a] Example using Beheira data.

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Exhibit V-3. Summary Capital Improvements Program (Continued)[a]

	Project	Purpose	Indicators	Completion Date	Type	Funding	Cost (LE Million)
8	Installation of Frequency Controllers at Damanhour and Idfina Water Treatment Plants (WTPs)	- Conserve power and reduce production costs	- Cost per m^3 produced	2002/03	Renewal	Utility	1
9	Supply and Installation of 10 Manganese Removal Units	- Maintain water quality	- Compliance with drinking water quality standards	2003/03	Renewal	Utility	0.25
10	Replacement of 32,000 Consumption Meters	- Achieve 95% working meter coverage for all nondomestic users and all sewered domestic users	- Working meters - Metered sales as percentage of all sales	2006/07	Renewal	Utility	4
11	Procurement and Installation of 50 Bulk Flow Meters	- Bulk meters installed at all main treatment plants and at significant nodes in regional network	- Metered production	2003/04	Compliance	Utility	2
12	Water Quality Sampling and Testing Equipment, including means of transport	- Sampling and testing at all water supply facilities according to Ministry of Health frequency standards	- No. of samples taken and tested	2003/04	Compliance	Utility	5
13	Accounting System Upgrading	- Complement unified accounting system databases and reporting routines with decentralized utility-based systems	- Decentralized reporting - Reports issued in compliance with regulatory accounting guidelines	2003/04	Compliance	Utility	10
14	Billing System Upgrading	- Modify data structures to comply with new rate structure, and expand reporting capacity	- Bill tabulations reported monthly - Connections and consumption sorted by meter size	2003/04	Compliance	Utility	0.5
15	Master Plan for Water Supply, Wastewater	- Set 20-year service targets and investment plan	- Plan completed	2003/04	Compliance	Utility	1

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	Collection, and Wastewater Treatment						

[a] Example using Beheira data.

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Exhibit V-4. Egyptian Water/Wastewater Sector Regulatory Agency

Capital Project Plan Summary

Date Prepared: _____

Name of Utility: _____Water ❑Wastewater ❑ Rate Term: _____

Instructions:
A Capital Project Plan Summary form should be prepared for each large capital project to be implemented over the rate term.

The form is used to calculate both the value of fixed assets to be added over the rate term and (in the case of projects funded by loans) the new debt service requirement. For projects funded through loans, show the lender's interest rate, the number of years over which the loan principal is to be repaid (including any grace period), and the length of the grace period. It is desirable that the annual project expenditure be identified by asset class (for purposes of calculating depreciation). In any case, total project expenditure by year must be provided.

Project Description: (Describe principal works to be implemented, project purpose, and expected benefit, location of works, and location of beneficiaries. Provide year that works began/will begin and total project cost and expenditure to date.)

Principal works:
Project purpose and expected benefits:
Location of works:
Location of beneficiaries:
Start date of project implementation
Expected completion date
Expected cost:
Expenditure to date:

Code Number:

Source of Funding:

Interest Rate (debt-funded projects only):

Grace Period (debt-funded projects only):

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Principal Repayment Rate (debt-funded projects only):

Project Expenditure by Asset Class	2002	2003	2004	2005	2006	2007	2003-2007
Pipelines (LE)							
Wells (LE)							
Roads (LE)							
Structures (LE)							
Equipment and machinery (LE)							
Means of transport (LE)							
Meters (LE)							
Other instrumentation and tools (LE)							
Office equipment (LE)							
Project Total (LE)							

Debt Service Obligations	2002	2003	2004	2005	2006	2007	2003-2007
Disbursement (LE)							
Interest obligation (LE)							
Principal repayment obligation (LE)							

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The Rate Application Model

A Microsoft Excel workbook has been developed to assist the utilities in developing their revenue requirements and rate designs.

A. Structure of the Model

The workbook is divided into 10 worksheets; their interrelations are depicted in Exhibits VI-1 and VI-2. Four of the worksheets are central to the revenue requirements analysis:

1. Demand
2. Revenues
3. Costs
4. Calculation of revenue requirements

The data input requirements and operation of these four linked worksheets are explained in detail in Section VII. It will be noted that the same model is used by water and wastewater utilities.

The main revenue requirements worksheets are supported by three subsidiary worksheets:

- Classes
- Debt service
- Regulatory compliance program

All utilities should begin their data entry to the revenue requirements analysis by entering their current customer classifications into the Classes worksheet. The Classes worksheet will automatically input the utility's customer classification into the relevant rows in the Demand and Revenues worksheets of the main revenue requirements analysis model, as well as the Uniform Rate Increase Option Rate Design worksheet. The model operator in the utility should then review these three worksheets and delete any empty rows, as the demonstration worksheet has been developed using seven classes. The Classes worksheet will accept any number of classes.

The Classes worksheet also includes a facility enabling the utility to set out a new customer classification for use in the structural tariff increase approach to rate design. In order for the Structured Tariff Increase worksheet to draw on the required information in the Demand and Revenues worksheets, the utility's proposed new customer classification needs to be linked to the old classes, that is, the old classes need to be grouped into the new classes in the Structured Tariffs Increase worksheet. Egyptian Water and Wastewater Sector Regulatory Agency (EWRA) assistance may be sought in applying the necessary formulas to the Structural Tariff Increase worksheet.

The Debt Service worksheet and the Regulatory Compliance worksheet assist the utility in developing these specific row inputs to the Costs worksheet. Changing an input in either subsidiary worksheet will automatically change the relevant row total in the Costs worksheet.

Two rate design models are included in the workbook:

- Uniform tariff increases
- Structured tariff increases

These are understood as *alternative* rate design options, though the utility may wish to experiment with both approaches. The two approaches are discussed in Section VIII, "Rates Design."

B. Model Conventions

B1. Color Coding

The cells throughout the model are color coded:

- Yellow cells with yellow backgrounds are cells which require *data input*. They are already formatted as either numbers or percentages and with the correct number of decimal places showing. Users need only to input data in these cells and do not need to alter the formatting.

- White cells with normal, white backgrounds are output cells. These cells make calculations based on information the users have already entered into relevant yellow cells. Users should not enter any data or make changes to these cells, as this would change the integrity and consistency of the model.

- Shaded cells are blank cells. The shading helps the user by indicating that no data should be entered by the user and no output should be expected. These cells should remain blank.

- Tan rows—worksheet title rows at the top of each worksheet are consistently shown with a tan background throughout the model.

- Blue rows—table titles within each worksheet are shown in blue. These titles are also numbered sequentially within each worksheet to aid users in scrolling through worksheets and navigating between related tables.

B2. Cell Formats

With the exception of the names of customer classes, which is one of the first required entries users must make on the model, all other input cells are numbers. Users should note that the cells throughout the model have already been formatted to fit:

Currency LE amounts:

- For cells measuring large numbers, such as revenues and costs, no decimal places are shown.

- For cells measuring costs or revenues per cubic meter of water, up to 2 decimal places are shown.

Cubic meters of water (m3):

- For cells measuring large numbers, such total levels of consumption, production, or purchases for sale, no decimal places are shown.

Percentages:

- Cells measuring percentage levels may show either no decimal places, when the expected percentage levels are relatively large (such as more than 10 percent), or they may show 1 decimal place when the expected range of values is relatively small (such as from 0.0 percent to 5.0 percent).

Other number:

- Other cells, such as those measuring total number of employees will show no decimal places, while those showing average number of employees per 1,000 connections show 1 decimal place.

Exhibit 6.1 Summary Structure of the Rate Application Model

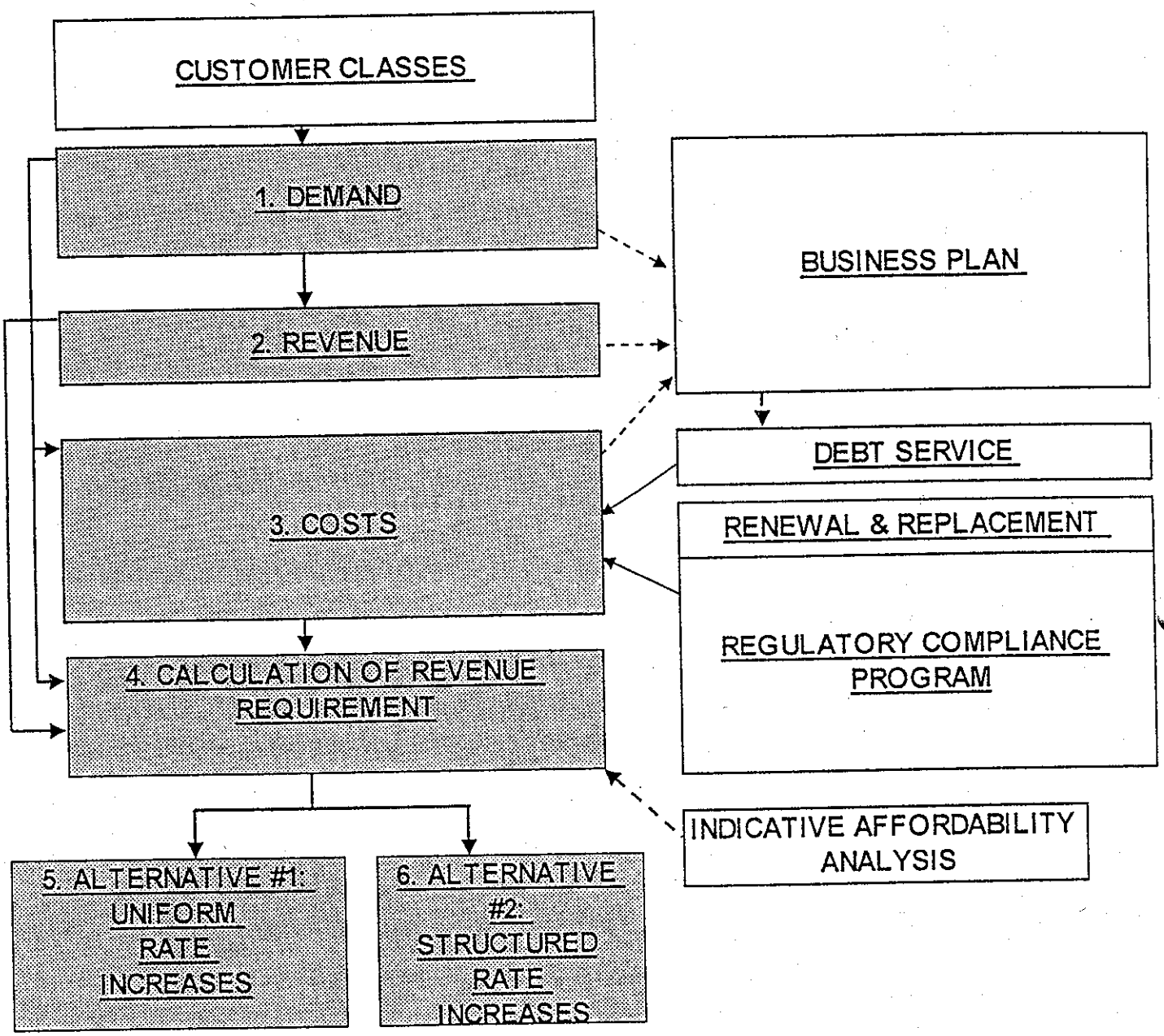
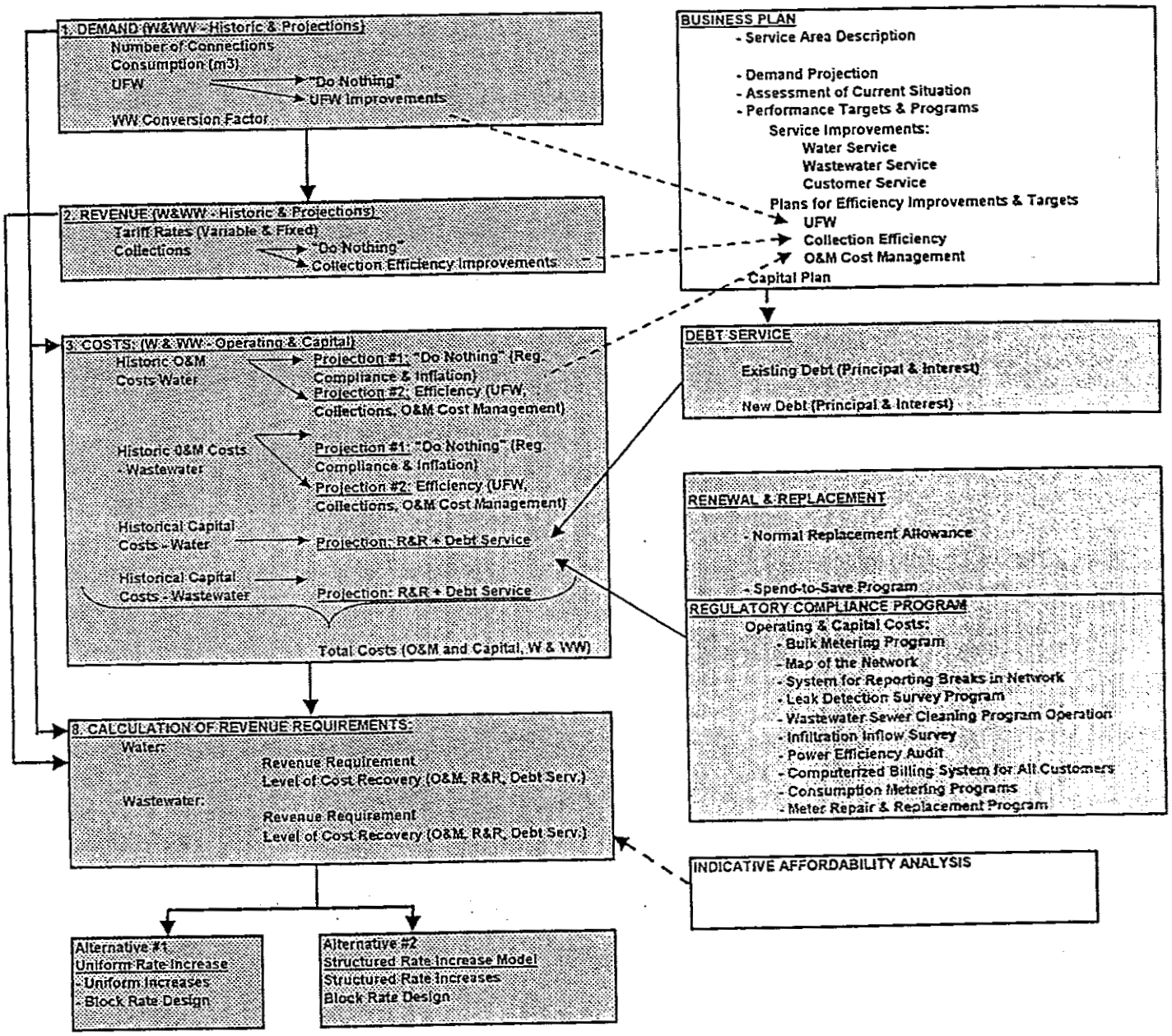


Exhibit 6.2 Detailed Structure of the Rate Application Model



Revenue Requirements Analysis

The basic revenue requirements analysis model consists of four linked worksheets:

1. Demand
2. Tariffs, revenues, and revenue collection
3. Costs
4. Revenue requirements calculation

The model is designed to identify the gap between projected cash-need expenses (given trends in demand, operational efficiency, inflation, and investment) and projected cash revenues (given trends in demand, operational efficiency, and investment, but assuming constant tariffs). The model assists the utility to identify the revenue requirement under the expected demand, efficiency, and investment assumptions, and the factor of increase needed to adjust current tariffs to cover the revenue requirements of various levels of cost recovery.

The columns in the model are grouped into a historical-year series and a rate-term projection series. The historical-year columns relate to the three historical years for which data are to be provided, the current budget year, and, where appropriate, total and average values for the historical and current year data. The purposes of these columns are to develop a picture of the current operational and financial situation of the utility and to develop an understanding of historical trends. If a particular data element is not available, the cell should be left blank (do not enter a zero).

The second series of columns relates to the rate term. These columns cover the 5 years of the rate term, plus columns for relevant 5-year totals and averages.

The formulas in the model are of several types:

- Some formulas, particularly ones related to intra-annual data elements, merely perform simple, time-saving mechanical calculations. For example, the model will automatically calculate the annual historical unaccounted-for water (UFW) rate (by dividing the billed consumption by the total treated water production and subtracting the result from "1").

- Another set of formulas, typically related to inter-annual relationships, use given values to project future values. For example, O&M Cost Projection No. 1 automatically increases chemical costs from one year to the next as a function of the expected inter-annual increase in treated water production.

- A third type of formula will modify the value of dependent cells based on a rate of change or improvement that is *input by the utility itself* rather than given in the model. For instance, in O&M Cost Projection No. 2, the rates of increase in commodity or service costs generated parametrically in O&M Cost Projection No. 1 can be

modified by the utility to show that efficiency improvements set out in the business plan are expected to reduce that rate of increase.

It is important to note that *the directionality of the linkages between the data elements often shifts between the historical and projection series of the model.* For example, while the historical series uses the demand and production figures to calculate the historical levels of UFW, the projection series adds projected UFW levels to projected demand to calculate the projected production. The directions of data cell linkage are discussed in detail below.

Exhibit VII-1 summarizes data inputs to the model that are to be provided by the utility.

A. The Demand Worksheet

A1. Water Demand

The water demand data elements are presented in five tables:

- Treated water connections (by class)
- Billed consumption of treated water (by class)
- Unaccounted-for water and production (historical trends)
- Unaccounted-for water and production (UFW reduction scenario)
- Billed consumption of treated water per connection

A1a. Determining Historical Year Water Demand

The inputs for historical year water demand are:

- Treated water connections (by class)
- Billed treated water consumption (by class)
- Treated water production

Note that bulk water purchases [from another governorate or a build-operate-transfer (BOT) project] should be identified separately from "own production."

When these data are put into the appropriate rows, the model generates the corresponding:

- Billed consumption per connection (by class): billed consumption by class divided by number of connections by class

- Unaccounted-for water (m^3): production minus billed consumption

- Unaccounted-for water (percentage): unaccounted-for water (m^3) divided by production (m^3)

A1b. Projecting Water Demand

The inputs required to project the 5-year rate term water demand are:

- Projected annual rate of growth in number of connections (by class)
- Projected annual rate of growth in billed consumption per connection (by class)
- Projected annual rate of reduction in unaccounted-for water (percentage)

The model generates two scenarios for the projected water production and UFW. The first uses the historical rate of UFW growth to generate the projected 5 years' UFW and required water production, given the water demand projection and no action to reduce UFW. The second applies the appropriate Egyptian Water and Wastewater Sector Regulatory Agency (EWRA) target for UFW reduction (see Section IV) to reduce the growth of UFW and, therefore, the production requirement.

If a utility will purchase water from another governorate utility or a BOT provider, it may be necessary for the utility to rebalance its sources of production in the projection series to reflect the total projected production.

From these inputs, the model generates:

- Billed consumption by class: connections per class multiplied by billed consumption per connection by class

- Two scenarios for unaccounted-for water (m^3): (total billed consumption) multiplied by the factor of additional water that must be produced to assure that production satisfies demand in view of the UFW rate (1/[100% - UFW%])

- Two scenarios for production required: total billed consumption plus UFW (m^3)

A1c. Linkages of Water Demand to Other Parts of the Model

- Billed consumption is an element in calculating the billable wastewater flow in the wastewater section of the demand module.

- The projected increase in connections generates projected increases in certain operations and maintenance (O&M) costs.

- Water consumption is an element in determining volume-based tariff revenues in the water section of the revenues module.

- The projected increase in water production generates increases in certain O&M costs in the costs module.

A1d. Business Planning Assumptions and Implications

As noted in Section V, "Business Planning Guidelines," the water utility must articulate its assumptions regarding the rate of growth in connections (by class), average consumption (by class), and UFW trends.

A2. Wastewater Demand

The wastewater demand data elements are presented in six tables:

- Sewer connections (by class)
- Billed treated water consumption of sewered users (by class)
- Billed treated water consumption of sewered users (by class)
- Water-wastewater conversion factor (by class)
- Billable wastewater discharge (by class)
- Billable wastewater discharge per sewered connection (by class)

The structure of the wastewater demand module partly reflects the data requirements for the new approach to determining wastewater service costs and tariffs (see Section III, "Affordability and the Cost Recovery Target").

A2a. Determining Historical Year Wastewater Demand

The inputs for historical year wastewater demand are:

- Number of sewer connections (by class)
- Billed treated water-consumption of sewered users (by class)
- Water-wastewater conversion factor (by class)

The billed treated water consumption of sewered users is best taken from the utility's billing records. Utilities are not advised to assume that the billed treated water consumption of sewered users is simply the average treated water consumption multiplied by the number of sewer connections because average water consumption tends to increase when a water user is sewered. However, when the percentage of sewer connections (in a given class) to water connections (in the same class) achieves levels of 85–90 percent, the simpler approach may be used.

The water-wastewater conversion factor, which is expressed as a percentage, is applied to the billed treated water consumption of sewered users to estimate the billable wastewater discharge. The billable wastewater discharge represents the volume of wastewater discharged to the sewer by sewered water users. A water-wastewater conversion factor of 80 percent is generally assumed in wastewater system design; this means that some 20 percent of the water consumption is fully consumed in use or evaporation. The model has been designed to give the utility the latitude to modify water-wastewater conversion factors in one or another class, though this is normally not necessary, and a utility that proposes a conversion factor greater or less than 80 percent for a given class should explain its grounds for doing so in its business plan. The exceptions are irrigation use, construction use, and new urban community ghurab use, which are normally not sewered and therefore have water-wastewater conversion factors of 0 percent,

although this is largely irrelevant because these users will not have sewer connections and will not contribute to the billed treated water consumption of sewered users.

When the inputs on sewer connections, billed treated water consumption of sewered users, and the water-wastewater conversion factor are entered, the model generates:

- Billed treated water consumption of sewered users per connection (by class): billed treated water consumption of sewered users divided by number of user connections
- Billable wastewater discharge (by class): billed treated water consumption of sewered users multiplied by the water-wastewater conversion factor
- Billable wastewater discharge per sewered connection: the billable wastewater discharge divided by the number of sewer connections

A2b. Projecting Wastewater Demand

The data elements needed to project wastewater demand during the rate term are:

- Number of sewer connections (by class)
- Billed treated water consumption of sewered users per connection (by class)
- Water-wastewater conversion factor

In projecting the billed treated water consumption of sewered users, the utility should take note of the expected rate term increase in the billed treated water consumption per water connection shown in the water demand module. Generally, there is no reason to modify the water-wastewater conversion factor from its historical levels.

When these data are put into the appropriate rows, the model generates:

- Billed treated water consumption of sewered users (by class): number of sewer connections multiplied by the average water consumption of sewered users
- Billable wastewater discharge (by class): the billed treated water consumption multiplied by the water-wastewater conversion factor
- Billable wastewater discharge per sewer connection (by class): billable wastewater discharge divided by the number of sewer connections

A2c. Linkages of Wastewater Demand to Other Parts of the Model

- Wastewater demand is partly derivative of water demand, especially the water consumption of sewered users.
- The billed treated water consumption of sewered users is an element in the determination of historical (and projected) wastewater tariff revenues.

- The billable wastewater discharge is an important element in the determination of wastewater revenue requirements.

- The total wastewater demand is a determinant of wastewater O&M costs.

A2d. Business Planning Assumptions and Implications

The key wastewater demand projection assumptions to be articulated in the business plan relate to the growth of sewer connections and the treated water consumption of sewered users.

B. The Revenues Worksheet

The Revenues worksheet is composed of 17 tables. In spite of the larger number of tables, the Revenues worksheet is actually less demanding than the Demand worksheet because the tables in the Revenues worksheet that relate to tariff revenue are generated automatically by the model from tables in the Demand worksheet and the Customer Classification worksheet. The principal new data-collection and business planning requirements of the Revenues worksheet are those related to the utility's revenue-collection levels and its other revenues.

It is important to understand that *current tariff rates are held constant in the Revenue* worksheet's *projections*. This is because the functions of the Revenues worksheet in the model are to enable the utility and the regulatory agency to:

- Isolate the impact of changes in relevant operating parameters (demand, collection efficiency, etc) on the utility's revenue stream

- Quantify the gap between expected expenses and expected revenues that must be met by tariff increases and/or continued subsidies

It is important also to understand the function of "other revenues" in the model. Other revenues are nontariff sources of utility revenue, including:

- Raw water sales
- Sludge/compost sales
- Treated effluent sales
- New connections revenue
- Licensing, permitting, and testing revenues
- Revenues from utility "enterprise" activities (goods manufactured for sale, services sold, etc.).

All other revenues are treated by the model as offsets to the tariff revenue requirement, that is, as deductions from utility O&M expenses. That is, the model assumes that the revenues generated from these utility activities at least cover the expenses associated with these activities, and that these expenses should not be included in the tariff burden.

It is typically the case that these activities are actually "profitable" for the utility in the sense that they typically generate revenues in excess of their actual expenses. But it is also typical that at

present most utilities cannot fully isolate their Other Activity expenses from their total expenses. Regulatory accounting guidelines to be developed by the regulatory agency will require segregation of Other Activity revenues and expenses, and it is expected that in future rate terms the regulatory agency will identify a percentage of "surplus" Other Activity revenue for retention by the utility. On the other hand, the regulatory agency will adopt a generally critical view of other activities that do not cover their expenses, especially if these activities do not make any contribution to core utility functions.

B1. Water Tariff Revenues

The water revenues module is composed of five tables:

- Volume-based water tariff rates
- Volume-based water tariff revenues
- Fixed-charge water revenues
- Total water tariff revenues
- Water tariff revenue per m^3 billed

B1a. Determining Historical Year Water Tariff Revenues

The annual total water tariff revenues are the sum of the *volume-based water tariff revenues* and the *fixed-charge water tariff revenues*.

Volume-based water tariff revenues are normally the product of the billed treated water consumption per class (from the Demand worksheet) and the class-specific tariffs per m^3 billed. Fixed-charge water tariff revenues are the revenues derived from the various fixed charges included on the water bill. Currently, in new urban communities they include:

- Consumption Insurance (*Ta'min Istihlak*)
- Large User Insurance (*Ta'min Insha'at*)
- Collection Fees (*Rusum Tahsil*)
- Penalties (*Ihdar Miyah*)

In governorate utilities, a meter maintenance charge is common. The utility should attach to its rate application a copy of its standard bill computation (*izn difa'*) and a standard bill. Also attach a list of the fixed charges in use, the unit charge for each type of fixed charge, and the bases for levying the charge (e.g., once per bill, once per year per account, etc.)

Charges such as sales tax and Local Service and Development Fund contributions, which represent revenues passed on to the other government agencies, should not be included. New Urban Communities Authority (NUCA) *muqaysa* revenue should be treated as Other Activity revenue.

B1b. Projecting Water Tariff Revenues

Since the Revenues worksheet holds the current tariffs constant throughout the rate term, the input requirements for the water tariff revenue projections are the same as for the corresponding historical rows. However, utilities should exercise care in developing the fixed-charge water tariff projections, since these are sensitive to the type of (and change in) fixed-charge billing units, which are too various to be incorporated into the model without excessive complication.

B1c. Linkages to Other Parts of the Model

As noted above, the volume-based water tariff revenues are largely derivative of the water demand. The water tariff revenue is an element in determining the utility's revenue collection efficiency. The water tariff revenue is a key element in calculating the total and average water revenue requirement.

B1d. Business Planning Assumptions and Implications

Limited. Since current water tariff rates are held constant, the trend in water tariff revenues is largely a function of demand.

B2. Wastewater Tariff Revenues

This module is composed of three tables:

- Wastewater service tariff rates
- Wastewater service tariff revenues
- Wastewater service tariff revenue per m^3 billable wastewater discharge

This is an extremely simple module to complete. The complications that arise from the shift in billing approaches between the historical use of surcharges and the future use of consumption-based charges are managed by the model.

B2a. Determining Historical Wastewater Tariff Revenues

The historical wastewater tariff revenues are simply the product of the billed water consumption of sewered users (by class) multiplied by the wastewater tariff rates. The model has converted the wastewater surcharge percentages for each class into an equivalent wastewater tariff per m^3 of water billed to sewered users.

An example of how the LE/m^3 wastewater tariff is derived, using the current NUCA customer classification and wastewater surcharge rates, is shown below:

Example Conversion of NUCA Wastewater Surcharges to Wastewater Unit Tariff

Class	Surcharge Rate	Current Water Tariff (LE/m^3)	Equivalent Wastewater Tariff (LE/m^3)
Residential	10%	LE 0.30	LE 0.03
Religious	10%	LE 0.30	LE 0.03
Governmental	20%	LE 0.30	LE 0.03
Service	20%	LE 0.40	LE 0.08
Commercial	20%	LE 0.50	LE 0.10
Industrial	30%	LE 0.75	LE 0.225
Investment	30%	LE 0.75	LE 0.225

The final table, Wastewater Tariff Revenue per m^3 Billable Wastewater Discharge, divides the wastewater tariff revenues by class by the billable wastewater discharge by class (which comes from the Demand worksheet) to estimate the average revenue per m^3 billable wastewater discharge. This calculation, which is needed to support the wastewater tariff revenue projections, is necessary because future volume-based wastewater revenue will be calculated from the billable wastewater flow rather than the total billed water consumption of sewered users.

B2b. Projecting Wastewater Tariff Revenues

Unlike the water tariff revenue projection, the wastewater tariff revenue projection formulas operate differently than the historical wastewater tariff revenue calculation.

The projected wastewater tariff revenue is the product of the multiplication of the following annual row elements:

- The billable wastewater discharge by class (from the Demand worksheet)
- The wastewater tariff revenue per m^3 billed wastewater discharge by class

B3. Total Tariff Revenues and Revenue Collection Efficiency

This module is composed of six tables:

- Total water and wastewater tariff revenues
- Water and wastewater tariff revenue collections
- Tariff revenue collection efficiency rates (two scenarios)
- Projected water and wastewater revenue collections (under improved collection rates)
- Water revenue collection
- Wastewater revenue collections

The only new historical data requirement for this series is the actual tariff revenue collections, from the utility's billing records.

B3a. Determining Historical Total Tariff Revenues and Revenue Collection Efficiency

The total tariff revenue is the sum of:

- Total water tariff revenue
- Total wastewater tariff revenue

Both data elements are provided in the previous sections of the Revenues worksheet.

Water and wastewater tariff revenue collections, expressed in total LE, represent the actual tariff revenue collections by the utility for the financial year.

The collection efficiency rates are generated by the model as the result of the tariff revenue collections by class divided by the total water and wastewater tariff revenues by class.

B3b. Projecting Total Tariff Revenues and Revenue Collection

As is typical of modules in the model that are influenced by utility business plan assumptions, the directionality of the formulas shifts in this module from historical to projection year calculations.

The total tariff revenue calculation is the same: the annual sums of the projected water and wastewater tariff revenues. But the projected revenue collections are now the *product* of the total tariff revenues multiplied by the projected collection efficiency *rates*.

The model develops two scenarios for the projection of revenues collected.

1. In Projection No. 1 (done on the same row as the historical revenue collection table), collections are projected applying the historical collection efficiency rate to the projected revenue.

2. Projection No. 2, presented in Table 2.13, calculates the collections expected when the collection efficiency improvement targets, given in Table 2.12, are applied to the projected revenues. (See Section IV for the collection efficiency improvement targets.)

Tables 2.14 (Water Revenue Collection) and 2.15 (Wastewater Revenue Collection) apply the overall collection efficiency rate to water and wastewater revenues, respectively.

B3c. Linkage to Other Parts of the Model

- The total tariff revenues are derived from earlier sections of the Revenues worksheet, which are in turn based on the Demand worksheet.

- The total revenue collection is the main element in the determination of the utility's collection-efficiency adjusted revenue requirements, as the basic formula for determining the tariff rate increase factor is costs/collections (see below).

B3d. Business Planning Assumptions and Implications

The collection efficiency improvement targets are critical to the determination of the utility's projected revenue collections. As noted in Section V, utilities are expected to develop collection-efficiency improvement program plans as part of their business plans.

B4. Other Revenues

The definition and significance of other revenues was described in section B above. In short, these nontariff sources of revenue will be treated as extraneous utility expenses to be deducted from the revenue requirement. In this way, the other revenues are used to offset the tariff revenue requirement. Note that the deduction occurs in the Costs worksheet, and that other water revenues are deducted from water expenses and other wastewater revenues from wastewater expenses.

The Other Revenues module consists of two tables:

- Other revenues: water
- Other revenues: wastewater

The model identifies some typical other revenue categories in each table, and leaves a blank row in each table for additional types of other revenue. The utility should identify each additional type of other revenue in the "Type" column. The utility's model operator need only insert new rows before the Total Other Revenues row in order to accommodate additional types.

B4a. Determining Historical Other Revenues

Historical other revenues data are usually readily identifiable. New connections revenue is also usually identified in the income statements. Raw water sales and treated effluent sales can be identified from billing records.

B4b. Projecting Other Revenues

Since other revenues reduce the tariff revenue requirement and since they may constitute a significant part of the utility's revenue, the same care should be taken in their projection as in other modules. The following guidelines may be useful:

- New connections revenue will bear a relatively close relationship to the projected growth of new connections.

- Treated effluent sales will be related to the wastewater demand, though the precise relationships will depend on the utility's assessment of whether the treated wastewater demand will grow at the same rate as that of the billable wastewater discharge.

- Raw water sales. Historical trends are likely to be a reliable guide to the raw water demand. But utility managers should consider raw water demand in the larger context

of treated water demand; utilities that find that the projected treated water demand (and UFW) begins to exert pressure on the utility's water production capacity will have to consider restricting future raw water supplies.

It is important to recognize that the prices charged for utility other products and services are generally not regulated charges, that is, the utility is free to charge whatever price the market for the relevant goods and services will bear. (An exception to this rule is new connection charges, which the regulatory agency expects to regulate in the future.)

B4c. Linkages to Other Parts of the Model

There are general relationships between other revenues and various elements in the Demand worksheet, as explained in section B4b above. Other revenues are deducted from O&M costs in the Costs worksheet to establish the Net O&M Costs for purposes of calculating the revenue requirement.

B4d. Business Planning Assumptions and Implications

Increasing other revenues can be an important means of reducing the revenue requirement. As such, strategies for increasing other revenues may and should be developed in the business plan. However, care must be taken not to program utility resources (human, physical, and financial) to other-revenue generating activities to the extent that these resources would be diverted from or detract from performance of the utility's statutory functions of clean water supply and wastewater collection, treatment, and disposal. This is especially the case in enterprise activities (e.g., workshops) and in some cases, raw water supply.

C. The Costs Worksheet

The Costs worksheet establishes the utility's rate term cash needs. (See Section III, "Cash Needs," for the definition and classification of cash needs.)

The Costs worksheet has 12 tables: six for water and six for wastewater. For each type of utility (water or wastewater), the Cost worksheet involves three main analyses:

- O&M costs
- Capital costs
- Net costs

The "net cost" analysis summarizes the respective O&M and capital costs analyses and then deducts the utility's nontariff revenue (which, as noted earlier, is used to offset the cash needs of statutory utility services) from O&M costs to arrive at the total utility cash need.

The O&M analysis includes two projections:

1. The first projects the O&M cash need based on the projected change in key operating parameters (such as the number of connections and the volume of water produced or a wastewater collected) and the impact of inflation, assumed to be 3 percent for materials

and services inputs. (Note that both water O&M cost projections are based on the water production volumes of Demand worksheet Projection 2, which presupposes UFW reduction.)
2. The second projection incorporates the impact of O&M input cost controls set out in the performance targets and business plans.

C1. Water Supply Costs

C1a. Water O&M Costs

C1a(1). Determining Historical Water O&M Costs

Table 3.1 refers to historical costs only. (See Section III, "Cash Needs," for a definition of the line items used in the O&M cost tables.) Costs of water purchased from an external governorate utility or a BOT project should be reported in the "Purchases for Sale" row. O&M service contract costs should be reported under "Maintenance" or "Other Services," following their classification in the utility's income statement.

Note that water utilities should also show their total staffing levels in this table. Combined water/wastewater utilities should report water-only staff in this row, prorating the numbers of finance/administration, and general management staff between water and wastewater according to the ratio of water or sewer connections to the total (water plus sewer) connections.

C1a(2). Parametric Projection of Water O&M Costs

No inputs are needed to Table 3.2, which projects the growth of water O&M expenses in the absence of cost control measures other than the UFW reduction projection in the Demand worksheet. The parametric formulas used in Table 3.2 are the following:

- Labor costs are increased according to the historical trends in staff and sewerage salary growth.
- Power and chemicals costs increase in proportion to the inter-annual increase in water production (from Table 1.4).
- All other commodity and service costs increase in proportion to the inter-annual increase in water connections (from Table 1.1).
- "Purchases for sale" costs increase in proportion to the inter-annual increase in Bulk Water Purchases (from Table 1.4).
- All nonlabor inputs are increased annually for 3 percent inflation.

C1a(3). Projection of O&M Cost Impact of Input Efficiencies

The second O&M cost projection factors the impact of input-related efficiencies set out in the performance targets and business plan into the first O&M projection.

With the exception of the Staffing per Thousand Connections row, for which values are derived from the performance targets, all other efficiencies should be derived from initiatives proposed in the utility's business plan. These efficiencies should be input as values less than 1.00 in the year(s) in which they are expected to be achieved. For example, if a utility plans a power factor correction program to achieve 5 percent power cost reductions in years 2004 and 2005, it would enter 5 percent in the corresponding year columns in the Power Costs row. The model will adjust subsequent year values to show cumulative effects of 1 year's improvement.

If no efficiency improvement in a cost item is expected in a given year, simply leave the appropriate cell blank and the model will carry over the Projection No. 1 value adjusted for the prior year Projection No. 2 achievements.

C1b. Water Capital Costs

Definitions and classifications of capital costs are provided in Section III, "Cash Needs."

C1b(1). Historical Water O&M Costs

For historical renewal and replacement (R&R) expenditure, utilities may use historical data on R&R project costs, if available. For historical debt service, show actual payments rather than obligations. (Obligations will be shown in the historical balance sheets submitted with the rate application.)

C1b(2). Projecting Capital Costs

The projected R&R cost has two components:

1. An allowance for normal replacement and extension works and for "spend-to-save" projects; this allowance is equivalent to 2 percent of each projection year's expected total value of fixed assets. The value of fixed assets is the value of current fixed assets plus assets to be added to service during the rate term. The latter should be shown in the capital plan, an attachment to the business plan.

2. Capital costs associated with achieving compliance with the accountability targets. The Regulatory Compliance Budgeting worksheet can be used to develop these costs. Projected debt service costs should be divided into service of new debt and service of pre-rate-term debt service obligations. The Debt Service Calculation worksheet included in the software package can be used to develop these costs.

C1c. Water Unit Cost Analysis

The final row of Table 3.4 calculates the total water supply costs. Table 3.5 calculates water cost per m^3 sold. No original inputs are required for this table.

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C1d. Water Net Costs

This table deducts Water Other Revenues (Table 2.16) from Water O&M Costs to arrive at the Net Water Cash Need.

C2. Wastewater Costs

The wastewater costs module is in all respects similar to the water costs module and can be completed following the same instructions. Increase in the billable wastewater flow is used to project growth of wastewater power and chemical costs in Table 3.7.

D. Revenue Requirements Calculation Worksheet

This is the final worksheet in the revenue requirements analysis. For each of water and wastewater, it contains two tables:

- Revenue requirements (Table 4.1 or Table 4.3)
- Cost recovery scenarios (Table 4.2 or Table 4.4)

The revenue requirements table consolidates the data from the preceding modules to develop the utility's total revenue requirement. No original inputs are needed to complete the revenue requirements table.

The cost recovery scenarios table indicates the average tariffs required for each level of cost recovery:

- Recovery of O&M costs only
- Recovery of O&M and R&R costs
- Recovery of O&M, R&R, and debt service costs, that is, full cost recovery

One original input is needed in the cost recovery scenarios table, namely, the target level of cost recovery, which is expressed as the percentage of each level of cost recovery that the utility is expected to achieve. Once this input is entered, the model generates the expected tariff revenue and, in cases of partial cost recovery, the required subsidy to make up the remainder of the total revenue requirement.

D1. Water Revenue Requirements

The method of determining the total revenue requirement was explained in Section III. Section III explained that the cash needs of the utility constitute its basic revenue requirement. The cash needs would constitute the total actual revenue requirement if the utility sold all of what it produced and, moreover, collected the revenues for all of what it sold. In such an ideal case, the required increases in tariffs would be represented by the factor (cash needs/revenues at current tariffs). But in the real world, the revenue requirement must be set at a level higher than the total cash need in order to compensate for inefficiencies in revenue collection; this is so that actual cash receipts be adequate to cover the cash needs.

Table 4.1 performs the following calculations:

- The total cash need is carried over from Table 3.11.
- The total projected water consumed is carried over from Table 1.2, and the total projected revenues and collections are carried over from Tables 2.4 and 2.14.
- The cash need per m^3 consumed is calculated.
- The ratio of expected collections to the cash need is calculated to arrive at the average tariff increase factor.
- The average tariff increase factor is multiplied by the expected revenues from current tariffs to arrive at the total revenue requirement.
- The total revenue requirement is divided by the expected volume of consumption to derive an average unit tariff.

D2. Water Cost Recovery Scenarios

The cost recovery scenarios table shows the revenue requirements and average tariffs for each of three levels of cost recovery. It then requires the utility to state its cost recovery target, and then goes on to calculate the projected tariff revenue and subsidy requirements.

The first part of the cost recovery scenarios table performs the following calculations:

- The average tariff increase factor is multiplied by the three types of cash need to arrive at the revenue requirement for each type of cash need.
- Each level of revenue requirement is progressively added to the previous one(s) to show the cumulative revenue requirement for each level of cost recovery.
- The average tariff for each level of cost recovery is calculated.

- The average tariff increase to achieve each level of cost recovery is calculated.

At this stage, the utility inputs the percentage of each level of cost recovery it intends to achieve. For example, a utility that intends to achieve recovery of O&M and R&R costs (but no debt service costs) would enter:

O&M	100%
R&R	100%
Debt service	0%

The model proceeds to calculate the total tariff revenue expectations for each type of cash need, the cumulative tariff revenue expectations, the total tariff revenue target, and the required subsidy. The model retracts the collection efficiency adjustment from the subsidy requirement.

As noted in Section III, "Affordability and the Cost Recovery Target," all utilities are expected at a minimum to propose to achieve recovery of O&M and R&R costs; utilities that could achieve this cost recovery target without significant tariff increases are expected to propose a greater or lesser percentage of debt service cost recovery as well.

A utility that proposes to achieve a level of cost recovery that does not cover O&M and R&R costs must present a well-reasoned argument backed by reliable and convincing data in its affordability assessment.

D3. Wastewater Revenue Requirements

The wastewater revenue requirement calculation is in all essentials identical to the water revenue requirement calculation, except that the billable wastewater flow is the basis for calculating the average unit wastewater tariff.

D4. Wastewater Cost Recovery Scenarios

Calculations and input requirements are the same as those for the water cost recovery scenario.

Table 7.1 Summary of Data Input Requirements for the Revenue Requirements Model

1. DEMAND	Historic		Projected
1.1 Water - Treated Water Connections	Number of Connections by class/block		Projected growth rates
1.2 Water - Billed Consumption of Treated Water (m3)	Billed consumption by class/block		Projected growth rates
1.3 Water - Production & UFW	Own water production (m3) Purchased water for sale (m3)		Projected Own Water production (m3) Projected purchases of water for sale (m3)
1.4 Water - Projected Production & UFW Improvement			
1.5 Water - Billed Consumption of Treated Water per Connection (m3 per Connection)			
1.6 Wastewater - Sewer Connections	Number of Connections by class/block		Projected growth rates
1.7 Wastewater - Billed Consumption of Treated Water by Sewered Connections (m3)	Billed consumption by class/block		Projected growth rates
1.8 Wastewater - Billed Consumption of Treated Water by Sewered Users per Connection (m3 per Connection)			
1.9 Wastewater - Water-Wastewater Conversion Factor	Water-Wastewater Conversion factor by class/block		Projected W-WW Conversion Factor Changes by class/block
1.10 Wastewater - Wastewater Discharge (m3)			
1.11 Wastewater - Billable Wastewater Discharge per Sewer Connection (m3 per Connection)			

Table 7.1 (continued) Summary of Data Input Requirements for the Revenue Requirements Model

2. REVENUE	Historic		Projected
2.1 Water - Volume-Based Water Tariff Rates (LE/m3)	Volume-based Tariffs by class/block		Current volume-based tariffs
2.2 Water - Volume-Based Charges (LE/m3)			
2.3 Water - Fixed-Charge Water Revenues (LE/m3)	Fixed-charge revenue by class/block		Current fixed-charge tariffs
2.4 Water - Total Water Tariff Revenues (LE)			
2.5 Water - Water Tariff Revenue per m3 Billed (LE/m3)			
2.6 Wastewater - Wastewater Service Tariff Rates	Wastewater Service Tariffs by class/block		Current wastewater service tariffs by class/block
2.7 Wastewater - Wastewater Service Tariff Revenues			
2.8 Wastewater - Wastewater Tariff Revenue per m3 of Billable Wastewater Discharge			
2.9 Total Water & Wastewater Tariff Revenues (LE)			
2.10 Water & Wastewater Tariff Revenue Collections (Projection #1: "Do Nothing")	Water & Wastewater Tariff Revenue Collections by class/block		
2.11 Tariff Revenue Collection Efficiency Rates (Projection #1: "Do Nothing")			
2.12 Projection #2: Improvements in Collection Efficiency Rates	Targeted Collection Efficiency Levels for specific user classes		
2.13 Projection #2: Improved Collection of Water & Wastewater Revenues (LE)			
2.14 Water - Water Tariff Revenue Collections (from Projection #2)			
2.15 Wastewater - Wastewater Tariff Revenue Collections			
2.16 Water - Other Revenues	Other Water Revenues by source		Projected growth rates of "Other Revenues" for Water
2.17 Wastewater - Other Revenues	Other Wastewater Revenues by source		Projected growth rates of "Other Revenues" for Wastewater

Table 7.1 (continued) Summary of Data Input Requirements for the Revenue Requirements Model

3. COSTS	Historic	Projected
3.1 Water - O&M Expenses	Labor, Commodities, Services & Other Expenses	
3.2 Water - O&M Projection #1: Impact of Demand Parameters		Projected Taxes & Duties
3.3 Water - O&M Projection #2: Impact of Efficiency Improvements		Projected Efficiency Improvements for Labor, Commodities, Services & Other Expenses
3.4 Water - Capital Costs	Fixed Assets, R&R costs, Existing Debt Principal & Interest	Projected Fixed Assets, Regulatory Compliance Capital, Existing & New Debt Principal & Interest
3.5 Water - Water Service Cost Analysis (LE/m3 Sold)		
3.6 Wastewater - O&M Expenses	Labor, Commodities, Services & Other Expenses	
3.7 Wastewater - O&M Projection #1: Impact of Demand Parameters		Projected Taxes & Duties
3.8 Wastewater - O&M Projection #2: Impact of Efficiency Improvements		Projected Efficiency Improvements for Labor, Commodities, Services & Other Expenses
3.9 Wastewater - Capital Costs	Fixed Assets, R&R costs, Existing Debt Principal & Interest	Projected Fixed Assets, Regulatory Compliance Capital, Existing & New Debt Principal & Interest
3.10 Wastewater - Service Cost Analysis (LE/m3 Collected)		
3.11 Water - Net Costs		
3.12 Wastewater - Net Costs		

4. CALCULATION OF REVENUE REQUIREMENT	Historic	Projected
4.1 Water - Revenue Requirements		
4.2 Water - Cost Recovery Scenarios	Cost Recovery Targets (%) for O&M, R&R and Debt Service	Cost Recovery Targets(%) for O&M, R&R and Debt Service
4.3 Wastewater - Revenue Requirements		
4.4 Wastewater - Cost Recovery Scenarios	Cost Recovery Targets (%) for O&M, R&R and Debt Service	Cost Recovery Targets (%) for O&M, R&R and Debt Service

Rates Design

Tariff rate design is the process of distributing the total tariff revenue requirement among customers. The tariff rate design submission to the regulatory agency consists of:

- The rate design strategy statement
- The rate design calculation
- Supporting documentation as appropriate

The rate design strategy statement describes the proposed rate structure and explains local conditions and utility objectives that have led the utility to develop the particular structure.

The rate design calculation shows the quantity and price estimates for each customer class/block and volume-based and fixed components of the tariff, and demonstrates that the expected total revenues generated by the proposed structure cover the approved tariff revenue requirement.

Supporting documentation may include bill tabulations, studies of water use, socioeconomic studies, or other information the utility has used to develop its rate design strategy and structure.

The rate structure is not expected to receive the same degree of regulatory scrutiny as the revenue requirement. The regulatory agency's principal interests in the rate design are:

- To check that the design is robust enough to generate the revenue requirement

- To assure that no type of customer is being treated unfairly, that is, subjected to bear an inordinate share of the revenue burden

A. Rate Design Strategy

Tariff structures can range from the extremely simple, such as a single uniform rate per m^3 applied to all customers, to the extremely complex, such as a structure that applies a fixed charge based on meter size plus a series of volume-based changes with inclining or declining rates for various levels of consumption, possibly incorporating also seasonal or time-of-day premiums.

The best rate structure is one which reflects the operational and financial circumstances of the utility considered together with the economic and social circumstances of the service area.

Exhibit VIII-1 illustrates how rates may be structured to reflect local features or trends.

Exhibit VIII-1. Matching Rate Structures to Local Conditions

Condition	Rate Design Objective	Rate Structure Elements
Demand pushing the limits of capacity	Encourage conservation	• Inclining block rates
Capacity in excess of demand	Encourage consumption	• Declining block rates
Monthly utility income fluctuates because of seasonal demand pattern	Stabilize monthly revenue yield	• Include a fixed charge component
Generally depressed income levels	Make lifeline level of service affordable to all	• Low rate for lifeline use • Inclined block rates applied to each block of the customer's usage
Pockets of severe poverty	Make lifeline level of service affordable to all	• Low rate for lifeline use • Inclined block rates applied to total consumption • Cross-subsidies from nonresidential users
Underdeveloped billing system	Make new rates easy to administer	• Uniform rate *or* • Increase each class's rate by the same percentage

Rate design objectives may clash with one another. The rate design strategy statement lists the utility's principal rate design objectives and describes how the utility has chosen to weight their rate design objectives.

B. Customer Classification

A basic element of the rate structure is the customer classification. A customer classification should group together users with broadly similar patterns of demand. No two users make identical demands on the water or wastewater system, but major classes can be identified on the basis of broad demand similarities. Egyptian Water and Wastewater Sector Regulatory Agency (EWRA)'s view is that the classification currently in use in most of the governorate utilities has too many classes, that is, it differentiates between types of user that have no meaningful differences in their pattern of demand. The classification used in the new urban communities, on the other hand, has fewer classes, but the groupings themselves combine users with different characteristics and differentiate users with similar characteristics. For most water utilities, the following classification of piped treated water users is recommended.

B1. Domestic Use

Domestic use, which typically accounts for the largest part of total demand in governorate utilities, is characterized by relatively significant time-of-day and time-of-year peaking demands. Domestic users generally have latitude to adjust their consumption in relation to price.

Domestic use is the category of use that may include low-income households whose intake of sufficient water may need to be safeguarded through the provision of a minimum, "lifeline" supply at rates that may be lower than the average tariff requirement.

B.2 Commercial Use

Commercial use refers to the use of utility services for economic activity, whether the establishment is privately or publicly owned. Commercial users have the capacity to conserve. High-volume commercial use is a typical source of cross-class subsidy. Nevertheless, there are limits to the capacity of high-volume commercial users to subsidize domestic use, especially where high-volume commercial use only accounts for a small part of total service area consumption. Unreasonably high rates will prompt major conservation efforts that could result in consumption below the levels expected in the demand projection.

B3. Institutional Use

Institutional users are facilities—usually public or communal—that must provide water and sanitation facilities for the use of a community of users who do not own the basic facility or are in transient residence. Typical institutional users are government office buildings, schools, hospitals, army barracks, prisons, mosques, and public standpipes. Institutional use may constitute a significant part of the total demand. The impact on system peak capacity requirements depends on the character of the institution.

The distinctive feature of institutional use is the limited capacity for conservation. This is a function of the public or communal access to the service. Hence, although institutional use may constitute a significant part of the total demand, it should not be a major source of cross-subsidy: the application of a sharply inclined block rate structure to this category could result in extremely high bills that the owner has little capacity to control.

B4. Irrigation Use

Treated drinking water for irrigation as a sole use is uncommon in governorate utilities. Dedicated agricultural use is typically commercial use, though it may entail time-of-year peak demands not characteristic of industrial use. Conservation is usually possible. In general, irrigation use can serve as a source of cross-subsidy.

In some new urban communities, treated water is used to irrigate public spaces and city green belts. Conservation is possible. This kind of use could be a source of cross-subsidy if the tariff burden, usually paid by the government, were recovered by the local administration through property taxes. This is equitable since property owners benefit from the desertification control and aesthetic benefits of the municipal irrigation program.

Exhibits VIII-3a, VIII-3b, and VIII-3c show the equivalences between the classification described above and the classifications currently in use in the governorates, Beheira, and the new urban communities, respectively.

Utilities may propose alternative classifications if deemed necessary to reflect special local patterns of demand. The utility's rate design strategy statement should set out the utility's proposed customer classification and explain how and why the proposed classification has been developed.

C. Consumption Blocks

It is common to structure rates that differentiate between levels of consumption. Block differentiation has long been applied to domestic use in the governorate utilities, in which total use above 30 m^3 per month is billed at a higher rate than use up to 30 m^3.

Block rate structures may supplement class-differentiated rate structures or be used as an alternative to class-based structures. The latter approach may be appropriate in utilities in which consumption is overwhelmingly domestic.

Block rate structures may use inclining rates or declining rates. A declining rate structure is one in which the rates decline as consumption increases. This approach may be sensible when the utility has excess capacity and wishes to maximize the return on fixed costs.

Inclining rates, in which rates increase as consumption increases, are applied typically for one or both of the following reasons:

- The utility faces current or imminent capacity shortfalls and wishes to manage demand in order to make the existing capacity sufficient to meet basic demand until new capacity can be installed.

- The utility wishes to cross-subsidize lifeline service consumption levels through higher rates on "luxury" levels of consumption.

If block rate structures are not developed systematically, the utility is likely to end up with revenue shortfalls. Historical records on levels of consumption by types of users are essential to setting the appropriate blocks and calculating tariff rate differentials that generate the required total revenue.

Generally, a bill tabulation, that is, a set of class-specific consumption frequency distribution tables, will provide adequate data for the block design. An example is shown in Exhibit VIII-2. The exhibit summarizes the number of metered users and total metered consumption represented by various blocks of usage over a single billing cycle. Note that in this table the figures for a given block represent the total number and total consumption of all users whose total consumption *ends* in that block. This table responds to a need for information to be used in setting blocks based on the user's total consumption. Other kinds of bill tabulations may be developed that show, for example, the number of users and total consumption in the block, including the consumption of users whose total use extends into higher blocks. This tabulation could be appropriate if the utility wishes to apply the block structure to each level of consumption *within* the user's total consumption.

The benefit of the bill tabulation is to enable the utility to estimate the percentages of each block in the total class (and aggregate total) consumption.

All utilities should adopt the practice of generating and storing bill tabulations for each billing cycle. For rate design purposes, three consecutive years of bill tabulation records are ideal. If three years are not available, a 1-year record is satisfactory. If a 1-year record is not available, selected tabulations representing the four seasons will provide some basis for the block design.

D. A Note on Cross-Subsidization

Utilities face considerable political and social pressure to keep rates for domestic use low. However real such pressures are, there may be limits to the extent of cross-subsidization possible in a rate design. Nondomestic consumption may represent such a small percentage of total consumption, especially in provincial governorates, that cross-class subsidies can only provide significant domestic rate relief at the cost of unreasonably high nondomestic rates.

The purpose of tariff increases is to enable the utility to continue to operate, maintain, and expand the system. All users suffer if the utility is not financially viable. In allowing partial cost recovery, the government is already providing financial support (through subsidies) to the population at large. There is no basis for further user subsidization (i.e., through cross-subsidies) other than that required to assure lifeline supply to the truly poor. The key to viable cross-subsidization policy is the determination of the lifeline level of consumption. The current allowance of 30 m^3 per month for residential use in most governorates is far too high to be taken as a minimum supply. A supply of 10 m^3 per month (equivalent to about 65 LCD for a family of five) should be adequate for a household's basic needs for health and sanitation.

The second component of a viable cross-subsidization policy in governorates without significant nondomestic consumption is the introduction of more fine-grained blocks into the domestic rate structure. As a general rule, aim for block structure in which the 20 m^3 block closely approximates the average tariff, and introduce sharply inclined rates for "luxury" use (e.g., in excess of 30 m^3).

E. Rates Design

Once the rate design objectives have been formulated, the rate-structural principles identified, and the appropriate customer classification and consumption blocks have been determined, the setting of the actual rates is a relatively straightforward, mechanical process in which various unit prices are applied to the appropriate class/block consumption estimates (and/or number of fixed-change units) until a set of prices is arrived at which generates the total tariff revenue requirement.

Although the arithmetic of the rate design is relatively simple, complex rate structures (such as ones using block rates) require detailed data on the historical and projected breakdown of consumption. A computerized billing system is generally a prerequisite for design of volume-related charges. The design of fixed charges needs information about meter size distribution.

Two rate modeling worksheets are included in the model.

E1. Uniform Rate Increase Model

This is a simple model in which the average tariff increase factor is applied to the current tariff rates. This model may be appropriate for utilities that have no information at all on block usage.

E2. Structured Increases Model

The structured increases model allows the utility to distribute the tariff revenue requirement among classes and then among blocks within classes. Both the class and block worksheets follow the same approach. First, each class's or block's rate-term consumption is listed and then calculated as a percentage of consumption. These percentages are used to derive class/block revenue requirements that are "naïve" in the sense that each row's share of the revenue requirement is treated as equivalent to its share of consumption. In order to structure the rates differently, the utility enters new percentages in the "Percentage of Cost to Bear" column. The model then calculates the new class/block revenue requirement and cubic meter price as well as shows the factor of increase to current tariffs that each new rate entails. Both models also automatically display average monthly bills for a range of consumption intervals.

Exhibit VIII-2. Example Bill Tabulation

Egyptian Water/Wastewater Sector Regulatory Agency
Name of Utility: Beheira Water Company
Attachment: BC Block Consumption
For Billing Period: 10/2001 (month/year)

Date Prepared:_____
Rate Term:_____

Blocks	Class A: Domestic		Class B: Commercial		Class C: Governmental		Class D: Public Sector		Class E:		Class F:		Total	
Total billed consumption of user	No. of users ending in this block	Total consumption of users ending in this block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)
0-20	266,006	3,123,179	11,943	110,688	1,421	28,420	430	8,600	7	140			279,807	3,271,027
21-30	29,911	802,652	700	18,598	246	6,272	56	1,411	3	85			30,916	829,018
31-50	22,581	969,292	661	28,872	347	14,031	66	2,665	11	476			23,666	1,015,336
51-100	9,920	772,411	379	31,023	462	33,644	84	6,045	35	2,579			10,880	845,702
> 100	1,572	260,947	190	53,987	1,071	639,212	213	128,325	65	16,578			3,111	1,099,049
Total	329,990	5,928,481	13,873	243,168	3,547	721,579	849	147,046	121	19,858	0	0	348,380	7,060,132

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Exhibit VIII-3a. Example Regrouping of Governorate-Type Customer Classification[a]

Existing Classification	Alternative Classification
1. Domestic Use	
Up to 30 m^3	Domestic
Greater than 30 m^3	Domestic
Building and construction works	Domestic
2. Nondomestic Use	
Places of worship	Institutional
Charity organizations	Institutional
Playgrounds	Institutional
Youth welfare centers	Institutional
Sports clubs	Institutional
- Clubs (a)	Institutional
- Clubs (b)	Institutional
Syndicates	Institutional
Embassies	Institutional
Abou Kier Port (ships—day/night)	Commercial
Alex. Port (sidewalk taps—day/night)	Commercial
Alex. Port (ships—day)	Commercial
Alex. Port (ships—night	Commercial
Dekheila Port (ships—day/night)	Commercial
Ship supply companies	Commercial
Public taps—free up to 80 m^3, > 80 m^3	Institutional
3. Companies and Enterprises	
Small factories, workshops	Commercial
Popular cafes and restaurants	Commercial
Big factories	Commercial
Filling stations, two- and three-star hotels	Commercial
Private schools, health insurance hospitals	Institutional
Garages, mills	Commercial
Bakeries	Commercial
Large factories with inlet pipe more than 30 millimeters in diameter	Commercial
4. Production and Investment	
Private hospitals	Institutional
First-class restaurants and first-class hotels	Commercial

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Exhibit VIII-3a. Example Regrouping of Governorate-Type Customer Classification[a] (Continued)

Existing Classification	Alternative Classification
Investment companies	Commercial
Free zones, travel agencies	Commercial
5. Raw Water for Irrigation[b]	
Governorates	N/a
Companies	N/a
6. Governments	
Factories, agencies	Institutional
Local government	Institutional
7. Distilled Water	N/a
8. Fixed Tariff for Governorate-Constructed Housing	
One bedroom	Domestic
Two bedrooms	Domestic
Three bedrooms	Domestic
Greater than three bedrooms	Domestic

[a] Alexandria example.
[b] Raw water sales (and distilled water sales) to be segregated from water tariff revenues.

Exhibit VIII-3b. Example Regrouping of Beheira Customer Classes

Existing Classification	Revised
Residential	Domestic
Governmental	Institutional
Religious	Institutional
Standpipes	Institutional
Commercial	Commercial
Public sector	Commercial

Exhibit VIII-3c. Example Regrouping of NUCA Customer Classes

Existing Classification	Alternative Classification
Residential	Domestic
Authorities and departments	Institutional
Local administration units	Institutional
Religious establishments	Institutional
Industrial (all factories)	Commercial
Construction works	Institutional
Private hospitals	Commercial
Free-zone companies	Commercial

Exhibit VIII-3c. Example Regrouping of NUCA Customer Classes (Continued)

Existing Classification	Alternative Classification
Tourism companies	Commercial
Investment companies	Commercial
Embassies	Institutional
Sports clubs (A and B levels)	Institutional
Private voluntary associations	Institutional
Syndicates	Institutional
Political party premises	Institutional
Private schools	Institutional
Commercial establishments	Commercial
Administrative offices	Commercial
Hotels, restaurants, casinos, cafés	Commercial
Gas stations	Commercial
Raw water[a]	N/a
Public playgrounds	Institutional
Youth centers	Institutional
Societies	Institutional
Public hospitals, health insurance organization hospitals	Institutional
Garages	Commercial
Bakeries	Commercial
Water sold at treatment plants (Ghurab, etc.), exclusive of transmission costs	Commercial

[a] Raw water sales to be treated as nontariff revenue.

Indicative Affordability Assessment Guidelines

All utilities should include an affordability assessment in the revenue requirements submission. The affordability assessment indicates the range of domestic use tariffs that would generate monthly household bills that do not exceed a certain percentage of average monthly household expenditure.

The affordability assessment is one basis for the determination of a utility's target level of cost recovery (see Section III, "Affordability and the Cost Recovery Target"). However, utilities will also be required to consider the opportunities for cost recovery posed by nondomestic users as well as high-volume domestic users, who may have the ability to pay tariffs higher than those deemed affordable for basic levels of domestic use.

A1. General Approach to Setting Affordable Tariff Levels

The general approach to assessing affordable tariff levels follows the standard espoused by the World Bank and other development agencies that a supply of water and wastewater services adequate to cover basic needs for drinking, cooking, bathing, and washing should be available to the average households at a price that does not exceed 3–5 percent of average household income. There are three variables involved in applying this approach to a given community:

1. The basic use standard
2. The precise value within the affordability criteria range of 3–5 percent that is to be applied
3. The average local household income

Once these values are provided, a "maximum affordable average monthly household bill" for the basic level of domestic consumption can be generated using the 1.5 percent standard. Dividing the value of this hypothetical bill by the assumed volume of use provides an indicative unit tariff for this level of domestic use.

A2. The Basic Use Standard

One hundred and thirty liters per person per day (LCD)—equivalent to 20 m^3 per month for a family of five—is believed to be sufficient for a family member's daily requirements for drinking, cooking, bathing, and washing, referred to herein as "basic use."

The several National Organization for Potable Water and Sanitary Drainage (NOPWASD)-commissioned master plans developed during the 1980s posited 65 LCD as the demand of a user in a rural household with a single water tap; this may be taken as a "lifeline" or absolute minimum level of service.

A3. The Affordability Standard

The lower range of the affordability criterion—3 percent—has been selected. Since water and wastewater tariffs will be calculated separately, the indicative assessment uses a 1.5 percent criterion for each service. (These percentages should be rebalanced in a situations in which one or the other service's average revenue requirement equates to a household bill less than 1.5 percent of household income.)

A4. Household Income Levels

The only known source of household budget data disaggregated by governorate is the CAPMAS household budget survey, conducted most recently in 1995/96. The original Central Agency for Population Mobilization and Statistics (CAPMAS) data were not available, but was reproduced, with adjustments to correct for perceived underreporting of income by survey respondents, in the Egypt Human Development Report (EHDR), published with updates annually by the Institute for National Planning with assistance from the United Nations Development Programme.

In order to assure that the income averages in EHDR are not excessive, the EHDR governorate per capita income averages for 1998/99 were reduced by the ratio of the per capita average national gross domestic product (GDP) household consumption to the average nationwide EHDR per capita income (*Monthly Economic Digest*, Ministry of Foreign Trade, vol. 3, no. 11, January 2002). In the series of exhibits following Exhibit A-1, the result is shown in the "Adjusted 98/99 GDP/capita" column. The adjusted 1998/99 per capita income is increased by 3 percent each year, following the Ministry of Foreign Trade's estimate of the annual GDP growth rate. Average *household* incomes were derived by multiplying the governorate per capita income by average family size for the governorate, calculated from CAPMAS 1996 census results.

The average household income is of little use in determining an affordable bill for *poor* households, estimated by EHDR 98/99 to constitute 22.9 percent of the population (22.5 percent of the urban population and 23.3 percent of the rural population). Developing a target tariff for such households is extremely difficult. No "average poor household" income estimate is available and, in principle, there is hardly a level below which incomes may not sink. (On the other hand, the ultra-poor are less likely to be connected to the network. Utilities may wish to use the average salary of their own employees as an indicator of the average low-income *household* income and then apply the 1.5 percent criterion to this figure to set a target tariff for lifeline use (65 LCD).

It should be noted that analysis of the EHDR data indicates a wide gap between the incomes of the poor and the average income. This gap is so wide that it is unlikely to be an effect of a small number of very wealthy households. This suggests that average "middle-class" incomes are truly in the range suggested in the tables.

A5. Using the Affordability Assessment to Set the Cost Recovery Target

Exhibit A-1 shows the indicative or target tariffs for basic domestic use (130 LCD, with 104 LCD billable wastewater flow) for the years 2002/03 to 2006/07 in the governorates for which governorate-level income data are available.

It is important to understand that the results of the affordability assessment are merely *indicative* of a range within which maximum affordable tariffs for a *basic* level of *residential* use should be plotted. Actual prices can be designed around the target level to make tariffs for lifeline levels of use lower and tariffs for luxury levels of use higher, or to cross-subsidize lifeline tariff levels through higher tariffs for nonresidential use. The proportion of nondomestic to total consumption is a useful indicator of the capacity for cross-class subsidization.

In its affordability assessment, the utility should use its historical billing data (as well as available professional demographic, social, and economic researches) to advise the regulator on the effect the governorate's particular conjuncture of income levels, urbanization levels, and class/block demand will have on ability and willingness to pay, and the implications for the utility's cost recovery target.

MAXIMUM RESIDENTIALTARIFFS FOR BASIC USE: 00/01

Governorate	EHDR 98/99 GDP/capita	Adjusted 98/99 GDP/capita	Average Family Size	Average Annual Family Income	Average Monthly Family Income	Monthly Basic Water Use per Person (m^3)	Monthly Basic Use for Family (m^3)	Monthly Basic WW Use per person (m^3)	Monthly Basic WW Use per Family (m^3)	Target % of Income for Water	Target % of Income for WW	Maximum Bill for Water	Maximum Bill for WW	Maximum m^3 Charge for Water	Maximum m^3 Charge for Wastewater	Maximum Monthly Bill
Cairo	8854.30	6,857	4.06	27,841	2,320	3.9	16	3.12	13	1.5%	1.5%	35	35	2.20	2.75	69.60
Alexandria	7024.70	5,440	4.15	22,577	1,881	3.9	16	3.12	13	1.5%	1.5%	28	28	1.74	2.18	56.44
Port Said	10536.0	8,160	4.14	33,781	2,815	3.9	16	3.12	13	1.5%	1.5%	42	42	2.62	3.27	84.45
Suez	7974.2	6,176	4.28	26,432	2,203	3.9	17	3.12	13	1.5%	1.5%	33	33	1.98	2.47	66.08
Damietta	5443.5	4,216	4.28	18,043	1,504	3.9	17	3.12	13	1.5%	1.5%	23	23	1.35	1.69	45.11
Daqahliya	3808.7	2,950	4.46	13,156	1,096	3.9	17	3.12	14	1.5%	1.5%	16	16	0.95	1.18	32.89
Sharqiya	3641.7	2,820	4.70	13,256	1,105	3.9	18	3.12	15	1.5%	1.5%	17	17	0.90	1.13	33.14
Qalyubiya	4695.4	3,636	4.61	16,764	1,397	3.9	18	3.12	14	1.5%	1.5%	21	21	1.17	1.46	41.91
Kafr El Sheikh	4387.1	3,398	5.04	17,124	1,427	3.9	20	3.12	16	1.5%	1.5%	21	21	1.09	1.36	42.81
Gharbiya	4628.5	3,585	4.70	16,847	1,404	3.9	18	3.12	15	1.5%	1.5%	21	21	1.15	1.44	42.12
Minufiya	3668.5	2,841	4.79	13,609	1,134	3.9	19	3.12	15	1.5%	1.5%	17	17	0.91	1.14	34.02
Beheira	4069.3	3,151	5.27	16,608	1,384	3.9	21	3.12	16	1.5%	1.5%	21	21	1.01	1.26	41.52
Ismailia	5215.7	4,039	4.64	18,743	1,562	3.9	18	3.12	14	1.5%	1.5%	23	23	1.29	1.62	46.86
Giza	5385.5	4,171	4.40	18,352	1,529	3.9	17	3.12	14	1.5%	1.5%	23	23	1.34	1.67	45.88
Beni Suef	2900.9	2,247	5.14	11,548	962	3.9	20	3.12	16	1.5%	1.5%	14	14	0.72	0.90	28.87
Fayoum	3146.1	2,437	5.01	12,207	1,017	3.9	20	3.12	16	1.5%	1.5%	15	15	0.78	0.98	30.52
Minya	3627.1	2,809	4.79	13,455	1,121	3.9	19	3.12	15	1.5%	1.5%	17	17	0.90	1.13	33.64
Asiut	2620.2	2,029	5.19	10,532	878	3.9	20	3.12	16	1.5%	1.5%	13	13	0.65	0.81	26.33
Suhag	2854.6	2,211	4.91	10,855	905	3.9	19	3.12	15	1.5%	1.5%	14	14	0.71	0.89	27.14
Qena	3422.6	2,651	5.13	13,598	1,133	3.9	20	3.12	16	1.5%	1.5%	17	17	0.85	1.06	33.99
Aswan	4163.1	3,224	4.80	15,476	1,290	3.9	19	3.12	15	1.5%	1.5%	19	19	1.03	1.29	38.69
Nationwide	4822.4	3742.36	4.65	17,402	1,450	3.9	18	3.12	15	1.5%	1.5%	22	22	1.20	1.50	43.50
	0.73															

*: "Basic use" defined as 130 LCD water consumption and 104 LCD wastewater flow

MAXIMUM RESIDENTIAL TARIFFS FOR BASIC USE: 01/02

Governorate	EHDR 98/99 GDP/capita	Adjusted 98/99 GDP/capita	Average Family Size	Average Annual Family Income	Average Monthly Family Income	Monthly Basic Water Use per Person (m^3)	Monthly Basic Use for Family (m^3)	Monthly Basic WW Use per person (m^3)	Monthly Basic WW Use per Family (m^3)	Target % of Income for Water	Target % of Income for WW	Maximum Bill for Water	Maximum Bill for WW	Maximum m^3 Charge for Water	Maximum m^3 Charge for Wastewater	Maximum Monthly Bill
Cairo	8854.30	7,063	4.06	28,676	2,390	3.9	16	3.12	13	1.5%	1.5%	36	36	2.26	2.83	71.69
Alexandria	7024.70	5,604	4.15	23,255	1,938	3.9	16	3.12	13	1.5%	1.5%	29	29	1.80	2.25	58.14
Port Said	10536.0	8,404	4.14	34,795	2,900	3.9	16	3.12	13	1.5%	1.5%	43	43	2.69	3.37	86.99
Suez	7974.2	6,361	4.28	27,225	2,269	3.9	17	3.12	13	1.5%	1.5%	34	34	2.04	2.55	68.06
Damietta	5443.5	4,342	4.28	18,585	1,549	3.9	17	3.12	13	1.5%	1.5%	23	23	1.39	1.74	46.46
Daqahliya	3808.7	3,038	4.46	13,550	1,129	3.9	17	3.12	14	1.5%	1.5%	17	17	0.97	1.22	33.88
Sharqiya	3641.7	2,905	4.70	13,653	1,138	3.9	18	3.12	15	1.5%	1.5%	17	17	0.93	1.16	34.13
Qalyubiya	4695.4	3,745	4.61	17,267	1,439	3.9	18	3.12	14	1.5%	1.5%	22	22	1.20	1.50	43.17
Kafr El Sheikh	4387.1	3,500	5.04	17,638	1,470	3.9	20	3.12	16	1.5%	1.5%	22	22	1.12	1.40	44.09
Gharbiya	4628.5	3,692	4.70	17,353	1,446	3.9	18	3.12	15	1.5%	1.5%	22	22	1.18	1.48	43.38
Minufiya	3668.5	2,926	4.79	14,017	1,168	3.9	19	3.12	15	1.5%	1.5%	18	18	0.94	1.17	35.04
Beheira	4069.3	3,246	5.27	17,107	1,426	3.9	21	3.12	16	1.5%	1.5%	21	21	1.04	1.30	42.77
Ismailia	5215.7	4,161	4.64	19,305	1,609	3.9	18	3.12	14	1.5%	1.5%	24	24	1.33	1.67	48.26
Giza	5385.5	4,296	4.40	18,902	1,575	3.9	17	3.12	14	1.5%	1.5%	24	24	1.38	1.72	47.26
Beni Suef	2900.9	2,314	5.14	11,894	991	3.9	20	3.12	16	1.5%	1.5%	15	15	0.74	0.93	29.74
Fayoum	3146.1	2,510	5.01	12,573	1,048	3.9	20	3.12	16	1.5%	1.5%	16	16	0.80	1.01	31.43
Minya	3627.1	2,893	4.79	13,859	1,155	3.9	19	3.12	15	1.5%	1.5%	17	17	0.93	1.16	34.65
Asiut	2620.2	2,090	5.19	10,848	904	3.9	20	3.12	16	1.5%	1.5%	14	14	0.67	0.84	27.12
Suhag	2854.6	2,277	4.91	11,181	932	3.9	19	3.12	15	1.5%	1.5%	14	14	0.73	0.91	27.95
Qena	3422.6	2,730	5.13	14,006	1,167	3.9	20	3.12	16	1.5%	1.5%	18	18	0.88	1.09	35.01
Aswan	4163.1	3,321	4.80	15,940	1,328	3.9	19	3.12	15	1.5%	1.5%	20	20	1.06	1.33	39.85
Nationwide	4822.4	3854.63	4.65	17,924	1,494	3.9	18	3.12	15	1.5%	1.5%	22	22	1.24	1.54	44.81
	0.73															

*. "Basic use" defined as 130 LCD water consumption and 104 LCD wastewater flow

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MAXIMUM RESIDENTIALTARIFFS FOR BASIC USE: 02/03

Governorate	EHDR 98/99 GDP/capita	Adjusted 98/99 GDP/capita	Average Family Size	Average Annual Family Income	Average Monthly Family Income	Monthly Basic Water Use per Person (m^3)	Monthly Basic Use for Family (m^3)	Monthly Basic WW Use per person (m^3)	Monthly Basic WW Use per Family (m^3)	Target % of Income for Water	Target % of Income for WW	Maximum Bill for Water	Maximum Bill for WW	Maximum m^3 Charge for Water	Maximum m^3 Charge for Wastewater	Maximum Monthly Bill
Cairo	8854.30	7,275	4.06	29,536	2,461	3.9	16	3.12	13	1.5%	1.5%	37	37	2.33	2.91	73.84
Alexandria	7024.70	5,772	4.15	23,952	1,996	3.9	16	3.12	13	1.5%	1.5%	30	30	1.85	2.31	59.88
Port Said	10536.0	8,657	4.14	35,838	2,987	3.9	16	3.12	13	1.5%	1.5%	45	45	2.77	3.47	89.60
Suez	7974.2	6,552	4.28	28,042	2,337	3.9	17	3.12	13	1.5%	1.5%	35	35	2.10	2.62	70.10
Damietta	5443.5	4,472	4.28	19,142	1,595	3.9	17	3.12	13	1.5%	1.5%	24	24	1.43	1.79	47.86
Daqahliya	3808.7	3,129	4.46	13,957	1,163	3.9	17	3.12	14	1.5%	1.5%	17	17	1.00	1.25	34.89
Sharqiya	3641.7	2,992	4.70	14,063	1,172	3.9	18	3.12	15	1.5%	1.5%	18	18	0.96	1.20	35.16
Qalyubiya	4695.4	3,858	4.61	17,785	1,482	3.9	18	3.12	14	1.5%	1.5%	22	22	1.24	1.55	44.46
Kafr El Sheikh	4387.1	3,605	5.04	18,167	1,514	3.9	20	3.12	16	1.5%	1.5%	23	23	1.16	1.44	45.42
Gharbiya	4628.5	3,803	4.70	17,874	1,489	3.9	18	3.12	15	1.5%	1.5%	22	22	1.22	1.52	44.68
Minufiya	3668.5	3,014	4.79	14,438	1,203	3.9	19	3.12	15	1.5%	1.5%	18	18	0.97	1.21	36.09
Beheira	4069.3	3,343	5.27	17,620	1,468	3.9	21	3.12	16	1.5%	1.5%	22	22	1.07	1.34	44.05
Ismailia	5215.7	4,285	4.64	19,884	1,657	3.9	18	3.12	14	1.5%	1.5%	25	25	1.37	1.72	49.71
Giza	5385.5	4,425	4.40	19,469	1,622	3.9	17	3.12	14	1.5%	1.5%	24	24	1.42	1.77	48.67
Beni Suef	2900.9	2,383	5.14	12,251	1,021	3.9	20	3.12	16	1.5%	1.5%	15	15	0.76	0.95	30.63
Fayoum	3146.1	2,585	5.01	12,950	1,079	3.9	20	3.12	16	1.5%	1.5%	16	16	0.83	1.04	32.38
Minya	3627.1	2,980	4.79	14,275	1,190	3.9	19	3.12	15	1.5%	1.5%	18	18	0.96	1.19	35.69
Asiut	2620.2	2,153	5.19	11,173	931	3.9	20	3.12	16	1.5%	1.5%	14	14	0.69	0.86	27.93
Suhag	2854.6	2,345	4.91	11,516	960	3.9	19	3.12	15	1.5%	1.5%	14	14	0.75	0.94	28.79
Qena	3422.6	2,812	5.13	14,426	1,202	3.9	20	3.12	16	1.5%	1.5%	18	18	0.90	1.13	36.06
Aswan	4163.1	3,420	4.80	16,418	1,368	3.9	19	3.12	15	1.5%	1.5%	21	21	1.10	1.37	41.05
Nationwide	4822.4	3970.27	4.65	18,462	1,538	3.9	18	3.12	15	1.5%	1.5%	23	23	1.27	1.59	46.15
	0.73															

*: "Basic use" defined as 130 LCD water consumption and 104 LCD wastewater flow

4/23

MAXIMUM RESIDENTIALTARIFFS FOR BASIC USE: 03/04

Governorate	EHDR 98/99 GDP/capita	Adjusted 98/99 GDP/capita	Average Family Size	Average Annual Family Income	Average Monthly Family Income	Monthly Basic Water Use per Person (m^3)	Monthly Basic Use for Family (m^3)	Monthly Basic WW Use per person (m^3)	Monthly Basic WW Use per Family (m^3)	Target % of Income for Water	Target % of Income for WW	Maximum Bill for Water	Maximum Bill for WW	Maximum m^3 Charge for Water	Maximum m^3 Charge for Wastewater	Maximum Monthly Bill
Cairo	8854.30	7,493	4.06	30,422	2,535	3.9	16	3.12	13	1.5%	1.5%	38	38	2.40	3.00	76.06
Alexandria	7024.70	5,945	4.15	24,671	2,056	3.9	16	3.12	13	1.5%	1.5%	31	31	1.91	2.38	61.68
Port Said	10536.0	8,916	4.14	36,913	3,076	3.9	16	3.12	13	1.5%	1.5%	46	46	2.86	3.57	92.28
Suez	7974.2	6,748	4.28	28,883	2,407	3.9	17	3.12	13	1.5%	1.5%	36	36	2.16	2.70	72.21
Damietta	5443.5	4,607	4.28	19,717	1,643	3.9	17	3.12	13	1.5%	1.5%	25	25	1.48	1.85	49.29
Daqahliya	3808.7	3,223	4.46	14,375	1,198	3.9	17	3.12	14	1.5%	1.5%	18	18	1.03	1.29	35.94
Sharqiya	3641.7	3,082	4.70	14,485	1,207	3.9	18	3.12	15	1.5%	1.5%	18	18	0.99	1.23	36.21
Qalyubiya	4695.4	3,974	4.61	18,318	1,527	3.9	18	3.12	14	1.5%	1.5%	23	23	1.27	1.59	45.80
Kafr El Sheikh	4387.1	3,713	5.04	18,712	1,559	3.9	20	3.12	16	1.5%	1.5%	23	23	1.19	1.49	46.78
Gharbiya	4628.5	3,917	4.70	18,410	1,534	3.9	18	3.12	15	1.5%	1.5%	23	23	1.26	1.57	46.02
Minufiya	3668.5	3,105	4.79	14,871	1,239	3.9	19	3.12	15	1.5%	1.5%	19	19	1.00	1.24	37.18
Beheira	4069.3	3,444	5.27	18,148	1,512	3.9	21	3.12	16	1.5%	1.5%	23	23	1.10	1.38	45.37
Ismailia	5215.7	4,414	4.64	20,480	1,707	3.9	18	3.12	14	1.5%	1.5%	26	26	1.41	1.77	51.20
Giza	5385.5	4,558	4.40	20,053	1,671	3.9	17	3.12	14	1.5%	1.5%	25	25	1.46	1.83	50.13
Beni Suef	2900.9	2,455	5.14	12,618	1,052	3.9	20	3.12	16	1.5%	1.5%	16	16	0.79	0.98	31.55
Fayoum	3146.1	2,662	5.01	13,339	1,112	3.9	20	3.12	16	1.5%	1.5%	17	17	0.85	1.07	33.35
Minya	3627.1	3,070	4.79	14,703	1,225	3.9	19	3.12	15	1.5%	1.5%	18	18	0.98	1.23	36.76
Asiut	2620.2	2,217	5.19	11,508	959	3.9	20	3.12	16	1.5%	1.5%	14	14	0.71	0.89	28.77
Suhag	2854.6	2,416	4.91	11,861	988	3.9	19	3.12	15	1.5%	1.5%	15	15	0.77	0.97	29.65
Qena	3422.6	2,896	5.13	14,859	1,238	3.9	20	3.12	16	1.5%	1.5%	19	19	0.93	1.16	37.15
Aswan	4163.1	3,523	4.80	16,911	1,409	3.9	19	3.12	15	1.5%	1.5%	21	21	1.13	1.41	42.28
Nationwide	4822.4	4089.37	4.65	19,016	1,585	3.9	18	3.12	15	1.5%	1.5%	24	24	1.31	1.64	47.54
	0.73															

*: "Basic use" defined as 130 LCD water consumption and 104 LCD wastewater flow

MAXIMUM RESIDENTIALTARIFFS FOR BASIC USE: 04/05

Governorate	EHDR 98/99 GDP/capita	Adjusted 98/99 GDP/capita	Average Family Size	Average Annual Family Income	Average Monthly Family Income	Monthly Basic Water Use per Person (m^3)	Monthly Basic Use for Family (m^3)	Monthly Basic WW Use per person (m^3)	Monthly Basic WW Use per Family (m^3)	Target % of Income for Water	Target % of Income for WW	Maximum Bill for Water	Maximum Bill for WW	Maximum m^3 Charge for Water	Maximum m^3 Charge for Wastewater	Maximum Monthly Bill
Cairo	8854.30	7,718	4.06	31,335	2,611	3.9	16	3.12	13	1.5%	1.5%	39	39	2.47	3.09	78.34
Alexandria	7024.70	6,123	4.15	25,411	2,118	3.9	16	3.12	13	1.5%	1.5%	32	32	1.96	2.45	63.53
Port Said	10536.0	9,184	4.14	38,021	3,168	3.9	16	3.12	13	1.5%	1.5%	48	48	2.94	3.68	95.05
Suez	7974.2	6,951	4.28	29,749	2,479	3.9	17	3.12	13	1.5%	1.5%	37	37	2.23	2.78	74.37
Damietta	5443.5	4,745	4.28	20,308	1,692	3.9	17	3.12	13	1.5%	1.5%	25	25	1.52	1.90	50.77
Daqahliya	3808.7	3,320	4.46	14,807	1,234	3.9	17	3.12	14	1.5%	1.5%	19	19	1.06	1.33	37.02
Sharqiya	3641.7	3,174	4.70	14,919	1,243	3.9	18	3.12	15	1.5%	1.5%	19	19	1.02	1.27	37.30
Qalyubiya	4695.4	4,093	4.61	18,868	1,572	3.9	18	3.12	14	1.5%	1.5%	24	24	1.31	1.64	47.17
Kafr El Sheikh	4387.1	3,824	5.04	19,273	1,606	3.9	20	3.12	16	1.5%	1.5%	24	24	1.23	1.53	48.18
Gharbiya	4628.5	4,034	4.70	18,962	1,580	3.9	18	3.12	15	1.5%	1.5%	24	24	1.29	1.62	47.41
Minufiya	3668.5	3,198	4.79	15,317	1,276	3.9	19	3.12	15	1.5%	1.5%	19	19	1.02	1.28	38.29
Beheira	4069.3	3,547	5.27	18,693	1,558	3.9	21	3.12	16	1.5%	1.5%	23	23	1.14	1.42	46.73
Ismailia	5215.7	4,546	4.64	21,095	1,758	3.9	18	3.12	14	1.5%	1.5%	26	26	1.46	1.82	52.74
Giza	5385.5	4,694	4.40	20,655	1,721	3.9	17	3.12	14	1.5%	1.5%	26	26	1.50	1.88	51.64
Beni Suef	2900.9	2,529	5.14	12,997	1,083	3.9	20	3.12	16	1.5%	1.5%	16	16	0.81	1.01	32.49
Fayoum	3146.1	2,742	5.01	13,739	1,145	3.9	20	3.12	16	1.5%	1.5%	17	17	0.88	1.10	34.35
Minya	3627.1	3,162	4.79	15,144	1,262	3.9	19	3.12	15	1.5%	1.5%	19	19	1.01	1.27	37.86
Asiut	2620.2	2,284	5.19	11,854	988	3.9	20	3.12	16	1.5%	1.5%	15	15	0.73	0.92	29.63
Suhag	2854.6	2,488	4.91	12,217	1,018	3.9	19	3.12	15	1.5%	1.5%	15	15	0.80	1.00	30.54
Qena	3422.6	2,983	5.13	15,305	1,275	3.9	20	3.12	16	1.5%	1.5%	19	19	0.96	1.20	38.26
Aswan	4163.1	3,629	4.80	17,418	1,452	3.9	19	3.12	15	1.5%	1.5%	22	22	1.16	1.45	43.55
Nationwide	4822.4	4212.06	4.65	19,586	1,632	3.9	18	3.12	15	1.5%	1.5%	24	24	1.35	1.69	48.97
	0.73															

*: "Basic use" defined as 130 LCD water consumption and 104 LCD wastewater flow

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MAXIMUM RESIDENTIAL TARIFFS FOR BASIC USE: 05/06

Governorate	EHDR 98/99 GDP/capita	Adjusted 98/99 GDP/capita	Average Family Size	Average Annual Family Income	Average Monthly Family Income	Monthly Basic Water Use per Person (m^3)	Monthly Basic Use for Family (m^3)	Monthly Basic WW Use per person (m^3)	Monthly Basic WW Use per Family (m^3)	Target % of Income for Water	Target % of Income for WW	Maximum Bill for Water	Maximum Bill for WW	Maximum m^3 Charge for Water	Maximum m^3 Charge for Wastewater	Maximum Monthly Bill
Cairo	8854.30	7,949	4.06	32,275	2,690	3.9	16	3.12	13	1.5%	1.5%	40	40	2.55	3.18	80.69
Alexandria	7024.70	6,307	4.15	26,173	2,181	3.9	16	3.12	13	1.5%	1.5%	33	33	2.02	2.53	65.43
Port Said	10536.0	9,459	4.14	39,162	3,263	3.9	16	3.12	13	1.5%	1.5%	49	49	3.03	3.79	97.90
Suez	7974.2	7,159	4.28	30,642	2,553	3.9	17	3.12	13	1.5%	1.5%	38	38	2.29	2.87	76.60
Damietta	5443.5	4,887	4.28	20,917	1,743	3.9	17	3.12	13	1.5%	1.5%	26	26	1.57	1.96	52.29
Daqahliya	3808.7	3,419	4.46	15,251	1,271	3.9	17	3.12	14	1.5%	1.5%	19	19	1.10	1.37	38.13
Sharqiya	3641.7	3,270	4.70	15,367	1,281	3.9	18	3.12	15	1.5%	1.5%	19	19	1.05	1.31	38.42
Qalyubiya	4695.4	4,216	4.61	19,434	1,619	3.9	18	3.12	14	1.5%	1.5%	24	24	1.35	1.69	48.58
Kafr El Sheikh	4387.1	3,939	5.04	19,851	1,654	3.9	20	3.12	16	1.5%	1.5%	25	25	1.26	1.58	49.63
Gharbiya	4628.5	4,156	4.70	19,531	1,628	3.9	18	3.12	15	1.5%	1.5%	24	24	1.33	1.66	48.83
Minufiya	3668.5	3,294	4.79	15,776	1,315	3.9	19	3.12	15	1.5%	1.5%	20	20	1.06	1.32	39.44
Beheira	4069.3	3,653	5.27	19,254	1,604	3.9	21	3.12	16	1.5%	1.5%	24	24	1.17	1.46	48.13
Ismailia	5215.7	4,683	4.64	21,728	1,811	3.9	18	3.12	14	1.5%	1.5%	27	27	1.50	1.88	54.32
Giza	5385.5	4,835	4.40	21,275	1,773	3.9	17	3.12	14	1.5%	1.5%	27	27	1.55	1.94	53.19
Beni Suef	2900.9	2,604	5.14	13,387	1,116	3.9	20	3.12	16	1.5%	1.5%	17	17	0.83	1.04	33.47
Fayoum	3146.1	2,825	5.01	14,151	1,179	3.9	20	3.12	16	1.5%	1.5%	18	18	0.91	1.13	35.38
Minya	3627.1	3,256	4.79	15,598	1,300	3.9	19	3.12	15	1.5%	1.5%	19	19	1.04	1.30	39.00
Asiut	2620.2	2,352	5.19	12,209	1,017	3.9	20	3.12	16	1.5%	1.5%	15	15	0.75	0.94	30.52
Suhag	2854.6	2,563	4.91	12,584	1,049	3.9	19	3.12	15	1.5%	1.5%	16	16	0.82	1.03	31.46
Qena	3422.6	3,073	5.13	15,764	1,314	3.9	20	3.12	16	1.5%	1.5%	20	20	0.98	1.23	39.41
Aswan	4163.1	3,738	4.80	17,941	1,495	3.9	19	3.12	15	1.5%	1.5%	22	22	1.20	1.50	44.85
Nationwide	4822.4	4338.42	4.65	20,174	1,681	3.9	18	3.12	15	1.5%	1.5%	25	25	1.39	1.74	50.43

Table A.1 MAXIMUM RESIDENTIAL TARIFFS FOR BASIC USE*: FY 2002/03 through FY 2006/07

Governorate	FY 2002/03					FY 2003/04					FY 2004/05					FY 2005/06					FY 2006/07				
	Bill for Water	Bill for WW	m^3 Charge for Water	m^3 Charge for Waste-water	Monthly Bill	Bill for Water	Bill for WW	m^3 Charge for Water	m^3 Charge for Waste-water	Monthly Bill	Bill for Water	Bill for WW	m^3 Charge for Water	m^3 Charge for Waste-water	Monthly Bill	Bill for Water	Bill for WW	m^3 Charge for Water	m^3 Charge for Waste-water	Monthly Bill	Bill for Water	Bill for WW	m^3 Charge for Water	m^3 Charge for Waste-water	Monthly Bill
Cairo	37	37	2.33	2.91	73.84	38	38	2.40	3.00	76.06	39	39	2.47	3.09	78.34	40	40	2.55	3.18	80.69	42	42	2.62	3.28	83.11
Alexandria	30	30	1.85	2.31	59.88	31	31	1.91	2.38	61.68	32	32	1.96	2.45	63.53	33	33	2.02	2.53	65.43	34	34	2.08	2.60	67.40
Port Said	45	45	2.77	3.47	89.60	46	46	2.86	3.57	92.28	48	48	2.94	3.68	95.05	49	49	3.03	3.79	97.90	50	50	3.12	3.90	100.84
Suez	35	35	2.10	2.62	70.10	36	36	2.16	2.70	72.21	37	37	2.23	2.78	74.37	38	38	2.29	2.87	76.60	39	39	2.36	2.95	78.90
Damietta	24	24	1.43	1.79	47.86	25	25	1.48	1.85	49.29	25	25	1.52	1.90	50.77	26	26	1.57	1.96	52.29	27	27	1.61	2.02	53.86
Daqahliya	17	17	1.00	1.25	34.89	18	18	1.03	1.29	35.94	19	19	1.06	1.33	37.02	19	19	1.10	1.37	38.13	20	20	1.13	1.41	39.27
Sharqiya	18	18	0.96	1.20	35.16	18	18	0.99	1.23	36.21	19	19	1.02	1.27	37.30	19	19	1.05	1.31	38.42	20	20	1.08	1.35	39.57
Qalyubiya	22	22	1.24	1.55	44.46	23	23	1.27	1.59	45.80	24	24	1.31	1.64	47.17	24	24	1.35	1.69	48.58	25	25	1.39	1.74	50.04
Kafr El Sheikh	23	23	1.16	1.44	45.42	23	23	1.19	1.49	46.78	24	24	1.23	1.53	48.18	25	25	1.26	1.58	49.63	26	26	1.30	1.63	51.12
Gharbiya	22	22	1.22	1.52	44.68	23	23	1.26	1.57	46.02	24	24	1.29	1.62	47.41	24	24	1.33	1.66	48.83	25	25	1.37	1.71	50.29
Minufiya	18	18	0.97	1.21	36.09	19	19	1.00	1.24	37.18	19	19	1.02	1.28	38.29	20	20	1.06	1.32	39.44	20	20	1.09	1.36	40.62
Beheira	22	22	1.07	1.34	44.05	23	23	1.10	1.38	45.37	23	23	1.14	1.42	46.73	24	24	1.17	1.46	48.13	25	25	1.21	1.51	49.58
Ismailia	25	25	1.37	1.72	49.71	26	26	1.41	1.77	51.20	26	26	1.46	1.82	52.74	27	27	1.50	1.88	54.32	28	28	1.55	1.93	55.95
Giza	24	24	1.42	1.77	48.67	25	25	1.46	1.83	50.13	26	26	1.50	1.88	51.64	27	27	1.55	1.94	53.19	27	27	1.60	2.00	54.78
Beni Suef	15	15	0.76	0.95	30.63	16	16	0.79	0.98	31.55	16	16	0.81	1.01	32.49	17	17	0.83	1.04	33.47	17	17	0.86	1.07	34.47
Fayoum	16	16	0.83	1.04	32.38	17	17	0.85	1.07	33.35	17	17	0.88	1.10	34.35	18	18	0.91	1.13	35.38	18	18	0.93	1.17	36.44
Minya	18	18	0.96	1.19	35.69	18	18	0.98	1.23	36.76	19	19	1.01	1.27	37.86	19	19	1.04	1.30	39.00	20	20	1.08	1.34	40.17
Asiut	14	14	0.69	0.86	27.93	14	14	0.71	0.89	28.77	15	15	0.73	0.92	29.63	15	15	0.75	0.94	30.52	16	16	0.78	0.97	31.44
Suhag	14	14	0.75	0.94	28.79	15	15	0.77	0.97	29.65	15	15	0.80	1.00	30.54	16	16	0.82	1.03	31.46	16	16	0.85	1.06	32.40
Qena	18	18	0.90	1.13	36.06	19	19	0.93	1.16	37.15	19	19	0.96	1.20	38.26	20	20	0.98	1.23	39.41	20	20	1.01	1.27	40.59
Aswan	21	21	1.10	1.37	41.05	21	21	1.13	1.41	42.28	22	22	1.16	1.45	43.55	22	22	1.20	1.50	44.85	23	23	1.23	1.54	46.20
Nationwide	23	23	1.27	1.59	46.15	24	24	1.31	1.64	47.54	24	24	1.35	1.69	48.97	25	25	1.39	1.74	50.43	26	26	1.43	1.79	51.95

* "Basic use" defined as 130 LCD water consumption and 104 LCD wastewater flow.

4/27

First-Cycle Regulatory Compliance Program Outputs

Water Suppy

1. Flow monitoring program operational.
   - 1.1 All outlets from conventional water treatment plants metered.
   - 1.2 Discharge of small water plants measured by fixed or portable flow meter once per month.
   - 1.3 Monthly metered power usage measured for each intake pumping facility, plant, and booster station.

2. Power-use efficiency audit conducted for each plant and booster station.

3. Water networks mapped
   - 3.1 Maps developed showing location of plants, tanks, boosters, valves, and lengths and diameter of pipelines.
   - 3.2 Zone pipelines inventory developed, analyzing total pipeline length by diameter, material, and age group (< 10 years, 11–25 years, 26–50 years, > 50 years).

4. Pipeline service interruptions recordkeeping and reporting system operational.
   - 4.1 Records of each pipeline service interruption will be prepared, classifying the interruption as break or burst, recording the diameter, material, and location of the affected pipe, and showing the date, time reported, and time restored to service.
   - 4.2 Quarterly and annual reports on pipeline service interruptions will be prepared, summarizing the frequency of interruption by cause, location, and diameter, and calculating the average time taken for service restoration.

5. Leak detection survey program completed.
   - 5.1 Leak detection survey using ultrasound or similar techniques completed for all cities.
   - 5.2 Night-flow monitoring program completed for all network systems.

6. Water distribution system evaluation completed.
   - 6.1 Water network maps digitized for all regional distribution systems and for all networks in cities with populations of 100,000 or more (where these cities' networks are not part of a regional system).
   - 6.2 Hydraulic analysis of the digitized networks completed.
   - 6.3 Statistical analysis of leak detection survey data to identify problem stretches completed.
   - 6.4 Cost estimates for network rehabilitation projects prepared.

6.5 Cost-effectiveness analysis of rehabilitation projects prepared.
6.6 Water network rehabilitation projects plan and budget prepared.

Regulatory Compliance Program Outputs

Wastewater Service

1. Flow monitoring program operational.
   - 1.1 All inlets and outlets of wastewater treatment plants metered.
   - 1.2 Main pump station flows metered.
   - 1.3 Discharge of each subsidiary pump station measured by fixed or portable meter once per month.
   - 1.4 Monthly metered power usage measured for each treatment plant and pump station.

2. Power-use efficiency audit conducted for each plant and main pump station.

3. Sewer networks mapped.
   - 3.1 Maps developed showing location of plants, pump stations, manholes, and discharge outfalls, lengths and diameters of sewers.
   - 3.2 Sewer inventory developed, analyzing total pipeline length by diameter, depth and age group (< 10 yrs, 11–25 years, 26–50 years, > 50 years).

4. Sewer service interruptions recordkeeping and reporting system operational.
   - 4.1 Records of each sewer backup/flooding incident will be prepared, classifying the cause of the incident, recording the diameter, depth, and location of the affected sewer, and showing the date, time reported, and time restored to service.
   - 4.2 Quarterly and annual reports on sewer backup/flooding incidents will be prepared, summarizing the frequency of incidents by cause, location, and diameter, and calculating the average time taken to restore service.

5. Manhole survey completed.

6. Sewer system evaluation completed. (*Note*: This program only required where the groundwater level exceeds average sewer depth of a drainage basin.)
   - 6.1 Problem basins identified, based on comparison of pump station discharges with estimates of customer wastewater discharge
   - 6.2 Problem stretches identified, based on manhole survey and/or testing (e.g., dye testing)
   - 6.3 Closed-circuit TV inspection of problem stretches
   - 6.4 Cost estimates developed for sewer rehabilitation projects
   - 6.5 Cost-effectiveness analysis of rehabilitation projects completed
   - 6.6 Sewer rehabilitation plan and budget prepared

Regulatory Compliance Program Outputs

Billing and Collection

1. Computerized customer information and billing system operational. The system will be capable of monthly reporting on:

   - Water connections, consumption, billings, and arrears by connection size, class, and zone

   - Water connections sewered and water consumption of sewered users by connection size, class, and zone

   - Meter status and meter condition of each connection, by connection size, class, and zone

2. Metering improvement program plan and budget prepared.

   2.1 Metering capability assessment report prepared. The report will cover:

   - Meter coverage and condition, by customer service district, customer class, and meter size

   - Distribution, equipment, and performance of existing meter repair and maintenance facilities

   - Current stock of new meters and spare parts, by size and make

   2.2 Meter improvement plan and budget prepared. The document will identify the following:

   Meter installation, replacement, repair, and maintenance requirements to achieve the goals of:

   - Full coverage of all nondomestic users and all sewered domestic users

   - Ninety percent of all meters in working order

   - The size, location, and annual workloads of existing and proposed meter repair and maintenance facilities, and the budget for operationalization of these facilities by the end of the rate term

- Annualized requirements for new meters and spare parts to achieve the 90-percent working meter target within 3 years of the date of computerized billing system operationalization

3. Meter reading quality assurance reporting program operational.
   3.1 A program of spot checks on recent meter readings will be designed for application to a statistically valid sample of users in each customer service district.
   3.2 Quarterly reports will be prepared, summarizing the results of the meter reading QA programs by customer service district and customer class.

Regulatory Compliance Program Outputs

Finance and Administration

1. Staffing Plan

Five-year staffing plan showing number of personnel by division and grade prepared by end of Year 1 of rate term

Annual reports prepared, showing actual/required variances and updates in staffing plan requirements

2. Cost Accounting System

Computerized cost accounts prepared annually showing operations and maintenance (O&M) line item, depreciation, and debt service costs of each utility function.

2.1 Water utility functions:

- Sourceworks (intakes, raw water pumping)
- Water treatment
- Transmission and distribution
- Billing, collection, and customer service
- Finance and administration

2.2 Wastewater utility functions:

- Sewers
- Septage trucking
- Conveyance (pump stations and force mains)
- Treatment
- Recycling (composting and effluent reuse)
- Customer service
- Finance and administration

3. Master Plan

Master plans for water and wastewater system development are required of all utilities that do not have master plans or whose current master plans are more than 15 years old.

Unit Prices for Selected Regulatory Compliance Program Inputs and Activities

Introduction

The costs of achieving compliance with the Egyptian Water and Wastewater Sector Regulatory Agency (EWRA)'s standards for quality assurance in performance measurement and/or customer service (listed in Annex B) are considered allowable revenue requirements, whether they be O&M costs or capital costs. This annex has been prepared to assist utilities in budgeting for their regulatory compliance program activities.

The mention of particular suppliers or service providers in this annex does not constitute an endorsement by EWRA. Technologies in these areas are evolving; the internet is a useful source of information on technologies, suppliers, and prices.

In using these guidelines, utilities will need to consider the number of "units" of product or service they will need to achieve compliance with the particular program. For example, the flow meter purchase requirement can be calculated as the difference between the number of plant outlets of various diameters which need to be metered and the number which are already metered. For outputs related to the network, on the other hand, utilities are advised to work with the notion of a standard crew (e.g., leak detection crew, manhole inspection crew, etc), determine the number of crews required to achieve the program outputs within the rate term, estimate the existing equipment, and then calculate the number of items needed to strengthen existing crews and equip additional ones as necessary.

C.1. Flow Monitoring

The principal types of flow meters can be distinguished in terms of conditions under which each is most effective.

a) Venturi Tube

The Venturi meter produces a differential pressure proportional to the square of the flow velocity. With its smooth approach and recovery cones, the Venturi tube works well in clean water applications. Head recovery is excellent. The approach cone tends to correct aberrations in flow profile caused by poor approach condition introduced by irregular flow profiles. Measurement error is much less than with orifice plates. Standard Venturi tubes are acceptable as custody transfer flow metering devices and are frequently used in clean water applications as revenue meters.

The principal disadvantage of a standard Venturi meter is the high cost for large sizes and long laying length. A number of proprietary designs have been developed to shorten the length and reduce the cost. The performance of these proprietary designs is generally

excellent, but the volume of laboratory data available to substantiate their performance may not be as great.

b) Turbine Flow Meters

Velocity meters use a rotor, such as a turbine or a propeller. The speed of the rotor changes with the velocity of flow. The rotor rotation is transmitted either mechanically or electrically to the receiver, which, then indicated, records and totalizes flow rate.

Turbine meters are available in a wide range of diameters. However, they can clog easily. Therefore, turbine meters are usually restricted to clean water application.

c) Magnetic Flow Meters

The magnetic flow meter is an open cylinder that produces practically no head loss and readily passes solids. It functions with any conductive liquid, such as water or sewage. It consists of a flow tube that develops a magnetic field across the flow profile. Where a conductor passes through a magnetic field, an electrical potential proportional to the conductor's velocity is produced. With the modern electronics and proper design, very accurate flow measurements can be obtained.

Wastewater containing grease can coat the electrodes and interfere with the potential measurement. This problem has been overcome somewhat by high-quality electronic circuitry that can measure the potential across very poor conductors. The magnetic flow liner must be both nonconductive and nonmagnetic. Polyurethane and Teflon are the most commonly used liners.

Magnetic flow meters are widely used in plants where it is necessary to measure flow without creating head loss or to measure reversing flow in pipes. Magnetic meters are readily available in a wide range of sizes.

Magnetic flow meters offer several operational advantages:

- Cause little obstruction to flow
- Create little head loss
- Do not clog
- Handle solids in suspension
- Have no small-pipe connections to clear or maintain as do venturi and similar flow tubes
- Can measure flow in either direction

The main disadvantage of magnetic flow meters is that they require regular maintenance and cleaning as suspended matter can coat the electrode and affect the meter reading. However, some meters are equipped with an electric vibrator for self-cleaning.

d) Ultrasonic Flow Meter

The transit time ultrasonic meters consist of at least one pair of piezoelectric transducers mounted on opposite sides of the pipeline and offset from each other by 30 to 45 degrees. Additional transducer pairs are often used to provide the ability to average the flow profile. An ultrasonic pressure pulse is injected by one transducer, and the time for it to reach the second transducer is measured. The process is then reversed. The difference in time required for the pulse to propagate upstream and downstream through the fluid is proportional to the average fluid velocity between the transducers. This metering system is capable of very high accuracy, and when multiple transducer pairs are used, it can average out irregularities in the flow profile. The process of reversing the signal direction cancels errors that would be caused by variations in the speed of sound through the fluid.

Ultrasonic meters do not perform well in dirty water or wastewater applications. This flow meter is useful especially on very large pipes where cost becomes less of a factor. The maximum velocity is limited only by what can be pumped through a given size pipe, and the minimum velocity is limited by the resolution of the timing circuits – 0.3 m/s.

Exhibit C-1 compares the different types of flow meters.

Exhibit C-1. Comparison of Flow Meters

Type	Water	Wastewater	Cost
Venturi	Good	Fair	High
Turbine	Excellent	Poor	Low
Magnetic	Excellent	Excellent	High
Ultrasonic	Excellent	Fair	High

Experience in Egypt does not favor the use of magnetic flow meters. Although they are quite accurate, problems such as lack of spare parts and the need for highly qualified technicians to maintain them have been reported.

For practical and economical reasons, turbine meters are recommended for small diameter pipes up to whatever diameter is available in the market (assumed in this report as 300 mm diameter).

Venturi meters are recommended for large diameters as long as the space required for installation is available. Otherwise, ultrasonic meters should be used.

Exhibit C-2. Standard Water Flow Meter Costs, by Diameter

Type	Diameter	Unit Cost (Estimated) $	Annual O&M Cost		
			Electricity	Spares	Maintenance
Turbine	100 mm	1,800	-	10%	10%
	150 mm	2,400			
	200 mm	3,000			
	250 mm	3,300			
	300 mm	3,500			
Venturi	400 mm	4,000	-	10%	10%
	450 mm	4,200			
	500 mm	4,500			
	600 mm	5,500			
	800 mm	7,500			
UltraSonic	Variable	10,000	800 LE.	2,000 LE.	1,000 LE.

Exhibit C-3. Standard Fixed Wastewater Flow Meter Costs

Diameter	Type	Procurement and Installation Cost	Annual O&M Cost		
			Electricity	Spares	Maintenance
250 mm	Doppler / transit time technology (magnetic)	35.000 LE.	800 LE.	2,000 LE.	1,000 LE.
300 mm		35.000 LE.	800 LE.	2,000 LE.	1,000 LE.
350 mm		35.000 LE.	800 LE.	2,000 LE.	1,000 LE.
700 mm		35.000 LE.	800 LE.	2,000 LE.	1,000 LE.
Open Channel	Doppler effect technology (UltraSonic)	40.000 LE.	800 LE.	2,000 LE.	1,000 LE.

Exhibit C-4. Standard Portable Flow Meter Costs

Diameter	Type	Unit Price Cost ($)	Annual O&M Cost Spares and Batteries
Open Channel	Doppler effect model Xytec 7050A USA	20,000	8,000 LE.
Open Channel	Doppler effect model Xytec 7000A USA	11,000	5,000 LE.

C.2. Power Factor Improvement and Control

EWRA's first-cycle requirement for this program is simply the conduct of power factor audits for the utility's large treatment facilities, boosters, and pump stations. These audits will be provided free of charge by the utility's regional electricity distribution company. Keep a copy of the diagnostic report for the utility's records to verify to EWRA that the audit has been conducted.

If the facility's power efficiency is assessed to be low, the standard electricity company prognosis is to install capacitators. They can be provided and installed by Nasr Company for Transformers and Electrical Products (Mako Company). Contact their sales department in Matariya (02-256-9551) or their Gisr il-Bahr office. Costs including procurement, installation, and the protection system are shown in Exhibits C-5 and C-6.

Exhibit C-5. For Low-Tension System (380 v/3 ph/50 Hz)

Size/Capacity	Cost Range
100 KVA	16,000 to 20,000 LE.
200 KVA	26,000 to 32,000 LE.
300 KVA	38,000 to 41,000 LE.
400 KVA	55,000 LE.
500 KVA	70,000 LE.

Exhibit C-6. For Medium Tension System (3.3 Kv/3 ph/50 Hz)

Size/Capacity	Cost Range
100 KVA	40,000 to 50,000 LE.
200 KVA	65,000 to 75,000 LE.
300 KVA	85,000 to 95,000 LE.
400 KVA	110,000 to 125,000 LE.
500 KVA	140,000 to 155,000 LE.

It is important to note that capacitator installation is not the only or necessarily the appropriate means for a utility to control its electricity costs.

C.3. Leak Detection

A turnkey private or public sector contract for leak detection services can be done in Egypt, at an average cost of 1,200 LE/km.

Exhibit C-7 shows costs for two types of leak detection equipment, in case the utility wishes to conduct its own leak detection survey. The Heath Aqua-Scope technology's usefulness is mostly limited to inspection of house connections and the joint of the house connection to the main. The utility should consider annual transportation costs if it wishes to conduct its own surveys.

Exhibit C-7. Leak Detection Equipment

Item No.	Type	Unit Price	Km./yr.	Annual O&M Cost Spares and Batteries
1	Aquascan 600 S (Portable) Boddingtons Ltd. (UK)	110,000 LE.	900	11,000 LE.
2	Aqua-Scope (Portable) Heath Consultants (USA)	5,000 LE.	600	400 LE.

C.4. Sewer Cleaning

Sewer cleaning as such is not a regulatory compliance requirement during the rate term. However, it is often a prerequisite to allow manhole inspection and sewer system evaluation. Moreover, it is an important component of sewer maintenance programs and will usually contribute to reducing the number of sewage backup/flooding incidents, a typical quality-of-service indicator for wastewater utilities.

Standard sewer cleaning equipment is listed and costed in Exhibit C-8. Note that the technologies have different capabilities. Exhibit C-9 shows standard annual performance rates (in km.) for a crew equipped with a particular technology.

Exhibit C-8. Sewer-Cleaning Technologies

Item No.	Technology	Components	Unit Price	Annual O&M Cost		
				Fuel	Oil	Spares
1	Jet cleaner (high-pressure water cleaning)	-Water tank -High pressure pump -Truck chassis -Hose reel	60,000 $	5,000 LE.	2,500 LE.	12,500 LE.
2	Jet/vacuum combined system	-Water tank -High-pressure pump -Blower -Debris tank -Truck chassis -Hydraulic boom	220,000 $	7,500 LE.	3,000 LE.	20,000 LE.
3	Bucket winching machine	-Two pulling unit -Engine (16–36 HP)	260,000 LE. to 290,000 LE.	2,500 LE.	2,500 LE.	25,000 LE.
4	Hydraulic Catch basin	-Dump truck -Truck crane -Hydraulic system -Orange reel set of buckets	450,000 LE.	2,500 LE.	1,500 LE.	5,000 LE.

Notes: Items nos. 1 and 3 clean pipes only; item no. 2 cleans pipes and manholes; and item no. 4 cleans manholes only.

Exhibit C-9. Annual Performance Rates for Sewer-Cleaning Technologies

Pipe Diameter (inches)	Jet/Vac Unit (km./yr.)	Jet Cleaner (km./yr.)	Bucket Winch (km./yr.)
6	96	72	——
8	96	72	——
10	96	72	——
12	90	54	——
15	90	54	——
18	72	36	——
20	72	36	2
24	54	18	1.2
30	36	——	1.2
36	18	——	1.2
48	9	——	1.2

C.5. Manhole Inspection

Manhole inspection covers detection, cleaning, and internal inspection. Metal detectors are needed in cases where the manhole has been paved over or covered by debris. Gas detection should be done prior to staff entry into the manhole.

Hydraulic catch basin machines are used to clean manholes in large diameter (24–48 inch) pipelines. Small diameter pipeline manholes are cleaned manually.

Vacuum units can be used to clean manholes for all diameter pipelines (6–48 inches) (see section C.4, above).

Manhole inspection crew performance should average 150 km./yr.

Exhibit C-10. Manhole Inspection Equipment

Equipment	Unit Cost	Annual O&M Cost			
		Fuel	Oil	Spares and Batteries	Chemical Cells
Hydraulic catch basin	450,000 LE.	2,500 LE.	1,500 LE.	5,000 LE	—
Metal detector	25,000 LE.	—	—	1,000 LE	—
Gas detector	30,000 LE.	—	—	3,000 LE.	18,000 LE.
Manual tools	1,000 LE.	—	—	—	—

C.6. Sewer TV Inspection

A sewer system evaluation is a major activity. Since few utilities need to engage in sewer system evaluations more frequently than once every 10 or 15 years or unless they suffer from urgent infiltration/inflow (I/I) problems, it is rarely cost effective for a utility to purchase the closed-circuit TV (CCTV) equipment used to conduct detailed inspection of problem stretches for purposes of quantifying the extent of I/I and supporting remedial action decision-making. Local firms have equipment and skills to conduct CCTV inspection on a turnkey basis.

Exhibit C-11. Turnkey Sewer-System CCTV Inspection Costs

Pipe Diameter Inches	Cost/m LE
6	15
8	15
10	15
12	17
15	17
18	20
20	20
24	24
36	30
40	30
48	30

These prices are for completely cleaned, flushed, and drained pipes.

Large metropolitan utilities with I/I problems that can justify the purchase of a CCTV van may consider the options shown in Exhibit C-12.

Exhibit C-12. CCTV Purchase and O&M Costs

CCTV Unit	Components	Unit Cost	Annual O&M Cost			
			Fuel	Oil	Spares	Tapes
Portable	-Control unit -Camera -Monitor -Video recorder -TV cable reel -Lighting unit -Generator -Data display	50,000 $	900 LE.	450 LE.	18,000 LE.	3,000 LE/
CCTV Van	-Truck chassis -Control unit -Data display -Camera -Monitor -Printer -VCR -Lighting unit -Cable reel	120,000 $	3,000 LE/	1,500 LE.	25,000 LE.	3,000 LE.

A portable unit is used for inspecting pipe diameters from 6 inches up to 18 inches, and its performance about 800 m/shift in newly cleaned pipelines, that is, 240 km./yr.

CCTV van is used for pipe diameters from 6 inches up to 48 inches, and its performance about 800 m/shift in newly cleaned and drained sewer pipes, that is, about 240 km./yr.

C.7. Meter Maintenance and Repair Program

A standard meter maintenance and repair unit would likely include the following apparatus and equipment:

a) Dual Trace Oscilloscope,
e.g., BK Precision Model 1541 C

b) D.C. Power Supply,
e.g., Triple Output D.C. Power Supply
BK Precision Model 1651

c) Calibrating Instruments:
Universal Counter,
e.g., HP 1823

d) Digital Multimeter,
e.g., Amprobe Instrument Model AM 3E

e) Portable Water Flow Meter,
e.g., Marsh McBirney, Inc., Model 2000

f) 5 MHz Function Generator

g) Tool Case

ANNEX D

Blank Template of Revenue Requirement Analysis and Rate Design Worksheets

Customer Classifications

Name of Utility	**Name of Utility**
Current Fiscal Year	2002

	Existing Customer Classifications	New Customer Classifications
1	Residential 0-20 m3/month	Domestic
2	Residential >20 m3/month	Institutional
3	Governmental	Commercial
4	Religious	Irrigation
5	Standpipes	
6	Commercial	
7	Public Sector	
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		

Name of Utility: Name of Utility

Service area (km²)

Service area population

1- DEMAND

1.1 WATER - SYSTEM LENGTH & TREATED WATER USERS

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	CURRENT FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Water Network System Length (Kms)				-	#DIV/0!	#NUM!									
Water Users:															
Residential 0-20 m3/month				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Residential >20 m3/month				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Governmental				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Religious				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Standpipes				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commercial				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Public Sector				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total	-	-	-	-	#DIV/0!		#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

1.2 WATER - BILLED CONSUMPTION OF TREATED WATER (In m³)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Residential >20 m3/month				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Governmental				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Religious				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Standpipes				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commercial				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Public Sector				-	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total	-	-	-	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

1.3 WATER - PRODUCTION & UNACCOUNTED-FOR WATER

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Historic Trend Projection: Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Treated Water Production															
Own Production				-	#DIV/0!	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Bulk Water Purchase 1				-	#DIV/0!	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Bulk Water Purchase 2				-	#DIV/0!	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Water Purchase	-	-	-	-	-	#NUM!	-		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Water Production	-	-	-	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Unaccounted-for water (m³)	-	-	-	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Trend-Based Unaccounted-for water (%) "No Changes"	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	-2.0%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!

1.4 WATER - PROJECTION OF WATER PRODUCTION & UFW

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected UFW Reduction: Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Treated Water Production															
Own Production															
Bulk Water Purchase															
Total Water Production							#NUM!	Annual UFW	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!		#NUM!
Unaccounted-for water (m³)							#NUM!	Reduction Target	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!		#NUM!
Unaccounted-for water (%)							#DIV/0!	-10%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!

1.5 WATER - BILLED CONSUMPTION OF TREATED WATER PER CONNECTION (In m³ per connection)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Residential >20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Religious	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Standpipes	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commercial	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Public Sector	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

#47.

BEST AVAILABLE COPY

1.6 WASTEWATER - SYSTEM LENGTH & SEWER CONNECTIONS

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002
Sewer System Length (Kms)				-	#DIV/0!	#NUM!	
Sewer Connections							
Residential 0-20 m3/month				-	#DIV/0!	#NUM!	
Residential >20 m3/month				-	#DIV/0!	#NUM!	
Governmental				-	#DIV/0!	#NUM!	
Religious				-	#DIV/0!	#NUM!	
Standpipes				-	#DIV/0!	#NUM!	
Commercial				-	#DIV/0!	#NUM!	
Public Sector				-	#DIV/0!	#NUM!	
Total	0	0	0	0	#DIV/0!		0

Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
							#DIV/0!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
0	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

1.7 WASTEWATER - BILLED CONSUMPTION OF TREATED WATER BY SEWERED USERS (in m³)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002
Residential 0-20 m3/month				-	#DIV/0!	#NUM!	
Residential >20 m3/month				-	#DIV/0!	#NUM!	
Governmental				-	#DIV/0!	#NUM!	
Religious				-	#DIV/0!	#NUM!	
Standpipes				-	#DIV/0!	#NUM!	
Commercial				-	#DIV/0!	#NUM!	
Public Sector				-	#DIV/0!	#NUM!	
Total	0	0	0	0			0

Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

1.8 WASTEWATER - BILLED CONSUMPTION OF TREATED WATER BY SEWERED USERS PER SEWER CONNECTION (in m³ per connection)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002
Residential 0-20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Residential >20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Religious	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Standpipes	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commercial	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Public Sector	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

1.9 WATER - WATER-WASTEWATER CONVERSION FACTOR

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002
Residential 0-20 m3/month					#DIV/0!	#NUM!	
Residential >20 m3/month					#DIV/0!	#NUM!	
Governmental					#DIV/0!	#NUM!	
Religious					#DIV/0!	#NUM!	
Standpipes					#DIV/0!	#NUM!	
Commercial					#DIV/0!	#NUM!	
Public Sector					#DIV/0!	#NUM!	

W-WW Conversion Factor

Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
	0	0	0	0	0		0
	0	0	0	0	0		0
	0	0	0	0	0		0
	0	0	0	0	0		0
	0	0	0	0	0		0
	0	0	0	0	0		0
	0	0	0	0	0		0

1.10 WASTEWATER - WASTEWATER DISCHARGE (in m³)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002
Residential 0-20 m3/month	0	0	0	-	-	#NUM!	#NUM!
Residential >20 m3/month	0	0	0	-	-	#NUM!	#NUM!
Governmental	0	0	0	-	-	#NUM!	#NUM!
Religious	0	0	0	-	-	#NUM!	#NUM!
Standpipes	0	0	0	-	-	#NUM!	#NUM!
Commercial	0	0	0	-	-	#NUM!	#NUM!
Public Sector	0	0	0	-	-	#NUM!	#NUM!
Total	0	0	0	0	0	#NUM!	#NUM!

Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

BEST AVAILABLE COPY

I.11 WASTEWATER - BILLABLE WASTEWATER DISCHARGE PER SEWER CONNECTION (In m^3 per connection)															
Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Residential >20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Religious	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Standpipes	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commercial	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Public Sector	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

BEST AVAILABLE COPY

Name of Utility: Name of Utility

2 - REVENUES

2.1 WATER - VOLUME-BASED WATER TARIFF RATES (in LE/M3)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month				0.00	#DIV/0!	#NUM!			0	0	0	0	0		0
Residential >20 m3/month				0.00	#DIV/0!	#NUM!			0	0	0	0	0		0
Governmental				0.00	#DIV/0!	#NUM!			0	0	0	0	0		0
Religious				0.00	#DIV/0!	#NUM!			0	0	0	0	0		0
Standpipes				0.00	#DIV/0!	#NUM!			0	0	0	0	0		0
Commercial				0.00	#DIV/0!	#NUM!			0	0	0	0	0		0
Public Sector				0.00	#DIV/0!	#NUM!			0	0	0	0	0		0

2.2 WATER - VOLUME-BASED CHARGES: WATER (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Residential >20 m3/month	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Governmental	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Religious	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Standpipes	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commercial	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Public Sector	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

2.3 WATER - FIXED-CHARGE WATER REVENUES (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month				0	#DIV/0!	#NUM!			0	0	0	0	0	0	0
Residential >20 m3/month				0	#DIV/0!	#NUM!			0	0	0	0	0	0	0
Governmental				0	#DIV/0!	#NUM!			0	0	0	0	0	0	0
Religious				0	#DIV/0!	#NUM!			0	0	0	0	0	0	0
Standpipes				0	#DIV/0!	#NUM!			0	0	0	0	0	0	0
Commercial				0	#DIV/0!	#NUM!			0	0	0	0	0	0	0
Public Sector				0	#DIV/0!	#NUM!			0	0	0	0	0	0	0
Total	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!	#NUM!	-	#DIV/0!	0	0	0	0	0	0	0

2.4 WATER - TOTAL WATER TARIFF REVENUES (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Residential >20 m3/month	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Governmental	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Religious	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Standpipes	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commercial	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Public Sector	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

2.5 WATER - WATER TARIFF REVENUE PER m^3 BILLED (in LE/m^3)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Residential >20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Religious	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Standpipes	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commercial	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Public Sector	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Average	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

BEST AVAILABLE COPY

2.6 WASTEWATER - WASTEWATER SERVICE TARIFF RATES

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Residential >20 m3/month	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Governmental	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Religious	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Standpipes	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Commercial	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Public Sector	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0

2.7 WASTEWATER - WASTEWATER SERVICE TARIFF REVENUES (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Residential >20 m3/month	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Governmental	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Religious	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Standpipes	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Commercial	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Public Sector	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Total	0.00	0.00	0.00	0.00	0	#NUM!	0.00		0	0	0	0	0	0	0

2.8 WASTEWATER - WASTEWATER TARIFF REVENUE PER m^3 BILLABLE WASTEWATER DISCHARGE

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Residential >20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Religious	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Standpipes	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commercial	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Public Sector	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

2.9 TOTAL WATER AND WASTEWATER TARIFF REVENUES (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Residential >20 m3/month	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Governmental	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Religious	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Standpipes	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commercial	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Public Sector	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total	-	-	-	0	0	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!		

2.10 WATER AND WASTEWATER TARIFF REVENUE COLLECTIONS (in LE) (Projection #1: "Do Nothing")

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Total				0	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

2.11 TARIFF REVENUE COLLECTION EFFICIENCY RATES (Projection #1: "Do Nothing")

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Average	65%	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!

2.12 Projection #2: IMPROVEMENTS IN COLLECTION EFFICIENCY RATES

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Average			#DIV/0!					10%	0%	0%	0%	0%	0%		0%

2.13 Projection #2: IMPROVED COLLECTION OF WATER & WASTEWATER REVENUES (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Total									#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

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2.14 WATER - WATER TARIFF REVENUE COLLECTIONS								Projection #2: Improved Collection Efficiency Rates							
Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
									#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total	-	-	-	0	0	#NUM!	#NUM!								

2.15 WASTEWATER - WASTEWATER TARIFF REVENUE COLLECTIONS								Projection #2: Improved Collection Efficiency Rates							
Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
									#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!								

2.16 WATER - OTHER REVENUES: WATER (in LE)															
Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Muqaysat (for NUC's)				0	#DIV/0!	#NUM!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
New connections				0	#DIV/0!	#NUM!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Sale of raw water				0	#DIV/0!	#NUM!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Other				0	#DIV/0!	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total	-	-	-	0	#DIV/0!	#DIV/0!	#NUM!	0.0%	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

2.17 WASTEWATER - OTHER REVENUES: WASTEWATER (in LE)															
Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Muqaysat (for NUC's)				0	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
New connections				0	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Sale of treated wastewater				0	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Other				0	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total	0	0	0	0	#DIV/0!	#NUM!	0	0	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

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Name of Utility: Name of Utility

3-COSTS

3.1 WATER - OPERATION AND MAINTENANCE EXPENSES

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Total Number of Staff				-	#DIV/0!	#NUM!								
Number of Staff per 1,000 Connections	#DIV/0!	#DIV/0!	#DIV/0!			#DIV/0!								
Wages and salaries				-	#DIV/0!	#NUM!								
Average Staff Salary	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!								
Commodity Requirements														
Power				-	#DIV/0!	#NUM!								
Chemicals				-	#DIV/0!	#NUM!								
Materials & Spare parts				-	#DIV/0!	#NUM!								
Oil & Fuels				-	#DIV/0!	#NUM!								
Other Commodities				-	#DIV/0!	#NUM!								
Subtotal, commodity requirements	-	-	-	-	-	#NUM!								
Services Requirements														
Maintenance				-	#DIV/0!	#NUM!								
Transportation				-	#DIV/0!	#NUM!								
Other Services				-	#DIV/0!	#NUM!								
Subtotal, service requirements	-	-	-	-	-	#NUM!								
Purchase for Sale:														
Purchases for Sale 1				-	#DIV/0!	#NUM!								
Purchases for Sale 2				-	#DIV/0!	#NUM!								
Total Purchases for Sale	-	-	-	-	-	#NUM!								
Regulatory Compliance Program O&M Costs				-	#DIV/0!	#NUM!								
Taxes and Duties				-	-	#NUM!								
Total, O&M expenses	-	-	-											

3.2 WATER - O&M PROJECTION #1: Impact of Expense Parameters

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Annual Inflation Rate for Wages							9%	Wage Inflation Rate	9%	9%	9%	9%	9%		9%
Total Number of Staff							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Number of Staff per 1,000 Connections							#DIV/0!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!		#NUM!
Wages and salaries							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Average Staff Salary							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!
Commodity & Services Inflation Rate							3%	Commodity Inflation Rat	3%	3%	3%	3%	3%		3%
Commodity Requirements															
Power							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Chemicals							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Materials & Spare parts							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Oil & Fuels							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Other Commodities							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Subtotal, commodity requirements							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Services Requirements															
Maintenance							-		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Transportation							-		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Other Services							-		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Subtotal, service requirements							-		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Purchase for Sale:															
Purchases for Sale 1 (@ LE 0.23/m3)							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Purchases for Sale 2 (@ LE 0.23/m3)							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Purchases for Sale							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Regulatory Compliance Program O&M Costs							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Taxes and Duties							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total, O&M expenses															

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3.3 WATER - O&M PROJECTION #2: Impact of Efficiency Improvements

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002
Total Number of Staff							#NUM!
Number of Staff per 1,000 Connections							#DIV/0!
Wages and salaries							#NUM!
Average Staff Salary							#DIV/0!
Commodity Requirements							
Power							#NUM!
Chemicals							#NUM!
Materials & Spare parts							#NUM!
Oil & Fuels							#NUM!
Other Commodities							#NUM! #NUM!
Subtotal, commodity requirements							
Services Requirements							
Maintenance							.
Transportation							.
Other Services							.
Subtotal, service requirements							#DIV/0!
Purchases for Sale							
Regulatory Compliance Program O&M Costs							#NUM!
Taxes and Duties							
Total O&M Expenses							#NUM!

Years	1 FY 2003	2 FY 2004	3 FY 2005	4 FY 2006	5 FY 2007	Total	Average
FY06/07 Staff. Target #DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!
Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#DIV/0!
Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#DIV/0!
Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#DIV/0!
Efficiency Improvement Result	#NUM! #NUM!	#NUM! #NUM!	#NUM! #NUM!	#NUM! #NUM!	#NUM! #NUM!	#NUM! #NUM!	#NUM! #NUM!
							#DIV/0!
Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#DIV/0!
Efficiency Improvement Result	#NUM! #NUM!	#NUM! #NUM!	#NUM! #NUM!	#NUM! #NUM!	#NUM! #NUM!	#NUM! #NUM!	#NUM! #NUM!
							#DIV/0!
Efficiency Improvement Result	#DIV/0! 0	#DIV/0! 0	#DIV/0! 0	#DIV/0! 0	#DIV/0! 0	#DIV/0!	#DIV/0!
Efficiency Improvement Result	#NUM! #DIV/0!	#NUM! #DIV/0!	#NUM! #DIV/0!	#NUM! #DIV/0!	#NUM! #DIV/0!	#NUM! #DIV/0!	#DIV/0! #NUM! #DIV/0!

3.4 WATER - CAPITAL COSTS

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002
Fixed Assets:				.	#DIV/0!	#NUM!	#NUM!
Total Fixed Assets Value				.	#DIV/0!	#NUM!	#NUM!
Land Value	.	.	.	.	.	#NUM!	#NUM!
Net Fixed Assets	0	0	0	.	.	#NUM!	#NUM!
Renewal & Replacement Costs:							
1.00%	0	0	0	.	.	#NUM!	#NUM!
Regulatory Compliance Capital Costs							
Total Renewal & Replacement Costs	0	0	0	.	.	#NUM!	#NUM!
New Debt Service							
Interest							
Repayment of principal							
Total New Debt Service							
Existing Debt Service							0
Interest	0	0	0	.	.	#NUM!	0
Repayment of principal	0	0	0	.	.	#NUM!	0
Total Existing Debt Service	0	0	0	.	.	#NUM!	0
Total Debt Service							0
Total Interest	0	0	0	.	.	#NUM!	0
Total Principal	0	0	0	.	.	#NUM!	0
Total Debt Service	0	0	0	.	.	#NUM!	#NUM!
Total capital expenses	0	0	0	.	.	#NUM!	#NUM!
Total water supply expenses							

Years	1 FY 2003	2 FY 2004	3 FY 2005	4 FY 2006	5 FY 2007	Total	Average
						0	#DIV/0!
						0	#DIV/0!
	0	0	0	0	0	0	0
R&R Target: % of Fixed Assets	0	0	0	0	0	0	0
	0	0	0	0	0		
	0	0	0	0	0	0	0
	0	0	0	0	0		
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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.5 WATER - WATER SERVICE COST ANALYSIS (LE/m³ SOLD)

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
O&M Expenses	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#REF!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Labor	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#REF!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commodities	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#REF!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Services	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#REF!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Purchases for Sale	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#REF!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Taxes and Duties	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#REF!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Subtotal, O&M	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Renewal & Replacement	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#REF!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Debt service	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Subtotal, capital expenses	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#REF!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total cost														

3.6 WASTEWATER - OPERATION AND MAINTENANCE EXPENSES

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Total Number of Staff	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#NUM!								
Number of Staff per 1,000 Connections				-	#DIV/0!	#DIV/0!								
Wages and salaries	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#NUM!								
Average Staff Salary					#DIV/0!	#DIV/0!								
Commodity Requirements				-	#DIV/0!	#NUM!								
Power				-	#DIV/0!	#NUM!								
Chemicals				-	#DIV/0!	#NUM!								
Materials & Spare parts				-	#DIV/0!	#NUM!								
Oil & Fuels				-	#DIV/0!	#NUM!								
Other Commodities				0	0	#NUM!								
Subtotal, commodity requirements	0	0	0		#DIV/0!									
Services Requirements				-	#DIV/0!	#NUM!								
Maintenance				-	#DIV/0!	#NUM!								
Transportation				-	#DIV/0!	#NUM!								
Other Services				-	-	#NUM!								
Subtotal, service requirements	0	0	0	-	#DIV/0!	#NUM!								
Purchases for Sale				-	#DIV/0!	#NUM!								
Taxes and Duties				-	-	#NUM!								
Total, O&M expenses	0	0	0											

3.7 WASTEWATER - O&M PROJECTION (Impact of Expense Parameters)

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Annual Inflation Rate for Wages							9%	Wage Inflation Rate	9%	9%	9%	9%	9%		
Total Number of Staff							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Number of Staff per 1,000 Connections							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!
Wages and salaries							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!
Average Staff Salary							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		
Commodity & Services Inflation Rate								Commodity Inflation Rat	3%	3%	3%	3%	3%		
Commodity Requirements							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Power							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Chemicals							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Materials & Spare parts							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Oil & Fuels							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Other Commodities							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Subtotal, commodity requirements															
Services Requirements							#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Maintenance							#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Transportation							#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Other Services							#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Subtotal, service requirements							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Purchases for Sale							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Taxes and Duties							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total, O&M expenses							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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& WASTEWATER - O&M PROJECTION #2: Impact of Efficiency Improvements

ype:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
otal Number of Staff							#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Number of Staff per 1,000 Connections							#DIV/0!								#DIV/0!
Wages and salaries							#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average Staff Salary							#DIV/0!								#DIV/0!
Commodity Requirements															
Power							#NUM!	Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Chemicals							#NUM!	Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Materials & Spare parts							#NUM!	Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Oil & Fuels							#NUM!	Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Other Commodities							#NUM!	Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Subtotal, commodity requirements							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Services Requirements															#DIV/0!
Maintenance							#NUM!	Efficiency Improvement Result	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Transportation							#NUM!	Efficiency Improvement Result	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Other Services							#NUM!	Efficiency Improvement Result	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Subtotal, service requirements							#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Purchases for Sale								Efficiency Improvement Result	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Regulatory Compliance Program O&M Costs							#NUM!		0	0	0	0	0	0	0
Taxes and Duties							#DIV/0!	Efficiency Improvement Result	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total O&M Expenses									#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

& WASTEWATER - CAPITAL COSTS

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Fixed Assets:														0	#DIV/0!
Total Fixed Assets Value					#DIV/0!	#NUM!	#NUM!							0	#DIV/0!
Land Value					#DIV/0!	#NUM!	#NUM!		0	0	0	0	0	0	0
Net Fixed Assets						#NUM!	#NUM!	R&R Cost Target % of Fixed Assets							
Renewal & Replacement Costs:	0	0	0						0	0	0	0	0	0	0
1.00%									0	0	0	0	0	0	0
Regulatory Compliance Capital Costs	0	0	0			#NUM!	#NUM!		0	0	0	0	0	0	0
Total Renewal & Replacement Costs									0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
New Debt Service									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interest									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Repayment of principal									0	0	0	0	0	0	0
Total New Debt Service							0		0	0	0	0	0	0	0
Existing Debt Service	0	0	0			#NUM!	0		0	0	0	0	0	0	0
Interest	0	0	0			#NUM!	0		0	0	0	0	0	0	0
Repayment of principal	0	0	0			#NUM!	0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Existing Debt Service	0	0	0			#NUM!	#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Debt Service	0	0	0			#NUM!	#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total capital expenses	0	0	0			#NUM!									
Total wastewater service expenses															

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WASTEWATER - SERVICE COST ALYSIS ($/m³ COLLECTED)															
e:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
M Expenses	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
abor	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Commodities	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Services	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Purchases for Sale									#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Regulatory Compliance Prog. O&M Costs	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Taxes and Duties	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
btotal, O&M	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
enewal & Replacement	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
ebt service	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
ubtotal, capital expenses	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
otal cost of wastewater service	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!								
II WATER - NET COSTS															
ype:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
&M Expenses (water service)	0	0	0	-	-	#NUM!	#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
ffset from other water revenue	0	0	0	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
let O&M Expenses, water service	0	0	0	-	-	#NUM!	#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
enewal & Replacement	0	0	0	-	-	#NUM!	#NUM!		0	0	0	0	0	0	0
ebt Service	0	0	0	-	-	#NUM!	0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
let expenses, water service	0	0	0	-	-	#NUM!	#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
AR WASTEWATER - NET COSTS															
Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
O&M Expenses (wastewater service)	0	0	0	-	-	#NUM!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Offset from other wastewater revenue	0	0	0	-	-	#NUM!	0		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Net O&M Expenses, wastewater service	0	0	0	-	-	#NUM!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Renewal & Replacement	0	0	0	-	-	#NUM!	#NUM!		0	0	0	0	0	0	0
Debt Service	0	0	0	-	-	#NUM!	0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Net expenses, wastewater service	0	0	0	-	-	#NUM!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

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Name of Utility: Name of Utility

4-CALCULATION OF REVENUE REQUIREMENTS

4.1 WATER - REVENUE REQUIREMENTS	FY 1999	FY 2000	FY 2001	Total	Average	Average Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Treated Water Expenses														
Net O&M expenses	0	0	0	0	0	#NUM!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Renewal & Replacement	0	0	0	0	0	#NUM!	#NUM!	0	0	0	0	0	0	0
Debt service	0	0	0	0	0	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total expenses (LE)	0	0	0	0	0	#NUM!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total treated water consumed (m^3)	0	0	0	0	0	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Average expense per m^3 consumed (LE/m^3)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total water tariff revenue (LE)	0	0	0	0	0	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Water Tariff Revenue Collection (LE)	0	0	0	0	0	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Water tariff revenue per m^3 sold (LE/m^3)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total water tariff revenue collected (LE)	0	0	0	0	0	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Water tariff revenue collection per m^3 sold (LE/m^3)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Water service expenses as % of water tariff revenue collected	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total water revenue requirement (LE)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Average water revenue requirement per m^3 sold (LE/m^3)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

4.2 WATER - COST RECOVERY SCENARIOS	FY 1999	FY 2000	FY 2001	Total	Average	Average Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
O&M revenue requirement	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
R&R revenue requirement	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Debt Service revenue requirement	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total water revenue requirement (LE)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Cumulative Revenue Requirements														
O&M revenue requirement	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
O&M plus R&R revenue requirements	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Full cost recovery revenue requirements	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Average tariff to recover:														
O&M cost	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
O&M plus R&R	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Full cost recovery	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Average tariff increase to recover:														
O&M cost	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
O&M plus R&R	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Full cost recovery	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Cost Recovery Targets as % of:														
O&M	100%	100%	100%		100%	0%	100%	100%	100%	100%	100%	100%		100%
R&R				0%	#DIV/0!	#NUM!							0%	#DIV/0!
Debt service				0%	#DIV/0!	#NUM!							0%	#DIV/0!
Total cost						#NUM!								

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Expected Revenues	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
O&M	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
R&R	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Debt service														
Cumulative Cost Recovery	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
O&M cost	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
O&M plus R&R	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Full cost recovery	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Target Tariff Revenues								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Average tariff increase to recover Target Tariff Revenue	0	0	0	0	0	#NUM!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Water Costs	0	0	0	0	0	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total Water Revenue Collected	0	0	0	0	0	#NUM!	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Target Subsidy														

4.3 WASTEWATER - REVENUE REQUIREMENTS	FY 1999	FY 2000	FY 2001	Total	Average	Average Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Wastewater Expenses	0	0	0	0	0	#NUM!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Net O&M expenses	0	0	0	0	0	#NUM!	#NUM!	0	0	0	0	0	0	0
Renewal & Replacement	0	0	0	0	0	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Debt service	0	0	0	0	0	#NUM!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total expenses (LE)	0	0	0	0	0	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total wastewater collected (m^3)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average expense per m^3 collected (LE/m^3)	0	0	0	0	0	#NUM!	0	0	0	0	0	0	0	0
Total wastewater tariff revenue (LE)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Wastewater tariff revenue per m^3 collected (LE/m^3)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total wastewater tariff revenue collected (LE)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Wastewater tariff revenue collection per m^3 collected (LE/m^3)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Wastewater service expenses as % of wastewater tariff revenue collected	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total wastewater revenue requirement (LE)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average wastewater requirement per m^3 collected (LE/m^3)														

4.4 WASTEWATER - COST RECOVERY SCENARIOS	FY 1999	FY 2000	FY 2001	Total	Average	Average Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
O&M revenue requirement	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
R&R revenue requirement	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#NUM!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Debt Service revenue requirement	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total water revenue requirement (LE)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Cumulative Revenue Requirements														
O&M revenue requirement	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
O&M plus R&R revenue requirements	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Full cost recovery revenue requirements	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average tariff to recover:														
O&M cost	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
O&M plus R&R	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Full cost recovery	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average tariff increase to recover:														
O&M cost	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
O&M plus R&R	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Full cost recovery	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

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Cost Recovery Targets as % of:														
O&M	100%	100%	100%	100%	100%	0.0%	100%	100%	100%	100%	100%	100%	500%	100%
R&R					#DIV/0!	#NUM!							0%	#DIV/0!
Debt service					#DIV/0!	#NUM!							0%	#DIV/0!
Total cost						#NUM!								
Expected Revenues														
O&M	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
R&R	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#NUM!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Debt service	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Cumulative Cost Recovery														
O&M cost	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
O&M plus R&R	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Full cost recovery	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Target Tariff Revenues	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average tariff increase to recover Target Tariff Revenue								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total Wastewater Costs	0	0	0	0	0	#NUM!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total Wastewater Revenue Collected	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Target Subsidy	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

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DEBT SERVICE

WATER

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Existing Debts - WATER													
Debt Service:													
Beginning of Year Principal Balance		0	0			0	#NUM!	0	0	0	0	0	0
Interest Paid				0	#DIV/0!		#NUM!						0
Repayment of principal				0	#DIV/0!		#NUM!						0
Total debt service on Existing Debt	0	0	0	0		0	#NUM!	0	0	0	0	0	0
End of Year Principal Balance	0	0	0				0	0	0	0	0	0	0
NEW DEBT (2002 - 2006) - WATER													

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
2003													
Source													
Grace Period on Principal (No. of Years)													
Beginning of Year Principal Balance									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Term									0	0	0	0	
Interest Rate									0	0	0	0	
Interest Due								0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Principal Due								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Total Debt Service								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
End of Year Principal Balance								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
2004													
Source													
Grace Period on Principal (No. of Years)													
Beginning of Year Principal Balance										#DIV/0!	#DIV/0!	#DIV/0!	
Term										0	0	0	
Interest Rate										0	0	0	
Interest Due									0	#DIV/0!	#DIV/0!	#DIV/0!	
Principal Due									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Total Debt Service									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
End of Year Principal Balance									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
2005													
Source													
Grace Period on Principal (No. of Years)													
Beginning of Year Principal Balance											#DIV/0!	#DIV/0!	
Term											0	0	
Interest Rate											0	0	
Interest Due										0	#DIV/0!	#DIV/0!	
Principal Due										#DIV/0!	#DIV/0!	#DIV/0!	
Total Debt Service										#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
End of Year Principal Balance										#DIV/0!	#DIV/0!	#DIV/0!	
2006													
Source													
Grace Period on Principal (No. of Years)													
Beginning of Year Principal Balance												#DIV/0!	
Term												0	
Interest Rate												0	
Interest Due											0	#DIV/0!	
Principal Due											#DIV/0!	#DIV/0!	
Total Debt Service											#DIV/0!	#DIV/0!	#DIV/0!
End of Year Principal Balance											#DIV/0!	#DIV/0!	

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2007														
Source														
Grace Period on Principal (No. of Years)														
Beginning of Year Principal Balance														
Term														
Interest Rate														
Interest Due														
Principal Due														0
Total Debt Service													#DIV/0!	
End of Year Principal Balance													#DIV/0!	#DIV/0!
													#DIV/0!	
Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Total Debt Service - WATER														
Total Debt Service on Existing Debt	0	0	0	0	0	#REFI	0		0	0	0	0	0	0
New Debt Service														
New Debt Interest Payments									0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
New Debt Principal Payments									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total New Debt Service							0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Debt Service Payments	0	0	0	0	0	#REFI			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

DEBT SERVICE

WASTEWATER

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
Existing Debts														
Debt Service:														
Beginning of Year Principal Balance	0	0	0		0	#NUM!	0		0	0	0	0	0	0
Interest Paid	0	0	0	0	0	#NUM!	0		0	0	0	0	0	0
Repayment of principal	0	0	0	0	0	#NUM!	0		0	0	0	0	0	0
Total debt service on Existing Debt	0	0	0	0	0	#NUM!	0		0	0	0	0	0	0
End of Year Principal Balance	0	0	0				0		0	0	0	0	0	0
NEW DEBT (2002 - 2006)														

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total
2003														
Source									0					
Grace Period on Principal (No. of Years)									0					
Beginning of Year Principal Balance									0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Term									0	0	0	0	0	
Interest Rate									0.00%	0	0	0	0	
Interest Due									0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Principal Due									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Total Debt Service									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
End of Year Principal Balance									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
2004														
Source														
Grace Period on Principal (No. of Years)										0				
Beginning of Year Principal Balance										0				
Term										0	#DIV/0!	#DIV/0!	#DIV/0!	
Interest Rate										0	0	0	0	
Interest Due										0	0	0	0	
Principal Due										0	#DIV/0!	#DIV/0!	#DIV/0!	
Total Debt Service										#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
End of Year Principal Balance										#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
										#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

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Regulatory Compliance Program

Water Supply

1 Flow Monitoring Program
2 Power Use Efficiency Audit
3 Leak Detection Survey Program
4 Water Distribution System Evaluation
5 Water System Master Plan
6 Computerized Customer Information & Billing System

Wastewater Service

7 Wastewater Flow Monitoring Program
8 Sewer Networks Mapping
9 Manhole Survey
10 Sewer System Evaluation
11 Wastewater System Master Plan
12 Computerized Customer Information & Billing System

Regulatory Compliance Program-WATER

1 Flow Monitoring Program	Program Costs				
	FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
Program O&M Costs:					
Wages and salaries					
Commodity Requirements					
Power					
Chemicals					
Materials & Spare parts					
Oil & Fuels					
Other Commodities					
Subtotal, commodity requirements	0	0	0	0	0
Services Requirements					
Maintenance					
Transportation					
Other Services					
Subtotal, service requirements	0	0	0	0	0
Purchases for Sale					
Taxes and Duties					
Total, O&M expenses	0	0	0	0	0
Program Capital Costs	0	0	0	0	0
Total Program Cost	0	0	0	0	0

2	Power Use Efficiency Audit	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs					
	Total Program Cost	0	0	0	0	0

3	Leak Detection Survey Program	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs					
	Total Program Cost	0	0	0	0	0

4	Water Distribution System Evaluation	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs					
	Total Program Cost	0	0	0	0	0

5	Water System Master Plan	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs					
	Total Program Cost	0	0	0	0	0

6	Computerized Customer Information & Billing System	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs					
	Total Program Cost	0	0	0	0	0

Total Costs - WATER Regulatory Compliance Program	Total Regulatory Compliance Costs				
	FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
Program O&M Costs:					
Wages and salaries	0	0	0	0	0
Commodity Requirements					
Power	0	0	0	0	0
Chemicals	0	0	0	0	0
Materials & Spare parts	0	0	0	0	0
Oil & Fuels	0	0	0	0	0
Other Commodities	0	0	0	0	0
Subtotal, commodity requirements	0	0	0	0	0
Services Requirements					
Maintenance	0	0	0	0	0
Transportation	0	0	0	0	0
Other Services	0	0	0	0	0
Subtotal, service requirements	0	0	0	0	0
Purchases for Sale	0	0	0	0	0
Taxes and Duties	0	0	0	0	0
Total, O&M expenses	0	0	0	0	0
Program Capital Costs	0	0	0	0	0
Total Program Costs	0	0	0	0	0

Regulatory Compliance Program: WASTEWATER

7	Wastewater Flow Monitoring Program	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs					
	Total Program Cost	0	0	0	0	0

8	Sewer Networks Mapping	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs					
	Total Program Cost	0	0	0	0	0

9	Manhole Survey	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs					
	Total Program Cost	0	0	0	0	0

10	Sewer System Evaluation	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs					
	Total Program Cost	0	0	0	0	0

11	Wastewater System Master Plan	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs	0	0	0	0	0
	Total Program Cost	0	0	0	0	0

12	Computerized Customer Information & Billing System	Program Costs				
		FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
	Program O&M Costs:					
	Wages and salaries					
	Commodity Requirements					
	Power					
	Chemicals					
	Materials & Spare parts					
	Oil & Fuels					
	Other Commodities					
	Subtotal, commodity requirements	0	0	0	0	0
	Services Requirements					
	Maintenance					
	Transportation					
	Other Services					
	Subtotal, service requirements	0	0	0	0	0
	Purchases for Sale					
	Taxes and Duties					
	Total, O&M expenses	0	0	0	0	0
	Program Capital Costs	0	0	0	0	0
	Total Program Cost	0	0	0	0	0

Total Costs - WASTEWATER Regulatory Compliance Program	Total Regulatory Compliance Costs				
	FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07
Program O&M Costs:					
Wages and salaries	0	0	0	0	0
Commodity Requirements					
Power	0	0	0	0	0
Chemicals	0	0	0	0	0
Materials & Spare parts	0	0	0	0	0
Oil & Fuels	0	0	0	0	0
Other Commodities	0	0	0	0	0
Subtotal, commodity requirements	0	0	0	0	0
Services Requirements					
Maintenance	0	0	0	0	0
Transportation	0	0	0	0	0
Other Services	0	0	0	0	0
Subtotal, service requirements	0	0	0	0	0
Purchases for Sale	0	0	0	0	0
Taxes and Duties	0	0	0	0	0
Total, O&M expenses	0	0	0	0	0
Program Capital Costs	0	0	0	0	0
Total Program Costs	0	0	0	0	0

Name: Name of Utility

5-UNIFORM RATE INCREASES

WATER

5.1-WATER - RATE DESIGN ALTERNATIVE 1: UNIFORM RATE INCREASES

Class:	Current Tariff/m³	Total (03-07) m³ billed	Ave. Tariff Increase Factor	New Tariff Rate (LE/m³)	Expected Revenue		
Residential 0-20 m3/month	0	#NUM!		#DIV/0!	#NUM!		
Residential >20 m3/month	0	#NUM!		#DIV/0!	#NUM!		
Governmental	0	#NUM!		#DIV/0!	#NUM!		
Religious	0	#NUM!		#DIV/0!	#NUM!		
Standpipes	0	#NUM!		#DIV/0!	#NUM!		
Commercial	0	#NUM!		#DIV/0!	#NUM!		
Public Sector	0	#NUM!		#DIV/0!	#NUM!		
Total		#NUM!	#DIV/0!		#NUM!	Total Tariff RR	#DIV/0!

5.2-WASTEWATER - RATE DESIGN ALTERNATIVE 1: RATE INCREASE PROPORTIONAL TO AVERAGE COLLECTION RATE

Class:	Current Tariff/m³	Total (03-07) m³ billed	Ave. Expense/ Collections Ratio	New Tariff Rate (LE/m³)	Expected Revenue
Residential 0-20 m3/month	0	#REF!	#REF!	#REF!	#REF!
Residential >20 m3/month	0	#REF!	#REF!	#REF!	#REF!
Governmental	0	#REF!	#REF!	#REF!	#REF!
Religious	0	#REF!	#REF!	#REF!	#REF!
Standpipes	0	#REF!	#REF!	#REF!	#REF!
Commercial	0	#REF!	#REF!	#REF!	#REF!
Public Sector	0	#REF!	#REF!	#REF!	#REF!
Total	0	#REF!			#REF!

AVERAGE MONTHLY BILLS

WATER - ALTERNATIVE 1: UNIFORM RATE INCREASES

Classes	Tariffs (LE/m3)	m3/month 10	m3/month 20	m3/month 30	m3/month 40	m3/month 50	m3/month 80	m3/month 150
Residential 0-20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Residential >20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Religious	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Standpipes	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commercial	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Public Sector	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

WASTEWATER - ALTERNATIVE 1: UNIFORM RATE INCREASES

Classes	Tariffs (LE/m3)	Billable Flows based upon water consumption of: 10	WW Bill	Billable Flow 20	WW Bill	Billable Flow 30	WW Bill	Billable Flow 40	WW Bill	Billable Flow 50	WW Bill	Billable Flow 80	WW Bill	Billable Flow 150	WW Bill
Residential 0-20 m3/month	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Residential >20 m3/month	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Governmental	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Religious	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Standpipes	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Commercial	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Public Sector	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!

COMBINED WATER & WASTEWATER FOR REPRESENTATIVE LEVELS OF WATER & WASTEWATER CONSUMPTION: ALTERNATIVE 1

Classes	Tariffs (LE/m3)	m3/month 10	m3/month 20	m3/month 30	m3/month 40	m3/month 50	m3/month 80	m3/month 150
Residential 0-20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Residential >20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Religious	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Standpipes	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commercial	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Public Sector	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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Name: Name of Utility

BLOCK CONSUMPTION AND AVERAGE MONTHLY BILLS

6-STRUCTURED RATE INCREASES

6.1 WATER - RATE DESIGN ALTERNATIVE 2: RATE INCREASE BASED UPON "% OF COST-TO-BEAR" OF EACH CLASS

New Customer Classes:	Total (03-07) Consumption m^3	Class % of Total Consumption	Revenue Requirement of Class (I.E)	Percentage of Cost-to-Bear	Percentage "Helper" Function	Cost-to-Bear	New Rate: Cost-to-Bear/ m3 Consumption	Percentage Increase of Current Tariffs	Expected Revenue
Domestic	#NUM!	#NUM!	#DIV/0!	50%	50.0%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Institutional	#NUM!	#NUM!	#DIV/0!	44%	44.0%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commercial	#NUM!	#NUM!	#DIV/0!	6%	6.0%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Irrigation		#NUM!	#DIV/0!		#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total	#NUM!	#NUM!	#DIV/0!	100%	#NUM!	#DIV/0!	#DIV/0!		#DIV/0!

6.2 WATER - RATE DESIGN FOR BLOCKS WITHIN CUSTOMER CLASSES

	Expected Revenue for the Class	5 Year (03-07) Block Consumption (m3)	Percent of Total Class Consumption by users ending in each Block	Block Revenue Requirement According to Consumption	Percentage of "Cost-to-Bear" of each Block	Percentage "Helper" Function	New Revenue Requirement of Block	New Block Tariffs:Cost/m 3
Domestic Block 1: 0-10 m3/month			#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
Domestic Block 2: 11-30 m3/month			#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
Domestic Block 3: 31+ m3/month			#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
Total	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!	

6.3 WASTEWATER - RATE DESIGN ALTERNATIVE 2: RATE INCREASE BASED UPON "COST-TO-BEAR" OF EACH CLASS

Class:	Total (03-07) Consumption m^3	Class % of Total Consumption	Revenue Requirement of Class (I.E)	Percentage of Cost-to-Bear	Percentage Helper Function	Cost-to-Bear	New Rate: Cost-to-Bear/ m3 Consumption		Expected Revenue
Domestic	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Institutional	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Commercial	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Irrigation	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Total	#REF!	#REF!	#REF!	0	#REF!	#REF!	#REF!		#REF!

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Name: Name of Utility

BLOCK CONSUMPTION AND AVERAGE MONTHLY BILLS

6-STRUCTURED RATE INCREASES

6.1 WATER - RATE DESIGN ALTERNATIVE 2: RATE INCREASE BASED UPON "% OF COST-TO-BEAR" OF EACH CLASS

New Customer Classes:	Total (03-07) Consumption m^3	Class % of Total Consumption	Revenue Requirement of Class (LE)	Percentage of Cost-to-Bear	Percentage "Helper" Function	Cost-to-Bear	New Rate: Cost-to-Bear/ m3 Consumption	Percentage Increase of Current Tariffs	Expected Revenue
Domestic	#NUM!	#NUM!	#DIV/0!	50%	50.0%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Institutional	#NUM!	#NUM!	#DIV/0!	44%	44.0%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commercial	#NUM!	#NUM!	#DIV/0!	6%	6.0%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Irrigation		#NUM!	#DIV/0!		#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total	#NUM!	#NUM!	#DIV/0!	100%	#NUM!	#DIV/0!	#DIV/0!		#DIV/0!

6.2 WATER - RATE DESIGN FOR BLOCKS WITHIN CUSTOMER CLASSES

	Expected Revenue for the Class	5 Year (03-07) Block Consumption (m3)	Percent of Total Class Consumption by users ending in each Block	Block Revenue Requirement According to Consumption	Percentage of "Cost-to-Bear" of each Block	Percentage "Helper" Function	New Revenue Requirement of Block	New Block Tariffs:Cost/m3
Domestic Block 1: 0-10 m3/month			#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
Domestic Block 2: 11-30 m3/month			#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
Domestic Block 3: 31+ m3/month			#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
Total	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!	#DIV/0!	

6.3 WASTEWATER - RATE DESIGN ALTERNATIVE 2: RATE INCREASE BASED UPON "COST-TO-BEAR" OF EACH CLASS

Class:	Total (03-07) Consumption m^3	Class % of Total Consumption	Revenue Requirement of Class (LE)	Percentage of Cost-to-Bear	Percentage Helper Function	Cost-to-Bear	New Rate: Cost-to-Bear/ m3 Consumption		Expected Revenue
Domestic	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Institutional	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Commercial	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Irrigation	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Total	#REF!	#REF!	#REF!	0	#REF!	#REF!	#REF!		#REF!

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6.4 WASTEWATER - RATE DESIGN FOR BLOCKS WITHIN CUSTOMER CLASSES

	Expected Revenue for the Class	5 Year (03-07) Block Consumption (m3)	Percent of Total Class Consumption by users ending in each Block	Block Revenue Requirement According to Consumption	Percentage of "Cost-to-Bear" of each Block	Percentage "Helper" Function	New Revenue Requirement of Block	New Block Tariffs:Cost/m3
Residential Block 1:Billable WW Flow - 0-10 m3/mo.			#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
Residential Block 2: Billable WW Flow 11-30 m3/mo.			#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
Residential Block 3: Billable WW Flow 31+ m3/mo.			#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
Total	#REF!	#REF!	#REF!	#DIV/0!	0	#DIV/0!	#DIV/0!	

WATER - ALTERNATIVE 2:RATE INCREASE BASED UPON "% OF COST-TO-BEAR" OF EACH CLASS

		m3/month	m3/month	m3/month	m3/month	m3/month	m3/month	m3/month
	Tariffs (LE/m3)	10	20	30	40	50	80	150
Classes								
Residential	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Religious	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Service	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commercial	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Industrial	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Investment	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Irrigation	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Ghurab	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

WASTEWATER - ALTERNATIVE 2:RATE INCREASE BASED UPON "% OF COST-TO-BEAR" OF EACH CLASS

		Billable Flow		Billable Flow		Billable Flow		Billable Flow		Billable Flow		Billable Flow		Billable Flow		Billable Flow	
	Tariffs (LE/m3)	10	WW Bill	20	WW Bill	30	WW Bill	40	WW Bill	50	WW Bill	80	WW Bill	150	WW Bill		
Classes																	
Residential	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!		
Religious	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!		
Governmental	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!		
Service	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!		
Commercial	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!		
Industrial	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!		
Investment	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!		
Irrigation	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
Ghurab	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		

COMBINED WATER & WASTEWATER FOR REPRESENTATIVE LEVELS OF WATER & WASTEWATER CONSUMPTION ALTERNATIVE 2

		m3/month	m3/month	m3/month	m3/month	m3/month	m3/month	m3/month
	Tariffs (LE/m3)	10	20	30	40	50	80	150
Classes								
Residential	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Religious	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Service	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commercial	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Industrial	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Investment	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Irrigation	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Ghurab	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

	No. of users ending in this block 0-10	Total Consumption of Users ending in this block	No. of users ending in this block 11-20	Total Consumption of Users ending in this block	No. of users ending in this block 21-30	Total Consumption of Users ending in this block	No. of users ending in this block 31-50	Total Consumption of Users ending in this block	No. of users ending in this block 51-80	Total Consumption of Users ending in this block	No. of users ending in this block 81+	Total Consumption of Users ending in this block	Total Users	Total Consumption
Classes														
Residential 0-20 m3/month													0	0
Residential >20 m3/month													0	0
Governmental													0	0
Religious													0	0
Standpipes													0	0
Commercial													0	0
Public Sector													0	0
0													0	0
0													0	0

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ANNEX E

Example Revenue Requirements Analysis and Rate Designs (Work-in-Progress)

Customer Classifications

Name of Utility	Hypothetical Egyptian Water Utility
Current Fiscal Year	2002

	Existing Customer Classifications	New Customer Classifications
1	Residential 0-20 m3/month	Domestic
2	Residential >20 m3/month	Institutional
3	Governmental	Commercial
4	Religious	Irrigation
5	Standpipes	
6	Commercial	
7	Public Sector	
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		

Name of Utility: Hypothetical Egyptian Water Utility
Service area (km²)
Service area population

1- DEMAND

1.1 WATER - SYSTEM LENGTH & TREATED WATER USERS

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	CURRENT FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Water Network System Length (Kms)			579,837	579,837	579,837	#DIV/0!									
Water Users:															
Residential 0-20 m3/month	234,852	248,000	284,146	766,998	255,666	8.5%	308,326	8.5%	308,326	334,563	363,033	393,926	427,447	2,135,621	305,089
Residential >20 m3/month	58,713	62,000	66,966	187,679	62,560	6.4%	71,249	6.4%	75,806	80,655	85,814	91,303	97,143	501,970	71,710
Governmental	4,865	5,100	5,776	15,741	5,247	7.6%	6,213	7.6%	6,683	7,189	7,733	8,318	8,947	45,083	6,440
Religious	1,500	1,580	1,790	4,870	1,623	7.9%	1,932	7.9%	2,085	2,250	2,428	2,621	2,828	14,144	2,021
Standpipes	2,400	2,412	2,732	7,544	2,515	4.6%	2,857	4.6%	2,988	3,125	3,269	3,419	3,576	19,235	2,748
Commercial	13,615	14,000	15,857	43,472	14,491	6.2%	16,839	6.2%	17,883	18,990	20,167	21,416	22,743	118,039	16,863
Public Sector	850	910	1,031	2,791	930	9.1%	1,125	9.1%	1,227	1,339	1,461	1,594	1,739	8,484	1,212
Total	316,795	334,002	378,298	1,029,095	343,032		408,541		414,998	448,112	483,904	522,596	564,423	2,842,575	406,082

1.2 WATER - BILLED CONSUMPTION OF TREATED WATER (in m³)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	37,074,441	37,354,594	39,322,614	113,751,649	37,917,216	2.2%	40,202,659	2.2%	41,102,399	42,022,275	42,962,739	43,924,250	44,907,280	255,121,602	36,445,943
Residential >20 m3/month	32,877,145	33,125,772	34,870,998	100,873,915	33,624,638	2.2%	35,651,552	2.2%	36,449,578	37,265,466	38,099,618	38,952,441	39,824,354	226,243,009	32,320,430
Governmental	9,166,430	9,163,148	9,892,481	28,222,059	9,407,353	2.6%	10,145,849	2.6%	10,405,706	10,672,218	10,945,557	11,225,896	11,513,415	64,908,641	9,272,663
Religious	9,106,440	9,163,148	9,892,481	28,162,069	9,387,356	3.0%	10,190,358	3.0%	10,497,205	10,813,291	11,138,895	11,474,304	11,819,812	65,933,864	9,419,123
Standpipes	23,757,944	23,894,222	24,731,204	72,383,370	24,127,790	1.5%	25,112,237	1.5%	25,499,141	25,892,006	26,290,924	26,695,988	27,107,293	156,597,591	22,371,084
Commercial	2,997,344	2,999,910	3,709,681	9,706,935	3,235,645	7.4%	3,858,068	4.0%	4,012,391	4,172,887	4,339,802	4,513,394	4,693,930	25,590,472	3,655,782
Public Sector	1,025,849	1,027,206	1,236,560	3,289,615	1,096,538	6.5%	1,286,022	4.0%	1,337,463	1,390,962	1,446,600	1,504,464	1,564,643	8,530,155	1,218,594
Total	116,005,593	119,830,810	123,656,027	243,486,837	367,142,864	3.3%	126,446,745		129,303,883	132,229,106	135,224,135	138,290,738	141,430,727	802,925,334	114,703,619

1.3 WATER - PRODUCTION & UNACCOUNTED-FOR WATER

Historic Trend Projection

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Treated Water Production															
Own Production	166,301,320	167,550,402	168,799,484	502,651,206	167,550,402	0.7%	171,251,975		173,642,150	176,112,914	178,665,262	181,300,277	184,019,127	893,739,729	178,747,946
Bulk Water Purchase 1	7,530,257	7,386,396	7,242,534	22,159,187	7,386,396	-1.9%	7,242,534	2%	7,387,385	7,535,132	7,685,835	7,839,552	7,996,343	38,444,247	7,688,849
Bulk Water Purchase 2	580,500	564,000	547,500	1,692,000	564,000	-2.9%	547,500		547,500	547,500	547,500	547,500	547,500	2,737,500	547,500
Total Water Purchase	8,110,757	7,950,396	7,790,034	23,851,187	7,950,396	-2.0%	7,790,034		7,934,885	8,082,632	8,233,335	8,387,052	8,543,843	41,181,747	8,236,349
Total Water Production	174,412,077	175,500,798	176,589,518	526,502,393	175,500,798	0.6%	179,042,009		181,577,034	184,195,546	186,898,597	189,687,329	192,562,970	934,921,476	186,984,295
Unaccounted-for water (m³)	58,406,484	55,669,988	52,933,491	167,009,963	55,669,988	-4.8%	52,595,263		52,273,152	51,966,440	51,674,461	51,396,591	51,132,243	258,442,887	51,688,577
Trend-Based Unaccounted-for water (%) "No Changes"	33%	32%	30%		31%	-5.4%	29%	-2.0%	29%	28%	28%	27%	27%		28%

1.4 WATER - PROJECTION OF WATER PRODUCTION & UFW

Projected UFW Reduction

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Treated Water Production															
Own Production															
Bulk Water Purchase															
Total Water Production							179,042,009	Annual UFW	175,776,192	173,516,502	172,073,846	171,307,841	171,112,180		172,757,312
Unaccounted-for water (m³)							52,595,263	Reduction Target	46,472,309	41,287,396	36,849,711	33,017,103	29,681,453		37,461,595
Unaccounted-for water (%)							29%	-10%	26.4%	23.8%	21.4%	19.3%	17.3%		21.7%

1.5 WATER - BILLED CONSUMPTION OF TREATED WATER PER CONNECTION (in m³ per connection)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	158	151	138	447	149	-5.8%	130	-5.8%	133	126	118	112	105	594	119
Residential >20 m3/month	560	534	521	1,615	538	-3.9%	500	-3.9%	481	462	444	427	410	2,223	445
Governmental	1,884	1,797	1,713	5,394	1,798	-4.7%	1,633	-4.7%	1,557	1,485	1,415	1,350	1,287	7,093	1,419
Religious	6,071	5,799	5,527	17,397	5,799	-4.6%	5,275	-4.6%	5,035	4,806	4,587	4,379	4,179	22,986	4,597
Standpipes	9,899	9,906	9,052	28,858	9,619	-2.9%	8,789	-2.9%	8,533	8,284	8,043	7,809	7,581	40,250	8,050
Commercial	220	214	234	668	223	1.1%	229	1.1%	224	220	215	211	206	1,076	215
Public Sector	1,207	1,129	1,199	3,535	1,178	-2.4%	1,143	-2.4%	1,090	1,039	990	944	900	4,963	993
Average	2,857	2,790	2,626	5,416	2,708	-3%	2,529	-3.3%	2,436	2,346	2,259	2,176	2,096	11,312	2,262

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1.6 WASTEWATER - SYSTEM LENGTH & SEWER CONNECTIONS

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Sewer System Length (Kms)				-	#DIV/0!	#NUM!									#DIV/0!
Sewer Connections				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Residential 0-20 m3/month				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Residential >20 m3/month				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Governmental				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Religious				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Standpipes				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Commercial				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Public Sector	0	0	0	0	#DIV/0!		0	0	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total															

1.7 WASTEWATER - BILLED CONSUMPTION OF TREATED WATER BY SEWERED USERS (in m³)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Residential >20 m3/month				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Governmental				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Religious				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Standpipes				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Commercial				-	#DIV/0!	#NUM!			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Public Sector	0	0	0	0	#DIV/0!		0		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total															

1.8 WASTEWATER - BILLED CONSUMPTION OF TREATED WATER BY SEWERED USERS PER SEWER CONNECTION (in m³ per connection)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Residential >20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Religious	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Standpipes	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Commercial	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Public Sector	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average															

1.9 WATER - WATER-WASTEWATER CONVERSION FACTORS

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	W-WW Conversion Factor Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	0.8	0.8	0.8		0.8	0.0%			0	0	0	0	0		0
Residential >20 m3/month	0.8	0.8	0.8		0.8	0.0%			0	0	0	0	0		0
Governmental	0.8	0.8	0.8		0.8	0.0%			0	0	0	0	0		0
Religious	0.8	0.8	0.8		0.8	0.0%			0	0	0	0	0		0
Standpipes	0.8	0.8	0.8		0.8	0.0%			0	0	0	0	0		0
Commercial	0.8	0.8	0.8		0.8	0.0%			0	0	0	0	0		0
Public Sector	0.8	0.8	0.8		0.8	0.0%			0	0	0	0	0		0

1.10 WASTEWATER - WASTEWATER DISCHARGE (in m³)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	29,659,553	29,883,675	31,458,091	91,001,319	30,333,773	2.2%	0		0	0	0	0	0	0	0
Residential >20 m3/month	26,301,716	26,500,618	27,896,798	80,699,132	26,899,711	2.2%	0		0	0	0	0	0	0	0
Governmental	7,333,144	7,330,518	7,913,985	22,577,647	7,525,882	2.6%	0		0	0	0	0	0	0	0
Religious	7,285,152	7,330,518	7,913,985	22,529,655	7,509,885	3.0%	0		0	0	0	0	0	0	0
Standpipes	19,006,355	19,115,378	19,784,963	57,906,696	19,302,232	1.5%	0		0	0	0	0	0	0	0
Commercial	2,397,875	2,399,928	2,967,745	7,765,548	2,588,516	7.4%	0		0	0	0	0	0	0	0
Public Sector	820,679	821,765	989,248	2,631,692	877,231	6.5%	0		0	0	0	0	0	0	0
Total	92,804,474	93,382,400	98,924,815	192,307,215	96,153,608	4%	0		0	0	0	0	0	0	0

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I.11 WASTEWATER - BILLABLE WASTEWATER DISCHARGE PER SEWER CONNECTION (in m³ per connection)															
Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Residential >20 m3/month	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Governmental	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Religious	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Standpipes	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Commercial	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Public Sector	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

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Name of Utility: Hypothetical Egyptian Water Utility

2 - REVENUES

2.1 WATER - VOLUME-BASED WATER TARIFF RATES (in LE/M3)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	0.23	0.23	0.23	0.69	0.23	0%	0.23	0.23	0.23	0.23	0.23	0.23	0.23		0.23
Residential >20 m3/month	0.35	0.35	0.35	1.05	0.35	0%	0.35	0.35	0.35	0.35	0.35	0.35	0.35		0.35
Governmental	0.45	0.45	0.45	1.35	0.45	0%	0.45	0.45	0.45	0.45	0.45	0.45	0.45		0.45
Religious	0.45	0.45	0.45	1.35	0.45	0%	0.45	0.45	0.45	0.45	0.45	0.45	0.45		0.45
Standpipes	0.45	0.45	0.45	1.35	0.45	0%	0.45	0.45	0.45	0.45	0.45	0.45	0.45		0.45
Commercial	0.75	0.75	0.75	2.25	0.75	0%	0.75	0.75	0.75	0.75	0.75	0.75	0.75		0.75
Public Sector	0.75	0.75	0.75	2.25	0.75	0%	0.75	0.75	0.75	0.75	0.75	0.75	0.75		0.75

2.2 WATER - VOLUME-BASED CHARGES: WATER (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	8,527,121	8,591,557	9,044,201	26,162,879	8,720,960	2%	9,246,612		9,453,552	9,665,123	9,881,430	10,102,577	10,328,674	49,431,357	9,886,271
Residential >20 m3/month	11,507,001	11,594,020	12,204,849	35,305,870	11,768,623	2%	12,478,043		12,757,352	13,042,913	13,334,866	13,633,354	13,938,524	66,707,010	13,341,402
Governmental	4,124,894	4,123,417	4,451,616	12,699,927	4,233,309	3%	4,565,632		4,682,568	4,802,498	4,925,501	5,051,653	5,181,037	24,643,256	4,928,651
Religious	4,097,898	4,123,417	4,451,616	12,672,931	4,224,310	3%	4,585,661		4,723,742	4,865,981	5,012,503	5,163,437	5,318,915	25,084,578	5,016,916
Standpipes	10,691,075	10,752,400	11,129,042	32,572,517	10,857,506	2%	11,300,507		11,474,614	11,651,403	11,830,916	12,013,195	12,198,282	59,168,409	11,833,682
Commercial	2,248,008	2,249,933	2,782,261	7,280,201	2,426,734	7%	2,893,551		3,009,293	3,129,665	3,254,852	3,385,046	3,520,447	16,299,303	3,259,861
Public Sector	769,387	770,405	927,420	2,467,211	822,404	6%	964,517		1,003,097	1,043,221	1,084,950	1,128,348	1,173,482	5,433,099	1,086,620
Total	41,965,383	42,205,147	44,991,006	129,161,536	43,053,845	3%	6,576,360		6,729,174	6,885,829	7,046,431	7,211,087	7,379,909	35,252,430	7,050,486

2.3 WATER - FIXED-CHARGE WATER REVENUES (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	6,603,070	7,351,468	8,422,944	22,377,481	7,459,160	12%		0	0	0	0	0	0	0	0
Residential >20 m3/month	1,650,767	1,837,867	1,985,074	5,473,708	1,824,569	10%		0	0	0	0	0	0	0	0
Governmental	136,784	151,179	171,218	459,181	153,060	11%		0	0	0	0	0	0	0	0
Religious	42,174	46,836	53,061	142,071	47,357	12%		0	0	0	0	0	0	0	0
Standpipes	67,478	71,499	80,985	219,962	73,321	8%		0	0	0	0	0	0	0	0
Commercial	382,798	415,002	470,049	1,267,849	422,616	10%		0	0	0	0	0	0	0	0
Public Sector	23,898	26,975	30,562	81,436	27,145	13%		0	0	0	0	0	0	0	0
Total	9,390,759	9,900,826	11,213,893	30,021,688	1,429,604	11.0%									

2.4 WATER - TOTAL WATER TARIFF REVENUES (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	15,130,191	15,943,024	17,467,145	48,540,360	16,180,120	7%	9,246,612		9,453,552	9,665,123	9,881,430	10,102,577	10,328,674	49,431,357	9,886,271
Residential >20 m3/month	13,157,768	13,431,887	14,189,923	40,779,579	13,593,193	3%	12,478,043		12,757,352	13,042,913	13,334,866	13,633,354	13,938,524	66,707,010	13,341,402
Governmental	4,261,677	4,274,596	4,622,835	13,159,108	4,386,369	3%	4,565,632		4,682,568	4,802,498	4,925,501	5,051,653	5,181,037	24,643,256	4,928,651
Religious	4,140,072	4,170,253	4,504,677	12,815,002	4,271,667	3%	4,585,661		4,723,742	4,865,981	5,012,503	5,163,437	5,318,915	25,084,578	5,016,916
Standpipes	10,758,553	10,823,899	11,210,027	32,792,478	10,930,826	2%	11,300,507		11,474,614	11,651,403	11,830,916	12,013,195	12,198,282	59,168,409	11,833,682
Commercial	2,630,806	2,664,935	3,252,310	8,548,050	2,849,350	8%	2,893,551		3,009,293	3,129,665	3,254,852	3,385,046	3,520,447	16,299,303	3,259,861
Public Sector	793,285	797,380	957,982	2,548,647	849,549	7%	964,517		1,003,097	1,043,221	1,084,950	1,128,348	1,173,482	5,433,099	1,086,620
Total	50,872,352	52,105,973	56,204,899	108,310,872	54,155,436	3.9%	46,034,523		47,104,218	48,200,805	49,325,017	50,477,610	51,659,362	246,767,012	49,353,402

2.5 WATER - WATER TARIFF REVENUE PER m^3 BILLED (in LE/m^3)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	0.41	0.43	0.44		0.43	2.0%	0.23		0.23	0.23	0.23	0.23	0.23	1.15	0.23
Residential >20 m3/month	0.40	0.43	0.41		0.40	0.2%	0.35		0.35	0.35	0.35	0.35	0.35	1.75	0.35
Governmental	0.46	0.47	0.47		0.47	0.3%	0.45		0.45	0.45	0.45	0.45	0.45	2.25	0.45
Religious	0.45	0.46	0.46		0.46	0.0%	0.45		0.45	0.45	0.45	0.45	0.45	2.25	0.45
Standpipes	0.45	0.45	0.45		0.45	0.0%	0.45		0.45	0.45	0.45	0.45	0.45	2.25	0.45
Commercial	0.88	0.89	0.88		0.88	0.7%	0.75		0.75	0.75	0.75	0.75	0.75	3.75	0.75
Public Sector	0.77	0.78	0.77		0.77	0.1%	0.75		0.75	0.75	0.75	0.75	0.75	3.75	0.75
Average	0.55	0.55	0.55		1	0%	0.49		0.49	0.49	0.49	0.49	0.49	2.45	0.49

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2.6 WASTEWATER - WASTEWATER SERVICE TARIFF RATES

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Residential >20 m3/month	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Governmental	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Religious	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Standpipes	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Commercial	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0
Public Sector	0	0	0	0.00	0.00	#NUM!		0	0	0	0	0	0		0

2.7 WASTEWATER - WASTEWATER SERVICE TARIFF REVENUES (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Residential >20 m3/month	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Governmental	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Religious	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Standpipes	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Commercial	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Public Sector	0.00	0.00	0.00	0.00	0.00	#NUM!	0.00		0.00	0.00	0.00	0.00	0.00	0	0
Total	0.00	0.00	0.00	0.00	0	#NUM!	0.00		0	0	0	0	0	0	0

2.8 WASTEWATER - WASTEWATER TARIFF REVENUE PER m^3 BILLABLE WASTEWATER DISCHARGE

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	0.00	0.00	0.00	0.00	0.00	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Residential >20 m3/month	0.00	0.00	0.00	0.00	0.00	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Governmental	0.00	0.00	0.00	0.00	0.00	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Religious	0.00	0.00	0.00	0.00	0.00	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Standpipes	0.00	0.00	0.00	0.00	0.00	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commercial	0.00	0.00	0.00	0.00	0.00	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Public Sector	0.00	0.00	0.00	0.00	0.00	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Average	0.00	0.00	0.00	0.00	0	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

2.9 TOTAL WATER AND WASTEWATER TARIFF REVENUES (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Residential 0-20 m3/month	15,130,191	15,943,024	17,467,145	48,540,360	16,180,120	7%	9,246,612		9,453,552	9,665,123	9,881,430	10,102,577	10,328,674	49,431,357	9,886,271
Residential >20 m3/month	13,157,768	13,431,887	14,189,923	40,779,579	13,593,193	3%	12,478,043		12,757,352	13,042,913	13,334,866	13,633,354	13,938,524	66,707,010	13,341,402
Governmental	4,261,677	4,274,596	4,622,835	13,159,108	4,386,369	3%	4,565,632		4,682,568	4,802,498	4,925,501	5,051,653	5,181,037	24,643,256	4,928,651
Religious	4,140,072	4,170,253	4,504,677	12,815,002	4,271,667	3%	4,585,661		4,723,742	4,865,981	5,012,503	5,163,437	5,318,915	25,084,578	5,016,916
Standpipes	10,758,553	10,823,899	11,210,027	32,792,478	10,930,826	2%	11,300,507		11,474,614	11,651,403	11,830,916	12,013,195	12,198,282	59,168,409	11,833,682
Commercial	2,630,806	2,664,935	3,252,310	8,548,050	2,849,350	8%	2,893,551		3,009,293	3,129,665	3,254,852	3,385,046	3,520,447	16,299,303	3,259,861
Public Sector	793,285	797,380	957,982	2,548,647	849,549	7%	964,517		1,003,097	1,043,221	1,084,950	1,128,348	1,173,482	5,433,099	1,086,620
Total	50,872,352	52,105,973	56,204,899	108,310,872	53,061,075	3.9%	46,034,523		47,104,218	48,200,805	49,325,017	50,477,610	51,659,362		

2.10 WATER AND WASTEWATER TARIFF REVENUE COLLECTIONS (in LE) (Projection #1: "Do Nothing")

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Total	40,697,882	33,868,882	36,533,184	70,402,067	35,201,033	-9%	#REF!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

2.11 TARIFF REVENUE COLLECTION EFFICIENCY RATES (Projection #1: "Do Nothing")

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Average	65%	65%	65%		65%	0.0%	#REF!	0%	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!

2.12 Projection #2: IMPROVEMENTS IN COLLECTION EFFICIENCY RATES

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Average			65%				65%	6%	69%	73%	77%	82%	87%		78%

2.13 Projection #2: IMPROVED COLLECTION OF WATER & WASTEWATER REVENUES (in LE)

Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Total									32,454,806	35,202,976	38,185,475	41,422,433	44,935,722	192,201,412	38,440,282

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2.14 WATER - WATER TARIFF REVENUE COLLECTIONS								Projection #2: Improved Collection Efficiency Rates							
Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Total	40,697,882	33,868,882	36,533,184	111,099,948	37,033,316	-9%	33,148,900		32,454,806	35,202,976	38,185,475	41,422,433	44,935,722	192,201,412	38,440,282
2.15 WASTEWATER - WASTEWATER TARIFF REVENUE COLLECTIONS								Projection #2: Improved Collection Efficiency Rates							
Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Total	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
2.16 WATER - OTHER REVENUES: WATER (in LE)															
Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Muqaysat (for NUC's)	0	0	0	0	0	#NUM!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
New connections	0	0	0	0	0	#NUM!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Sale of raw water	0	0	0	0	0	#NUM!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Other	13,880,000	13,880,000	14,500,250	42,260,250	14,086,750	1%	14,713,099	1.5%	14,929,073	15,148,217	15,370,578	15,596,202	15,825,139	76,869,209	15,373,842
Total	13,880,000	13,880,000	14,500,250	28,380,250	14,086,750	4.5%	15,225,263	1.5%	14,929,073	15,148,217	15,370,578	15,596,202	15,825,139	76,869,209	15,373,842
2.17 WASTEWATER - OTHER REVENUES: WASTEWATER (in LE)															
Class:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Projected Annual Growth	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Muqaysat (for NUC's)	0	0	0	0	0	#NUM!	0	0	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
New connections	0	0	0	0	0	#NUM!	0	0	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Sale of treated wastewater	0	0	0	0	0	#NUM!	0	0	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Other	0	0	0	0	0	#NUM!	0	0	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total	0	0	0	0	0	#NUM!	0	0	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

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Name of Utility: Hypothetical Egyptian Water Utility

3-COSTS

3.1 WATER - OPERATION AND MAINTENANCE EXPENSES

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate
Total Number of Staff	2,556	2,678	3,062	8,296	2,765	7.9%
Number of Staff per 1,000 Connections	8	8	8			0.5%
Wages and salaries	21,447,142	25,006,840	27,215,673	73,669,655	24,556,552	13.9%
Average Staff Salary	8,391	9,338	8,888		9,113	-2.4%
Commodity Requirements						
Power	9,453,010	10,187,506	10,451,958	30,092,474	10,030,825	6.0%
Chemicals	2,053,792	3,042,091	3,121,059	8,216,942	2,738,981	31.1%
Materials & Spare parts	3,487,394	2,205,567	2,262,820	7,955,781	2,651,927	-25.7%
Oil & Fuels	503,468	566,404	581,107	1,650,979	550,326	9.1%
Other Commodities	2,795,719	2,426,515	2,489,504	7,711,738	2,570,579	-8.2%
Subtotal, commodity requirements	18,293,383	18,428,083	18,906,448	55,627,914	18,542,638	1.4%
Services Requirements						
Maintenance	1,171,300	1,310,524	1,449,748	3,931,572	1,310,524	11.5%
Transportation	283,027	316,669	350,310	950,006	316,669	11.5%
Other Services	729,389	816,086	902,783	2,448,258	816,086	11.5%
Subtotal, service requirements	2,183,716	2,443,279	2,702,841	7,329,836	2,443,279	11.5%
Purchase for Sale:						
Purchases for Sale 1	1,731,959	1,640,000	1,665,783	5,037,742	1,679,247	-3.1%
Purchases for Sale 2	78,368	76,140	73,913	228,421	76,140	-2.9%
Total Purchases for Sale	1,810,327	1,716,140	1,739,696	5,266,163	1,755,388	-3.1%
Regulatory Compliance Program O&M Costs						
Taxes and Duties	537,496	537,496	602,000	1,676,992	558,997	3.9%
Total, O&M expenses	44,272,064	48,131,838	51,166,658	143,570,560	47,856,853	7.9%

3.2 WATER - O&M PROJECTION #1: Impact of Expense Parameters

Type:	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Annual Inflation Rate for Wages	9%	Wage Inflation Rate	9%	9%	9%	9%	9%		9%
Total Number of Staff	3,303		3,563	3,843	4,146	4,472	4,824	20,848	4,170
Number of Staff per 1,000 Connections	8		8.6	8.6	8.6	8.6	8.5		8.6
Wages and salaries	31,012,165		33,676,306	39,595,785	46,555,766	54,739,143	64,360,960	238,927,960	47,785,592
Average Staff Salary	8,672		9,452	10,303	11,230	12,241	13,342		11,313
Commodity & Services Inflation Rate	3%	Commodity Inflation Rat	3%	3%	3%	3%	3%		3%
Commodity Requirements									
Power	10,611,344		11,082,231	11,577,118	12,097,249	12,643,933	13,218,553	60,619,084	12,123,817
Chemicals	3,168,653		3,309,265	3,457,043	3,612,359	3,775,605	3,947,192	18,101,464	3,620,293
Materials & Spare parts	2,297,327		2,399,272	2,506,414	2,619,021	2,737,377	2,861,780	13,123,864	2,624,773
Oil & Fuels	589,969		616,149	643,664	672,582	702,976	734,924	3,370,294	674,059
Other Commodities	2,527,468		2,639,626	2,757,501	2,881,388	3,011,600	3,148,467	14,438,582	2,887,716
Subtotal, commodity requirements	19,194,760		20,046,543	20,941,740	21,882,599	22,871,491	23,910,915	109,653,288	21,930,658
Services Requirements									
Maintenance	1,493,240		1,562,346	1,737,619	1,932,703	2,149,851	2,391,577	9,774,096	1,954,819
Transportation	360,819		377,518	419,870	467,009	519,480	577,889	2,361,765	472,353
Other Services	929,866		972,900	1,082,045	1,203,527	1,338,749	1,489,276	6,086,497	1,217,299
Subtotal, service requirements	2,783,926		1,939,864	2,157,489	2,399,711	2,669,331	2,969,465	12,135,860	2,427,172
Purchase for Sale:									
Purchases for Sale 1 (@ LE 0.23 m3)	1,665,783		1,699,098	1,733,080	1,767,742	1,803,097	1,839,159	8,842,177	1,768,435
Purchases for Sale 2 (@ LE 0.23/m3)	125,925		125,925	125,925	125,925	125,925	125,925	629,625	125,925
Total Purchases for Sale	1,791,708		1,825,023	1,859,005	1,893,667	1,929,022	1,965,084	9,471,802	1,894,360
Regulatory Compliance Program O&M Costs									
Taxes and Duties	625,178		649,248	674,245	700,204	727,163	755,160	3,506,021	701,204
Total, O&M expenses	55,407,738		58,136,984	65,228,264	73,431,948	82,936,150	93,961,584	373,694,930	689,252,877

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3.3 WATER - O&M PROJECTION #2: Impact of Efficiency Improvements

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	Years	1. FY 2003	2 FY 2004	3 FY 2005	4 FY 2006	5 FY 2007	Total	Average
Total Number of Staff							3,303	FY06/07 Staff. Target 7	3,281	3,441	3,607	3,777	3,951	18,056	3,611
Number of Staff per 1,000 Connections							8.1		7.9	7.7	7.5	7.2	7.0		7.5
Wages and salaries							31,012,165		31,011,865	35,454,403	40,501,188	46,227,128	52,714,689	205,909,273	41,181,855
Average Staff Salary							8,672		9,452	10,303	11,230	12,241	13,342		11313.48395
Commodity Requirements															
Power							10,611,344	Efficiency Improvement	5%	5%	5%	5%	5%		0.05
								Result	11,058,687	11,528,830	12,022,954	12,542,304	13,088,192	60,240,966	12,048,193
Chemicals							3,168,653	Efficiency Improvement	1%	1%	1%	1%	1%		1%
								Result	3,307,859	3,454,159	3,607,922	3,769,535	3,939,406	18,078,882	3,615,776
Materials & Spare parts							2,297,327	Efficiency Improvement	0%	0%	0%	0%	0%		0%
								Result	2,399,272	2,506,414	2,619,021	2,737,377	2,861,780	13,123,864	2,624,773
Oil & Fuels							589,969	Efficiency Improvement	0%	0%	0%	0%	0%		0%
								Result	616,149	643,664	672,582	702,976	734,924	3,370,294	674,059
Other Commodities							2,527,468	Efficiency Improvement	1%	1%	1%	1%	1%		1%
								Result	2,638,504	2,755,200	2,877,849	3,006,759	3,142,257	14,420,569	2,884,114
Subtotal, commodity requirements							19,194,760		20,020,471	20,888,267	21,800,328	22,758,951	23,766,559	109,234,575	21,846,915
Services Requirements															
Maintenance							1,493,240	Efficiency Improvement	-1.00%	-1.00%	-1.00%	-1.00%	-1.00%		-1%
								Result	1,563,037	1,740,063	1,937,097	2,156,417	2,400,560	9,797,175	1,959,435
Transportation							360,819	Efficiency Improvement	0%	0%	0%	0%	0%		0
								Result	377,518	419,870	467,009	519,480	577,889	2,361,765	472352.9212
Other Services							929,866	Efficiency Improvement	0%	0%	0%	0%	0%		0%
								Result	972,900	1,082,045	1,203,527	1,338,749	1,489,276	6,086,497	1,217,299
Subtotal, service requirements							2,783,926		2,913,455	3,241,978	3,607,633	4,014,646	4,467,725	18,245,437	3,649,087
Purchases for Sale							1,791,708	Efficiency Improvement	0%	0%	0%	0%	0%		0%
								Result	1,825,023	1,859,005	1,893,667	1,929,022	1,965,084	9,471,802	1,894,360
Regulatory Compliance Program O&M Costs							625,178	Efficiency Improvement	0%	0%	0%	0%	0%		0%
								Result	649,248	674,245	700,204	727,163	755,160	3,506,021	701,204
Taxes and Duties							55,407,738		56,420,062	62,117,898	68,503,021	75,656,910	83,669,217	346,367,108	69,273,422
Total O&M Expenses															

3.4 WATER - CAPITAL COSTS

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Fixed Assets:															
Total Fixed Assets Value	455,655,335	455,655,335	516,424,265	1,427,734,935	475,911,645	4.3%	538,430,972		561,375,464	585,297,704	610,239,358	636,243,865	663,356,519	3,056,512,909	611,302,582
Land Value	5,039,028	5,039,028	5,588,741	15,666,797	5,222,266	3.5%	5,784,996		5,988,142	6,198,423	6,416,087	6,641,395	6,874,615	32,118,663	6,423,733
Net Fixed Assets	450,616,307	450,616,307	510,835,524	1,412,068,138	470,689,379	4.3%	532,645,976	R&R Target: % of Fixed Assets 1.00%	555,387,322	579,099,281	603,823,270	629,602,470	656,481,903	3,024,394,246	604,878,849
Renewal & Replacement Costs: 1.00%	4,506,163	4,506,163	5,108,355	14,120,681	4,706,894	4.3%	5,326,460		5,553,873	5,790,993	6,038,233	6,296,025	6,564,819	30,243,942	6,048,788
Regulatory Compliance Capital Costs									0	0	0	0	0		
Total Renewal & Replacement Costs	4,506,163	4,506,163	5,108,355	14,120,681	4,706,894	4.3%	5,326,460		5,553,873	5,790,993	6,038,233	6,296,025	6,564,819	30,243,942	6,048,788
New Debt Service															
Interest									0	0	0	0	0	0	0
Repayment of principal									0	1	2	3	4	10	2
Total New Debt Service									0	1	2	3	4	10	2
Existing Debt Service															
Interest	7,500,000	7,100,000	6,700,000	21,300,000	7,100,000	-5.4%	0		6,900,000	6,900,000	6,900,000	6,900,000	6,900,000	34,500,000	6,900,000
Repayment of principal	6,200,000	6,200,000	6,200,000	18,600,000	6,200,000	0.0%	0		6,200,000	6,200,000	6,200,000	6,200,000	6,200,000	31,000,000	6,200,000
Total Existing Debt Service	13,700,000	13,300,000	12,900,000	39,900,000	13,300,000	-2.9%	0		13,100,000	13,100,000	13,100,000	13,100,000	13,100,000	65,500,000	13,100,000
Total Debt Service															
Total Interest	7,500,000	7,100,000	6,700,000	21,300,000	7,100,000	-5.4%	0		6,900,000	6,900,000	6,900,000	6,900,000	6,900,000	34,500,000	6,900,000
Total Principal	6,200,000	6,200,000	6,200,000	18,600,000	6,200,000	0.0%	0		6,200,000	6,200,001	6,200,002	6,200,003	6,200,004	31,000,010	6,200,002
Total Debt Service	13,700,000	13,300,000	12,900,000	39,900,000	13,300,000	-2.9%	0		13,100,000	13,100,001	13,100,002	13,100,003	13,100,004	65,500,010	13,100,002
Total capital expenses	18,206,163	17,806,163	18,008,355	54,020,681	18,006,894	-1.1%	5,326,460		18,653,873	18,890,994	19,138,235	19,396,028	19,664,823	95,743,952	19,148,790
Total water supply expenses	62,478,227	65,938,001	69,175,013	197,591,241	65,863,747	5.3%	5,326,460		75,073,935	81,008,892	87,641,255	95,052,938	103,334,040	442,111,060	88,422,212

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3.5 WATER - WATER SERVICE COST ANALYSIS (LE/m³ SOLD)

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
O&M Expenses														
Labor	0.18	0.21	0.22	1	0	10.3%	#REF!	0.24	0.27	0.30	0.33	0.37	1.51	0.30
Commodities	0.16	0.15	0.15	0	0	-1.8%	#REF!	0.15	0.16	0.16	0.16	0.17	0.81	0.16
Services	0.02	0.02	0.02	0	0	7.9%	#REF!	0.02	0.02	0.03	0.03	0.03	0.13	0.03
Purchases for Sale	0.02	0.01	0.01	0	0	-6.1%	#REF!	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Taxes and Duties	0.00	0.00	0.00	0	0	0.6%	#REF!	0.01	0.01	0.01	0.01	0.01	0.03	0.01
Subtotal, O&M	0.38	0.40	0.41	1	0	4.5%	#REF!	0.44	0.47	0.51	0.55	0.59	2.55	4.67
Renewal & Replacement	0.04	0.04	0.04	0	0	1.0%	#REF!	0.04	0.04	0.04	0.05	0.05	0.22	0.04
Debt service	0.05	0.05	0.05	0	0	-3.2%	#REF!	0.10	0.10	0.10	0.09	0.09	0.48	0.10
Subtotal, capital expenses	0.09	0.09	0.09	0	0	-1.4%	#REF!	0.14	0.14	0.14	0.14	0.14	0.71	0.14
Total cost	0.47	0.49	0.51	1	0	3.4%	#REF!	0.58	0.61	0.65	0.69	0.73	3.26	5.94

3.6 WASTEWATER - OPERATION AND MAINTENANCE EXPENSES

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Total Number of Staff					#DIV/0!	#NUM!								
Number of Staff per 1,000 Connections	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!								
Wages and salaries				-	#DIV/0!	#NUM!								
Average Staff Salary	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!								
Commodity Requirements														
Power				-	#DIV/0!	#NUM!								
Chemicals				-	#DIV/0!	#NUM!								
Materials & Spare parts				-	#DIV/0!	#NUM!								
Oil & Fuels				-	#DIV/0!	#NUM!								
Other Commodities				-		#NUM!								
Subtotal, commodity requirements	0	0	0	0	0									
Services Requirements					#DIV/0!									
Maintenance				-	#DIV/0!	#NUM!								
Transportation				-	#DIV/0!	#NUM!								
Other Services				-	#DIV/0!	#NUM!								
Subtotal, service requirements	0	0	0	-		#NUM!								
Purchases for Sale				-	#DIV/0!	#NUM!								
Taxes and Duties				-	#DIV/0!	#NUM!								
Total, O&M expenses	0	0	0	-		#NUM!								

3.7 WASTEWATER - O&M PROJECTION #1: Impact of Expense Parameters

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Annual Inflation Rate for Wages							9%	Wage Inflation Rate	9%	9%	9%	9%	9%		
Total Number of Staff							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Number of Staff per 1,000 Connections							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!
Wages and salaries							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Average Staff Salary							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!
Commodity & Services Inflation Rate								Commodity Inflation Ra	3%	3%	3%	3%	3%		
Commodity Requirements							#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Power							#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Chemicals							#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Materials & Spare parts							#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Oil & Fuels							#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Other Commodities							#NUM!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Subtotal, commodity requirements															
Services Requirements							#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Maintenance							#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Transportation							#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Other Services							#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Subtotal, service requirements							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Purchases for Sale							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Taxes and Duties							#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total, O&M expenses															

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3.8 WASTEWATER - O&M PROJECTION #2: Impact of Efficiency Improvements

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Total Number of Staff							#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Number of Staff per 1,000 Connections							#DIV/0!								#DIV/0!
Wages and salaries							#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average Staff Salary							#DIV/0!								#DIV/0!
Commodity Requirements															
Power															#DIV/0!
							#NUM!	Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Chemicals															#DIV/0!
							#NUM!	Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Materials & Spare parts															#DIV/0!
							#NUM!	Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Oil & Fuels															#DIV/0!
							#NUM!	Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Other Commodities															#DIV/0!
							#NUM!	Efficiency Improvement Result	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Subtotal, commodity requirements							#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Services Requirements															
Maintenance															#DIV/0!
							#NUM!	Efficiency Improvement Result	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Transportation															#DIV/0!
							#NUM!	Efficiency Improvement Result	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Other Services															#DIV/0!
							#NUM!	Efficiency Improvement Result	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Subtotal, service requirements							#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Purchases for Sale															
							#NUM!	Efficiency Improvement Result	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Regulatory Compliance Program O&M Costs									0	0	0	0	0	0	0
Taxes and Duties															
							#NUM!	Efficiency Improvement Result	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total O&M Expenses							#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

3.9 WASTEWATER - CAPITAL COSTS

Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Fixed Assets:															
Total Fixed Assets Value				-	#DIV/0!	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Land Value				-	#DIV/0!	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Net Fixed Assets	0	0	0	-	-	#NUM!	#NUM!	R&R Cost Target	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Renewal & Replacement Costs								% of Fixed Assets							
1.00%	0	0	0	-	-	#NUM!	#NUM!	1.00%	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Regulatory Compliance Capital Costs									0	0	0	0	0	0	0
Total Renewal & Replacement Costs	0	0	0	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
New Debt Service															
Interest									0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Repayment of principal									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total New Debt Service									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Existing Debt Service															
Interest	0	0	0	-	-	#NUM!	0		0	-6,200,000	-12,400,000	-18,600,000	-24,800,000	-62,000,000	-12,400,000
Repayment of principal	0	0	0	-	-	#NUM!	0		6,900,000	6,900,000	6,900,000	6,900,000	6,900,000	34,500,000	6,900,000
Total Existing Debt Service	0	0	0	-	-	#NUM!	0		6,900,000	700,000	-5,500,000	-11,700,000	-17,900,000	-27,500,000	-5,500,000
Total Debt Service	0	0	0	-	-	#NUM!	0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total capital expenses	0	0	0	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total wastewater service expenses	0	0	0	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!

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3.10 WASTEWATER - SERVICE COST ANALYSIS (LE/m³ COLLECTED)															
Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
O&M Expenses															
Labor	0.00	0.00	0.00	-	-	#NUM!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Commodities	0.00	0.00	0.00	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Services	0.00	0.00	0.00	-	-	#NUM!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Purchases for Sale	0.00	0.00	0.00	-	-	#NUM!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Regulatory Compliance Prog. O&M Costs									#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Taxes and Duties	0.00	0.00	0.00	-	-	#NUM!	#NUM!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Subtotal, O&M	0.00	0.00	0.00	-	-	#NUM!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Renewal & Replacement	0.00	0.00	0.00	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Debt service	0.00	0.00	0.00	-	-	#NUM!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Subtotal, capital expenses	0.00	0.00	0.00	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Total cost of wastewater service	0.00	0.00	0.00	-	-	#NUM!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

3.11 WATER - NET COSTS															
Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
O&M Expenses (water service)	44,272,064	48,131,838	51,166,658	143,570,560	47,856,853	7.9%	55,407,738		56,420,062	62,117,898	68,503,021	75,656,910	83,669,217	346,367,108	69,273,422
Offset from other water revenue	13,880,000	13,880,000	14,500,250	42,260,250	14,086,750	1.5%	15,225,263		14,929,073	15,148,217	15,370,578	15,596,202	15,825,139	76,869,209	15,373,842
Net O&M Expenses, water service	30,392,064	34,251,838	36,666,408	101,310,310	33,770,103	10.8%	31,012,165		41,490,989	46,969,681	53,132,443	60,060,708	67,844,078	269,497,899	53,899,580
Renewal & Replacement	4,506,163	4,506,163	5,108,355	14,120,681	4,706,894	4.3%	5,326,460		5,553,873	5,790,993	6,038,233	6,296,025	6,564,819	30,243,942	6,048,788
Debt Service	13,700,000	13,300,000	12,900,000	39,900,000	13,300,000	-2.9%	0		13,100,000	13,100,001	13,100,002	13,100,003	13,100,004	65,500,010	13,100,002
Net expenses, water service	48,598,227	52,058,001	54,674,763	155,330,991	51,776,997	6.4%	3,168,653		60,144,862	65,860,675	72,270,678	79,456,735	87,508,901	365,241,851	73,048,370

3.12 WASTEWATER - NET COSTS															
Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
O&M Expenses (wastewater service)	0	0	0	-	-	#NUM!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Offset from other wastewater revenue	0	0	0	-	-	#NUM!	0		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Net O&M Expenses, wastewater service	0	0	0	-	-	#NUM!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Renewal & Replacement	0	0	0	-	-	#NUM!	#NUM!		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Debt Service	0	0	0	-	-	#NUM!	0		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Net expenses, wastewater service	0	0	0	-	-	#NUM!	#DIV/0!		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

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Name of Utility: Hypothetical Egyptian Water Utility

4. CALCULATION OF REVENUE REQUIREMENTS

4.1 WATER REVENUE REQUIREMENTS

	FY 1999	FY 2000	FY 2001	Total	Average	Average Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Treated Water Expenses														
Net O&M expenses	30,392,064	34,251,838	36,666,408	101,310,310	33,770,103	10.8%	31,012,165	41,490,989	46,969,681	53,132,443	60,060,708	67,844,078	269,497,899	53,899,580
Renewal & Replacement	4,506,163	4,506,163	5,108,355	14,120,681	4,706,894	4.3%	5,326,460	5,553,873	5,790,993	6,038,233	6,296,025	6,564,819	30,243,942	6,048,788
Debt service	13,700,000	13,300,000	12,900,000	39,900,000	13,300,000	-2.9%	0	13,100,000	13,100,001	13,100,002	13,100,003	13,100,004	65,500,010	13,100,002
Total expenses (LE)	*48,598,227*	*52,058,001*	*54,674,763*	*155,330,991*	*51,776,997*	*6.4%*	*36,338,625*	*60,144,862*	*65,860,675*	*72,270,678*	*79,456,735*	*87,508,901*	*365,241,851*	*73,048,370*
Total treated water consumed (m^3)	116,005,593	119,830,810	123,656,027	359,492,430	119,830,810	3.3%	126,446,745	129,303,883	132,229,106	135,224,135	138,290,738	141,430,727	676,478,588	135,295.718
Average expense per m^3 consumed (LE/m^3)	0.42	0.43	0.44	1.30	0.43	3.1%	0.29	0.47	0.50	0.53	0.57	0.62	2.69	0 54
Total water tariff revenue (LE)	50,872,352	52,105,973	56,204,899	159,183,224	53,061,075	4.2%	46,034,523	47,104,218	48,200,805	49,325,017	50,477,610	51,659,362	246,767,012	49,353,402
Water Tariff Revenue Collection (LE)	40,697,882	33,868,882	36,533,184	111,099,948	37,033,316	-9 3%	33,148,900	32,454,806	35,202,976	38,185,475	41,422,433	44,935,722	192,201,412	38,440,282
Water tariff revenue per m^3 sold (LE/m^3)	0.44	0.43	0.45	1.33	0.44	0.9%	0.36	0.49	0 49	0.49	0.49	0.49	2.45	0.49
Total water tariff revenue collected (LE)	40,697,882	33,868,882	36,533,184	111,099,948	37,033,316	-9.3%	33,148,900	32,454,806	35,202,976	38,185,475	41,422,433	44,935,722	192,201,412	38,440,282
Water tariff revenue collection per m^3 sold (LE/m^3)	0.35	0.28	0.30	0.93	0.31	-12.1%	0.26	0.25	0.27	0.28	0.30	0.32	1 42	0.28
Water service expenses as % of water tariff revenue collected	119%	154%	150%	423%	141%	17.3%	110%	185%	187%	189%	192%	195%	948%	190%
Total water revenue requirement (LE)	60,747,784	80,089,232	84,115,020	224,952,036	74,984,012	22.2%	50,464,156	87,292,979	90,178,102	93,353,622	96,826,425	100,602,679	468,253,808	93,650,762
Average water revenue requirement per m^3 sold (LE/m^3)	0.52	0.67	0.68	1.87	0.62	18.4%	0.40	0.68	0.68	0.69	0.70	0.71	3.46	0.69

4.2 WATER COST RECOVERY SCENARIOS

	FY 1999	FY 2000	FY 2001	Total	Average	Average Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
O&M revenue requirement	36,291,826	52,646,620	54,874,143	143,812,588	47,937,529	29.9%	33,996,285	76,890,610	87,874,812	100,559,641	115,208,774	132,121,183	512,655,020	102,531,004
R&R revenue requirement	5,380,907	6,926,176	7,645,053	19,952,136	6,650,712	22.3%	5,838,994	10,292,372	10,834,274	11,428,093	12,077,069	12,784,486	57,416,294	11,483,259
Debt Service revenue requirement	16,359,468	20,442,700	19,305,857	56,108,026	18,702,675	13.8%	0	24,276,765	24,508,579	24,793,355	25,128,497	25,511,262	124,218,456	24,843.691
Total water revenue requirement (LE)	58,032,202	80,015,496	81,825,053	219,872,750	73,290,917	24.8%	39,835,279	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Cumulative Revenue Requirements														
O&M revenue requirement	36,291,826	52,646,620	54,874,143	143,812,588	47,937,529	29.9%	33,996,285	76,890,610	87,874,812	100,559,641	115,208,774	132,121,183	512,655,020	102,531,004
O&M plus R&R revenue requirements	41,672,733	59,572,796	62,519,195	163,764,724	54,588,241	29.0%	39,835,279	87,182,982	98,709,087	111,987,734	127,285,843	144,905,669	570,071,314	114,014,263
Full cost recovery revenue requirements	58,032,202	80,015,496	81,825,053	219,872,750	73,290,917	24.8%	39,835,279	111,459,746	123,217,665	136,781,088	152,414,340	170,416,931	694,289,770	138,857,954
Average tariff to recover:														
O&M cost	0 31	0 44	0.44	1	0	25.8%	0.27	0.59	0 66	0.74	0.83	0.93	3.77	0 75
O&M plus R&R	0 36	0.50	0.51	1	0	24.9%	0.32	0.67	0 75	0.83	0.92	1.02	4 19	0.84
Full cost recovery	0 50	0.67	0.66	2	1	20.9%	0.32	0 86	0.93	1.01	1.10	1.20	5.11	1.02
Average tariff increase to recover:														
O&M cost	0.71	1.01	0.98	3	1	24.7%	0.74	1.63	1.82	2.04	2.28	2.56	10.33	2 07
O&M plus R&R	0.00	0 00	0.00	0	0	19.8%	0.00	0.00	0.00	0.00	0.00	0.00	0 00	0.00
Full cost recovery	0 00	0 00	0.00	0	0	16.0%	0 00	0.00	0 00	0 00	0.00	0 00	0.00	0.00
Cost Recovery Targets as % of:														
O&M	100%	100%	100%		100%	0%	100%	100%	100%	100%	100%	100%		100%
R&R	100%	100%	100%	200%	100%	0.0%	100%	100%	100%	100%	100%	100%		100%
Debt service				0%	#DIV/0!	#NUM!							0%	#DIV/0!
Total cost						#NUM!								
Expected Revenues														
O&M	36,291,826	52,646,620	54,874,143	143,812,588	47,937,529	29.9%	33,996,285	76,890,610	87,874,812	100,559,641	115,208,774	132,121,183	512,655,020	102,531,004
R&R	5,380,907	6,926,176	7,645,053	19,952,136	6,650,712	22.3%	5,838,994	10,292,372	10,834,274	11,428,093	12,077,069	12,784,486	57,416,294	11,483,259
Debt service	0	0	0	0	0	#NUM!	0	0	0	0	0	0	0	0

Cumulative Cost Recovery														
O&M cost	36,291,826	52,646,620	54,874,143	143,812,588	47,937,529	29.9%	33,996,285	76,890,610	87,874,812	100,559,641	115,208,774	132,121,183	512,655,020	102,531,004
O&M plus R&R	41,672,733	59,572,796	62,519,195	163,764,724	54,588,241	29.0%	39,835,279	87,182,982	98,709,087	111,987,734	127,285,843	144,905,669	570,071,314	114,014,263
Full cost recovery	41,672,733	59,572,796	62,519,195	163,764,724	54,588,241	29.0%	39,835,279	87,182,982	98,709,087	111,987,734	127,285,843	144,905,669	570,071,314	114,014,263
Target Tariff Revenues	41,672,733	59,572,796	62,519,195	163,764,724	54,588,241	29.0%	39,835,279	87,182,982	98,709,087	111,987,734	127,285,843	144,905,669	570,071,314	114,014,263
Average tariff increase to recover Target Tariff Revenue								1.85	2.05	2.27	2.52	2.81	11.50	2.30
Total Water Costs	48,598,227	52,058,001	54,674,763	155,330,991	51,776,997	6.4%	36,338,625	60,144,862	65,860,675	72,270,678	79,456,735	87,508,901	365,241,851	73,048,370
Total Water Revenue Collected	40,697,882	33,868,882	36,533,184	111,099,948	37,033,316	-9.3%	33,148,900	32,454,806	35,202,976	38,185,475	41,422,433	44,935,722	192,201,412	38,440,282
Target Subsidy	7,900,345	18,189,118	18,141,579	44,231,042	14,743,681	74.2%	3,189,725	27,690,056	30,657,699	34,085,203	38,034,302	42,573,179	173,040,439	34,608,088

4.3 WASTEWATER - REVENUE REQUIREMENTS

	FY 1999	FY 2000	FY 2001	Total	Average	Average Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
Wastewater Expenses														
Net O&M expenses	0	0	0	0	0	#NUM!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Renewal & Replacement	0	0	0	0	0	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Debt service	0	0	0	0	0	#NUM!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total expenses (LE)	0	0	0	0	0	#NUM!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total wastewater collected (m^3)	92,804,474	93,382,400	98,924,815	285,111,690	95,037,230	2.4%	0	0	0	0	0	0	0	0
Average expense per m^3 collected (LE/m^3)	0.00	0.00	0.00	0	0	#NUM!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total wastewater tariff revenue (LE)	0	0	0	0	0	#NUM!	0	0	0	0	0	0	0	0
Wastewater tariff revenue per m^3 collected (LE/m^3)	0.00	0.00	0.00	0	0	#NUM!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total wastewater tariff revenue collected (LE)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Wastewater tariff revenue collection per m collected	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Wastewater service expenses as % of wastewater tariff revenue collected	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total wastewater revenue requirement (LE)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average wastewater requirement per m^3 collected (LE/m^3)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

4.4 WASTEWATER - COST RECOVERY SCENARIOS

	FY 1999	FY 2000	FY 2001	Total	Average	Average Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	Average
O&M revenue requirement	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
R&R revenue requirement	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Debt Service revenue requirement	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total water revenue requirement (LE)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Cumulative Revenue Requirements														
O&M revenue requirement	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
O&M plus R&R revenue requirements	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Full cost recovery revenue requirements	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average tariff to recover:														
O&M cost	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
O&M plus R&R	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Full cost recovery	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average tariff increase to recover:														
O&M cost	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
O&M plus R&R	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Full cost recovery	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Cost Recovery Targets as % of:														
O&M	100%	100%	100%	100%	100%	0.0%	100%	100%	100%	100%	100%	100%	500%	100%
R&R					#DIV/0!	#NUM!							0%	#DIV/0!
Debt service					#DIV/0!	#NUM!							0%	#DIV/0!

2/90

2005														
Source											0			
Grace Period on Principal (No. of Years)											0			
Beginning of Year Principal Balance											0	#DIV/0!	#DIV/0!	
Term											0	0	0	
Interest Rate											0	0	0	
Interest Due											0	#DIV/0!	#DIV/0!	
Principal Due										#DIV/0!		#DIV/0!	#DIV/0!	
Total Debt Service										#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
End of Year Principal Balance										#DIV/0!		#DIV/0!	#DIV/0!	
2006														
Source												0		
Grace Period on Principal (No. of Years)												0		
Beginning of Year Principal Balance												0	#DIV/0!	
Term												0	0	
Interest Rate												0	0	
Interest Due												0	#DIV/0!	
Principal Due											#DIV/0!		#DIV/0!	
Total Debt Service											#DIV/0!		#DIV/0!	#DIV/0!
End of Year Principal Balance											#DIV/0!		#DIV/0!	
2007														
Source													0	
Grace Period on Principal (No. of Years)													0	
Beginning of Year Principal Balance													0	
Term													0	
Interest Rate													0	
Interest Due													0	
Principal Due												#DIV/0!		
Total Debt Service												#DIV/0!		#DIV/0!
End of Year Principal Balance												#DIV/0!		
Type:	FY 1999	FY 2000	FY 2001	Total	Average	Average Historic Growth Rate	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Total	
Total Debt Service														
Total Debt Service on Existing Debt	0	0	0	0	0	#REF!	0	0	0	0	0	0	0	
New Debt Service														
New Debt Interest Payments								0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
New Debt Principal Payments								#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Total New Debt Service							0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Total Debt Service Payments	0	0	0	0	0	#REF!		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

BEST AVAILABLE COPY

Total cost						#NUM!								
Expected Revenues														
O&M	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
R&R	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Debt service	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Cumulative Cost Recovery														
O&M cost	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
O&M plus R&R	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Full cost recovery	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Target Tariff Revenues	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Average tariff increase to recover Target Tariff Revenue								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total Wastewater Costs	0	0	0	0	0	#NUM!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Total Wastewater Revenue Collected	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	0	0	0	0	0	0	0
Target Subsidy	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

Name: Hypothetical Egyptian Water Utility

5-UNIFORM RATE INCREASES

WATER

5.1 WATER - RATE DESIGN ALTERNATIVE 1: UNIFORM RATE INCREASES

Class:	Current Tariff/m³	Total (03-07) m³ billed	Ave. Tariff Increase Factor	New Tariff Rate (LE/m³)	Expected Revenue		
Residential 0-20 m3/month	0.23	255,121,602		0.53	134,909,822		
Residential >20 m3/month	0.35	226,243,009		0.80	182,058,816		
Governmental	0.45	64,908,641		1.03	67,155,801		
Religious	0.45	65,933,864		1.03	68,216,517		
Standpipes	0.45	156,597,591		1.03	162,019,054		
Commercial	0.75	25,590,472		1.72	44,127,372		
Public Sector	0.75	8,530,155		1.72	14,709,120		
Total		802,925,334	2.30		673,196,502	Total Tariff RR	570,071,314

5.2 WASTEWATER - RATE DESIGN ALTERNATIVE 1: RATE INCREASE PROPORTIONAL TO AVERAGE COLLECTION RATE

Class:	Current Tariff/m³	Total (03-07) m³ billed	Ave. Expense/ Collections Ratio	New Tariff Rate (LE/m³)	Expected Revenue
Residential 0-20 m3/month	0	#REF!	#REF!	#REF!	#REF!
Residential >20 m3/month	0	#REF!	#REF!	#REF!	#REF!
Governmental	0	#REF!	#REF!	#REF!	#REF!
Religious	0	#REF!	#REF!	#REF!	#REF!
Standpipes	0	#REF!	#REF!	#REF!	#REF!
Commercial	0	#REF!	#REF!	#REF!	#REF!
Public Sector	0	#REF!	#REF!	#REF!	#REF!
Total	0	#REF!			#REF!

AVERAGE MONTHLY BILLS

WATER - ALTERNATIVE I: UNIFORM RATE INCREASES

Classes	Tariffs (LE/m3)	m3/month 10	m3/month 20	m3/month 30	m3/month 40	m3/month 60	m3/month 80	m3/month 150
Residential 0-20 m3/month	0.53	5.29	10.58	15.86	21.15	26.44	42.30	79.32
Residential >20 m3/month	0.80	8.05	16.09	24.14	32.19	40.24	64.38	120.71
Governmental	1.03	10.35	20.69	31.04	41.38	51.73	82.77	155.19
Religious	1.03	10.35	20.69	31.04	41.38	51.73	82.77	155.19
Standpipes	1.03	10.35	20.69	31.04	41.38	51.73	82.77	155.19
Commercial	1.72	17.24	34.49	51.73	68.97	86.22	137.95	258.66
Public Sector	1.72	17.24	34.49	51.73	68.97	86.22	137.95	258.66

WASTEWATER - ALTERNATIVE I: UNIFORM RATE INCREASES

Classes	Tariffs (LE/m3)	Billable Flows based upon water consumption of: 10	WW Bill	Billable Flow 20	WW Bill	Billable Flow 30	WW Bill	Billable Flow 40	WW Bill	Billable Flow 60	WW Bill	Billable Flow 80	WW Bill	Billable Flow 150	WW Bill
Residential 0-20 m3/month	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Residential >20 m3/month	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Governmental	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Religious	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Standpipes	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Commercial	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Public Sector	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!

494.

Name: Hypothetical Egyptian Water Utility

BLOCK CONSUMPTION AND AVERAGE MONTHLY BILLS

6-STRUCTURED RATE INCREASES

6.1 WATER - RATE DESIGN ALTERNATIVE 2: RATE INCREASE BASED UPON "% OF COST-TO-BEAR" OF EACH CLASS

New Customer Classes:	Total (03-07) Consumption m^3	Class % of Total Consumption	Revenue Requirement of Class (LE)	Percentage of Cost-to-Bear	Percentage "Helper" Function	Cost-to-Bear	New Rate: Cost-to-Bear/ *m3 Consumption*	Percentage Increase of *Current Tariffs*	Expected Revenue
Domestic	481,364,611	60%	341,765,473	50%	50.0%	285,035,657	0.59	257%	285,035,657
Institutional	287,440,096	36%	204,080,437	44%	44.0%	250,831,378	0.87	249%	250,831,378
Commercial	34,120,627	4%	24,225,404	6%	6.0%	34,204,279	1.00	223%	34,204,279
Irrigation		0%	0		100.0%	0	#DIV/0!	#DIV/0!	#DIV/0!
Total	802,925,334	100%	570,071,314	100%	2	570,071,314	#DIV/0!		#DIV/0!

6.2 WATER - RATE DESIGN FOR BLOCKS WITHIN CUSTOMER CLASSES

	Expected Revenue for the Class	5 Year (03-07) Block Consumption (m3)	Percent of Total Class Consumption by users ending in each Block	Block Revenue Requirement According to Consumption	Percentage of "Cost-to-Bear" of each Block	Percentage "Helper" Function	New Revenue Requirement of Block	New Block Tariffs:Cost/m3
Domestic Block 1: 0-10 m3/month			0%	0		0.0%	0	#DIV/0!
Domestic Block 2: 11-30 m3/month			0%	0		0.0%	0	#DIV/0!
Domestic Block 3: 31+ m3/month			0%	0		0.0%	0	#DIV/0!
Total	285,035,657	285,035,657	100%	0	0	0	0	

6.3 WASTEWATER - RATE DESIGN ALTERNATIVE 2: RATE INCREASE BASED UPON "COST-TO-BEAR" OF EACH CLASS

Class:	Total (03-07) Consumption m^3	Class % of Total Consumption	Revenue Requirement *of Class (LE)*	Percentage of *Cost-to-Bear*	Percentage Helper *Function*	Cost-to-Bear	New Rate: Cost-to-Bear/ m3 Consumption		Expected Revenue
Domestic	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Institutional	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Commercial	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Irrigation	#REF!	#REF!	#REF!		#REF!	#REF!	#REF!		#REF!
Total	#REF!	#REF!	#REF!	0	#REF!	#REF!	#REF!		#REF!

6.4 WASTEWATER: RATE DESIGN FOR BLOCKS WITHIN CUSTOMER CLASSES

	Expected Revenue for the Class	5 Year (03-07) Block Consumption (m3)	Percent of Total Class Consumption by users ending in each Block	Block Revenue Requirement According to Consumption	Percentage of "Cost-to-Bear" of each Block	Percentage "Helper" Function	New Revenue Requirement of Block	New Block Tariffs:Cost/m3
Residential Block 1:Billable WW Flow - 0-10 m3/mo.			0	0		0.0%	0	#DIV/0!
Residential Block 2: Billable WW Flow 11-30 m3/mo.			0	0		0.0%	0	#DIV/0!
Residential Block 3: Billable WW Flow 31+ m3/mo.			0	0		0.0%	0	#DIV/0!
Total	#REF!	#REF!	#REF!	0	0	0	0	

WATER: ALTERNATIVE: RATE INCREASE BASED UPON % OF COST-TO-BEAR OF EACH CLASS

Classes	Tariffs (LE/m3)	m3/month 10	m3/month 20	m3/month 30	m3/month 40	m3/month 50	m3/month 80	m3/month 150
Residential	0.59	5.921408646	11.84281729	17.76422594	23.68563458	29.60704323	47.37126917	88.82112969
Religious	0.87	8.726387934	17.45277587	26.1791638	34.90555174	43.63193967	69.81110347	130.895819
Governmental	1.00	10.02451648	20.04903296	30.07354944	40.09806592	50.1225824	80.19613184	150.3677472
Service	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commercial	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Industrial	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Investment	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Irrigation	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Ghurab	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

WASTEWATER: ALTERNATIVE: RATE INCREASE BASED UPON % OF COST-TO-BEAR OF EACH CLASS

Classes	Tariffs (LE/m3)	Billable Flow 10	WW Bill	Billable Flow 20	WW Bill	Billable Flow 30	WW Bill	Billable Flow 40	WW Bill	Billable Flow 50	WW Bill	Billable Flow 80	WW Bill	Billable Flow 150	WW Bill
Residential	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Religious	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Governmental	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Service	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Commercial	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Industrial	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Investment	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!	0	#REF!
Irrigation	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Ghurab	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

COMBINED WATER & WASTEWATER FOR REPRESENTATIVE LEVELS OF WATER & WASTEWATER CONSUMETION: ALTERNATIVE 2

Classes	Tariffs (LE/m3)	m3/month 10	m3/month 20	m3/month 30	m3/month 40	m3/month 50	m3/month 80	m3/month 150
Residential		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Religious		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Governmental		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Service		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Commercial		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Industrial		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Investment		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Irrigation		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Ghurab		#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

Classes	No. of users ending in this block 0-10	Total Consumption of Users ending in this block	No. of users ending in this block 11-20	Total Consumption of Users ending in this block	No. of users ending in this block 21-30	Total Consumption of Users ending in this block	No. of users ending in this block 31-50	Total Consumption of Users ending in this block	No. of users ending in this block 51-80	Total Consumption of Users ending in this block	No. of users ending in this block 81+	Total Consumption of Users ending in this block	Total Users	Total Consumption
Residential 0-20 m3/month													0	0
Residential >20 m3/month													0	0
Governmental													0	0
Religious													0	0
Standpipes													0	0
Commercial													0	0
Public Sector													0	0
0													0	0
0													0	0

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The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-funded Project

NUCA TRAINING MATERIALS FOR RATE APPLICATION AND REVIEW, FINANCIAL MODELING, AND RATES ANALYSIS

April 30, 2002

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

CHEMONICS EGYPT

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LIRR II, EGYPT

NUCA Training Materials for Rate Application and Review and Financial Modeling and Rates Analysis

USAID LIRR II, Egypt

Ministry of Housing, Utilities, and New Urban Communities

Water/Wastewater Tariff for New Urban Communities

30 April 2002

Tariff Adjustment and Cost Recovery

- Tariff adjustments are one element in a utility's integrated strategy of cost recovery
- The tariff increase covers the financial gap that remains after possible efficiency improvements have been identified and planned

Tariff Planning: Main Processes

1. Identification of the revenue requirement – projections of demand, revenue of current tariffs, costs

2. Tariff rate design – allocation of the tariff burden among types of users

Definition of the Tariff Revenue Requirement: Cash Needs Approach

- O&M: labor, materials, services

- R&R
  - Small renewal and replacement projects
  - Cost-effective efficiency improvement projects

- Debt service: major capital works

NUCA Utility Revenue Requirements: Assumptions

- Five-year rate term: revenue stability, tariff stability, efficiency gains
- Debt service not required in this term

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Revenue Requirements Formulation

- Operation and maintenance costs
- *Minus* non-tariff revenues deduction
- *Plus* renewal and replacement costs
- *X* collection efficiency adjustment factor

divided by units of service (m^3)

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Typical Areas for Efficiency Improvement

- Unaccounted-for water reduction
- Revenue collection
- Staffing per thousand users
- Materials cost per m^3 produced
- Preventive maintenance

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Rate Application Contents

Model

- Demand
- O&M costs
- Capital costs
- Current revenue Analysis
- Tariff analysis
- Block rate design (optional)

Text

- Explanation of assumptions: demand, UFW, costs, revenue collections, fixed assets
- Efficiency improvement plan
- Approach to customer classification
- Approach to tariff rate design

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Data and Analysis Requirements

Historical Data	Planning Analyses
▪ Water consumption, by class	▪ Growth rates for consumption, by class
▪ Wastewater demand, by class	▪ Growth in wastewater demand, by class
▪ Revenue collections	▪ Revenue collection efficiency targets
▪ Treated water production	▪ UFW reduction targets
▪ Line item costs	▪ Cost control targets
▪ Fixed asset values	▪ Projected fixed asset values
▪ Non-tariff revenues	▪ Changes in non-tariff revenues

Tariff Planning

- Consolidate historical and projected data on revenues and costs
- Determine the magnitude of the tariff increase required
- Check to assure that efficiency targets are suitably challenging
- Adjust tariff rates to achieve positive net income

Roles of the Regulatory Authority

- Orient utility officials to the data and analysis requirements
- Customize the financial model as necessary (e.g., customer classification, non-tariff revenue sources)
- Check historical records and data inputs
- Review the utility's projections
- Assist in tariff rate design
- Assure that no class of customer is treated unfairly in the rates design

6 October/Sheikh Zayed Assumptions

Demand:

1) Large new bulk users added in FY 2002/03
2) Luxury housing area wastewater flows added in FY 2006/07
3) Domestic demand increases at 10%-30% annually
4) Government and service demand increases at 8% annually
5) Municipal irrigation use increases at 2% annually
6) Industrial demand increases at 6% annually

Costs:

1) UFW reduced from 20% to 11% by 2007
2) R&R allowance of 0.5% of fixed assets, plus improvement costs
3) Inflation at 2.5% annually

Collections: Collection efficiency increases from 61% to 85%

6 October/Sheikh Zayed Efficiency Improvement Plan

1. *Improve collection efficiency from 61% to 85%*
   - Install computerized billing system
2. *Reduce unaccounted-for water*
   - Install flow meters
   - Develop geographic information system of the network
   - Conduct leakage survey
   - Increase bulk sales as % of total sales
3. *Control growth of O&M costs*
   - Use asset catalogue to implement preventive maintenance program
   - Use existing staff in new facilities

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Summary of Five-Year Revenue Requirements (at current tariffs)

Costs		Revenues	
Water O&M costs	LE 195 m		
Wastewater O&M costs	64 m		
Total O&M costs	259 m	Water revenues	322 m
Non-tariff deduction	-9 m	Wastewater revenues	25 m
Net O&M costs	250 m	Total revenues	347 m
R&R costs	41 m	Collection efficiency	75 %
Total costs	**292 m**	Total collections	**261 m**
Average tariff increase factor = 1.12 (292/261)			

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Suggested Tariffs

Class	Water			Wastewater		
	2003	2004	2005 on	2003	2004	2005on
Residential	0.33	0.36	0.36	0.05	0.10	0.15
Government	0.30	0.30	0.30	0.05	0.10	0.15
Service	0.44	0.48	0.50	0.15	0.20	0.25
Commercial	0.54	0.58	0.60	0.15	0.20	0.25
Investment	0.78	0.80	0.80	0.30	0.35	0.40
Irrigation	0.35	0.40	0.45	N/a	N/a	N/a

Average Monthly Household Bills (2005)

Water Consumption (m^3)	Water Bill (LE)	Wastewater Bill (LE)	Total Bill (LE)
10 m^3	2.40	0.70	3.10
20 m^3	5.60	1.80	7.40
30 m^3	9.90	3.90	13.80

Tables For Compilation of Input Data

Table 1 — Demand Data

Bulk Water Sale		2000	2001	2002	2003	2004	2005	2006	2007
To Sheikh Zayed City	M3/Year	3,650,000	-	-					
Investment Area and Shooting Club	M3/Year				18,250,000	18,250,000	18,250,000	18,250,000	18,250,000
Jolly Ville and Pyramids Plateau	M3/Year				18,250,000	18,250,000	18,250,000	18,250,000	18,250,000
Intelligent Village	M3/Year				3,650,000	3,650,000	3,650,000	3,650,000	3,650,000
Giza Security Forces	M3/Year				1,825,000	1,825,000	1,825,000	1,825,000	1,825,000
Ministry of Interior	M3/Year				9,490,000	9,490,000	9,490,000	9,490,000	9,490,000
Total Bulk Water Sale Demand (m3/day)	M3/Year	3,650,000	-	-	51,465,000	51,465,000	51,465,000	51,465,000	51,465,000
Total Unaccounted-for Water (m3/day)	M3/Year	8,527,970	9,845,642	10,516,015	11,130,394	11,796,682	12,489,030	13,141,415	13,843,306
Daily Demand By Customer Class									
Residential, 6th October, Demand (m3/day)	M3/Year	8,199,900	8,741,366	9,615,503	10,577,053	11,634,758	12,798,234	14,078,057	15,485,863
Residential Sheikh Zayed, Demand (m3/day)	M3/Year	137,747	214,840	279,291	363,079	472,002	613,603	767,004	958,755
Commercial, Both,Demand (m3/day)	M3/Year	1,402,418	1,197,663	1,978,959	2,406,829	2,905,623	3,352,959	3,711,265	4,111,154
Government, Both, Demand (m3/day)	M3/Year	1,164,725	1,274,815	1,376,800	1,486,944	1,605,900	1,734,372	1,855,778	1,985,682
Service, Both, Demand (m3/day)	M3/Year	400,000	500,000	540,000	583,200	629,856	680,244	727,862	778,812
Municipal Irrigation, Both, Demand (m3/day)	M3/Year	6,772,210	7,072,210	7,213,654	7,357,927	7,505,086	7,655,188	7,808,291	7,964,457
Factories (m3/day)	M3/Year	11,519,721	14,772,870	15,659,242	16,598,796	17,594,724	18,650,408	19,582,928	20,562,074
Construction (Both Cities)	M3/Year	1,728,712	2,216,898	2,349,911	2,490,906	2,640,360	2,798,782	2,938,721	3,085,657
High class residential	M3/Year	2,334,842	2,994,197	3,084,023	3,176,544	3,271,840	3,369,995	3,471,095	3,575,228
Investment Companies	M3/Year	989,353	1,268,745	1,306,807	1,346,011	1,386,391	1,427,983	1,470,823	1,514,947
		34,649,628	40,253,603	43,404,190	46,387,289	49,646,541	53,081,768	56,411,824	60,022,631

Table 2.1 — O&M Costs - Water

Item	2000	2001	2002	2003	2004	2005	2006	2007
Wages and Salaries (both plants in 2003)	3,300,000	3,300,000	5,000,000	6,295,200	6,295,200	6,295,200	6,295,200	6,295,200
Commodities								
Electrictity	9,676,424	9,746,486	11,524,036	21,567,374	22,265,443	22,999,000	23,707,080	24,473,665
Fuel and Oil (incl. in maint. allow. from 2003)	60,158	65,555	69,248					
Chemicals	1,180,391	1,264,781	1,361,195	2,764,187	2,863,098	2,967,067	3,067,405	3,176,079
Spare parts (incl. in maint. allow. from 2003)	300,165	340,000	682,114					
Other Commodities (incl. in maint. allow. from 2003)	197,760	339,353	392,774					
Services								
Maintenance (Allowance from 2003)	1,199,835	1,150,500	817,886	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000
Transportation (incl. in maint. allow. from 2003)	23,842	18,445	14,752					
Other Services	590,281	1,018,647	1,178,322	1,660,538	1,700,387	1,742,263	1,782,684	1,826,447
Base O&M costs for Water Supply	16,528,856	17,243,767	21,040,327	34,787,298	35,624,128	36,503,530	37,352,369	38,271,391
Allowance for inflation at 2.5%/yr	-	-	-	434,841	1,346,592	2,328,925	3,376,654	4,500,716
Total Estimated O&M costs for Water Supply	16,528,856	17,243,767	21,040,327	35,222,140	36,970,720	38,832,455	40,729,023	42,772,107

Table 2.2 — O&M Costs - Wastewater

Item	2000	2001	2002	2003	2004	2005	2006	2007
Wages and Salaries	1,828,500	1,828,500	1,828,500	1,828,500	1,828,500	1,828,500	1,828,500	1,828,500
Commodities								
Electrictity	7,771,479	7,867,618	7,935,683	7,997,971	8,065,956	8,136,752	8,205,045	8,278,405
Fuel and Oil (incl. in maint. allow. from 2003)	33,400	35,900	38,400					
Chemicals	172,724	194,242	215,759	237,276	258,794	280,311	303,844	327,376
Spare parts (incl. in maint. allow. from 2003)	350,000	333,000	315,000					
Other Commodities (incl. in maint. allow. from 2003)	396,225	400,343	406,597					
Services								
Maintenance (Allowance from 2003)	1,150,000	1,167,000	1,185,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000
Transportation (incl. in maint. allow. from 2003)	14,600	12,100	9,600					
Other Services	169,811	171,575	174,170	150,000	150,000	150,000	150,000	150,000
Base O&M costs for Wastewater	11,886,739	12,010,278	12,108,709	12,013,747	12,103,250	12,195,563	12,287,389	12,384,282
Allowance for inflation at 2.5%/yr	-	-	-	150,172	457,503	778,077	1,110,780	1,456,392
Total Estimated O&M costs for Wastewater	11,886,739	12,010,278	12,108,709	12,163,919	12,560,753	12,973,640	13,398,168	13,840,673

Table 3 Renewal and Replacement Costs

Task	Engineering and Investment Program	Total Cost	Year of Tariff Effectiveness Period	2002	2003	2004	2005	2006	2007
	Fixed Asset Value[1]			216,991,504	1,076,387,093	1,080,888,093	1,085,492,093	1,338,112,093	1,340,732,093
				Year of Tariff Effectiveness					
1.0	Survey/Install Primary Meters	1,035,000	1	-	1,035,000	-	-	-	-
2.0	Prepare/Calibrate Distribution System Model	460,000	1--2	-	230,000	230,000	-	-	-
3.0	Establish Computerized Customer Database and Billing System	1,440,000	1--5	-	936,000	234,000	90,000	90,000	90,000
4.0	Catalog System Assets in Computerized Database	1,840,000	2	-	-	1,840,000	-	-	-
5.0	Survey/Install Secondary Meters[2]	12,650,000	1--5	-	-	-	-	-	-
6.0	Locate and Quantify Unaccounted-For Water	736,000	3--4	-	-	-	368,000	368,000	-
	Total--Investment & Engineering	18,161,000							
	Total engineering and investment program[2]				2,201,000	2,304,000	458,000	458,000	90,000
	Normal R&R program[3]				6,458,323	6,485,329	6,512,953	8,028,673	8,044,393
	Total R&R and metering upgrade				8,659,323	8,789,329	6,970,953	8,486,673	8,134,393

Notes:
1. Fixed asset value increased in 2003 to reflect inclusion of Shakh Zayed water treatment plant and in 2006 to reflect additional wastewater treatment capacity expected to be placed in service. The values used are solely for the purpose of illustration and actual asset values should be substituted by the utility as the information becomes available.
2. The cost of secondary meters and meter installation will be borne by the customers.
3. Annual R&R expenditures are estimated at 0.6% of the value of fixed assets in service; the percentage may be adjusted according to the needs of the utility, or the utility may elect to prepare estimated R&R funding requirements without reference to the value of fixed assets in service.

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	A	B	C	D	E	F	G	H	I	J
1										
2	Table 4 a	CURRENT REVENUE ANALYSIS WORKSHEET, 6TH OF OCTOBER AND SHEIKH ZAYED CITIES								
3		2000	2001	2002	2003	2004	2005	2006	2007	2003-2007
4	**Billed Water Consumption (m^3):**									
5	Residential (6 October)	8,199,900	8,741,366	9,615,503	10,577,053	11,634,758	12,798,234	14,078,057	15,485,863	64,573,965
6	Residential (S. Zayed)	137,747	214,840	279,291	363,079	472,002	613,603	767,004	958,755	3,174,443
7	Commercial	1,402,418	1,197,663	1,978,959	2,406,829	2,905,623	3,352,959	3,711,265	4,111,154	16,487,831
8	Government	1,164,725	1,274,815	1,376,800	1,486,944	1,605,900	1,734,372	1,855,778	1,985,682	8,668,676
9	Service	400,000	500,000	540,000	583,200	629,856	680,244	727,862	778,812	3,399,974
10	Bulk Water	1,825,000	0	0	51,465,000	51,465,000	51,465,000	51,465,000	51,465,000	257,325,000
11	Factories	11,519,721	14,772,870	15,659,242	16,598,796	17,594,724	18,650,408	19,582,928	20,562,074	92,988,931
12	Construction	1,728,712	2,216,898	2,349,911	2,490,906	2,640,360	2,798,782	2,938,721	3,085,657	13,954,427
13	High-Class Residential	2,334,842	2,994,197	3,084,023	3,176,544	3,271,840	3,369,995	3,471,095	3,575,228	16,864,702
14	Investment Companies	989,353	1,268,745	1,306,807	1,346,011	1,386,391	1,427,983	1,470,823	1,514,947	7,146,156
15	Municipal Irrigation	6,772,210	7,072,210	7,213,654	7,357,927	7,505,086	7,655,188	7,808,291	7,964,457	38,290,949
16	**Total Billed Water Consumption m3)**	**36,474,628**	**40,253,603**	**43,404,190**	**97,852,289**	**101,111,541**	**104,546,768**	**107,876,824**	**111,487,631**	**522,875,054**
17	**Current Water Tariffs (LE/m^3):**									
18	Residential (6 October)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
19	Residential (S. Zayed)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
20	Commercial	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
21	Government	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
22	Service	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
23	Bulk Water (Mixed Rate)	0.75	0.00	0.00	0.68	0.70	0.70	0.70	0.70	0.70
24	Factories	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
25	Construction	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
26	High-Class Residential	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
27	Investment Companies	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
28	Municipal Irrigation	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
29	Average water tariff	0.54	0.54	0.54	0.61	0.62	0.62	0.61	0.61	0.62
30	**Water Tariff Revenue (LE):**									
31	Residential (6 October)	2,459,970	2,622,410	2,884,651	3,173,116	3,490,427	3,839,470	4,223,417	4,645,759	19,372,190
32	Residential (S. Zayed)	41,324	64,452	83,787	108,924	141,601	184,081	230,101	287,626	952,333
33	Commercial	701,209	598,832	989,479	1,203,414	1,452,811	1,676,480	1,855,633	2,055,577	8,243,915
34	Government	349,418	382,445	413,040	446,083	481,770	520,312	556,733	595,705	2,600,603
35	Service	160,000	200,000	216,000	233,280	251,942	272,098	291,145	311,525	1,359,990
36	Bulk Water	1,368,750	0	0	35,050,950	36,193,400	36,193,400	36,193,400	36,193,400	179,824,550
37	Factories	8,639,791	11,079,652	11,744,431	12,449,097	13,196,043	13,987,806	14,687,196	15,421,556	69,741,698
38	Construction	1,296,534	1,662,673	1,762,434	1,868,180	1,980,270	2,099,087	2,204,041	2,314,243	10,465,820
39	High-Class Residential	1,751,131	2,245,648	2,313,017	2,382,408	2,453,880	2,527,496	2,603,321	2,681,421	12,648,527
40	Investment Companies	742,015	951,558	980,105	1,009,508	1,039,794	1,070,987	1,103,117	1,136,210	5,359,617
41	Municipal Irrigation	2,031,663	2,121,663	2,164,096	2,207,378	2,251,526	2,296,556	2,342,487	2,389,337	11,487,285
42	**Total water tariff revenue (LE)**	**19,541,805**	**21,929,332**	**23,551,041**	**60,132,338**	**62,933,465**	**64,667,772**	**66,290,592**	**68,032,359**	**322,056,527**
43	**Wastewater Service Usage (m^3):**									
44	Residential (6 October)	7,789,905	8,304,298	9,134,727	10,048,200	11,053,020	12,158,322	13,374,154	14,711,570	61,345,267
45	Residential (S. Zayed)	130,860	204,098	265,327	344,925	448,402	582,923	728,654	910,817	3,015,721
46	Commercial	1,402,418	1,197,663	1,978,959	2,406,829	2,905,623	3,352,959	3,711,265	4,111,154	16,487,831
47	Service	400,000	500,000	540,000	583,200	629,856	680,244	727,862	778,812	3,399,974
48	Bulk Water	0								
49	Factories	11,174,129	14,329,684	15,189,465	16,100,833	17,066,883	18,090,895	18,995,440	19,945,212	90,199,263
50	Construction	0	0	0	0	0	0	0	0	0
51	High-Class Residential	0	0	0	0	0	0	0	2,681,421	2,681,421
52	Investment Companies	59,361	76,125	78,408	80,761	83,183	85,679	88,249	90,897	428,769
53	Municipal Irrigation	0	0	0	0	0	0	0	0	0
54	**Total wastewater service usage (m^3)**	**20,956,673**	**24,611,867**	**27,186,886**	**29,564,747**	**32,186,967**	**34,951,023**	**37,625,625**	**43,229,884**	**177,558,246**
55	**Current Wastewater Tariffs (LE/m^3):**									

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	A	B	C	D	E	F	G	H	I	J
3		2000	2001	2002	2003	2004	2005	2006	2007	2003-2007
56	Residential (6 October)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
57	Residential (S. Zayed)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
58	Commercial	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
59	Government	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
60	Service	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
61	Bulk Water	0	0	0	0	0	0	0	0	0
62	Factories	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
63	Construction	0	0	0	0	0	0	0	0	0
64	High-Class Residential	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
65	Investment Companies	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
66	Municipal Irrigation	0	0	0	0	0	0	0	0	0
67	Overall average wastewater tariff	0.14	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.14
68	**Wastewater Revenue (LE):**									
69	Residential (6 October)	233,697	249,129	274,042	301,446	331,591	364,750	401,225	441,347	1,840,358
70	Residential (S. Zayed)	3,926	6,123	7,960	10,348	13,452	17,488	21,860	27,325	90,472
71	Commercial	140,242	119,766	197,896	240,683	290,562	335,296	371,127	411,115	1,648,783
72	Government	12,000	15,000	16,200	17,496	18,896	20,407	21,836	23,364	101,999
73	Service	32,000	40,000	43,200	46,656	50,388	54,420	58,229	62,305	271,998
74	Bulk Water	0	0	0	0	0	0	0	0	0
75	Factories	2,514,179	3,224,179	3,417,630	3,622,687	3,840,049	4,070,451	4,273,974	4,487,673	20,294,834
76	Construction	0	0	0	0	0	0	0	0	0
77	High-Class Residential	0	0	0	0	0	0	0	603,320	603,320
78	Investment Companies	13,356	17,128	17,642	18,171	18,716	19,278	19,856	20,452	96,473
79	Municipal Irrigation	0	0	0	0	0	0	0	0	0
80	**Total wastewater revenues (LE)**	**2,949,400**	**3,671,325**	**3,974,569**	**4,257,487**	**4,563,654**	**4,882,089**	**5,168,106**	**6,076,901**	**24,948,237**
81	Non-Revenue Water (%)	19%	20%	20%	10%	10%	11%	11%	11%	11%
82	Non-Revenue Water (m^3)	8,527,970	9,845,642	10,516,015	11,130,394	11,796,682	12,489,030	13,141,415	13,843,306	62,400,827
83	Water Production (m^3)	45,002,598	50,099,245	53,920,205	108,982,683	112,908,223	117,035,798	121,018,239	125,330,936	585,275,880
84	Water O&M Costs (LE)	16,528,856	17,243,767	21,040,327	35,222,140	36,970,720	38,832,455	40,729,023	42,772,107	194,526,445
85	Water Cost/ m^3 produced	0.37	0.34	0.39	0.32	0.33	0.33	0.34	0.34	0.33
86	Water Cost/m^3 sold	0.45	0.43	0.48	0.36	0.37	0.37	0.38	0.38	0.37
87	Wastewater Collected (m^3)	20,956,673	24,611,867	27,186,886	29,564,747	32,186,967	34,951,023	37,625,625	43,229,884	177,558,246
88	Wastewater O&M Cost (LE)	11,886,739	12,010,278	12,108,709	12,163,919	12,560,753	12,973,640	13,398,168	13,840,673	64,937,153
89	Wastewater Cost/ m^3 collected	0.57	0.49	0.45	0.41	0.39	0.37	0.36	0.32	0.37
90	Ww Cost/ m3 of water billed to sewered customers	0.50	0.43	0.39	0.36	0.35	0.33	0.32	0.30	0.33
91	Total O&M cost (LE)	28,415,595	29,254,045	33,149,037	47,386,059	49,531,473	51,806,095	54,127,191	56,612,780	259,463,598
92	Deduction for effluent sales (LE)	1,047,834	1,230,593	1,359,344	1,478,237	1,609,348	1,747,551	1,881,281	2,161,494	8,877,912
93	Net O&M Costs (LE)	27,367,762	28,023,452	31,789,692	45,907,821	47,922,125	50,058,544	52,245,910	54,451,286	250,585,686
94	Total R & R (Estimated - to be proposed by utility)	0	0	0	8,659,323	8,789,329	6,970,953	8,486,673	8,134,393	41,040,669
95	Total Costs	27,367,762	28,023,452	31,789,692	54,567,144	56,711,453	57,029,496	60,732,583	62,585,679	291,626,355
96	Total Revenue (LE)	22,491,205	25,600,657	27,525,610	64,389,826	67,497,119	69,549,862	71,458,697	74,109,260	347,004,764
97	Collection Efficiency Rate	63%	64%	61%	65%	70%	75%	80%	85%	75%
98	Net Revenue Collection - Cash (LE)	14,168,538	16,381,726	16,686,529	41,853,387	47,247,983	52,162,396	57,166,958	62,992,871	261,423,595
99	**NET INCOME**	**-13,199,223**	**-11,641,726**	**-15,103,163**	**-12,713,757**	**-9,463,470**	**-4,867,100**	**-3,565,625**	**407,193**	**-30,202,760**
100										
101	**ASSUMPTIONS:**									
102	1) Shaykh Zayed water treatment plant becomes operational in July 2002.									
103	2) Wastewater flows to new WWTP serving southeastern Sixth of October area begin in FY 2007.									
104	3) Shaykh Zayed wastewater is conveyed to an external utility (Abu Rawash WWTP) for treatment. *Abu Rawash does not* charge Shaykh Zayed for this service at present.									
105	**NOTE:**									
106	1) Shaded cells, except cells for tariff rates, are cells that draw data from the Imput Data or Capital Costs worksheets. Tariffs within shaded cells are those being adjusted as									
107	required to provide revenues sufficient to cover O&M costs and R&R.									
108										

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	A	B	C	D	E	F	G	H	I	J
1										
2	Table 4 b	TARIFF ANALYSIS WORKSHEET, 6TH OF OCTOBER AND SHEIKH ZAYED CITIES								
3		2000	2001	2002	2003	2004	2005	2006	2007	2003-2007
4	**Billed Water Consumption (m^3):**									
5	Residential (6 October)	8,199,900	8,741,366	9,615,503	10,577,053	11,634,758	12,798,234	14,078,057	15,485,863	64,573,965
6	Residential (S. Zayed)	137,747	214,840	279,291	363,079	472,002	613,603	767,004	958,755	3,174,443
7	Commercial	1,402,418	1,197,663	1,978,959	2,406,829	2,905,623	3,352,959	3,711,265	4,111,154	16,487,831
8	Government	1,164,725	1,274,815	1,376,800	1,486,944	1,605,900	1,734,372	1,855,778	1,985,682	8,668,676
9	Service	400,000	500,000	540,000	583,200	629,856	680,244	727,862	778,812	3,399,974
10	Bulk Water	3,650,000	0	0	51,465,000	51,465,000	51,465,000	51,465,000	51,465,000	257,325,000
11	Factories	11,519,721	14,772,870	15,659,242	16,598,796	17,594,724	18,650,408	19,582,928	20,562,074	92,988,931
12	Construction	1,728,712	2,216,898	2,349,911	2,490,906	2,640,360	2,798,782	2,938,721	3,085,657	13,954,427
13	High-Class Residential	2,334,842	2,994,197	3,084,023	3,176,544	3,271,840	3,369,995	3,471,095	3,575,228	16,864,702
14	Investment Companies	989,353	1,268,745	1,306,807	1,346,011	1,386,391	1,427,983	1,470,823	1,514,947	7,146,156
15	Municipal Irrigation	6,772,210	7,072,210	7,213,654	7,357,927	7,505,086	7,655,188	7,808,291	7,964,457	38,290,949
16	**Total billed water consumption (m^3)**	**38,299,628**	**40,253,603**	**43,404,190**	**97,852,289**	**101,111,541**	**104,546,768**	**107,876,824**	**111,487,631**	**522,875,054**
17	**Water Tariffs (LE/m^3):**									
18	Residential (6 October)	0.30	0.30	0.30	0.33	0.36	0.36	0.36	0.36	0.35
19	Residential (S. Zayed)	0.30	0.30	0.30	0.33	0.36	0.36	0.36	0.36	0.35
20	Commercial	0.50	0.50	0.50	0.54	0.58	0.60	0.60	0.60	0.58
21	Government	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
22	Service	0.40	0.40	0.40	0.44	0.48	0.50	0.50	0.50	0.48
23	Bulk Water (Mixed Rate)	0.75	0.00	0.00	0.68	0.70	0.70	0.70	0.70	0.70
24	Factories	0.75	0.75	0.75	0.78	0.80	0.80	0.80	0.80	0.80
25	Construction	0.75	0.75	0.75	0.78	0.80	0.80	0.80	0.80	0.80
26	High-Class Residential	0.75	0.75	0.75	0.78	0.80	0.80	0.80	0.80	0.80
27	Investment Companies	0.75	0.75	0.75	0.78	0.80	0.80	0.80	0.80	0.80
28	Municipal Irrigation	0.30	0.30	0.30	0.35	0.40	0.45	0.45	0.45	0.42
29	Average water tariff	0.55	0.54	0.54	0.63	0.65	0.65	0.65	0.65	0.65
30	**Water Tariff Revenue (LE):**									
31	Residential (6 October)	2,459,970	2,622,410	2,884,651	3,490,427	4,188,513	4,607,364	5,068,101	5,574,911	22,859,184
32	Residential (S. Zayed)	41,324	64,452	83,787	119,816	169,921	220,897	276,121	345,152	1,123,753
33	Commercial	701,209	598,832	989,479	1,299,688	1,685,261	2,011,776	2,226,759	2,466,693	9,628,893
34	Government	349,418	382,445	413,040	446,083	481,770	520,312	556,733	595,705	2,600,603
35	Service	160,000	200,000	216,000	256,608	302,331	340,122	363,931	389,406	1,645,587
36	Bulk Water	2,737,500	0	0	35,050,950	36,193,400	36,193,400	36,193,400	36,193,400	179,824,550
37	Factories	8,639,791	11,079,652	11,744,431	12,947,061	14,075,779	14,920,326	15,666,342	16,449,660	74,019,189
38	Construction	1,296,534	1,662,673	1,762,434	1,942,907	2,112,288	2,239,026	2,350,977	2,468,526	11,107,724
39	High-Class Residential	1,751,131	2,245,648	2,313,017	2,477,704	2,617,472	2,695,996	2,776,876	2,860,182	13,424,303
40	Investment Companies	742,015	951,558	980,105	1,049,889	1,109,113	1,142,387	1,176,658	1,211,958	5,688,340
41	Municipal Irrigation	2,031,663	2,121,663	2,164,096	2,575,275	3,002,034	3,444,834	3,513,731	3,584,006	16,082,199
42	**Total water tariff revenue (LE)**	**20,910,555**	**21,929,332**	**23,551,041**	**61,656,408**	**65,937,883**	**68,336,440**	**70,169,630**	**72,139,597**	**338,004,324**
43	**Wastewater Service Usage (m^3):**									
44	Residential (6 October)	7,789,905	8,304,298	9,134,727	10,048,200	11,053,020	12,158,322	13,374,154	14,711,570	61,345,267
45	Residential (S. Zayed)	130,860	204,098	265,327	344,925	448,402	582,923	728,654	910,817	3,015,721
46	Commercial	1,402,418	1,197,663	1,978,959	2,406,829	2,905,623	3,352,959	3,711,265	4,111,154	16,487,831
47	Service	400,000	500,000	540,000	583,200	629,856	680,244	727,862	778,812	3,399,974
48	Bulk Water	0								
49	Factories	11,174,129	14,329,684	15,189,465	16,100,833	17,066,883	18,090,895	18,995,440	19,945,212	90,199,263
50	Construction	0	0	0	0	0	0	0	0	0
51	High-Class Residential	0	0	0	0	0	0	0	2,681,421	2,681,421
52	Investment Companies	59,361	76,125	78,408	80,761	83,183	85,679	88,249	90,897	428,769
53	Municipal Irrigation	0	0	0	0	0	0	0	0	0
54	**Total wastewater service usage (m^3)**	**20,956,673**	**24,611,867**	**27,186,886**	**29,564,747**	**32,186,967**	**34,951,023**	**37,625,625**	**43,229,884**	**177,558,246**

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	A	B	C	D	E	F	G	H	I	J
3		2000	2001	2002	2003	2004	2005	2006	2007	2003-2007
55	**Wastewater Tariffs (LE/m^3)**									
56	Residential (6 October)	0.03	0.03	0.03	0.05	0.10	0.15	0.15	0.15	0.12
57	Residential (S. Zayed)	0.03	0.03	0.03	0.05	0.10	0.15	0.15	0.15	0.12
58	Commercial	0.10	0.10	0.10	0.15	0.20	0.25	0.25	0.25	0.22
59	Government	0.03	0.03	0.03	0.05	0.10	0.15	0.15	0.15	0.12
60	Service	0.08	0.08	0.08	0.15	0.20	0.25	0.25	0.25	0.22
61	Bulk Water	0	0	0	0.00	0.00	0.00	0.00	0.00	0
62	Factories	0.225	0.225	0.225	0.30	0.35	0.40	0.40	0.40	0.37
63	Construction	0	0	0	0.00	0.00	0.00	0.00	0.00	0
64	High-Class Residential	0.225	0.225	0.225	0.30	0.35	0.40	0.40	0.40	0.37
65	Investment Companies	0.225	0.225	0.225	0.30	0.35	0.40	0.40	0.40	0.37
66	Municipal Irrigation	0	0	0	0.00	0.00	0.00	0.00	0.00	0
67	Average wastewater tariff	0.14	0.15	0.15	0.20	0.25	0.29	0.29	0.30	0.27
68	**Wastewater Revenue (LE):**									
69	Residential (6 October)	233,697	249,129	274,042	502,410	1,105,302	1,823,748	2,006,123	2,206,735	7,361,432
70	Residential (S. Zayed)	3,926	6,123	7,960	17,246	44,840	87,438	109,298	136,623	361,887
71	Commercial	140,242	119,766	197,896	361,024	581,125	838,240	927,816	1,027,789	3,627,323
72	Government	12,000	15,000	16,200	29,160	62,986	102,037	109,179	116,822	407,997
73	Service	32,000	40,000	43,200	87,480	125,971	170,061	181,965	194,703	747,994
74	Bulk Water	0	0	0	0	0	0	0	0	0
75	Factories	2,514,179	3,224,179	3,417,630	4,830,250	5,973,409	7,236,358	7,598,176	7,978,085	33,373,727
76	Construction	0	0	0	0	0	0	0	0	0
77	High-Class Residential	0	0	0	0	0	0	0	1,072,568	992,126
78	Investment Companies	13,356	17,128	17,642	24,228	29,114	34,272	35,300	36,359	158,645
79	Municipal Irrigation	0	0	0	0	0	0	0	0	0
80	**Total wastewater revenues (LE)**	**2,949,400**	**3,671,325**	**3,974,569**	**5,851,799**	**7,922,747**	**10,292,154**	**10,967,858**	**12,769,683**	**47,031,130**
81	Non-Revenue Water (%)	18%	20%	20%	10%	10%	11%	11%	11%	11%
82	Non-Revenue Water (m^3)	8,527,970	9,845,642	10,516,015	11,130,394	11,796,682	12,489,030	13,141,415	13,843,306	62,400,827
83	Water Production (m^3)	46,827,598	50,099,245	53,920,205	108,982,683	112,908,223	117,035,798	121,018,239	125,330,936	585,275,880
84	Water O&M Costs (LE)	16,528,856	17,243,767	21,040,327	35,222,140	36,970,720	38,832,455	40,729,023	42,772,107	194,526,445
85	Water Cost/ m^3 produced	0.35	0.34	0.39	0.32	0.33	0.33	0.34	0.34	0.33
86	Wastewater Collected (m^3)	20,956,673	24,611,867	27,186,886	29,564,747	32,186,967	34,951,023	37,625,625	43,229,884	177,558,246
87	Wastewater O&M Cost (LE)	11,886,739	12,010,278	12,108,709	12,163,919	12,560,753	12,973,640	13,398,168	13,840,673	64,937,153
88	Wastewater Cost/ m^3 collected	0.57	0.49	0.45	0.41	0.39	0.37	0.36	0.32	0.37
89	Ww Cost/ m3 of water billed to sewered customers	0.50	0.43	0.39	0.36	0.35	0.33	0.32	0.30	0.33
90	Water Cost/m^3 sold	0.43	0.43	0.48	0.36	0.37	0.37	0.38	0.38	0.37
91	Total O&M cost	28,415,595	29,254,045	33,149,037	47,386,059	49,531,473	51,806,095	54,127,191	56,612,780	259,463,598
92	Deduction for effluent sales (LE)	1,047,834	1,230,593	1,359,344	1,478,237	1,609,348	1,747,551	1,881,281	2,161,494	8,877,912
93	Net O&M Costs (LE)	27,367,762	28,023,452	31,789,692	45,907,821	47,922,125	50,058,544	52,245,910	54,451,286	250,585,686
94	Total R & R (Estimated - to be proposed by utility)	0	0	0	8,659,323	8,789,329	6,970,953	8,486,673	8,134,393	41,040,669
95	Total Costs	27,367,762	28,023,452	31,789,692	54,567,144	56,711,453	57,029,496	60,732,583	62,585,679	291,626,355
96	Total Revenue (LE)	23,859,955	25,600,657	27,525,610	67,508,206	73,860,630	78,628,594	81,137,488	84,909,281	386,044,198
97	Collection Efficiency Rate	59%	64%	61%	65%	70%	75%	80%	85%	76%
98	Net Revenue Collection - Cash (LE)	14,168,538	16,381,726	16,686,529	43,880,334	51,702,441	58,971,445	64,909,990	72,172,889	291,637,099
99	**NET INCOME**	**-13,199,223**	**-11,641,726**	**-15,103,163**	**-10,686,810**	**-5,009,013**	**1,941,949**	**4,177,408**	**9,587,210**	**10,745**
100										
101	**ASSUMPTIONS:**									
102	1) Shaykh Zayed water treatment plant becomes operational in July 2002.									
103	2) Wastewater flows to new WWTP serving southeastern Sixth of October area begin in FY 2007.									
104	3). Shaykh Zayed wastewater is conveyed to an external utility (Abu Rawash WWTP) for treatment. Abu Rawash does not charge Shaykh Zayed for this service at present.									
105	**NOTE:**									
106	1) Shaded cells, except cells for tariff rates, are cells that draw data from the Imput Data or Capital Costs worksheets. Tariffs within shaded cells are those being adjusted as									
107	required to provide revenues sufficient to cover O&M costs and R&R.									

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Table 5 TARIFF BLOCK RATE CALCULATION WORKSHEET
Residential Customer Classes
(Using Estimated Account and Consumption Data)

ESTIMATED ACCOUNT DATA 2001 / **ESTIMATED AVERAGE ACCOUNT DATA 2003-2007**

Residential Consumers - Water

Consumption Block CuM/Mo.	No. Of Customers	Avg. Monthly Consumption	Avg.Cons. Per Block CuM/Mo.	No. Of Customers	Avg.Cons Per Month CuM/Mo	Delta Avg. Tff.	Target Avg. Tariff (2005) 0.36 Avg. Revenue LE	Tariffs Per Consumption Block LE/CuM
0-10	18,032	18,800	1.0	26,401	27,525	-0.12	6,606	0.24
11-20	15,027	166,400	11.1	22,001	243,626	-0.08	68,703	0.28
21-30	6,512	153,200	23.5	9,534	224,300	-0.03	73,122	0.33
31-50	7,514	246,860	32.9	11,001	361,428	0.04	145,475	0.40
51 & above	3,005	161,100	53.6	4,400	235,867	0.10	108,499	0.46
Totals	50,090	746,360	14.9	73,337	1,092,746		4,828,845	
					Target Revenue (2005)		4,828,261	

Residential Consumers - Wastewater

Consumption Block CuM/Mo.	No. Of Customers	Avg. Monthly Consumption	Avg.Cons. Per Block CuM/Mo.	No. Of Customers	Avg.Cons Per Month CuM/Mo	Delta Avg. Tff.	Target Tariff (2005) 0.15 Avg. Revenue LE	Tariffs Per Consumption Block LE/CuM
0-10	18,032	18,800	1.0	26,401	27,525	-0.08	1,927	0.07
11-20	15,027	166,400	11.1	22,001	243,626	-0.06	21,926	0.09
21-30	6,512	153,200	23.5	9,534	224,300	-0.02	29,159	0.13
31-50	7,514	246,860	32.9	11,001	361,428	0.00	54,214	0.15
51 & above	3,005	161,100	53.6	4,400	235,867	0.04	44,815	0.19
Totals	50,090	746,360	14.9	73,337	1,092,746		1,824,491	
					Target Revenue (2005)		1,823,748	

Residential Tariffs, Water/Wastewater

Consumption Block CuM/Mo.	Current Water	Current Wastewater	2003 Water	2003 Wastewater	2004 Water	2004 Wastewater	2005 & Beyond Water	2005 & Beyond Wastewater
	Piasters Per CuM							
0-10	30	3	21	3	22	5	24	7
11-20	30	3	25	4	28	7	28	9
21-30	30	3	30	4	31	9	33	13
31-50	30	3	37	5	38	10	40	15
51 & above	30	3	41	6	42	13	46	19

Other Tariffs (Flat Rate)

Customer Classification	Current Water	Current Wastewater	2003 Water	2003 Wastewater	2004 Water	2004 Wastewater	2005 & Beyond Water	2005 & Beyond Wastewater
	Piasters Per CuM							
Commercial	50	10	54	15	58	20	60	25
Government	30	3	30	5	30	10	30	15
Service	40	8	44	15	48	20	50	25
Bulk Water (Mixed Rate)	0	0	68	0	70	0	70	0
Factories	75	22.5	78	30	80	35	80	40
Construction	75	0	78	0	80	0	80	0
High-Class Residential	75	22.5	78	30	80	35	80	40
Investment Companies	75	22.5	78	30	80	35	80	40
Municipal Irrigation	30	0	35	0	40	0	45	0

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The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-funded Project

EGYPTIAN WATER/WASTEWATER REGULATORY AGENCY LOGISTICS AND IT PLAN, FIVE-YEAR BUDGET, AND FINANCING OPTIONS

July 2002

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

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Annex A: EWRA Staffing Sequence
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ACRONYMS

BOOT	Build, Own, Operate, Transfer
BOT	Build, Operate, Transfer
CAL	Client Access Licensing
CD	Central Department
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
GD	General Department
GOE	Government of Egypt
EWRA	Egyptian Water/Wastewater Sector Regulatory Agency
IIS	Internet Information Server
ISP	Internet Service Provider
IT	Information Technology
LAN	Local Area Network
LE	Egyptian Pound
LIRR-II	Legal, Institutional and Regulatory Reform II Project
MHUUC	Ministry of Housing, Utilities and Urban Communities
MSSQL	Microsoft Structured Query Language
M&IE	Meals and Incidental Expenses
NT	Network Technology
PC	Personal Computer
PEA	Public Economic Authority
RAS	Remote Access Server
UPS	Uninterrupted Power Supply
W/WW	Water and Wastewater

EWRA Logistics and IT Plan, Five-Year Budget, and Financing Options

1. Introduction

This document provides an indicative budget for the first five years of the Egyptian Water and Wastewater Sector Regulatory Agency (EWRA) operation. In order to arrive at the budget, the document presents:

- An overall strategy for the gradual build-up of EWRA operations;
- A staffing schedule, showing in which year each of the 105 professional and clerical staff members are hired;
- Logistics and information technology (IT) plans, enabling the determination of the quantities and procurement scheduling of major items of equipment needed by the agency; and
- Unit price assumptions and a budget template.

The final section reviews financing mechanisms commonly used to sustain regulatory agency operations. The options are described and compared in terms of several criteria, including stability of the revenue source, and the degree of independence from political influence or "regulatory capture" that each source affords.

2. Logistical Assumptions

In developing a budget for the first five years of EWRA existence, it is necessary to make assumptions about the general manner of EWRA operations and about the roll-out of these operations over the five years. These two factors enable projection of the annual personnel and equipment requirements, which largely determine the operating costs.

2.1 Roll-Out of Agency Operations

An organization design for EWRA was included in the Legal, Institutional and Regulatory Reform II (LIRR II) project's EWRA Strategic, Organization, and Personnel Plan (June 2002). That design featured an organization with four basic components:

- Executive Director's Office;
- Central Department (CD) for Tariffs, composed of general departments for economic regulation and rate analysis;
- Central Department for Standards and Compliance, composed of general departments for standards and monitoring, customer affairs, and legal affairs; and

- General Department (GD) for Finance and Administration.

The two central departments handle the majority of the agency's operational functions. With 30 and 49 professional staff respectively, the two departments account for 85 percent of the professional staff.

The strategic plan set out a series of key actions to be carried out under the first five years to activate all EWRA functions. The roll-out strategy can be summarized simply. In its first year, the agency's principal tasks are to develop and install key management systems, primarily those related to the functioning of the Executive Director's office and the General Department for Finance and Administration. In addition, the agency is involved in designing the operating systems that will govern the activities of tariffsetting and compliance monitoring.

In the second year, the agency is primarily engaged in field-testing of the operating systems, followed by dissemination of guidelines to the utilities. In year three, the agency moves into full operation.

The roll-out of agency operations are assumed to be gradual. Egypt has 27 governorates and approximately 16 new urban communities. It would require an extremely large regulatory agency to initiate operations in all these locations at once. Hence, it is assumed that utilities will be "inducted" into the regulatory system at a rate of approximately five governorates and three new urban communities per year.

The induction process for a single location takes two years. In the first year of an induction, the utility is trained and assisted to prepare a tariff rate application and compliance monitoring plan. In the second year, the utility is trained and assisted to implement the compliance monitoring plan. Hence, the induction process entails a fairly intensive level of work with concerned utilities. Following the induction, the agency's involvement with the utility is scaled back to routine periodic monitoring and as needed investigative work associated with serious violations of standards, persistent customer complaints, or disputes between government utility and a private service provider (e.g. build, operate, transfer (BOT) operator or management contractor).

An inducted utility's tariff application and compliance monitoring plan are assumed to cover a five-year period.

The workload increases significantly between years two and four, at which point the standard workload is in force. This standard annual workload reflects a situation in which:

- One set of utilities is in the first year of the induction process;
- One set is in the second year of the induction process; and
- All previously inducted utilities are followed up on periodic and as-required bases.

2.2 Staffing

The LIRR II EWRA organization plan projected a full-strength staffing level of 105. This total includes professional and clerical staff, but not unskilled and semi-skilled labor categories such as office boys and drivers. In addition to the 105 professional and clerical staff, it is also

projected that there will be seven office boys in two levels, starting in years one and two, as well as four drivers, hired incrementally as vehicles are purchased.

The build-up to the full staffing level is expected to last for four years, with 55 persons hired in the first year, 29 in the second year, 17 in the third year, and the remainder in year four. The staffing sequence is shown in Annex A.

2.2.1 Year One

First-year hires include:

- All personnel affiliated to the office of the Executive Director, including the Executive Director (11 people);
- All personnel attached to the General Department for Finance and Administration, except the two members of the training section (13 people); and
- The two undersecretaries who head the central departments, the five general managers who head the general departments affiliated to the two central departments, and the managers of the eleven departments affiliated to the general departments, plus the eight secretaries who support the managers of central and general departments (26 people).

Hence, at the end of year one, the Executive Director's office is fully staffed, the GD/Finance and Administration is fully staffed except for the training section, and all managerial personnel have been hired. The agency is ready to design its management and operating systems and procedures.

2.2.2 Year Two

In year two, most Grade II personnel associated with all sub-units of the CD Tariffs and CD/Standards and Compliance are hired, as well as selected Grade III personnel. In addition, the training section is staffed. Hence, by the end of year two, all sections have at least one staff member. The agency is ready to undertake field operations.

2.2.3 Year Three

In year three, most of the remaining Grade III personnel required for the tariff-setting and compliance monitoring functions are hired. This reflects the increasing workload as a second series of utility inductions begins.

2.2.4 Year Four

The four additional professional staff hired in year four, completing the five-year requirement.

2.3 Field Operations

During the first five years of its existence, EWRA will need to train and assist utilities to develop tariff applications and implement the compliance monitoring program. Hence, EWRA members, particularly in the Central Departments for Tariffs and Standards and Compliance, will need to

travel frequently. Since the means of transportation are various, the modeling of EWRA expenses associated with field operations is somewhat complex.

2.3.1 Travel Requirements

Travel requirements are determined mainly by the induction schedule. As noted above, the induction scheduling target is to induct five governorates and three new urban communities, i.e. eight locations, into the regulatory system each year starting in year two.

The induction process has two phases, each lasting one year per location. In the first phase of the process, five visits are made to each location. The purpose, duration, and team composition of the series of first-phase visits for a single location are shown in Table 2.1. In the second phase of the process, four visits are made to each location to follow up and assist in implementation of the compliance monitoring system. The purpose, duration, and team composition of the series of second phase induction process visits for a single location are shown in Table 2.2. Second-phase induction begins in year three.

Table 2.1 First Phase Induction Travel Requirements, per location

Visit	Purpose	Duration/Days	Personnel		
			Tariffs	Compliance	Total
1.	Orientation to tariff applications and compliance targets	3	2	3	5
2.	Training in customized tariff and monitoring models	3	2	3	5
3.	Follow-up of data collection and analysis	3	2	3	5
4.	Follow-up of data collection analysis	3	2	3	5
5.	Final review	3	2	3	5
Total Trips		5			
Total Person-days			30	45	75

Table 2.2 Second Phase Induction Travel Requirements, per location

Visit	Purpose	Duration/Days	Personnel		
			Tariffs	Compliance	Total
1.	Follow-up of data collection analysis	3	1	2	3
2.	Review of reports	3	1	2	3
3.	Evaluation of reporting system effectiveness	3	1	2	3
4.	Utility performance evaluation	3	1	2	3
Total Trips		4			

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Visit	Purpose	Duration/Days	Personnel		
			Tariffs	Compliance	Total
Total Person-days			12	24	36

Post-induction travel is required for periodic follow-up and special investigations related to license violations or persistent customer complaints. Periodic follow-up involves an audit of compliance with EWRA reporting requirements and with performance targets set out in the approved tariff applications. These audits are expected to take place twice annually in each inducted location for three days and to require one person from CD/Tariffs and one from CD/Standards and Compliance.

The frequency of special investigations can only be estimated. An average of three days per year per inducted location is assumed, with a team of two, mainly from CD/Standards and Compliance. Annual post-induction travel requirements per location are shown in Table 2.3.

Table 2.3 Post-Induction Travel Requirements, per location

Purpose	Duration (Days)	Personnel		
		Tariffs	Compliance	Total
Routine follow-up (1)	3	1	1	2
Routine follow-up (2)	3	1	1	2
Special Investigation (1)	3	0	2	2
Special Investigation (2)	3	0	2	2
Total Trips	4			
Total Person-days		6	18	24

2.3.2 Modes of Transportation

Transportation of EWRA personnel is by EWRA vehicle or by a combination of air travel plus rented local ground transportation. Most locations are visited by EWRA vehicle, but the following six locations are traveled to by plane: Matruh, Aswan, Luxor, Qena, Red Sea, South Sinai.

The total annual numbers of trips and person-days of travel, differentiated by mode of transportation, are calculated in Table 2.4.1 of Annex B.

2.3.3 Vehicle Requirements

In estimating the number of EWRA vehicles required, it is assumed that:

- The EWRA Executive Director's office has one vehicle reserved for the executive director's use;
- Eight locations are inducted each year starting in year two;

- Each induction process visit is assumed to engage a vehicle for a full week (even though the actual days in the field may be only three or four);
- Each vehicle is available for 40 trips per year; and
- Beginning in year three, two locations of the eight are visited by air.

Total vehicle requirements are calculated in Table 2.4.2 of Annex B. By year five, the agency is expected to need four vehicles. These are vehicles of the sport utility or van type, capable of seating a driver and five passengers.

2.3.4 Air Travel and Local Ground Transportation Requirements

As noted above, six locations can be visited more efficiently by plane than by vehicle. The annual requirement for the number of round-trip plane tickets is calculated as the number of air trips multiplied by the number of persons per trip. Total plane tickets required yearly is shown in Table 2.4.3 of Annex B.

Local ground transportation is based on the number of days spent in the field in locations visited by plane.

2.3.5 Travel Allowances

Travel allowances consist of hotel accommodation and per diem for meals and incidental expenses (M&IE).

Hotel nights are estimated assuming that personnel return to Cairo directly on the last day of a trip. Hence hotel nights per trip equal the number of days per trip minus one.

Per diem is allocated for each person day in the field.

3. Information Technology Requirements

3.1 Overview

Described below is a proposed solution for the client requirements, in order to allow the agency to more effectively achieve its objectives. This solution is designed to maximize the efficacy of the servers, and therefore render the system more efficient. While this plan sets out a blueprint of what should be included, the final design of the system should be determined with the assistance of the EWRA's management information systems (MIS) manager, and is dependent on the area in which the agency will actually be housed. Further, the MIS manager may wish to solicit proposals from local IT firms to facilitate the initial set up of this information technology solution.

That being said, this information technology solution depends on a Windows 2000 domain server, with a registered domain name. This server will be connected to the Internet through a leased line connected to the agency's local area network (LAN). Through this, the agency and public economic authorities (PEAs), as well as customers, can communicate to share information through a backbone of directories, and an Internet-based solution, including a web site. This will

facilitate communication both internally between the various central and general departments and the executive director, as well as externally between the customers and EWRA. All EWRA professional and clerical staff members will have individual workstations, allowing them to facilitate their work.

Following is a description of the basic set up, including recommended server and workshop rooms, the network, hardware and software. Further, the solution goes on to recommend policies on security for the system, as well as a disaster prevention and recovery plan.

3.2 Network and Structure of the Unit

3.2.1 Server Room

The server room will house all the servers, therefore, it must be secured, well utilized and equipped with a Smart Uninterrupted Power Supplies (UPS) of 2-3 KVA at the server level to protect the data from harmful electric power failure and unauthorized personnel. Also, the server room must be well designed, noting the server vendor conditions for operation to protect the data from environmental conditions such as heat and humidity. In order to ensure protection of the equipment, an air conditioning unit should be installed specifically to regulate the environmental conditions in this room.

3.2.2 Workshop

If space in the EWRA office allows, it is recommended to have a workshop on site to be used for all computer hardware maintenance and troubleshooting. For security reasons, only technical staff should be allowed access to the workshop.

3.2.3 Network

As mentioned above, the system will include a LAN network that connects all workstations to the servers, and therefore shared directories, shared printers, and access to the Internet. Users will be connected to the server through modular switches connected to the server, rather than through a hub. These switches will be stackable and upgradeable to allow for expansion as the agency grows. These switches will also be connected through a patch panel for easy identification of wires.

The LAN will be set up with a backbone of public directories, to which the various general and central departments have shared access. Access to certain directories may be restricted to specific departments by the network administrator.

As the network is set up in a registered domain, through a leased line, access to the Internet will be continuous, providing staff members with the ability to communicate effectively both internally and externally via electronic mail, and to facilitate transfer of electronic data.

The network will link the workstations to the servers through wall-mounted and/or internal cabling.

Ultimately, a website will be developed that allows for web-based access to information, transmission of data and reports, and facilitates communications between the EWRA, PEAs (identified as "branch offices on the IT Plan Diagram in Annex C), and customers.

3.3 Hardware

3.3.1 Servers

Since servers are considered the backbone of any IT operation, consideration must be taken in purchasing and utilizing them. Name brand servers are recommended, particularly of the rack-mounted pizza box type for both efficiency and ease of utility, as well as minimum storage space requirements.

For smooth operations, five servers are recommended, with an additional server listed as optional, for the following functions:

Server 1

Server one is the first domain controller used to store the main active directory database, and to authenticate and verify the user. It could also be used as Dynamic Host Configuration Protocol (DHCP) or Domain Name System (DNS) for name resolution and to remotely control all the agency's setting and conditions.

Server 2

The second domain controller, server two, is used as a backup for server one as part of the disaster prevention and recovery plan, as referred to below.

Server 3

Server three works as:

- An exchange server to provide e-mail accounts to clients; and
- Internet Information Server (IIS) to host the internet web sites.

Server 4

Server four serves as a proxy server that works as firewall and Internet caching. Through server four all clients can transparently connect to the internet to send their reports and complaints.

Server 5

Server five is a file server to centralize and store all clients' files and backups, since backing up documents and files is an integral part of the disaster prevention and recovery plan. Server five could also be used as remote access service to provide the user with a remote access to the network.

Server 6 (Optional)

A sixth server could be added as a database server used to store the database system engine (Microsoft Structured Query Language (MSSQL)) to hold information on utilities, customer complaints and corrective measures, *et cetera*. Reports on this database can be sorted by utility, successful measures, general complaints, and/or by area, *et cetera,* according to needs.

3.3.2 Workstations

Powerful personal computers (PCs) are recommended in order to avoid problems with the users. Again, brand names computers are recommended. As mentioned previously, each professional or clerical staff member will have a personal computer. However, wherever that person logs in on the network, he will have his unique desktop setting.

Laptop/notebook computers with network docking stations are recommended for those staff members who will be travelling frequently to remote locations. This will facilitate sharing between the clients for easy accesses to files on the network remotely through the remote access server (RAS) when and if there is a need for that.

3.4 Software

The operating system will be Windows 2000 Server. Software will be either Microsoft products and/or Oracle product as follows:

- Microsoft Office package will be deployed in all clients computers;
- Microsoft Exchange Server software will be deployed in the mail server; and
- Microsoft Proxy Server software will be deployed to work as a firewall.

Note that it is possible to install any other software needed if it is compatible with Microsoft environment.

The initial server installation of Windows 2000 Server includes licenses for five users. Additional licenses will be purchased for all additional users.

3.5 Policies and Plans

3.5.1 Security Policy

The security policy depends on using the Windows 2000 environment as the only operating system in the server. The client then has the option of installing an active directory in native mode and applying high security templates which permit only encrypted communication with the servers.

No one except the administrator's staff can log on interactively to the servers, and modify the network configuration.

Every PC user should have a password in order to access his/her data. The access permissions and rights will be defined by general/central departments, as well as by user. The password, which should have a minimum length of characters, will be required to be changed on a regular basis, or the user will be locked out of the system.

As noted above, a firewall will be installed in order to prevent security breaches from hackers.

3.5.2 Disaster Prevention and Recovery Plan
The disaster prevention and recovery plan has been established in order to prevent loss of data and disruption to agency activities and services. It functions as follows:

- Performing daily backup for all servers and users files to secure the daily data in case of a hardware failure;
- Using a dedicated file server equipped with a fault tolerant storage device to minimize the chance of losing data;
- Using UPS devices in the server room to eliminate the chance of hardware failure due to electric power failure or any other condition;
- Providing a cool and secure storage environment for the servers to prevent overheating, or other damage to the hardware;
- Using effective virus protection software to ensure hardware and data against different computer viruses; and
- Using Windows 2000 with Network Technology (NT) to minimize the corruption of the data.

4. Budget

4.1 Wages and Salaries

Average basic salaries were derived from Law 47/1978 on the civil service and adjusted by the annual escalation factor stated in Law 47/1978 with amendments to 2001, to reflect the historical effect of the annual increases on basic salary levels. Each employee is assumed to be hired at the mid-point of the grade salary scale, apart from the First Undersecretary whose salary scale does not have a ceiling.

Allowances are estimated at 100 percent of the basic salary.

The agency's contribution for social insurance is calculated at 26 percent of the basic salary (up to £E 600 per month) and 24 percent of allowances (up to £E 500 per month). As a rough estimate for budgeting purposes, salaries over £E 1,100 per month (including basic salary and allowances) are budgeted for £E 276 per month, and salaries below £E 1,100 per month (including basic salary and allowances) are estimated at £E 138 per month.

Basic medical insurance is covered by social insurance payments. Supplemental medical insurance contributions, which provide insurance coverage for services by private providers, are calculated at one percent of the basic salary.

4.2 Other Direct Costs
Costs other than salaries and fringe benefits include three different categories:

- Furniture, vehicles and equipment;
- Travel and transportation; and
- Other direct costs.

The furniture, vehicles and equipment line item includes expenses incurred in order to start-up the office; such as vehicles, computer equipment, office equipment and office furniture. The travel and transportation line item includes travel expenses incurred in field operations in order to start-up and roll-out the agency functions. Other direct costs includes monthly recurring operational expenses such as utilities, expendable supplies, communications and reproduction expenses. This section will include furniture, vehicles and equipment, as well as other direct costs, but will not discuss the travel and transportation, as it was expanded upon in section 2.

4.2.1 Furniture, Vehicles and Equipment

- Four vehicles were budgeted as noted in 2.3.3 above;
- Five servers were budgeted in year one, based on the IT plan above. Each server was budgeted at £E 20,000, as an average for the various ranges, and different functionalities of the servers. Additionally, a sixth server was budgeted in year six in the event that the database server is determined necessary;
- Cabling is estimated at £E 1.00 per meter with an estimate of 10,000 meters of cabling for the entire network;
- Racks were budgeted for each server (45 cm in height), and a 90 cm high rack was budgeted for the router;
- Server/cabling accessories were budgeted at a lump sum estimate of £E 2,000 in year one only;
- The router is estimated in year one. This estimate of £E 12,000 will cover a high capacity Cisco 1601 router;
- Switch boxes were budgeted on the estimate of one switch box for every 24 users. Therefore, three switchboxes were budgeted in year one, and one switch box was added in both years two and three as the agency grows;
- Patch panels are budgeted at one per switch box, so there are three in year one, and one each in years two and three;

- Smart UPSs were budgeted for each server;
- A leased line is budgeted at an annual cost of approximately £E 8,000;
- An internet service provider (ISP) is budgeted at an annual cost of £E 20,000;
- Computer workstations were budgeted by a factor of one computer for every staff member of Grade 4 and above; of these approximately half of them will be purchased as laptops for staff members who will be travelling frequently to remote locations;
- Docking stations were budgeted for all laptop computers so that they can tap into the LAN when they are in the main office;
- External monitors, keyboards and other accessories were budgeted for each workstation/laptop;
- Network printers were budgeted on the basis of one network printer for each general department, as well, as one for the Executive Director; for a total of seven;
- Windows 2000 Server software was budgeted for each of the servers at a one time cost, and Microsoft Exchange software was budgeted for the mail server also at a one time cost;
- A one time registration fee for registering a domain name was budgeted at approximately $100, or £E 500;
- Client access licensing (CAL) to allow individual user access to each server which has Windows 2000 Server software is budgeted for each user, multiplied by the number of servers on which it is installed;
- Windows XP licenses and Microsoft Officer licenses were purchased for each user;
- Two photocopiers are budgeted from the outset of the agency, with an additional photocopier to be added in year three;
- Office furniture including desks, filing cabinets, *et cetera,* were budgeted similarly to the computers by a factor of one computer for every staff member of Grade 4 and above;
- Office furniture including conference table, chairs, *et cetera*, and excluding desks and filing cabinets, was budgeted on a lump sum basis. The telephone system provides for up to 50 users. Therefore, two have been budgeted from the outset, with a third to be added in year three; and
- Telephone lines are budgeted on a factor of one phone line for every five staff members of Grade 3 or above, and are added incrementally in the out-years.

4.2.2 Other Direct Costs

- It is assumed that office rent will be covered by the Ministry and therefore this has not been budgeted. However, utilities have been budgeted incrementally from £E 500 per month in year one, to approximately £E 1,000 per month by year five, an escalation factor of 20 percent per year, which factors in the increased staff size;
- Expendable supplies were budgeted on a monthly average of approximately £E 750 per ten people per month, starting in year 1. This monthly average increased annually by five percent, based on the same calculation of ten people per month for the monthly cost;
- Communication costs were based on the number of phone lines multiplied by an average monthly phone bill. The monthly phone costs were inflated at a rate of five percent annually;
- Reproduction costs were based on an average monthly cost per photocopier, and were increased annually by a factor of five percent;
- Translation was budgeted at an approximate number of pages to be translated per year based on a per page rate. The per page rate has been inflated by five percent annually; and
- Vehicle expenses were budgeted on the basis of £E 1,500 per vehicle per month for year one, with an inflation factor of 20 percent per year built in, in order to include maintenance costs.

5. Financing Options for the Regulatory Agency

The EWRA is intended to be established in Egypt, in accordance with a law and a Presidential Decree. In order for the agency to begin fully independent operation, appropriate long-term financing will need to be secured.

This section describes various common funding mechanisms to provide financial support for the EWRA. The funding mechanism is an important factor in the agency design and sector reform in that it can greatly influence the EWRA's independence, and thereby influence the extent to which the private sector would be willing to invest.

5.1 Purpose of Funding

Funding Objectives
Balance Independence Stability Diversity Flexibility

The funding mechanism for a regulatory agency should consider the criteria of balance, independence, stability, diversity and flexibility. While these are criteria to be considered in choosing a funding mechanism, each criterion does not have equal weight at a given point in time or in the eyes of decision-makers. It is important to balance the needs and expectations of the regulatory agency with the level of resources available within the sector. Independence of the regulatory agency is also important. Funding should be designed to enhance the agency's exemption from

output-based rewards, such as issuance of permits or granting of rate requests, supporting a truly independent regulator. Similarly, funding should provide stability of revenues over time. Diversity of funding sources is an element that helps to ensure continuity of funds while distributing the burden of financial support among appropriate beneficiaries of the system. A flexible, broad-based approach to funding is desirable if the agency will be required to respond to changing statutory requirements or priorities.

5.2 Design

A fundamental principle of fair and just regulation is that the regulatory agency be independent of the entities that it regulates. This independence is generally assured in several ways. One critically important element of regulatory independence is the mechanisms used to fund the regulatory authority.

- First funding ought to have a sound legal basis such as enacted laws or decrees. It is not efficient if the question of funding for the agency needs to be addressed on a recurring basis;
- Second, funding should be independent of the decisions made by the agency, and should not be subject to positions taken by the agency on requests from regulated entities. For example, if funding is based on a percentage of revenue, then the regulator could be perceived to have a vested interest in higher rates. Further, if long term funding is based on licenses granted, there may be perceived to be a self-interest involved in approvals of license applications;
- Third, the funding ought to be stable, and not influenced by outside conditions such as cyclical variations in the economy resulting in spikes or declines in water sales or wastewater treatment;
- Fourth, the funding should contribute to the financial and cash flow requirements of the agency; and
- Fifth, in times of the establishment of a new regulatory body, there will likely be a need for interim or short term funding mechanisms to cover expenses related to hiring of new personnel, development and occupation of new office space, purchase of new equipment and other related start-up costs. The short term funding designed to meet these needs, however, may not be appropriate over a long period of time.

5.3 Mechanisms

Many regulatory authorities support their operations through a combination of funding mechanisms. The following is a list of funding mechanisms in common practice. Each will be discussed in turn:

- Government appropriation;
- Taxation of regulated entities;
- Flat assessment on each company;
- One time license fees assessed on assets of newly regulated entities;

- Recurring license fees assessed on sales by regulated entities;
- Tariff filing fees;
- Hybrid combination of several different mechanisms; and
- Other sources, such as charges for purchase of documents, copies *et cetra.*

Chart 2 below shows the eight funding mechanisms. Each mechanism is characterized by the measure of balance, independence, stability, diversity and flexibility it exhibits. A brief description of each follows.

BALANCE

A primary consideration for funding the regulatory agency is to assure that there is a measure of balance between the needs of the regulatory process and the resources available within the sector.

A well-balanced funding scheme will include several different broad-based mechanisms. Individual funding sources are balanced if they can provide a broad base of revenues for the regulator over time. A moderately balanced funding mechanism provides less broad-based revenues. A low level of balance would come from funding sources that are very narrow in scope such as miscellaneous charges for minor services.

INDEPENDENCE

An important objective of the funding process is to ensure that funding mechanisms are not outcome-based. There should be no expectation of funds becoming available contingent upon a particular decision. An example would be the charging of fees for licenses granted. The preferred method would be to charge for fees for license applications irrespective of whether the regulator approves them. If the regulator only collects revenues based upon a favorable outcome, the regulator will have a motivation to approve license applications. While this may not be the case, the objective of a transparent regulatory process will be adversely affected even if the perception exists.

A high degree of independence results if the funding mechanism is free of outcome based decision-making. A moderate degree of independence results if funding is largely free of outcome-based decision making. There is a low degree of independence if there is a perception that the regulator could be motivated to partial decision-making.

STABILITY

For a regulatory agency to function properly, it must have a stable funding source. There should be some insulation from the potential swings in the volume of water sales or wastewater collected and treated.

DIVERSITY

This issue gets to the source(s) of funding. If funding comes from a broad spectrum of payees, such as an appropriation from government funds, then it is highly diverse. If it is drawn from a narrow source of payees, it is not.

FLEXIBILITY

Some funding sources are more flexible in their design and implementation than others. For example, an assessment is highly flexible. It can be implemented quickly. It may be very well suited to support the regulatory agency in times of extraordinary activity, or at the time of start up. Less flexible mechanisms may have other advantages. Flexibility in the source of funding will be important to the regulator as part of a broad-based funding scheme.

Type	Balance	Independence	Stability	Diversity	Flexibility
1.Appropriation	High	Moderate	Moderate	High	Low
2.Tax	Moderate	High	Moderate	Moderate	Low
3.Assessment	Moderate	Moderate	High	Low	High
4.One time fee	Moderate	Low	Low	Low	Moderate
5.Recurring Fee	High	Moderate	High	Moderate	Moderate
6.Tariff fee	High	Low	Low	Low	Low
7.Other	Low	High	Low	High	High
8.Hybrid	High	High	High	High	High

5.3.1 Appropriations

Type	Balance	Independence	Stability	Diversity	Flexibility
1.Appropriation	High	Moderate	Moderate	High	Low

A widespread mechanism for funding regulatory agencies is through budgetary appropriations from the government. Expenses of the regulatory agency are considered to be part of the cost of operation of the government and are treated as a common expense along with other agencies of the government.

There is logic to this approach as regulatory agencies are often part of the host government, however independent in design. They are government agencies and their employees are government employees entitled to government benefits and obligations. Hence, the argument goes, it is good public policy for the government to support the regulatory agency with an appropriation.

This results in a high degree of balance between the needs of the regulatory agency and the ability of the taxpayers to pay. Elected members of the parliament make the appropriation decision. They are the closest to the people in determining the ability of people to pay, and they understand the demands placed on the treasury for use of government funds. They are sensitive to the ability of taxpayers to pay, and they are aware of the benefits of good regulation.

The appropriations process is moderately supportive of an independent regulator. Generally the government support allows the regulator to function without recourse to the regulated utilities. The level of appropriation is generally not dependent on company satisfaction with agency decisions. However, there is always the danger that politicians may take issue with specific decisions, and this makes the appropriations process potentially contentious. This is especially

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true with new agencies where the history of support for regulation does not exist and the custom of public support for regulation has not matured. Additionally, supporting a regulatory agency with general treasury funds causes the agency to "compete" with other government agencies for (usually) scarce resources, resulting in the possibility that the regulatory agency could be under-funded.

The appropriations process provides a moderately stable source of revenue. It offers significant benefits for cash flow purposes as the revenues are made available to the agency on clearly predictable schedules. As noted above, however, it is possible that policy discussions within the government could cause uncertainty over the level of funding as appropriations are made.

The diversity of this funding source is high. Government funds come from many sources, including taxes of many different kinds, fees and assessments. No single part of the population is burdened any more than they are under the tax system of the nation. However, in essence, unless there is a reduction in ministry staff that corresponds to the number of staff hired by the regulatory agency, funding the regulatory agency through a general appropriation results in a marginal increase in taxes.

The flexibility this mechanism provides to the agency is low. The best appropriations provide stability over time. They are not designed to cover extraordinary expenses such as might be required for large numbers of tariff filings or new license applications. If the agency can develop a recurring appropriation that is stable over time, that is beneficial, but the flexibility that may be required to operate an agency should come from other sources, especially at the beginning

5.3.2 Dedicated Taxes

Type	Balance	Independence	Stability	Diversity	Flexibility
2. Tax	Moderate	High	Moderate	Moderate	Low

Another common funding mechanism for regulatory agencies is a dedicated tax usually approved by the parliamentary body. The tax is assessed on the regulated utilities. This is regarded by some as more efficient than a general appropriation as the revenues from this tax are dedicated exclusively to the regulatory process.

The dedicated tax mechanism provides a moderate balance between the needs of the regulatory body and the regulated utilities. It provides a high degree of independence for the regulator. Because there is dedicated revenue for the sole purpose of supporting regulation, there is less likelihood of national budgetary pressures reducing the funding.

The stability provided by this mechanism is moderate. If the tax is based on a stable or increasing factor such as capacity, then it will provide stability. If it is based on a more variable factor such as utility profits, then it is less likely to provide stability.

The diversity provided by taxation is moderate. It is more broad based than targeted assessments or fees but less diverse than a general appropriation.

The flexibility it offers to the regulator is low because it must be changed by law. Furthermore, it is not desirable to change the tax once it is in place.

5.3.3 Assessments

Type	Balance	Independence	Stability	Diversity	Flexibility
3. Assessment	Moderate	Moderate	High	Low	High

Assessments are measured appraisals of the cost of regulation, which are generally levied on the regulated utilities. They are similar to a fee for service. They are based on a predetermined formula imposed upon a measurable quantity.

If it is determined that the cost of regulation is to be £E 2,000,000 annually, then this amount would be raised from those entities in the water/wastewater sector subject to regulation. The fee may be determined in several ways. It may be based on various factors, including assets of regulated utilities, revenues, profits, or units sold. Most regulatory agencies relying upon assessments for some portion of their revenue make an attempt to keep the formulas simple. Often, approval from a parliamentary organization is required for the assessment.

Assessments provide a moderate level of balance between the beneficiaries of regulation and the needs of the regulator. The needs of the regulator may be met, providing there are no difficulties with the Parliament. However, the regulated utilities must provide all the support for the regulatory process, without the balance that would come from other sources of revenue.

Assessments provide for a moderate level of independence for the regulatory authority. The performance of the regulatory authority is generally not an issue, so that the regulatory assessment is independent of considerations that are based on the character of the decision-makers.

The stability of this funding mechanism is high for the regulator. The amount of resources that are needed can be raised by the formula used to assess the regulated utilities. This mechanism is very acceptable to many regulators for this reason.

Similarly, this mechanism affords a high degree of flexibility. In start-up conditions, such as is the case presently in Egypt, this mechanism provides a high degree of flexibility because the formula can be set to match the anticipated needs of a start-up authority. As time passes, and the regulatory system is in place, this may become less important.

The diversity of this funding source as the sole source of revenue is fairly low. As the regulatory authority becomes established, there may be benefits to be derived from the ability to draw upon more than one funding source.

5.3.4 One Time Fee

Type	Balance	Independence	Stability	Diversity	Flexibility
4. One time fee	Moderate	Low	Low	Low	Moderate

Another source of revenues for regulatory authorities is license fees. License fees are generally assessed on regulated entities, such as the existing utilities and any new market entrants such as build, own, operate, transfer (BOOT) licensees. These assessments can be made on an annual or one-time basis. They are usually derived from assessments based on: license applications or construction permits, based on the installed capacity of the utility or the amount of water sold or wastewater processed through the facility. They provide a moderate balance between the needs of the regulatory authority and the regulated utilities.

They provide a low level of independence for the regulator. This is because it is difficult for the regulator to depend solely on one-time fees. The regulatory body would need to process numerous applications for licenses every year in order to maintain the appropriate level of oversight in the any utility sector. Such frequent filings are not dependable.

For the same reason, the diversity of such funding sources is also low.

The flexibility offered to the regulator in this mechanism is moderate. It is often part of the funding portfolio of regulatory authorities. If there are large, complicated or contentious proposals coming before the regulatory authority, then one-time fees may be appropriate. The fees can be filing fees or licensing fees.

An added benefit of such one-time fees is that it may discourage frivolous applications coming before the regulator. If the fees are expensive, as they often are, then only serious applicants will be willing to pay the fee to go through the process. This can contribute to efficient management of the workload of the regulatory authority.

A major disadvantage of this mechanism is that it requires existing entities to go through a licensing process. In the last analysis, the only reason for requiring existing utilities to file an application for a license is to generate revenue. It is not reasonable to assume that the application of an existing entity for a license would be denied.

5.3.5 Recurring License Fee

Type	Balance	Independence	Stability	Diversity	Flexibility
5. Recurring License Fee	High	Moderate	High	Moderate	High

Some license fees are assessed on a recurring (e.g. annual) basis. The rationale behind this type of license fee is that the licensee itself may resemble a contract that calls for certain filings to be made by the utility to which the EWRA would be required to react. The recurring fee, then, pays at least for the staff that perform these functions.

This mechanism provides for a high degree of balance. Licensed water and wastewater utilities would be charged the fee. As such, they would be responsible for paying the fees and supporting the regulatory process. This is appropriate, but it does not capture the broader funding base that is found in a general appropriation.

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This mechanism also provides a moderate measure of independence for the regulator. The regulator does not need to take any particular action to earn the license fee, except insofar as there must be a goodly number of licensed entities to support the regulator.

This mechanism provides a high degree of stability over time. Once the entity is licensed, it can be counted on to continue payments to the regulator. This characteristic makes this source of funding very common among regulatory agencies. There is one caution and that is that there ought to be a number of licensed entities so that there is no perceived partiality on the part of the regulator to continue a non-performing licensee simply to maintain a revenue stream for the agency.

This funding mechanism provides a moderate level of diversity, since there is more than one licensee.

There is a moderate level of flexibility. Generally, the charges for licensing fees will become part of the license at the time it is issued. Changes will not usually occur to the license once both parties issue it without concurrence. In that financing decisions are based on the license, it is unlikely that licensees would be willing to consider increases in licensing fees annually without this being specified in the terms of the license. However, it is likely that there will be more licenses as time passes, and this would provide an opportunity for changes in the level of funding from licensing fees.

In the final analysis, a recurring license fee can be justified if, as a condition of the license, certain data is required to be filed annually to which the regulatory agency would be required to react.

5.3.6 Tariff Application Fee

Type	Balance	Independence	Stability	Diversity	Flexibility
6. Tariff Fee	High	Low	Low	Low	Low

Tariffs are at the heart of regulation. One of the most important roles of a regulatory authority is the fixing of tariffs charged by the regulated utilities. Considerable resources are devoted to the review and determination of the appropriate levels and design of tariffs. Therefore, it is considered highly appropriate that the costs associated with analyzing tariffs should be borne by those requesting tariff changes. There is a high correlation between the entity incurring and the entity paying for the costs. It balances the needs of the regulatory authority with the requirements of the utilities.

Tariff fees do not correlate well with independence, insofar as there may be the supposition that independent regulatory authorities ought to have access to a more broad based funding source. If for whatever reason there are no requests for changes in tariffs, there is no revenue for the regulator, even though it may have large responsibilities for oversight of aspects of the sector. In the same way, tariff-filing fees provide little diversity for funding the regulatory authority. It is a rather narrow mechanism. It has little flexibility.

It is best when used as part of a variety of funding mechanisms. As such, it constitutes a reliable source of funds that related directly to an important regulatory expense.

5.3.7 Other

Type	Balance	Independence	Stability	Diversity	Flexibility
7. Other	Low	High	Low	High	High

There are a number of other fees that regulatory agencies routinely charge. These do not generally produce large amounts of funds. They include fees to parties requesting publications or unusual copying requests. They might include entrance fees for special services offered by the regulator. They are usually targeted toward a specific group and hence are not generally balanced. They contribute to the independence of the regulator; they provide stability and diversity to the funding mechanisms. They are also highly flexible.

5.4 Hybrids

Type	Balance	Independence	Stability	Diversity	Flexibility
8. Hybrid	High	High	High	High	High

Perhaps the most effective funding mechanisms are those with diverse sources of revenue for the regulatory authority. They are also the most difficult to design. The benefits of this arrangement are that the regulator is not dependent on any one source of funding. If there is a decline in the sale of water, for example, then any fee structure based solely on cubic meters sold will result in less revenue for the regulator. Similarly, if the fee is based on cubic meters of water sold, and there is damage to the transmission system, less water will be transmitted or sold until the main is repaired. This can be several weeks of lost revenue to the utility and hence to the regulator. Revenues based on profits of the utility will depend on the success of other people at managing their company and may cause loss in anticipated revenue to the regulator without any action taken by the regulator.

The objective for both the regulator and the regulated entities in the sector is to derive a funding mechanism that is stable, predictable and has broad consensus. The stability and predictability are important to both the regulator and the utilities because when the expenses and revenues are known, planning can be done. When the costs of regulation are not known, the uncertainty makes it more difficult for people to manage. Similarly, when investors are looking at the stability of the regulatory process, they will want to know that the revenues of the regulator are sufficient to accomplish fair, just, transparent regulation.

5.5 Recommended Funding Mechanisms

Each of the mechanisms above has its advantages and disadvantages. Nevertheless, we recommend that *in the long term* the regulatory assessment mechanism be adopted. It does not require an increase in taxes, has the regulated entities paying the costs of regulation and is elegant in its simplicity. Further, it provides a check and balance role for the government. While fine-tuning would be necessary in both the long and short term, this approach would take the following form:

- The Ministry of Finance would approve an overall budget for the EWRA; and

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- The EWRA would apportion that budgeted amount among the regulated water and wastewater entities based upon the amount of a given water utility's water produced (or a given wastewater utility's effluent collected) divided by the sum of the water produced and wastewater collected nationwide.

5.6 Issues for Resolution

5.6.1 Long Term

While the general outlines of how much each utility would pay are articulated above, the amount that each customer would pay is not.

Various options exist, from the non-transparent approach of not putting an amount representing the assessment on each customer's bill (in which case all customers would de facto be paying the same amount), to further pro-rating the assessment to customers based upon some factor, such as their usage or the amount of their bill (either of which creates administrative problems).

5.6.2 Short Term

The short-term problem is that the regulatory assessment will impose an additional cost upon regulated utilities. However, the plan for evaluating/changing water and wastewater utility rates contemplates a five-year cycle before all regulated utilities in the sector will have had a rate proceeding. It would probably be unfair to place this added cost on all utilities—most of which are not recovering existing costs. It would be more unfair if the assessment was placed on all utilities but only some of them had had rate relief.

Two broad options exist:

- Until the first cycle has been completed in five years (and all regulated utilities have had their rates reviewed), fund the EWRA from appropriations; or
- During the first cycle, impose a regulatory assessment only on those utilities that have had rate reviews (using the methodology recommended above) and fund the balance of the EWRA's budget from the Ministry of Finance. By so doing, the amount of the EWRA budget funded from general tax revenues should decline each year until the regulatory agency, after five years, is completely funded by the regulated entities.

ANNEX A

EWRA Staffing Sequence

TABLE 2.1 EWRA STAFFING SEQUENCE

Position	Affiliation	Rank	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Office of the Executive Director								
Executive Director	Director's Office	1 US	1					1
Secretariat Section								0
Manager	Director's Office	1st	1					1
Administrative Asst III	Director's Office	3rd	1					1
Planning and Monitoring Section								0
Manager	Director's Office	1st	1					1
Administrative Asst III	Director's Office	3rd	1					1
Public Relations Section								0
Manager	Director's Office	1st	1					1
Administrative Asst III	Director's Office	3rd	1					1
Information Center								0
Manager	Director's Office	1st	1					1
Computer Services Specialist IV	Director's Office	4th	1					1
IT Trainer III	Director's Office	3rd	1					1
Computer Equipment Specialist III	Director's Office	3rd	1					1
Central Department Heads								
Undersecretary	Tariffs	US	1					1
Secretary II	Tariffs	2nd	1					1
GD/ Economic Regulation								0
General Manager for Economic Regulation	Tariffs	GM	1					1
Secretary II	Tariffs	2nd	1					1
Dept. for Operations Analysis								0
Manager	Tariffs	1st	1					1
Water Supply Operations Section								0
Water Engineer II	Tariffs	2nd		1				1
Water Engineer III	Tariffs	3rd		1				1
Wastewater Service Operations Section								0
Wastewater Engineer II	Tariffs	2nd		1				1
Wastewater Engineer III	Tariffs	3rd		1				1
Utility Commercial Operations Secton								0
Billing Systems Specialist II	Tariffs	2nd		1				1
Metering Specialist II	Tariffs	2nd		1				1
Dept. for Investment Analysis								0
Manager	Tariffs	1st	1					1
Technical Feasibility Review Section								0
Sanitary Engineer II	Tariffs	2nd		1				1
Sanitary Engineer III	Tariffs	3rd			1			1
Financial Feasibility Review Section								0
Financial Analyst II	Tariffs	2nd		1				1
Financial Analyst III	Tariffs	3rd			1			1
Economic Feasibility Review Section								0
Economist II	Tariffs	2nd		1				1
Public Health Specialist II	Tariffs	3rd			1			1
GD/Rates Analysis								0
General Manager for Rates Analysis	Tariffs	GM	1					1
Secretary II	Tariffs	2nd	1					1
Dept. for Cost of Service Analysis								0
Manager	Tariffs	1st	1					1
Water Cost of Service Analysis Section								0
Cost Engineer II	Tariffs	2nd		1				1
Cost Engineer III	Tariffs	3rd			1			1
Wastewater Cost of Service Analysis Section								0
Cost Engineer II	Tariffs	2nd		1				1

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TABLE 2.1 EWRA STAFFING SEQUENCE

Position	Affiliation	Rank	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Cost Engineer III	Tariffs	3rd			1			1
Dept. for Rate Design								0
Manager	Tariffs	1st	1					1
Water Rates Design Section								0
Rates Analyst II	Tariffs	2nd		1				1
Rates Analyst III	Tariffs	3rd			1			1
Wastewater Rates Design Section								0
Rates Analyst II	Tariffs	2nd		1				1
Rates Analyst III	Tariffs	3rd			1			1
Central Department for Standards and Compliance								0
Undersecretary	Standards	US	1					1
Secretary II	Standards	2nd	1					1
GD/ Standards and Monitoring								0
General Manager for Standards and Monitoring	Standards	GM	1					1
Secretary II	Standards	2nd	1					1
Accounting Standards and Monitoring Dept.								0
Manager	Standards	1st	1					1
Accounting Standards Section								0
Accountant II	Standards	2nd	1					1
Plant/Expense Accountant III	Standards	3rd	1					1
Revenue/Income Accountant III	Standards	3rd	1					1
Financial Accountant III	Standards	3rd	1					1
Accounts Monitoring Section								0
Accountant II	Standards	2nd		1				1
Accountant III	Standards	3rd		1	1	1		3
Data Base Operator III	Standards	3rd		1				1
Technical Standards and Monitoring Dept.								0
Manager	Standards	1st	1					1
Technical Standards Section								0
Sanitary Engineer II	Standards	2nd	1					1
Commercial System Engineer II	Standards	2nd	1					1
Technical Monitoring Section								0
Sanitary Engineer II	Standards	2nd		1				1
Commercial System Engineer II	Standards	2nd		1				1
Sanitary Engineer III	Standards	3rd			1			1
Commercial System Engineer III	Standards	3rd			1			1
Database Operator III	Standards	3rd		1				1
GD/ Customer Affairs								0
General Manager for Customer Affairs	Standards	1st	1					1
Secretary II	Standards	2nd	1					1
Dept. for Complaints Reporting and Follow-Up								0
Manager	Standards	1st	1					1
Complaints Receiving and Classification Section								0
Complaints Analyst II	Standards	2nd		1				1
Complaints Analyst III	Standards	3rd			1			1
Complaints Investigation Section								0
Investigator II	Standards	2nd		1				1
Investigator III	Standards	3rd			1	1		2
Dept. for Public Information								0
Manager	Standards	1st	1					1
Communications Section								0
Technical Writer II	Standards	2nd		1				1
Copy Editor III	Standards	3rd			1			1
Media Section								0

TABLE 2.1 EWRA STAFFING SEQUENCE

Position	Affiliation	Rank	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Media Specialist II	Standards	2nd		1				1
Internet Specialist III	Standards	3rd			1			1
Publications Specialist III	Standards	3rd			1			1
GD/ Legal Affairs								0
General Manager/Chief Counsel	Standards	GM	1					1
Secretary II	Standards	2nd	1					1
Dept. of Licensing								0
Manager	Standards	1st	1					1
Licensing Section								0
Lawyer II	Standards	2nd		1				1
Dispute Resolution Section								0
Lawyer II	Standards	2nd			1			1
Dept. of Customer Contracts & Penalties								0
Manager	Standards	1st	1					1
Customer Contracts Section								0
Lawyer II	Standards	2nd		1				1
Penalties Section								0
Lawyer II	Standards	2nd			1			1
Dept. of Legal Opinion								0
Manager	Standards	1st	1					1
Administrative Law Section								0
Lawyer II	Standards	2nd		1				1
Lawyer III	Standards	3rd				1		1
Commercial Law Section								0
Lawyer II	Standards	2nd		1				1
Lawyer III	Standards	3rd				1		1
GD/ Finance & Administration								
General Manager for Finance and Administration	Fin & Admin	GM	1					1
Secretary II	Fin & Admin	2nd	1					1
Dept. for Financial Affairs								0
Manager	Fin & Admin	1st	1					1
Budget Section								0
Budget Specialist II	Fin & Admin	2nd	1					1
Accounts Section								0
Accountant II	Fin & Admin	2nd	1					1
Clerk III	Fin & Admin	3rd	1					1
Payment & Receipts Section								0
Cashier III	Fin & Admin	3rd	1					1
Dept. for Administrative Affairs								0
Manager	Fin & Admin	1st	1					1
Logistics Section								0
Administrative Asst II	Fin & Admin	2nd	1					1
Clerk III	Fin & Admin	3rd	1					1
Training Section								0
Training Specialist II	Fin & Admin	2nd		1				1
Material Developer III	Fin & Admin	3rd		1				1
Personnel Affairs Section								0
Personnel Specialist II	Fin & Admin	2nd	1					1
Payroll Specialist IV	Fin & Admin	4th	1					1
Procurement & Contracting Section								0
Procurement Specialist III	Fin & Admin	3rd	1					1
TOTAL			55	29	17	4	0	105

ANNEX B

Travel Requirements

TABLE 2.4: TRAVEL REQUIREMENTS

Table 2.4.1 - Parameters

First Phase Induction Visits	Year 1	Year 2	Year 3	Year 4	Year 5
Number of Locations	0	8	8	8	8
Number of Trips per Location	5	5	5	5	5
Number of Persons per Trip	5	5	5	5	5
Number of Days per Trip	3	3	3	3	3
Total First Phase Induction Trips	0	40	40	40	40
Total Person Trips	0	200	200	200	200
Total Person Days of Travel	0	600	600	600	600
Locations Visited by Vehicles		8	6	6	6
Total Vehicle Trips	0	40	30	30	30
Total Days Vehicle Trips	0	120	90	90	90
Total Person Trips by Vehicle	0	200	150	150	150
Total Person Days on Vehicle Trips	0	600	450	450	450
Locations Visited by Air	0	0	2	2	2
Total Air Trips	0	0	10	10	10
Total Days Air Trips	0	0	30	30	30
Total Person Trips by Air	0	0	50	50	50
Total Person-Days on Air Trips	0	0	150	150	150
Total Days	0	120	120	120	120
Second Phase Induction Visits	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Number of Locations		0	8	8	8
Number of Trips per Location			4	4	4
Number of Persons per Trip			3	3	3
Number of Days per Trip			3	3	3
Total Second Phase Induction Trips	0	0	32	32	32
Total Person Trips	0	0	96	96	96
Total Person Days of Travel	0	0	288	288	288
Locations Visited by Vehicles			8	6	6
Total Vehicle Trips	0	0	32	24	24
Total Days Vehicle Trips	0	0	96	72	72
Total Person Trips by Vehicle	0	0	96	72	72
Total Person Days on Vehicle Trips	0	0	288	216	216
Locations Visited by Air	0	0	0	2	2
Total Air Trips	0	0	0	8	8
Total Days Air Trips	0	0	0	24	24
Total Person Trips by Air	0	0	0	24	24
Total Person-Days on Air Trips	0	0	0	72	72
Total Days	0	0	96	96	96
Follow-Up Visits & Investigations	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Number of Locations				8	16
Number of Trips per Location				4	4
Number of Persons per Trip				2	2
Number of Days per Trip				3	3
Total Follow-Up Visit Trips	0	0	0	32	64
Total Person Trips	0	0	0	64	128
Total Person Days of Travel	0	0	0	192	384
Locations Visited by Vehicles				8	14
Total Vehicle Trips	0	0	0	32	56
Total Days Vehicle Trips	0	0	0	96	168
Total Person Trips by Vehicle	0	0	0	64	112
Total Person Days on Vehicle Trips	0	0	0	192	336
Locations Visited by Air	0	0	0	0	2

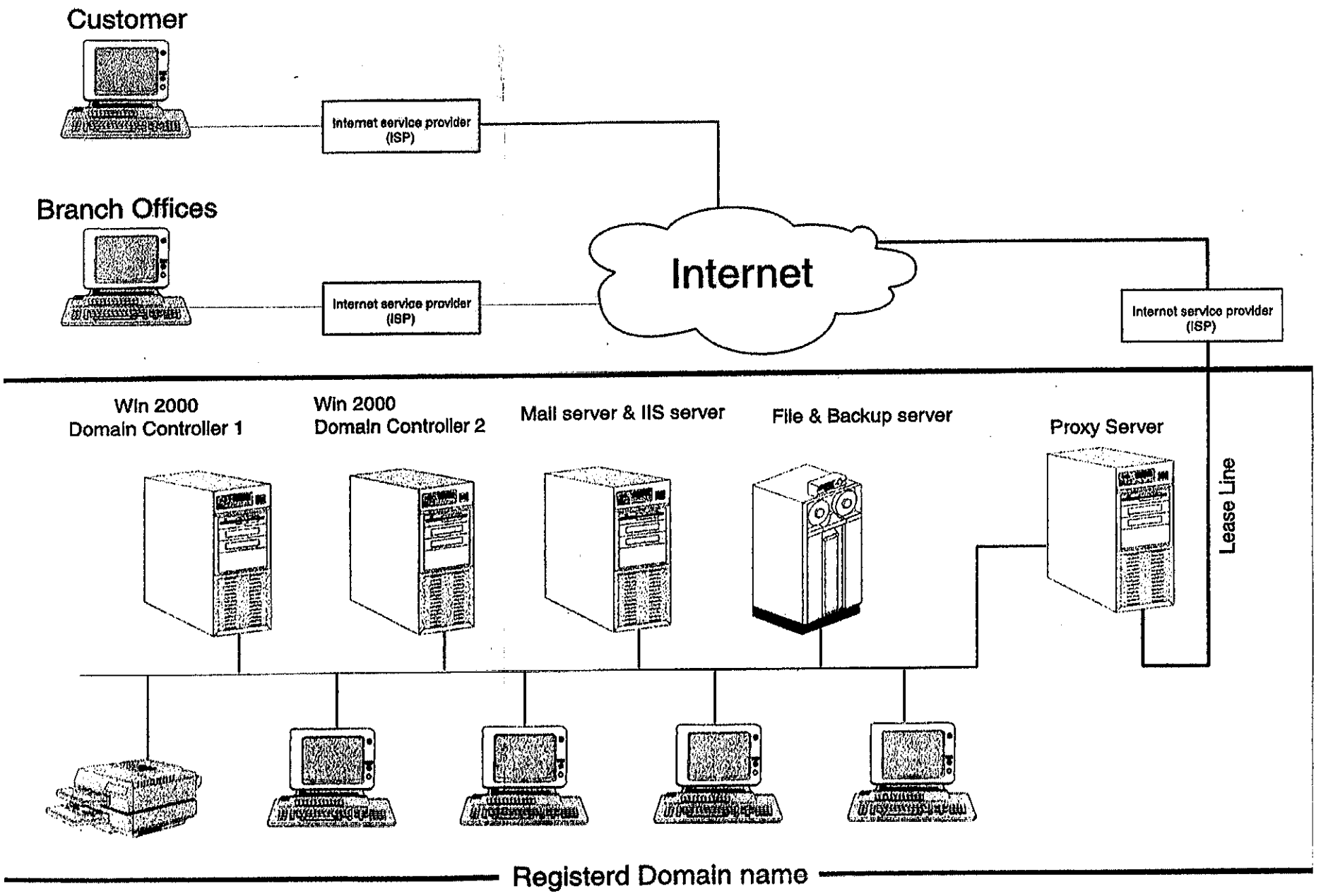
Total Air Trips	0	0	0	0	8
Total Days Air Trips	0	0	0	0	24
Total Person Trips by Air	0	0	0	0	16
Total Person-Days on Air Trips	0	0	0	0	48
Total Days	0	0	0	96	192

Travel Requirements Summary	Year 1	Year 2	Year 3	Year 4	Year 5
Total Locations	0	8	16	24	32
Total Trips	0	40	72	104	136
Total Vehicle Trips	0	40	62	86	110
Total Air Trips	0	0	10	204	348
Total Person Trips	0	200	296	328	360
Total Person Trips - by Vehicle	0	200	246	318	390
Total Person Trips - by Air	0	0	50	74	82
Total Days	0	120	120	192	240
Total Days - Vehicle Trips	0	120	186	258	330
Total Days - Air Trips	0	0	30	38	46
Total Person Days	0	600	888	1080	1272
Total Person Days - Vehicle Trips	0	600	738	858	1002
Total Person Days - Air Trips	0	0	150	174	190

	Year 1	Year 2	Year 3	Year 4	Year 5
Table 2.4.2 - Vehicles					
Number of Vehicle Trips Required	0	40	62	86	110
Trips per vehicle per year	0	40	40	40	40
Number of Vehicles Required for Trips	0	1	2	3	3
Executive Director's Vehicle	1	1	1	1	1
Cumulative Number of Vehicles Required	1	2	3	4	4
Number of Vehicles to Purchase in the Year	1	1	1	1	0
Table 2.4.3 - Plane Tickets					
Total Person Trips by Plane	0	0	50	74	82
Table 2.4.4 - Ground Transportation Rental					
Number of Days Air Trips	0	0	30	38	46
Table 2.2.5 - Hotel Nights					
Total Person Days	0	600	888	1080	1272
Minus 1 Person Day per Person Trip	0	200	296	328	360
Total Hotel Nights	0	400	592	752	912
Table 2.2.6. - Per Diem					
Total Number of Person Days of Travel	0	600	888	1,080	1,272

ANNEX C

IT Plan Diagram


Customer
Internet service provider (ISP)
Branch Offices
Internet service provider (ISP)
Internet
Internet service provider (ISP)
Win 2000 Domain Controller 1
Win 2000 Domain Controller 2
Mail server & IIS server
File & Backup server
Proxy Server
Lease Line
Registerd Domain name

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ANNEX D

EWRA Budget Projections

Summary EWRA Years 1-5

	Year 1	Year 2	Year 3	Year 4	Year 5	Total LE Years 1-5
	Total LE	Total LE	Total LE	Total LE	Total LE	
Staff Salaries	560,013	919,283	1,174,262	1,336,866	1,470,553	5,460,977
Fringe Benefits	952,338	1,294,883	1,628,308	1,827,617	1,985,373	7,688,518
Furniture, Vehicles, and Equipment	1,668,700	851,738	743,937	501,237	28,000	3,793,611
Travel and Transportation	0	60,000	109,680	141,766	169,246	480,692
Other Direct Costs	408,600	561,060	692,955	899,562	963,202	3,525,379
Total Operation Costs	3,589,651	3,686,963	4,349,142	4,707,047	4,616,374	20,949,177

Detailed Summary EWRA Budget Years 1- 5

	Year 1			Year 2			Year 3			Year 4			Year 5			Total LE Years 1-5
	Rate	Units	Total LE	Rate	Units	Total LE	Rate	Units	Total LE	Rate	Units	Total LE	Rate	Units	Total LE	
Staff Salaries																
1st Undersecretary	1,417	12	17,004	1,559	12	18,705	1,715	12	20,575	1,886	12	22,632	2,075	12	24,896	103,812
Undersecretary	1,137	24	27,280	1,250	24	30,008	1,375	24	33,009	1,513	24	36,309	1,664	24	39,940	166,546
General Manager	1,081	72	77,842	1,189	72	85,626	1,308	72	94,188	1,439	72	103,607	1,583	72	113,968	475,230
Grade One	895	204	182,571	984	204	200,828	1,083	204	220,911	1,191	204	243,002	1,310	204	267,302	1,114,613
Grade Two	764	180	137,575	841	456	383,376	925	492	455,006	1,017	492	500,507	1,119	492	550,557	2,027,020
Grade Three	611	144	87,954	672	216	145,124	739	384	283,798	813	432	351,200	894	432	386,320	1,254,395
Grade Four	470	24	11,288	517	24	12,417	569	24	13,659	626	24	15,025	689	24	16,527	68,916
Grade Five	385	48	18,500	424	60	25,438	466	72	33,578	513	84	43,091	564	84	47,400	168,007
Grade Six	336	0	0	370	48	17,763	407	48	19,540	448	48	21,494	493	48	23,643	82,439
Subtotal, Staff	7,097	708	560,013	7,807	1,116	919,283	8,587	1,332	1,174,262	9,446	1,392	1,336,866	10,391	1,392	1,470,553	5,460,977
Fringe Benefits																
Allowances			560,013			919,283			1,174,262			1,336,866			1,470,553	5,460,977
13th Month Bonus	46,668	1	46,668	76,607	1	76,607	97,855	1	97,855	111,406	1	111,406	122,546	1	122,546	455,081
Social insurance < 1100	138.00	1,192	164,521	138.00	132.00	18,216	138.00	120	16,560	138.00	132	18,216	138.00	48	6,624	224,137
Social insurance > 1100	276.00	636	175,536	276.00	984.00	271,584	276.00	1,188	327,888	276.00	1,260	347,760	276.00	1,344	370,944	1,493,712
Medical Insurance	560,013	0	5,600	919,283	0.01	9,193	1,174,262	0	11,743	1,336,866	0	13,369	1,470,553	0	14,706	54,610
Subtotal, Fringe Benefits			952,338			1,294,883			1,628,308			1,827,617			1,985,373	7,888,518
Furniture, Vehicles, and Equipment																
Vehicle	350,000	1	350,000	367,500	1	367,500	385,875	1	385,875	405,169	1	405,169	425,427	0	0	1,508,544
Network			189,200			33,900			57,500			28,000			28,000	336,600
Workstations			516,500			241,300			136,900			34,800			0	929,500
Software			119,750			50,750			37,150			7,800			0	215,450
Photocopier	27,000	2	54,000	28,350	0	0	29,768	1	29,768	31,256	0	0	32,819	0	0	83,768
Office Furniture (Desk, Files, etc.)	3,750	55	206,250	3,938	29	114,188	4,134	17	70,284	4,341	4	17,364	4,558	0	0	408,086
Office Furniture (Tables, Chairs, etc.)	150,000	1	150,000	157,500	0	0	165,375	0	0	173,644	0	0	182,326	0	0	150,000
Phone System	3,000	2	6,000	3,150	0	0	3,308	1	3,308	3,473	0	0	3,647	0	0	9,308
Phone Lines	7,000	11	77,000	7,350	6	44,100	7,718	3	23,153	8,103	1	8,103	8,509	0	0	152,356
Subtotal, Furniture, Vehicles and Equipment			1,668,700			851,738			743,937			501,237			28,000	3,793,611
Travel and Transportation																
Total Airfare	287	0	0	302	0	0	318	50	15,900	334	74	24,716	351	82	28,782	69,398
Total Vehicle Rental	150	0	0	158	0	0		30	4,980	175	38	6,650	184	46	8,464	20,094
Total Accomodation	75	0	0	75	400	30,000	75	592	44,400	75	752	56,400	75	912	68,400	199,200
Total M&IE Per Diem	50	0	0	50	600	30,000	50	888	44,400	50	1,080	54,000	50	1,272	63,600	192,000
Travel & Transportation			0			60,000			109,680			141,766			169,246	480,692
Other Direct Costs																
Office rent and utilities	500	0	0	525	0	0	551	0	0	579	0	0	608	0	0	0
Expendable supplies	750	72	54,000	788	108	85,050	827	132	109,148	868	144	125,024	912	144	131,275	504,496
Communications	1,050	132	138,600	1,103	204	224,910	1,158	240	277,830	1,216	252	306,308	1,276	252	321,623	1,269,271
Reproduction	750	24	18,000	788	24	18,900	827	36	29,768	868	36	31,256	912	36	32,819	130,742
Translation	45	4,000	180,000	47	4000	189,000	50	4,000	198,450	52	6,000	312,559	55	6,000	328,187	1,208,195
Vehicle expenses	1,500	12	18,000	1,800	24	43,200	2,160	36	77,760	2,592	48	124,416	3,110	48	149,299	412,675
Subtotal, Other Direct Costs			408,600			561,060			692,955			899,562			963,202	3,525,379
Total Operation Costs			3,589,651			3,686,963			4,349,142			4,707,047			4,616,374	20,949,177

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Detailed EWRA Budget Years 1 - 5

	Year 1					Year 2					Year 3					Year 4					Year 5					Total LE Years 1-5
	PM or Units	Staff/ Equip	Total LOE	Rate	Total LE	PM or Units	Staff/ Equip	Total LOE	Rate	Total LE	PM or Units	Staff/ Equip	Total LOE	Rate	Total LE	PM or Units	Staff/ Equip	Total LOE	Rate	Total LE	PM or Units	Staff/ Equip	Total LOE	Rate	Total LE	
Staff Salaries																										
1st Undersecretary	12	1	12	1,417	17,004	12	1	12	1,559	18,705	12	1	12	1,715	20,575	12	1	12	1,886	22,632	12	1	12	2,075	24,896	103,812
Undersecretary	12	2	24	1,137	27,280	12	2	24	1,250	30,008	12	2	24	1,375	33,009	12	2	24	1,513	36,308	12	2	24	1,664	39,940	166,546
General Manager	12	6	72	1,081	77,842	12	6	72	1,189	85,628	12	6	72	1,308	94,188	12	6	72	1,439	103,607	12	6	72	1,583	113,958	475,230
Grade One	12	17	204	895	182,571	12	17	204	984	200,828	12	17	204	1,083	220,911	12	17	204	1,191	243,002	12	17	204	1,310	267,302	1,114,613
Grade Two	12	15	180	764	137,575	12	38	456	841	383,376	12	41	492	925	455,006	12	41	492	1,017	500,507	12	41	492	1,119	550,557	2,027,020
Grade Three	12	12	144	611	87,954	12	18	216	672	145,124	12	32	384	739	283,798	12	36	432	813	351,200	12	36	432	894	386,320	1,254,395
Grade Four	12	2	24	470	11,288	12	2	24	517	12,417	12	2	24	569	13,659	12	2	24	626	15,025	12	2	24	689	16,527	68,916
Grade Five	12	4	48	385	18,500	12	5	60	424	25,438	12	6	72	466	33,578	12	7	84	513	43,091	12	7	84	564	47,400	168,007
Grade Six	12	0	0	336	0	12	4	48	370	17,763	12	4	48	407	19,540	12	4	48	448	21,494	12	4	48	493	23,643	82,439
Subtotal, Staff	108	59	708	7,097	560,013	108	93	1116	7,607	919,283	108	111	1332	8,587	1,174,262	108	116	1392	9,446	1,336,866	108	116	1392	10,391	1,470,553	5,460,977
Fringe Benefits																										
Allowances					560,013					919,283					1,174,262					1,336,866					1,470,553	5,460,977
13th Month Bonus	1			48,668	48,668	1			76,607	76,607	1			97,855	97,855	1			111,406	111,406	1			122,546	122,546	455,081
Social Insurance < 1100	1,192			138.00	164,521	132			138.00	18,216	120			138.00	16,560	132			138.00	18,216	48			138.00	6,624	224,137
Social Insurance > 1100	636			276.00	175,536	984			276.00	271,584	1,188			276.00	327,888	1,260			276.00	347,760	1,344			276.00	370,944	1,493,712
Medical Insurance	1%			560,013	5,600	1%			919,283	9,193	1%			1,174,262	11,743	1%			1,336,866	13,369	1%			1,470,553	14,706	54,610
Subtotal, Fringe Benefits					952,338					1,294,883					1,628,308					1,827,517					1,985,373	7,688,516
Furniture, Vehicles, and Equipment																										
Vehicle	1			350,000	350,000	1			367,500	367,500	1			385,875	385,875	1			405,169	405,169	0			425,427	0	1,508,544
Network					189,200					33,900					57,500					28,000					28,000	336,600
Workstations					516,500					241,300					130,900					34,800					0	929,500
Software					110,750					50,750					37,150					7,800					0	215,450
Photocopier	2			27,000	54,000	0			29,350	0	1			29.768	29,768	0			31,256	0	0			32,819	0	83,768
Office Furniture (Desk, Files, etc.)	55			3,750	206,250	29			3,938	114,188	17			4,134	70,284	4			4,341	17,364	0			4,558	0	408,086
Office Furniture (Tables, Chairs, etc.)	1			150,000	150,000	0			157,500	0	0			165,375	0	0			173,644	0	0			182,326	0	150,000
Phone System	2			3,000	6,000	0			3,150	0	1			3,308	3,308	0			3,473	0	0			3,647	0	9,308
Phone Lines	11			7,000	77,000	6			7,350	44,100	3			7,718	23,153	1			8,103	8,103	0			8,509	0	152,356
Subtotal, FV&E					1,668,700					851,738					743,937					501,237					26,000	3,793,611
Travel and Transportation																										
Total Airfare	0			287	0	0			302	0	50			318	15,900	74			334	24,716	82			351	28,782	69,398
Total Vehicle Rental	0			150	0	0			158	0	30			166	4,980	35			175	6,650	46			184	8,464	20,094
Total Accomodation	0			75	0	400			75	30,000	592			75	44,400	752			75	56,400	912			75	68,400	199,200
Total M&IE Per Diem	0			50	0	600			50	30,000	888			50	44,400	1,060			50	54,000	1,272			50	63,600	192,000
Subotal, Travel & Transportation					0					60,000					109,680					141,766					169,246	480,692
Other Direct Costs																										
Office rent and utilities	12		0	500	0	12		0	600	0	12		0	720	0	12		0	864	0	12		0	1,037	0	0
Expendable supplies	12	0	72	750	54,000	12	9	108	788	85,050	12	11	132	827	109,149	12	12	144	868	125,024	12	12	144	912	131,276	504,490
Communications	12	11	132	1,050	138,600	12	17	204	1,103	224,910	12	20	240	1,158	277,830	12	21	252	1,216	306,306	12	21	252	1,276	321,023	1,269,271
Reproduction	12	2	24	750	18,000	12	2	24	788	18,900	12	3	36	827	29,768	12	3	36	868	31,256	12	3	36	912	32,819	130,742
Translation	2000	2	4000	45	180,000	2000	2	4000	47	189,000	2000	2	4000	50	198,450	2000	3	6000	52	312,659	2000	3	6000	55	328,187	1,208,195
Vehicle expenses	12	1	12	1,500	18,000	12	2	24	1,600	43,200	12	3	36	2,160	77,760	12	4	48	2,592	124,416	12	4	48	3,110	149,299	412,675
Subtotal, Other Direct Costs					408,600					561,060					692,955					800,662					963,204	3,525,370
Total					3,669,651					3,666,963					4,349,142					4,707,047					4,616,374	20,649,177

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Tables for Compilation of Input Data

ANNEX E

Information Technology Inputs

Information Technology Inputs

	Year One			Year Two			Year Three			Year Four			Year Five			
	Units	Rate	Total	Units	Rate	Total	Units	Rate	Total	Units	Rate	Total	Units	Rate	Total	Total
Hardware																
Network																
Servers	5	20,000	100,000	0	20,000	0	1	20,000	20,000	0	20,000	0	0	20,000	0	120,001
Cabling	10,000	1	10,000	0	1	0	0	1	0	0	1	0	0	1	0	10,001
Rack (45 ccm)	5	600	3,000	0	600	0	1	600	600	0	600	0	0	600	0	3,601
Rack (90 cm)	1	1,500	1,500	0	1,500	0	0	1,500	0	0	1,500	0	0	1,500	0	3,000
Server/Cabling Accessories			2,000	0	0	0	0	0	0	0	0	0	0	0	0	2,000
Router	1	12,000	12,000	0	12,000	0	0	12,000	0	0	12,000	0	0	12,000	0	24,000
Switch Boxes (24 users)	3	5,000	15,000	1	5,000	5,000	1	5,000	5,000	0	5,000	0	0	5,000	0	25,002
Patch Panel	3	900	2,700	1	900	900	1	900	900	0	900	0	0	900	0	4,502
UPS (Server)	5	3,000	15,000	0	3,000	0	1	3,000	3,000	0	3,000	0	0	3,000	0	18,001
Leased Line	1	8,000	8,000	1	8,000	8,000	1	8,000	8,000	1	8,000	8,000	1	8,000	8,000	24,002
ISP	1	20,000	20,000	1	20,000	20,000	1	20,000	20,000	1	20,000	20,000	1	20,000	20,000	60,002
Subtotal, Network			189,200			33,900			57,500			28,000			28,000	294,112
Workstations																
Workstations	28	5,000	137,500	15	5,000	72,500	9	5,000	42,500	2	5,000	10,000	0	5,000	0	215,023
Laptops	27	10,000	265,000	14	10,000	135,000	8	10,000	75,000	2	10,000	20,000	0	10,000	0	410,021
Docking Stations	27	1,000	26,500	14	1,000	13,500	8	1,000	7,500	2	1,000	2,000	0	1,000	0	41,021
External Monitors	55	500	27,500	29	500	14,500	17	500	8,500	4	500	2,000	0	500	0	42,546
Keyboards	55	100	5,500	29	100	2,900	17	100	1,700	4	100	400	0	100	0	8,546
Workstation Accessories	55	100	5,500	29	100	2,900	17	100	1,700	4	100	400	0	100	0	8,546
Network Printers	7	7,000	49,000	0	7,000	0	0	7,000	0	0	7,000	0	0	7,000	0	56,000
Subtotal, Workstations			516,500			241,300			136,900			34,800			0	781,703
Software																
Server Software																
Windows 2000 Server	5	4,000	20,000	0	4,000	0	1	4,000	4,000	0	4,000	0	0	4,000	0	24,001
Microsoft Exchange	1	8,000	8,000	0	8,000	0	0	8,000	0	0	8,000	0	0	8,000	0	16,000
Software Licenses																
Registering Domain Name	1	500	500	0	500	0	0	500	0	0	500	0	0	500	0	1,000
Client Access Licensing (CAL)	250	200	50,000	145	200	29,000	102	200	20,400	24	200	4,800	0	200	0	79,447
Windows XP Licensing	55	500	27,500	29	500	14,500	17	500	8,500	4	500	2,000	0	500	0	42,546
Microsoft Office	55	250	13,750	29	250	7,250	17	250	4,250	4	250	1,000	0	250	0	21,296
Subtotal, Software			119,750			50,750			37,150			7,800			0	184,290

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The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-funded Project

TARIFF PLANNING GUIDELINES FOR WATER AND WASTEWATER UTILITIES IN THE NEW URBAN COMMUNITIES And SIXTH OF OCTOBER/SHEIKH ZAYED CITIES TARIFFS STUDY

May 26, 2002

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

CHEMONICS EGYPT

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ACRONYMS

FY	Fiscal Year
LE	Egyptian Pound
LIRR-II	Legal, Institutional and Regulatory Reform II Project
NUCA	New Urban Communities Authority
O&M	Operations and Maintenance
R&R	Renewal and Replacement
UFW	Unaccounted-for Water

SECTION I

Tariff Planning Guidelines for Water and Wastewater Utilities in the New Urban Communities

A. Purpose of the Guidelines

Public economic authorities in Egypt, such as the New Urban Communities Authority (NUCA), are required to operate as financially autonomous entities that recover their operating and capital costs through the sale of the goods and services they produce and distribute.

As operating units of the city development agencies, the water and wastewater utilities of the new urban communities are expected to make their contribution to NUCA's financial viability. The primary source of revenue for water and wastewater utilities is *tariffs*, that is, regular (monthly or bi-monthly) charges for water sold and wastewater collected and treated. These guidelines provide a methodology for use by NUCA utilities in designing tariffs for water and wastewater services. In Section II of this document, the methodology is illustrated in a case study of Sixth of October and Sheikh Zayed Cities' water and wastewater utilities.

B. The Tariff-Setting Process

The tariff-setting process involves two steps:

a) the determination of the revenue requirement; and
b) the design of tariff rates.

B1. Revenue Requirements

The revenue requirements are the tariff revenues required to cover the utility's costs. The determination of the revenue requirement involves the assessment and projection of costs and consumption. This process enables the utility to estimate an average tariff, which is the cost divided by the units of service delivered (water sold or wastewater collected).

The revenue requirements of a government-owned utility are all operating and capital costs entailed in the provision of water and wastewater services. This definition excludes the costs of activities not directly related to the provision of utility services, such as engineering and laboratory services conducted on a fee-basis. In these activities, the utility is behaving like a private business, the goods and services provided are not public goods, and the utility is not entitled to charge users of the regulated, monopoly public service for expenses incurred in these side-businesses.

The utility's operating costs include labor, commodities, services, and purchases for sale. (This latter category may include purchase of treated water in bulk from a neighboring public utility or a private utility.)

The utility's capital costs may be of two types. First is the repayment of loans and the interest on loans. Debt is the most common source of finance for major capital works by government-owned utilities. The second type of capital cost is a diverse category of works combined under the term *renewal and replacement* (R&R). The common feature of renewal and replacement works is that they are relatively small and provide immediate benefits. For both reasons, it is appropriate to recover the full costs of renewal and replacement from current tariff revenues as the costs are incurred. In these respects, R&R works differ from major capital expansion works. Capital expansion works are generally too costly to recover within a few years; moreover, they provide benefits for future as well as present ratepayers, so it is appropriate to spread their costs over many years.

It is understood that NUCA intends to *continue to carry the debt service of the water and wastewater utilities*. This is partly to mitigate the "rate shock" that full cost recovery might entail for customers and partly to recognize that facilities in some of the new urban communities have been designed in excess of current demand in anticipation of significant growth in population and investment. Hence, the revenue requirement for the rate term consists of operations and maintenance (O&M) and R&R costs only.

B2. Rates Design

The rates design is the process of developing sale prices. While it is possible to charge each customer the average tariff for each unit of service, it is customary to allocate the revenue requirement based on the type of use (e.g., domestic, industrial, *et cetera*) and on the level of consumption (e.g., one rate for use up to ten m^3 per month with higher rates for higher levels of consumption). In structuring their rates, utilities seek to achieve one or more of the following objectives:

a) to protect customers from the "shock" of a sudden increase in tariffs;
b) to assure a minimum supply of water and wastewater service to low-income households at an affordable price; and
c) to encourage or discourage certain patterns or levels of demand.

C. The Rate Term

Tariffs may be adjusted to reflect historical costs or projected costs. These guidelines adopt the projected-cost approach, using a five-year rate term. A projected-cost approach has several advantages:

a) The five-year term provides the utility with the revenue stability to carry out improvements;
b) The five-year term allows for the implementation of efficiency improvements that can mitigate the increase in tariff revenues required; and
c) A five-year term keeps tariff rate case development and review costs lower than an approach in which utilities must submit a rate adjustment application more frequently.

D. Structure and Operation of the Tariff Analysis Model

A tariff adjustment application is submitted to the authority responsible for setting the utility's tariffs. At present, NUCA is this authority for the new urban community water and wastewater utilities.

The tariff application model consists of one Excel workbook divided into six linked Excel worksheets, submitted with appropriate documentation and explanations. All highlighted cells require data inputs by the utility. For the historical data part of each sheet, the data inputs are usually volumes or Egyptian pound (LE) figures and should be provided from actual measurements and records. Inputs to cells in projection years are typically *rates* of change; the model then calculates the relevant quantities.

a) **Worksheet No. 1: The Water Consumption/Demand and Wastewater Flows Input Data Worksheet.** Five tables which present historical water consumption, wastewater flows and quantities of water produced at the water treatment plant(s). The worksheet projects data on water demand, wastewater flows and required quantities of treated water.
b) **Worksheet No. 2: The Water and Wastewater Operation and Maintenance (O&M) Costs Input Data Worksheet.** Two tables present historical and projected data on O&M costs for water and wastewater facilities.
c) **Worksheet No. 3: The Capital Costs Worksheet.** One table summarizes the utility's five-year R&R program and estimates its costs.
d) **Worksheet No. 4: The Tariff Revenue Analysis Worksheet.** Four tables, two each covering existing and projected tariffs and revenues for water and wastewater. The worksheet calculates the tariff revenues by multiplying the tariffs listed in the worksheet by the consumption/demand and wastewater flows included in Worksheet No. 1.
e) **Worksheet No. 5: The Water and Wastewater Tariff Analysis Worksheet** which brings together in one table, the data from the preceding worksheets to develop the revenue requirement and determine the percentage tariff increase required to achieve positive net income.
f) **Worksheet No. 6: The Block Rate Design for Residential Customer Classes Worksheet.** This worksheet has six tables. Table 6-1 is a tool to assist the utility in determining how the revenue requirement of a particular customer class can be distributed over monthly consumption blocks. (In the Sixth of October and Sheikh Zayed Cities Model, a block rate design has been developed for the residential customer class, only, but the block rate design worksheet can be used for developing block rates for any customer class by inserting a new worksheet). Table 6-2 calculates the percentage rate increase for each block. Table 6-3 shows expected monthly bills for users at several representative levels of water consumption.

D1. Water Consumption/Demand and Wastewater Flows

The worksheet comprises five tables that require the utility to input five years of historical data (or the latest years available) on water consumption, wastewater collection, and water treatment plant (WTP) production. Then it asks for the utility's assumptions about the growth in demand.

The demand assumptions are critical to the entire tariff analysis model:

a) The demand projections are the quantities that, when multiplied by the tariffs, provide a basis for revenue projections;
b) The demand projections are an important source of the O&M cost projections; and
c) The demand projections, when rendered in class-specific terms, provide the *raw data* for tariff rate design.

The dynamic character of the new urban communities as *growth poles* creates great challenges for demand forecasting. While an "old community" such as a governorate might safely assume that future demand will grow at rates similar to the historical trend of recent years, the new urban community utility planner must take more pains and rely on a close understanding of local development. For example, in the case of the cities of Sixth of October and Sheikh Zayed (treated as one unit because their water systems are interconnected), the following factors weigh on the demand forecast:

a) The Sixth of October City industrial zone is largely "filled in", i.e., the growth of connections and demand for this group of customers is likely to be slower than in previous years; and
b) Some large bulk customers are expected to make unprecedented water demands beginning in 2003.

The utilities are therefore advised to consider possible class variations in demand, as well as the possibilities of bulk off takes by new customers from outside city boundaries. Each utility must consider the supply and demand circumstances particular to its physical capacity and its local service area.

Utilities are also advised not to overestimate growth in demand. This will lead to premature expansion of production and treatment facilities, and the resulting higher capacity costs to be spread over a lower-than-expected revenue base.

The worksheet incorporates some standard demand forecasting assumptions with respect to the growth of commercial demand (the LE 0.50 per m^3 class in the 1997 NUCA tariff schedule, principally the small business sector) the growth of commercial demand is projected in proportion to the growth of residential demand.

Finally, it will be noted that in the case study, certain types of uses grouped within one or another of the five standard NUCA tariff classes have been set apart from their main class. This distinction reflects demand planning needs, some of which may be special to Sixth of October and Sheikh Zayed Cities, while others may apply more generally:

a) It is generally advisable to separate types of water use that do not generate flow to sewers, e.g., irrigation and construction use. This facilitates the wastewater flow forecast; and
b) In Sixth of October and Sheikh Zayed cities specifically, a certain type of user in the LE 0.75 per m^3 "industrial/investment" class – namely, the luxury housing estates

('high-class residential") – was singled out because most customers in this class are not presently served by the utility's wastewater system.

Each utility should design the customer classification it feels necessary to develop demand estimates and subsequent tariff structures that reflect local circumstances.

The difference between production and consumption is the water system losses. It is the volume of production rather than consumption that drives variable water supply costs such as power and chemicals. Losses require the water utility to produce more than is necessary to meet customer demand. Conversely, loss reduction reduces the power and chemical cost of meeting the same volume of demand. The model calculates the historical level of losses by subtracting consumption from production, but it requires the utility to project a loss *rate* over the years of the rate term. This loss rate is converted by the model into compensating additional water production, which is then added to the projected cities' water demand to project the total water production requirement. The total water production requirement drives the water O&M cost projection.

Utilities should set realistic targets for loss reduction. Generally, the higher the current unaccounted-for water rate, the more quickly and cheaply it can be reduced. Utilities should submit a diagnosis of their water loss situation, in the form of a discussion of the principal sources of unaccounted-for water, and describe their strategies and programs for cost-effective unaccounted-for water (UFW) reduction. Systematic leak detection surveys should be conducted before proposing major network rehabilitation.

Table 1-1: Cities' Water Consumption and Demand by Customer Class

- Table 1-1 records the historical consumption of users within the cities' boundaries and projects these users' water demand for the five-year rate period.

- Historical data: the utility inputs the water consumption for each year by customer class. The worksheet calculates the percentage annual increase:

  For each customer class, calculated annual increase percent = [(Y2002 consumption / Y2001 consumption) – 1]

- Projected data: the utility inputs the assumed percentage for annual increase in consumption yearly by customer class. The model calculates the projected annual class consumption, by applying the annual growth rate to the previous year's consumption.

  Y2003 demand = [Y2002 consumption x (1 + Y2003 assumed percent annual increase)]

- The worksheet calculates the annual totals for the historical water consumption and projected total water demand.

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Table 1-2: Bulk Water Sales

- *Bulk water sales* refers to treated water sales to users outside city boundaries. The utility normally incurs no distribution costs in selling the water. Moreover, if the bulk supply is metered at the beginning of the transmission line, it can be assumed that all the supply is accounted-for.

- Historical data: the utility inputs the yearly bulk water sales by customer. The worksheet sums the annual bulk water sales.

- Projected data: the utility inputs yearly bulk water sales by customer. The worksheet sums the expected annual bulk water sales.

Table 1-3: Unaccounted-for Water

- Historical data: The worksheet computes the yearly quantity of unaccounted-for water (UFW) by subtracting the sum of the total yearly cities' consumption and bulk sales from the total treatment plant production in Table 1-4, e.g.,:
  UFW for the Y2001 (m^3/year) = [WTP production for Y2001 - (total cities' water consumption for Y2001 + total bulk sales for Y2001)]

The sheet then calculates the percentage of UFW:

% UFW for Y2001 = quantity of UFW for Y2001 / WTP production for Y2001

- Projected data: The utility inputs a target rate of UFW for each projection year. The model converts this rate into a quantity of UFW:

  UFW for Y2004 (m^3/year) = total water production for Y2004 minus cities' water demand minus bulk water sales.

- As noted above, in the case study, bulk water sales are treated as fully accounted-for.

Table 1-4: Water Treatment Plant Production

- Historical data: the utility inputs the yearly WTPs (in the case of more than one). The worksheet sums the annual WTPs production.

- Projected data: the worksheet computes the yearly total required WTPs production:

  Total Y2004 WTPs Production (m^3/year) = (total cities' water demand Y2004 Y2004 /(1-UFW percent)+ bulk water sales Y2004

  In the case of distribution systems supplied by several WTPs, the utility must input the estimated required production for each plant based on its own judgment. The split in required production of individual plants is only indicative and does not affect any

computations in the workbook, but the sum of production from the various plants should not exceed the total production requirement.

Table 1-5: Wastewater Flows by Customer Class

The "Egyptian Code for Design and Construction of Water and Wastewater Treatment Plants and Pumping Stations", Volume II "Treatment Facilities (Wastewater)", Second Edition 2000, states under "Article 2-3: Wastewater Flows":

Average wastewater flow = [0.8 – 0.9] x Average water consumption

NUCA recommends using 80 percent which concurs with the code.

- Historical data: the utility inputs the percentage of water consumption for each year by customer class that discharges to the sewer system. The worksheet calculates the yearly total flow.

- Projected data: the utility inputs the percentage of water demand for each year by customer class that discharges to the sewer system. The worksheet calculates the yearly total flow.

D2. Water and Wastewater Operation and Maintenance Costs

Operation and maintenance costs (other than wages and salaries) should be proportional to the system outputs. Such a relationship will usually be evident if the utility accounts are kept on an accrual basis. If the utility's accounts are cash-based, the historical data may be modified to represent the actual O&M costs more realistically. In any case, a copy of the utility's income statement should be attached to the rate application.

The model requests the utility to input estimated commodity and services costs for the first projection year. The model then projects the future year costs based on the growth in water production or wastewater flow.

Wage and salary cost projections operate differently from other O&M cost projections in the model. Wages and salary cost changes are a function of two variables — the number of staff and the rate of wage inflation. If the number of staff is available, calculate the average staff salary and, if several years data are available, calculate the annual rate of wage inflation. This can be used to develop projections for annual average staff salaries, which when multiplied by the projected number of staff, will provide the annual wages and salaries cost projection.

As noted above, the annual price inflation rate is not applied to wages and salaries.

Table 2-1: Water Facilities O&M Costs

- Historical data: the utility inputs all the data related to labor (number of employees and associated wages), commodities (electricity, fuel, oil, chemicals, spare parts/maintenance, *et cetera*), services (maintenance, transportation, *et cetera*) and other

from actual records. The worksheet calculates the percentage annual increase in labor and sums the yearly total water supply O&M costs.

- Projected data: the utility inputs the percentage annual increase in wages or any additions or reduction in labor wages. Note that where sufficient reliable data is available, the number of staff per 1,000 connections can be used to estimate future staffing levels and related personnel expenses.

- For commodities, services and other, the percentage increase is related to the WTP production, e.g.:

  Electricity costs Y2003 = Electricity costs Y2002 x [WTP production Y2003 (from Table 1-4) / WTP production Y2002 (from Table 1-4)]

  The worksheet sums the yearly costs for commodities, services and other that is the "Base Water Supply O&M Costs". The utility then inputs the allowance for yearly inflation to be applied to the "Base Water Supply O&M Costs". The worksheet calculates the amount of inflation yearly (compound). The sheet then sums the "Total Water Supply O&M Costs".

  Total Water Supply O&M Costs Y2003 = [total wages Y2003 + Base Water Supply O&M Costs Y2003 + allowance for inflation Y2003]

Table 2-2: Wastewater Facilities O&M Costs

This table is identical to Table 2-1 but for wastewater facilities.

D3. Capital Costs Development

Capital costs comprise debt service and the needs for renewal, replacement, and small improvement projects. NUCA, however, will not require recovery of debt service costs through tariffs over the prospective rate term.

R&R costs are best developed on the basis of actual needs. In addition to the actual needs, utilities may wish to add an allowance for unpredictable but likely needs for normal asset renewal and replacement.

The Capital Costs Worksheet for the Sixth of October and Sheikh Zayed Cities case — a completed example of which is shown as Table 3 in Section — applies both of these approaches for purposes of illustration.

First, it lists the specific projects the utility plans to fund through tariff revenues. In the case study, these investments are focused on the objectives of improving maintenance (asset catalogue), identifying and controlling unaccounted-for water (primary metering, computerized billing system, distribution system model, and leakage survey), and improving revenue collection (computerized customer database and billing system).

The secondary metering program aims to expand consumption meter coverage. Its costs have been included for utility planning and budgeting purposes, but its costs will be recovered through charges to the relevant customers rather than through tariffs.
In completing this part of the worksheet, utilities are also required to show the year or years in which the program expenditure is expected to occur.

In addition to these programmed expenditures, the utility may wish to add to its R&R requirement an allowance for normal renewals and replacement. One approach to estimating the size of this allowance is to use a percentage of the value of the fixed assets in service. This requires the utility to estimate the projected value of fixed assets over each year of the rate term. Utilities should attach a copy of their most recent balance sheets and a five-year capital plan showing the years in which new works are expected to enter service.

Utilities should input the current values of fixed assets based on their current balance sheet and add the asset values of major new capital works expected to be implemented over the rate term. The model will add to the total annual fixed asset values the values of the smaller works to be implemented through the programs listed on the worksheet. The percentage of the value of fixed assets used to estimate the R&R allowance should not be excessive. The facilities in the new urban communities are generally new and are not expected to require large replacement budgets over the rate term. One percent of the value of fixed assets should be treated as a maximum allowance, and utilities may choose to use a lower percentage or to rely entirely on projections of annual needs.

D4. Revenue Analysis

The principal new data requirement for the Tariff Revenue Worksheet is the existing tariffs for the user classes (see Section D1. above regarding customer classification). These are input in Table 4-1 and Table 4-3. It will be noted that Table 4-3 requires the utilitiy to convert the wastewater surcharge into an equivalent LE wastewater tariff per m^3 water sold (e.g., if the water tariff is LE 0.30 per m^3 and the wastewater surcharge is ten percent, the equivalent wastewater unit tariff is LE 0.03 per m^3 of water sold). The wastewater flow projection (from Table 1-5) indicates the percentage of water discharged to the sewer by each class of water user.

The projected wastewater surcharge has been set at 35 percent for domestic users and 65 percent for industrial users in accordance with the practices in several governorates in Egypt and NUCA Tariff Setting Committee guidance. However, the model allows for this surcharge to be modified.

The required water tariff increase is determined in Worksheet No 5. This determination automatically adjusts the projection year tariffs in Tables 4-1 and 4-3.

D5. Water and Wastewater Tariff Analysis

The Tariff Analysis Worksheet (see Table 5-1) consolidates information from the demand and cost worksheets to assess their implications for tariff levels.

Based on the historical data on tariff revenue collection and collection efficiency (collections/revenues), for projection years, the utility sets a target collection efficiency rate, and the worksheet calculates the expected collections for comparison with the revenue requirement to estimate the net income during the rate term. Utilities should explain the strategies and programs they intend to implement to achieve the collection efficiency improvements they project.

The utility must then experiment with percentages of tariff increase until it arrives at average class tariffs that are adequate to cover the revenue requirement (i.e., the total costs). The proposed tariff increase percentage will automatically change the tariff rates for the projection years in Tables 4-1 and 4-3, which will automatically calculate the tariff revenues in Tables 4-2 and 4-4.

It will be noted that in the Sixth of October and Sheikh Zayed Cities case, the basis for the tariff analyses is the combined cost of water & wastewater O&M and R&R. This approach provides greater latitude to the utility in determining how the cost burden should be distributed among customers.

D6. Tariff Block Rate Calculation Worksheet

The rationale of inclining block tariff rates was discussed in Section B2., above. The tariff block rate calculation worksheet is a tool that assists the utility to distribute the class revenue requirement among the tariff blocks. (See Table 6 in Part B for an example.)

In the case study, the block rates are applied only to the residential class; this is in order to assure the affordability of minimum blocks of residential usage. The worksheet can also be used to develop block rates for other user classes. However, this was not felt necessary in Sixth of October and Sheikh Zayed Cities because the Tariff Analysis Worksheet already assigned above-average tariffs to these classes and so the use of blocks within these high-volume classes could lead to extremely high bills as well as conservation measures which could result in revenue shortfalls for the utility.

The block rates are developed in Table 6-1 through the following process:

1) Develop the class-specific monthly consumption blocks. In the Sixth of October and Sheikh Zayed Cities example for residential use, five blocks are used (0-10, >10-20, >20-30, >30-40, >40-50, >50-100 and over 100 m^3);
2) Use utility records or estimates to determine the number of users whose average monthly usage ends in each block and the total volume of monthly consumption that block represents. This is done both for historic years and for one or more projection years. Derive the average consumption of the block user;
3) In the "Target Average Tariff" box, enter the average residential tariff for the design year (in this case 2005, the midpoint year in the rate term) from the Tariff Analysis Worksheet;
4) In the "Change from Average Tariff" column, assign the "discount" or "penalty" to the average residential tariff that the utility wishes to apply to the block and show the resulting block rate per m^3 in the "Tariff per Consumption Block" column; and

5) Multiply the block rate by the total average consumption represented by the block to estimate the monthly revenue from the block.

The total block revenues must add up the target average monthly revenue requirement of the class. Several trials may be required to arrive at a balanced set of block rates.

Table 6-2 calculates the percentage tariff increase for each block shown in Table 6-1. Table 6-3 calculates monthly water and wastewater bills for representative levels of water consumption in the blocks given in Table 6-1. No data inputs are required for Tables 6-2 or 6-3.

SECTION II

Sixth of October and Sheikh Zayed Cities Water and Wastewater Tariffs Study

A. Introduction

This case study has been prepared to illustrate the tariff adjustment methodology developed by the Legal, Institutional and Regulatory Reform II (LIRR-II) project for use by water and wastewater utilities in Egypt's new urban communities. The case study data herein represent LIRR-II's best efforts to determine the historic and projected demands of Sixth of October and Sheikh Zayed Cities and the historic and projected costs of utility service. The case study narrative represented by the numbered sections of this document is presented as if it were an actual application submitted by the utility for NUCA review and approval. Prior to the case study proper, however, we list some assumptions that guided the analysis.

The study is based on historical data for the years 2000 and 2001 and estimates for 2002 provided to LIRR-II by NUCA on May 12, 2002. (These data are shown in Annex A, NUCA Data). The study aims to identify the utility's revenue requirements for the five financial years 2002/2003 to 2006/2007.

A1. General Assumption

a) The water utilities of Sixth of October and Sheikh Zayed Cities will either formally merge or will operate jointly as though a single utility;

b) If necessary, funding will be provided to supplement the income of the utility during the first few years of the rate term so that it may undertake O&M activities at a "full funding" level and initiate the R&R program that is so essential to its programmed gains in efficiency (e.g., improved performance in collections). Note that based on the assumptions used in the present analysis, supplemental funding would not be required;

c) The government's preferred rate term is five years, an overall water rate increase of ten percent is to be effective throughout the full rate term and a consumption block — progressive/increasing schedule of rates is the desired approach for domestic customers; and

d) An increase in the surcharge on water bills for wastewater services will be made for all customer classes; currently at ten percent, 20 percent and 30 percent for various classes. The new surcharge rates will be increased to 35 percent for all customer classes with the exception that a 65 percent surcharge will be applied to the water bills of industrial users.

A2. Assumptions Underlying Projections

a) The projections of billed water consumption are based on demand projections for each user category, starting from historic levels;

b) In some instances, historic O&M accounts are characterized by wide fluctuations in value from year to year, making it extremely difficult to determine trends reliable enough for use in making projections. In such cases, projections were made in consideration of other known factors that would influence the projections, the professional judgment of the analyst(s) and information gathered while preparing similar forecasts for other water/wastewater utilities in Egypt and elsewhere;

c) O&M costs are estimated for both water and wastewater in consideration of historic trends and in recognition of changing circumstances. Major increases are expected for example, in connection with the assumption of operating responsibilities for the Sheikh Zayed water treatment plant;

d) Fixed asset values were constructed from book value information provided by the utility. The information provided consists primarily of plant infrastructure including water treatment plants, wastewater treatment plants and pumping stations. Associated facilities and equipment are included as well as some pipeline asset information. It is believed, however, that the values may be understated somewhat given the fact that much of the network asset value for both water and wastewater may not be included;

e) Data covering the account structure of residential accounts (for use in the Block Rate Calculation Worksheet) was derived from a combination of information provided by the utility and the professional judgment and experience of the analyst(s) gained in other Egyptian utilities. It is difficult, however, to reconcile the very low level of household consumption. The most likely reason for this stems from the large number of flats/units that have become water customers, but who spend little time at the Sixth of October premises and use little water. The worksheet is still useful, however, in demonstrating the methodology for preparing a block rate tariff schedule and how the approach can provide an affordable — lifeline type rate for levels of consumption up to and beyond 20 m^3 per month; and

f) The metering and customer account upgrade program is recommended for inclusion in the utility's R&R budget. Completion of this work will contribute substantially to the utility's ability to improve its collections, monitor and improve its operating performance, reduce losses, and improve service to its customers.

B. Service Area

The cities of Sixth of October and Sheikh Zayed are contiguous and have interconnected water systems. The interconnection of the water systems makes it appropriate to treat the cities as a single unit for tariff setting purposes.

The current (year 2002) population of the two towns is estimated at 230,283. The population is expected to grow to 382,718 by June 2007, the end of the five-year period for which these rates have been developed. These projections are based on the 1996 census data showing a population of about 35,000 and estimated growth rates obtained from the Development Authority. Other factors that were used to impute population include domestic water consumption and the number of premises connected to the electric power system.

C. Customer Classification

The current NUCA customer classification, issued in 1997, is shown in Exhibit 1 at the end of this section. The main classes are referred to in this case study as:

- residential (LE 0.30 per m^3, with ten percent wastewater surcharge)
- service (LE 0.40 per m^3, with 20 percent wastewater surcharge)
- commercial (LE 0.50 per m^3, with 20 percent wastewater surcharge)
- industrial/investment (LE 0.75 per m^3, with 30 percent wastewater surcharge)

Several specific types of user are treated as distinct from these main classes in this case study because of special features of their demand. These include:

- governmental users (LE 0.30 per m^3 currently exempt from wastewater surcharge)
- construction use (LE 0.75 m^3), which is inherently un-sewered
- municipal irrigation use, which is inherently un-sewered
- high-class residential use, referring mainly to southeastern luxury housing estates and treated by the utility as members of the LE 0.75 per m^3 class; these users currently have private wastewater systems

D. Demand Assumptions

Table 1[1] shows the reported water consumption of Sixth of October in FYs 1999/2000, 2001/2002 and 2002/2003, and the demand projections through the Year 2007. The relatively small percentage of residential demand in the total 2003-2007 water demand (16 percent) is noteworthy, as is the high percentage of bulk water supply during the period (47 percent). Residential wastewater flow however constitutes a greater percentage (41 percent) of the total 2003-2007 wastewater demand.

D1. Water Demand

The principal assumptions behind the demand projections are as follows:

D1a. Class Demands

The assumed demand projections between 2003 and 2007 were taken from the *Sixth of October and Sheikh Zayed Cities Water and Wastewater Final Pre-feasibility Study* dated April 2002 and are based on the following:

[1] All tables and exhibits appear at the end of this section.

a) Residential Demand: According to Sixth of October City and NUCA officials, population growth in the Sixth of October City area is expected to be significant in the coming years. Initially, the population was projected to grow at an average of ten percent per year, through 2015. A significant number of buildings have already been constructed and are awaiting occupancy. It is expected that the city will draw middle-class residents from the Cairo metropolitan area. As existing buildings are occupied and the amount of desirable land is reduced, the rate of growth has been assumed to decrease.

   Projected water usage for this sector began with an estimated per-capita consumption figure of 118 l/c/d. This figure was projected to grow to 180 l/c/d over the project period, as the rate of permanent occupancy increases. In addition, the rate of population growth in Sheikh Zayed is expected to be greater than Sixth of October's).

b) Commercial Demand: There are no accurate figures for existing commercial demand in Sixth of October and Sheikh Zayed cities. Sixth of October City's current commercial estimate is approximately 13 percent of residential demand, which is significantly lower than typical. The demand estimate for the Commercial Sector is driven by domestic demand: increased population will usually require more shops and other kinds of services. Commercial demand might typically be 25 percent of residential demand, or less. In the estimate for this sector, the commercial growth was projected to increase along with residential demand, but at a lower rate designed to bring commercial demand more within typical figures.

c) Service and Governmental Demand: The demand from these sources has been estimated to grow at a similar, though slightly lower, rate than that of the population, beginning at eight percent per year in 2000 and declining throughout the project period.

d) Industrial: The industrial category in Sixth of October City includes water required for factories, site construction (concrete production and wash down), a high-class residential area, and water amusement park, and so-called investment companies that are constructing other residential buildings. Each of these categories have been assumed to decline over the project period, as Sixth of October City "builds out" and less land is available for these activities.

e) Municipal Irrigation: Currently, municipal irrigation of green spaces requires over ten percent of current water usage. This is excessive and will certainly decrease if the municipality is charged the full cost of water for irrigation. However, additional green space will be created as Sixth of October City "builds out" and irrigation water will be required. To compensate for less water use per unit of land as more green space is created, LIRR-II projected essentially flat growth for municipal irrigation demand. In addition, to the reported planned raw water irrigation network.

f) Bulk Water Sales: Several large users outside the city boundaries begin to make water demands beginning in 2002/03. The actual demand is as yet undetermined; NUCA's planning estimates are applied and held constant throughout the rate term. It is

noteworthy that these users may account for approximately half the total water sales from 2003 on. Roughly, two-thirds of this demand is in the investment company class and one-third in the governmental class.

D1b. Unaccounted-for Water

UFW is defined as water that has been fully treated and pumped into the distribution system but is lost before it reaches the customer meter. Thus, this water produces no revenue. UFW losses are caused by leaks in pipes and valves, inaccurate meters and meter reading, theft (illegal connections), and un-metered uses such as fire fighting, flushing of water mains, and other public uses.

UFW losses in Sixth of October City have been approximated by city officials at six percent of all water produced, which is very low for developing countries. A 2003 UFW rate about 24 percent has been assumed. Modest decreases are projected over the rate term.

D2. Wastewater Flows

The wastewater flows projections exclude the water usage of the unsewered users such as construction and irrigation, as well as the majority of the high-class residential complexes, most of which are not presently connected to the public wastewater system. Rates of water-wastewater conversion for sewered classes are estimated at 80 percent.

E. Costs Development

Costs to be recovered through tariffs include O&M costs and the costs of the utility's renewal and replacement program.

E1. Operation and Maintenance Costs

O&M costs are developed in Tables 2-1 and 2-2. Wages and salaries are projected to increase by eight percent annually. It is assumed that the growth in labor cost derives from wage inflation and that current staffing levels will be stable throughout the tariff period. In any case, the cities rely extensively on O&M service contracts. Increases in commodity and service requirements are projected to grow in proportion to the growth if water production or wastewater flow.

E2. Capital Costs

It is understood that NUCA will continue to carry the debt service obligations of the utility throughout the rate term. Renewal and replacement costs have been calculated on two bases:

E2a. System Improvements Program

Principal utility objectives for the 2003-2007 period are to:

a) improve billing and revenue collection performance
b) develop and begin implementation of a program to identify, diagnose, and reduce sources of non-revenue water

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c) improve preventive maintenance

The investments proposed to support these objectives are listed in Table 3. Total cost is LE 18.2 million; this figure includes LE 12.65 million in customer metering expenses which would be recovered from the individual beneficiaries rather than through tariffs. (The tariff revenue requirements of the engineering and investment program are LE 5.5 million.) The investments are expected to improve the quality of service, contain the growth of O&M costs, and increase revenue collection. These improvements will contribute to a decline in O&M costs (in today's prices) for both water and wastewater over the rate term.

E2b. Normal Renewals and Replacements

Costs for normal renewal and replacement of facilities are estimated at 0.6 percent of the value of fixed assets in service, since the assets are young and in good condition. The value of fixed assets increases sharply in 2003, on the assumption that the Sixth of October wastewater plant and the Sheikh Zayed water plant are formally accepted by NUCA and so enter the fixed asset account.

F. Revenue Requirements

The total revenue requirements for the five-year rate term are estimated at LE 307,496,163, shown in the final column of the "Total Costs" row of Table 5-1. The breakdown of this total is as follows:

Water O&M costs	LE 203,475,556
Wastewater O&M costs	74,921,356
R&R costs	41,040669
Deduction for effluent sales	(11,941,418)

The total revenue billed through the revised tariffs is expected to equal LE 560,286,606. However, residual shortcomings in collection efficiency are expected to reduce the five-year cash yield of the tariff to LE 384,051,768. However the five-year operating income still amounts to LE 76,555,606.

G. Average Tariffs

The average water tariff for the term is LE 0.68 per m^3, the average wastewater tariff is LE 0.31 per m^3 water sold to sewered water users. 0.39. The average wastewater tariff has been increased dramatically, and is now sufficient to cover wastewater O&M costs with some surplus funding that can be applied to capital costs.

H. Tariff Rates Design

The tariff design has the following features:

a) Tariffs are increased for most classes of user and stable for the five year period

b) The tariff rate spreads between the existing NUCA tariff classes have been preserved
c) A block rate structure has been introduced into the residential class tariffs (see Table 6). Under this structure, water tariffs for up to 30 m^3 per month are actually lower than the current residential tariff. Exhibits 2 through 5 show the progression of tariffs for domestic and non-domestic users. Average year 2005 monthly household bills for the following representative levels of residential water consumption are shown in Table 6-3.

The city recognizes a need for special determinations of the wastewater bills of the investment companies. Several of these companies re-use their water. While this has been taken into account in estimating wastewater demand, costs, and tariffs, the billing system will have to be adapted to show the percentage of water consumption that should be the basis for the companies' wastewater charge. This percentage may be based on an average for similar companies or on case-by-case basis.

EXHIBIT 1: CURRENT NUCA WATER TARIFF SCHEDULE

Ministry of Housing, Utilities, and New Urban Communities
New Urban Communities Authority
Office of the Vice Chairman

Water Prices Tabulation for New City Agencies
(effective 1/1/1997)

Description	Price/ m3
Residential Authorities and departments Local administration units Religious establishments	0.30
Industrial (all factories) Construction works Private hospitals Free zone companies Tourism companies Investment companies Embassies	0.75
Sports clubs (A & B levels) Private voluntary associations Syndicates Political party premises Private schools Commercial establishments Offices Hotels, restaurants, casinos, cafés Gas stations Raw water	0.50
Public playgrounds Youth centers Societies Public hospitals, health insurance organization hospitals Garages Bakeries	0.40
Water sold at treatment plants, excluding of transmission costs	1.00

NUCA Vice Chairman for Economic, Financial, and Administrative Affairs
Eng. Youssef Hassan Tourky

Exhibit 2: Existing and Proposed Water and Wastewater Tariffs

(LE/m^3 of Water Consumed)

Customer Class	Water Tariff		Wastewater Tariff		Combined Water and Wastewater Tariff		
	Existing (2002)	Proposed (2003-2007)	Existing (2002)	Proposed (2003-2007)	Existing (2002)	Proposed (2003-2007)	Percentage +/-
Residential (Both Cities)							
0-10	0.300	**0.240**	0.030	**0.084**	0.330	**0.324**	-1.8%
>10-20	0.300	**0.260**	0.030	**0.091**	0.330	**0.351**	6.4%
>20-30	0.300	**0.280**	0.030	**0.098**	0.330	**0.378**	14.5%
>30-40	0.300	**0.320**	0.030	**0.112**	0.330	**0.432**	30.9%
>40-50	0.300	**0.360**	0.030	**0.126**	0.330	**0.486**	47.3%
>50-100	0.300	**0.410**	0.030	**0.144**	0.330	**0.554**	67.7%
>100	0.300	**0.460**	0.030	**0.161**	0.330	**0.621**	88.2%
Commercial (Both Cities)	0.500	**0.550**	0.100	**0.193**	0.600	**0.743**	23.8%
Government (Both Cities)	0.300	**0.330**	0.000	**0.116**	0.300	**0.446**	48.5%
Service (Both Cities)	0.400	**0.440**	0.080	**0.154**	0.480	**0.594**	23.8%
Municipal Irrigation (Both Cities)	0.300	**0.330**	0.000	**0.000**	0.300	**0.330**	10.0%
Factories (Sixth of October Only)	0.750	**0.825**	0.225	**0.536**	0.975	**1.361**	39.6%
Construction (Both Cities)	0.750	**0.825**	0.000	**0.000**	0.750	**0.825**	10.0%
Amusement Parks (Both Cities)	0.750	**0.825**	0.225	**0.289**	0.975	**1.114**	14.2%
Investment Companies (Both Cities)	0.750	**0.825**	0.225	**0.289**	0.975	**1.114**	14.2%
Bulk Water Sales	0.750	**0.825**			0.750	**0.825**	10.0%
Bulk Sale of Treated Effluent from Sixth of October WWTP			0.05	**0.055**	0.050	**0.055**	10.0%

Table 1-1: Cities Water Consumption and Demand by Customer Class (m^3/year)

Year	Historical Data				
	1998	1999	2000	2001	2002
Residential - Sixth of October City	[illegible]	[illegible]	10318865	13937585	16331943
Calculated Annual Increase %				6.0%	10.0%
Residential - Sheikh Zayed City	[illegible]	[illegible]	1521081	1612345	1773579
Calculated Annual Increase %				6.0%	10.0%
Commercial (Both Cities)	[illegible]	[illegible]	1296240	1374014	1511416
Calculated % of Residential Consumption			8.8%	8.8%	8.8%
Government (Both Cities)	[illegible]	[illegible]	1969498	2087657	2296423
Calculated Annual Increase %				6.0%	10.0%
Service (Both Cities)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calculated Annual Increase %					
Municipal Irrigation (Both Cities)	[illegible]	[illegible]	6200000	7632000	8395200
Calculated Annual Increase %				6.0%	10.0%
Factories (Sixth of October Only)	[illegible]	[illegible]	17696172	18757942	20633737
Calculated Annual Increase %				6.0%	10.0%
Construction (Both Cities)	[illegible]	[illegible]	816924	865939	952533
Calculated Annual Increase %				6.0%	10.0%
Amusement Parks (Both Cities)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calculated Annual Increase %					
Investment Companies (Both Cities)	[illegible]	[illegible]	450977	487570	536327
Calculated Annual Increase %				6.0%	10.0%
AAA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calculated Annual Increase %					
BBB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calculated Annual Increase %					
CCC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calculated Annual Increase %					
DDD	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calculated Annual Increase %					
Total Cities Water Consumption	0	0	44,108,541	46,755,052	51,430,558

Year	Projections				
	2003	2004	2005	2006	2007
Residential - Sixth of October City	16,864,477	18,550,925	20,406,018	22,446,619	24,691,281
Assumed Annual Increase %	10.0%	10.0%	10.0%	10.0%	10.0%
Residential - Sheikh Zayed City	2,305,653	2,997,349	3,896,553	4,870,691	6,088,364
Assumed Annual Increase %	40.0%	40.0%	40.0%	25.0%	25.0%
Commercial (Both Cities)	4,217,429	5,171,586	6,075,643	6,829,328	7,694,911
Assumed % of Residential Demand	22.0%	24.0%	26.0%	25.0%	25.0%
Government (Both Cities)	2,480,137	2,678,548	2,892,832	3,095,330	3,312,003
Assumed Annual Increase %	8.0%	8.0%	8.0%	7.0%	7.0%
Service (Both Cities)	583,200	629,856	680,244	727,862	778,812
Assumed Annual Increase %	8.0%	8.0%	8.0%	7.0%	7.0%
Municipal Irrigation (Both Cities)	8,563,104	8,734,366	8,909,053	9,087,234	9,268,979
Assumed Annual Increase %	2.0%	2.0%	2.0%	2.0%	2.0%
Factories (Sixth of October Only)	21,871,761	23,184,067	24,575,111	25,803,866	27,094,060
Assumed Annual Increase %	6.0%	6.0%	6.0%	5.0%	5.0%
Construction (Both Cities)	1,009,685	1,070,266	1,134,482	1,191,206	1,250,766
Assumed Annual Increase %	6.0%	6.0%	6.0%	5.0%	5.0%
Amusement Parks (Both Cities)	3,176,544	3,271,840	3,369,995	3,471,095	3,575,228
Assumed Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%
Investment Companies (Both Cities)	552,417	568,989	586,059	603,641	621,750
Assumed Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%
AAA	0	0	0	0	0
Assumed Annual Increase %	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BBB	0	0	0	0	0
Assumed Annual Increase %	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CCC	0	0	0	0	0
Assumed Annual Increase %	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DDD	0	0	0	0	0
Assumed Annual Increase %	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total Cities Water Demand	*61,624,406*	*66,857,791*	*72,525,990*	*78,126,873*	*84,376,155*

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Worksheet No. 1: Water Consumption Demand and Wastewater Flows

Table 1-2: Bulk Water Sales (m^3/year)

Year	Historical Data				
	1998	1999	2000	2001	2002
To Sheikh Zayed City			1,521,080	1,521,080	1,521,080
Investment Area and Shooting Club					
Jolly Ville and Pyramids Plateau					
Intelligent Village					
Giza Security Forces					
Ministry of Interior					
EEE					
FFF					
GGG					
HHH					
III					
Total Bulk Water Sale	0	0	1,521,080	1,521,080	1,521,080

Year	Projections				
	2003	2004	2005	2006	2007
To Sheikh Zayed City					
Investment Area and Shooting Club	18,250,000	18,250,000	18,250,000	18,250,000	18,250,000
Jolly Ville and Pyramids Plateau	18,250,000	18,250,000	18,250,000	18,250,000	18,250,000
Intelligent Village	365,000	365,000	365,000	365,000	365,000
Giza Security Forces	18,250,000	18,250,000	18,250,000	18,250,000	18,250,000
Ministry of Interior	9,490,000	9,490,000	9,490,000	9,490,000	9,490,000
EEE					
FFF					
GGG					
HHH					
III					
Total Bulk Water Sale	64,605,000	64,605,000	64,605,000	64,605,000	64,605,000

Table 1-3: Unaccounted-for Water (m^3/year)

Year	Historical Data				
	1998	1999	2000	2001	2002
Quantity (m^3/year)	0	0	2,853,709	2,823,868	1,798,362
Calculated %			5.9%	5.5%	3.3%

Year	Projections				
	2003	2004	2005	2006	2007
Quantity (m3/year)	19,781,679	21,190,222	22,694,128	24,133,432	25,727,571
% of Total Cities Water Demand	24.3%	24.1%	23.8%	23.6%	23.4%

Table 1-4: Water Treatment Plant Production (m^3/year)

Year	Historical Data				
	1998	1999	2000	2001	2002
Sixth of October Treatment Plant	0	0	48,483,330	51,100,000	54,750,000
Sheikh Zayed Treatment Plant					
Total Treatment Plant Production	0	0	48,483,330	51,100,000	54,750,000

Year	Projections				
	2003	2004	2005	2006	2007
Sixth of October Treatment Plant	76,934,313	82,269,271	87,779,937	93,106,285	98,823,702
Sheikh Zayed Treatment Plant	69,076,771	70,383,742	72,045,181	73,759,020	75,885,023
Total Required Treatment Plant Production	146,011,085	152,653,013	159,825,118	166,865,305	174,708,725

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[illegible]

Table 1-5: Wastewater Flow by Cutomer Class (m^3/year)

Year	Historical Data				
	1998	1999	2000	2001	2002
Residential - Sixth of October City					
% To Sewer	[illegible]	[illegible]	80.0%	80.0%	80.0%
Wastewater Flow	0	0	10,518,932	11,150,068	12,265,074
Residential - Sheikh Zayed City					
% To Sewer	[illegible]	[illegible]	80.0%	80.0%	80.0%
Wastewater Flow	0	0	1,216,864	1,289,876	1,418,863
Commercial (Both Cities)					
% To Sewer	[illegible]	[illegible]	80.0%	80.0%	80.0%
Wastewater Flow	0	0	1,036,992	1,099,211	1,209,133
Government (Both Cities)					
% To Sewer	[illegible]	[illegible]	80.0%	80.0%	80.0%
Wastewater Flow	0	0	1,575,590	1,670,126	1,837,138
Service (Both Cities)					
% To Sewer	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wastewater Flow	0	0	0	0	0
Municipal Irrigation (Both Cities)					
% To Sewer	0.0%	20.0%	40.0%	0.0%	0.0%
Wastewater Flow	0	0	0	0	0
Factories (Sixth of October Only)					
% To Sewer	[illegible]	[illegible]	80.0%	80.0%	80.0%
Wastewater Flow	0	0	14,156,938	15,006,354	16,506,990
Construction (Both Cities)					
% To Sewer	0.0%	0.0%	0.0%	0.0%	0.0%
Wastewater Flow	0	0	0	0	0
Amusement Parks (Both Cities)					
% To Sewer	[illegible]	[illegible]	10.0%	10.0%	10.0%
Wastewater Flow	0	0	0	0	0
Investment Companies (Both Cities)					
% To Sewer	[illegible]	[illegible]	80.0%	80.0%	80.0%
Wastewater Flow	0	0	367,978	390,056	429,062
AAA					
% To Sewer	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wastewater Flow	0	0	0	0	0
BBB					
% To Sewer	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wastewater Flow	0	0	0	0	0
CCC					
% To Sewer	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wastewater Flow	0	0	0	0	0
DDD					
% To Sewer	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wastewater Flow	0	0	0	0	0
Total Wastewater Flow (Both Cities)	0	0	28,873,294	30,605,690	33,666,260
Total Wastewater Flow (Sixth of October City Only)			25,346,079	26,866,843	29,553,528

Year	Projections				
	2003	2004	2005	2006	2007
Residential - Sixth of October City					
% To Sewer	80.0%	80.0%	80.0%	80.0%	80.0%
Wastewater Flow	13,491,582	14,840,740	16,324,814	17,957,295	19,753,025
Residential - Sheikh Zayed City					
% To Sewer	80.0%	80.0%	80.0%	80.0%	80.0%
Wastewater Flow	1,844,522	2,397,879	3,117,242	3,896,553	4,870,691
Commercial (Both Cities)					
% To Sewer	80.0%	80.0%	80.0%	80.0%	80.0%
Wastewater Flow	3,373,943	4,137,269	4,860,514	5,463,462	6,155,929
Government (Both Cities)					
% To Sewer	80.0%	80.0%	80.0%	80.0%	80.0%
Wastewater Flow	1,984,109	2,142,838	2,314,265	2,476,264	2,649,602
Service (Both Cities)					
% To Sewer	80.0%	80.0%	80.0%	80.0%	80.0%
Wastewater Flow	466,560	503,885	544,196	582,289	623,050
Municipal Irrigation (Both Cities)					
% To Sewer	0.0%	0.0%	0.0%	0.0%	0.0%
Wastewater Flow	0	0	0	0	0
Factories (Sixth of October Only)					
% To Sewer	80.0%	80.0%	80.0%	80.0%	80.0%
Wastewater Flow	17,497,409	18,547,254	19,660,089	20,643,093	21,675,248
Construction (Both Cities)					
% To Sewer	0.0%	0.0%	0.0%	0.0%	0.0%
Wastewater Flow	0	0	0	0	0
Amusement Parks (Both Cities)					
% To Sewer	10.0%	10.0%	10.0%	10.0%	10.0%
Wastewater Flow	317,654	327,184	337,000	347,110	357,523
Investment Companies (Both Cities)					
% To Sewer	80.0%	80.0%	80.0%	80.0%	80.0%
Wastewater Flow	441,933	455,191	468,847	482,913	497,400
AAA					
% To Sewer	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wastewater Flow	0	0	0	0	0
BBB					
% To Sewer	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wastewater Flow	0	0	0	0	0
CCC					
% To Sewer	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wastewater Flow	0	0	0	0	0
DDD					
% To Sewer	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wastewater Flow	0	0	0	0	0
Total Wastewater Flow (Both Cities)	39,417,713	43,352,239	47,626,967	51,848,979	56,582,468
Total Wastewater Flow (Sixth of October City Only)	32,544,899	35,266,486	38,264,697	41,279,603	44,608,091

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Worksheet No. 2: Water and Wastewater Operation and Maintenance Costs

Table 2-1: Water Facilities O&M Costs (LE/year)

Year	Historical Data				
	1998	1999	2000	2001	2002
Labor					
Number of Employees					
Total Wages			2,996,237	3,445,637	3,962,523
Annual Increase				15.00%	15.00%
Commodities					
Electricity			9,589,278	13,158,569	13,158,569
Fuel, Oil and Chemicals			1,235,758	1,297,546	1,362,423
Spare parts and Maintenance			524,271	550,485	578,009
Other Commodities					
Services					
Maintenance					
Transportation					
Other Services					
Other					
Total Water Supply O&M Costs	0	0	14,345,544	18,452,237	19,061,524

Year	Projections				
	2003	2004	2005	2006	2007
Labor					
Number of Employees					
Total Wages	6,295,200	6,798,816	7,342,721	7,930,139	8,564,550
Annual Increase		8.00%	8.00%	8.00%	8.00%
Commodities					
Electricity	21,567,374	22,548,456	23,607,852	24,647,761	25,806,317
Fuel, Oil and Chemicals	2,764,187	2,889,927	3,025,705	3,158,985	3,307,472
0	0	0	0	0	0
Spare parts and Maintenance		0	0	0	0
Other Commodities	0	0	0	0	0
0					
0					
0					
Services					
Maintenance	2,500,000	2,613,723	2,736,524	2,857,066	2,991,361
Transportation		0	0	0	0
Other Services	1,660,538	1,736,075	1,817,641	1,897,706	1,986,907
Other					
0					
0					
0					
0					
0					
0					
0					
Base Water Supply O&M Costs	28,492,098	29,788,181	31,187,721	32,561,519	34,092,057
Allowance for yearly inflation at					
2.5%	356,151	1,126,366	1,988,461	2,941,990	4,009,586
Total Water Supply O&M costs	**35,143,450**	**37,713,363**	**40,518,903**	**43,433,648**	**46,666,192**

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Worksheet No. 2: Water and Wastewater Operation and Maintenance Costs

Table 2-2: Wastewater Facilities O&M Costs (LE/year)

Year	Historical Data				
	1998	1999	2000	2001	2002
Labor					
Number of Employees					
Total Wages			1,626,993	1,871,042	2,161,698
Annual Increase				15.00%	15.00%
Commodities					
Electricity			7,413,947	8,239,941	7,935,683
Fuel, Oil and Chemicals			220,891	231,936	243,532
0					
Spare parts and Maintenance			990,802	1,040,542	1,092,859
Other Commodities					
0					
0					
0					
Services					
Maintenance					
Transportation					
Other Services					
Other					
0					
0					
0					
0					
0					
0					
0					
Total Wastewater O&M Costs	0	0	10,254,633	11,383,261	11,423,272

Year	Projections				
	2003	2004	2005	2006	2007
Labor					
Number of Employees					
Total Wages	1,828,500	1,974,780	2,132,762	2,303,383	2,487,654
Annual Increase		8.00%	8.00%	8.00%	8.00%
Commodities					
Electricity	7,997,971	8,666,806	9,403,622	10,144,541	10,962,523
Fuel, Oil and Chemicals	237,276	257,119	278,978	300,959	325,226
0	0	0	0	0	0
Spare parts and Maintenance		0	0	0	0
Other Commodities	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
Services					
Maintenance	1,800,000	1,950,526	2,116,352	2,283,101	2,467,193
Transportation		0	0	0	0
Other Services	150,000	162,544	176,363	190,258	205,599
Other	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
Base Wastewater O&M Costs	10,185,247	11,036,994	11,975,314	12,918,859	13,960,542
Allowance for yearly inflation at					
	127,316	417,336	763,520	1,167,242	1,641,907
Total Wastewater O&M Costs	12,141,063	13,429,111	14,871,596	16,389,483	18,090,103

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Worksheet No. 3: Capital Costs

Table 3-1: Capital Costs (LE/year)

Item	Historical Data					Total 1998-2002	Year of Tariff Effectiveness Period	Projections					Total 2003-2007
	1998	1999	2000	2001	2002			2003	2004	2005	2006	2007	
Fixed Asset Value[1]					216,991,504			1,076,387,093	1,080,888,093	1,085,492,093	1,338,112,093	1,340,732,093	
Engineering and Investment Program													
Survey/Install Primary Meters					0	0	1	1,035,000	0	0	0	0	1,035,000
Prepare/Calibrate Distribution System Model					0	0	1 - 2	230,000	230,000	0	0	0	460,000
Establish Computerized Customer Database and Billing System					0	0	1 - 5	936,000	1,234,000	90,000	90,000	90,000	1,440,000
Catalog System Assets in Computerized Database					0	0	2	0	1,840,000	0	0	0	1,840,000
Survey/Install Secondary Meters[2]					0	0	1 - 5						
Locate and Quantify Unaccounted-for Water					0	0	3 - 4	0	0	368,000	368,000	0	736,000
Total Investment & Engineering Program[2]						0		**2,201,000**	**2,304,000**	**458,000**	**458,000**	**90,000**	**5,511,000**
Normal R&R Program[3]	0	0	0	0	1,301,949			6,458,323	6,485,329	6,512,953	8,028,673	8,044,393	35,529,669
Total R&R and System Upgrade	**0**	**0**	**0**	**0**	**1,301,949**			**8,659,323**	**8,789,329**	**6,970,953**	**8,486,673**	**8,134,393**	**41,040,669**

Notes:

(1) Fixed asset value increased in 2003 to reflect inclusion of Sheikh Zayed water treatment plant and in 2006 to reflect additional wastewater treatment capacity expected to be placed in service. The values used are solely for the purpose of illustration and actual asset values should be substituted by the utility as the information becomes available.

(2) The cost of secondary meters and meter installation of LE 12 650 000 will be borne by the customers.

(3) Annual R&R expenditures are estimated at 0.6% of the value of fixed assets in service; the percentage may be adjusted according to the needs of the utility, or the utility may elect to prepare estimated R&R funding requirements without reference to the value of fixed assets in service.

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Worksheet No. 4: Tariff Revenue Analysis

Table 4-1: Water Tariffs (LE/m³)

Year	Historical Data				
	1998	1999	2000	2001	2002
Residential - Sixth of October City	[illegible]	[illegible]	0.400	0.300	0.300
Residential - Sheikh Zayed City	[illegible]	[illegible]	0.300	0.300	0.300
Commercial (Both Cities)	[illegible]	[illegible]	0.500	0.500	0.500
Government (Both Cities)	[illegible]	[illegible]	0.300	0.300	0.300
Service (Both Cities)	[illegible]	[illegible]	0.400	0.400	0.400
Municipal Irrigation (Both Cities)	[illegible]	[illegible]	0.300	0.300	0.300
Factories (Sixth of October Only)	[illegible]	[illegible]	0.750	0.750	0.750
Construction (Both Cities)	[illegible]	[illegible]	0.750	0.750	0.750
Amusement Parks (Both Cities)	[illegible]	[illegible]	0.750	0.750	0.750
Investment Companies (Both Cities)	[illegible]	[illegible]	0.750	0.750	0.750
AAA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BBB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CCC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DDD	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Bulk Water Sales					
To Sheikh Zayed City	[illegible]	[illegible]	0.750	0.750	0.750
Investment Area and Shooting Club	[illegible]	[illegible]	0.750	0.750	0.750
Jolly Ville and Pyramids Plateau	[illegible]	[illegible]	0.750	0.750	0.750
Intelligent Village	[illegible]	[illegible]	0.750	0.750	0.750
Giza Security Forces	[illegible]	[illegible]	0.750	0.750	0.750
Ministry of Interior	[illegible]	[illegible]	0.750	0.750	0.750
EEE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
FFF	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GGG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
HHH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
III	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Year	Projections				
	2003	2004	2005	2006	2007
Residential - Sixth of October City	0.330	0.330	0.330	0.330	0.330
Residential - Sheikh Zayed City	0.330	0.330	0.330	0.330	0.330
Commercial (Both Cities)	0.550	0.550	0.550	0.550	0.550
Government (Both Cities)	0.330	0.330	0.330	0.330	0.330
Service (Both Cities)	0.440	0.440	0.440	0.440	0.440
Municipal Irrigation (Both Cities)	0.330	0.330	0.330	0.330	0.330
Factories (Sixth of October Only)	0.825	0.825	0.825	0.825	0.825
Construction (Both Cities)	0.825	0.825	0.825	0.825	0.825
Amusement Parks (Both Cities)	0.825	0.825	0.825	0.825	0.825
Investment Companies (Both Cities)	0.825	0.825	0.825	0.825	0.825
AAA	0.000	0.000	0.000	0.000	0.000
BBB	0.000	0.000	0.000	0.000	0.000
CCC	0.000	0.000	0.000	0.000	0.000
DDD	0.000	0.000	0.000	0.000	0.000
Bulk Water Sales					
To Sheikh Zayed City	0.825	0.825	0.825	0.825	0.825
Investment Area and Shooting Club	0.825	0.825	0.825	0.825	0.825
Jolly Ville and Pyramids Plateau	0.825	0.825	0.825	0.825	0.825
Intelligent Village	0.825	0.825	0.825	0.825	0.825
Giza Security Forces	0.825	0.825	0.825	0.825	0.825
Ministry of Interior	0.825	0.825	0.825	0.825	0.825
EEE	0.000	0.000	0.000	0.000	0.000
FFF	0.000	0.000	0.000	0.000	0.000
GGG	0.000	0.000	0.000	0.000	0.000
HHH	0.000	0.000	0.000	0.000	0.000
III	0.000	0.000	0.000	0.000	0.000

Worksheet No. 4 Tariff Revenue Analysis

Table 4-2: Water Tariff Revenue (LE/year)

Year	Historical Data				
	1998	1999	2000	2001	2002
Residential - Sixth of October City	0	0	3,944,600	4,181,276	4,599,403
Residential - Sheikh Zayed City	0	0	456,324	483,704	532,074
Commercial (Both Cities)	0	0	648,120	687,007	755,708
Government (Both Cities)	0	0	590,846	626,297	688,927
Service (Both Cities)	0	0	0	0	0
Municipal Irrigation (Both Cities)	0	0	2,160,000	2,289,600	2,518,560
Factories (Sixth of October Only)	0	0	13,272,129	14,068,457	15,475,303
Construction (Both Cities)	0	0	612,693	649,454	714,400
Amusement Parks (Both Cities)	0	0	0	0	0
Investment Companies (Both Cities)	0	0	344,979	365,678	402,245
AAA	0	0	0	0	0
BBB	0	0	0	0	0
CCC	0	0	0	0	0
DDD	0	0	0	0	0
Total Water Tariff Revenue	**0**	**0**	**22,029,691**	**23,351,471**	**25,686,619**
Bulk Water Sales					
To Sheikh Zayed City	0	0	1,140,810	1,140,810	1,140,810
Investment Area and Shooting Club	0	0	0	0	0
Jolly Ville and Pyramids Plateau	0	0	0	0	0
Intelligent Village	0	0	0	0	0
Giza Security Forces	0	0	0	0	0
Ministry of Interior	0	0	0	0	0
EEE	0	0	0	0	0
FFF	0	0	0	0	0
GGG	0	0	0	0	0
HHH	0	0	0	0	0
III	0	0	0	0	0
Total Bulk Water Sale Revenue	**0**	**0**	**1,140,810**	**1,140,810**	**1,140,810**

Year	Projections				
	2003	2004	2005	2006	2007
Residential - Sixth of October City	5,565,278	6,121,805	6,733,986	7,407,384	8,148,123
Residential - Sheikh Zayed City	760,865	989,125	1,285,863	1,607,328	2,009,160
Commercial (Both Cities)	2,319,586	2,844,372	3,341,603	3,756,130	4,232,201
Government (Both Cities)	818,445	883,921	954,634	1,021,459	1,092,961
Service (Both Cities)	256,608	277,137	299,308	320,259	342,677
Municipal Irrigation (Both Cities)	2,825,824	2,882,341	2,939,988	2,998,787	3,058,763
Factories (Sixth of October Only)	18,044,203	19,126,855	20,274,466	21,288,190	22,352,599
Construction (Both Cities)	832,990	882,970	935,948	982,745	1,031,882
Amusement Parks (Both Cities)	2,620,649	2,699,268	2,780,246	2,863,654	2,949,563
Investment Companies (Both Cities)	455,744	469,416	483,499	498,004	512,944
AAA	0	0	0	0	0
BBB	0	0	0	0	0
CCC	0	0	0	0	0
DDD	0	0	0	0	0
Total Water Tariff Revenue	**34,500,192**	**37,177,210**	**40,029,540**	**42,743,940**	**45,730,874**
Bulk Water Sales					
To Sheikh Zayed City	0	0	0	0	0
Investment Area and Shooting Club	15,056,250	15,056,250	15,056,250	15,056,250	15,056,250
Jolly Ville and Pyramids Plateau	15,056,250	15,056,250	15,056,250	15,056,250	15,056,250
Intelligent Village	301,125	301,125	301,125	301,125	301,125
Giza Security Forces	15,056,250	15,056,250	15,056,250	15,056,250	15,056,250
Ministry of Interior	7,829,250	7,829,250	7,829,250	7,829,250	7,829,250
EEE	0	0	0	0	0
FFF	0	0	0	0	0
GGG	0	0	0	0	0
HHH	0	0	0	0	0
III	0	0	0	0	0
Total Bulk Water Sale Revenue	**53,299,125**	**53,299,125**	**53,299,125**	**53,299,125**	**53,299,125**

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Worksheet No. 4: Tariff Revenue Analysis

Table 4-3: Wastewater Tariffs (LE/m³ of Water Consumed)

Domestic Percentage of Water Tariff = 35%

Industrial Percentage of Water Tariff = 65%

Year	Historical Data					Projections				
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Residential - Sixth of October City	[illegible]	[illegible]	0.030	0.030	0.030	0.116	0.116	0.116	0.116	0.116
Residential - Sheikh Zayed City	[illegible]	[illegible]	0.030	0.080	0.030	0.116	0.116	0.116	0.116	0.116
Commercial (Both Cities)	[illegible]	[illegible]	0.100	0.100	0.100	0.193	0.193	0.193	0.193	0.193
Government (Both Cities)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.116	0.116	0.116	0.116	0.116
Service (Both Cities)	[illegible]	[illegible]	0.080	0.080	0.080	0.154	0.154	0.154	0.154	0.154
Municipal Irrigation (Both Cities)										
Factories (Sixth of October Only)	[illegible]	[illegible]	0.225	0.225	0.225	0.536	0.536	0.536	0.536	0.536
Construction (Both Cities)										
Amusement Parks (Both Cities)	[illegible]	[illegible]	0.225	0.225	0.225	0.289	0.289	0.289	0.289	0.289
Investment Companies (Both Cities)	[illegible]	[illegible]	0.225	0.225	0.225	0.289	0.289	0.289	0.289	0.289
AAA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.000	0.000	0.000	0.000	0.000
BBB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.000	0.000	0.000	0.000	0.000
CCC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.000	0.000	0.000	0.000	0.000
DDD	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.000	0.000	0.000	0.000	0.000
Bulk Sale of Treated Effluent from Sixth of October WWTP	[illegible]	[illegible]	0.050	0.050	0.050	0.055	0.055	0.055	0.055	0.055

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Worksheet No.4: Tariff Revenue Analysis

Table 4-4: Wastewater Tariff Revenue (LE/year)

Year	Historical Data				
	1998	1999	2000	2001	2002
Residential - Sixth of October City	0	0	394,460	418,128	459,940
Residential - Sheikh Zayed City	0	0	45,632	48,370	53,207
Commercial (Both Cities)	0	0	129,624	137,401	151,142
Government (Both Cities)	0	0	0	0	0
Service (Both Cities)	0	0	0	0	0
Municipal Irrigation (Both Cities)					
Factories (Sixth of October Only)	0	0	3,981,639	4,220,537	4,642,591
Construction (Both Cities)					
Amusement Parks (Both Cities)	0	0	0	0	0
Investment Companies (Both Cities)	0	0	103,494	109,703	120,674
AAA	0	0	0	0	0
BBB	0	0	0	0	0
CCC	0	0	0	0	0
DDD	0	0	0	0	0
Bulk Sale of Treated Effluent from Sixth of October WWTP	0	0	1,267,304	1,343,342	1,477,676
Total Wastewater Tariff Revenue	**0**	**0**	**5,922,153**	**6,277,482**	**6,905,230**

Year	Projections				
	2003	2004	2005	2006	2007
Residential - Sixth of October City	1,947,847	2,142,632	2,356,895	2,592,585	2,851,843
Residential - Sheikh Zayed City	266,303	346,194	450,052	562,565	703,206
Commercial (Both Cities)	811,855	995,530	1,169,561	1,314,646	1,481,270
Government (Both Cities)	286,456	309,372	334,122	357,511	382,536
Service (Both Cities)	89,813	96,998	104,758	112,091	119,937
Municipal Irrigation (Both Cities)					
Factories (Sixth of October Only)	11,728,732	12,432,456	13,178,403	13,837,323	14,529,190
Construction (Both Cities)					
Amusement Parks (Both Cities)	917,227	944,744	973,086	1,002,279	1,032,347
Investment Companies (Both Cities)	159,510	164,296	169,225	174,301	179,530
AAA	0	0	0	0	0
BBB	0	0	0	0	0
CCC	0	0	0	0	0
DDD	0	0	0	0	0
Bulk Sale of Treated Effluent from Sixth of October WWTP	1,789,969	1,939,657	2,104,558	2,270,378	2,453,445
Total Wastewater Tariff Revenue	**17,997,712**	**19,371,878**	**20,840,660**	**22,223,678**	**23,733,305**

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Worksheet 5-1: Water and Wastewater Tariff Analysis

Table 5-1: Water and Wastewater Tariff Analysis

Year	Historical Data					Projections					Total 2003-2007
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Water Services											
Total Billed Water Consumption (m^3/year)	0	0	45,629,621	48,276,132	52,951,638	126,229,406	131,462,791	137,130,990	142,731,873	148,981,155	686,536,215
Total Water Revenue (LE/year	0	0	23,170,501	24,492,281	26,827,429	87,799,317	90,476,335	93,328,665	96,043,065	99,029,999	466,677,381
Average Water Tariff (LE/m^3)			0.51	0.51	0.51	0.70	0.69	0.68	0.67	0.66	0.68
Unaccunted-for Water (m^3/year)	0	0	2,853,709	2,823,868	1,798,362	19,781,679	21,190,222	22,694,128	24,133,432	25,727,571	113,527,031
Water Production (m^3/year)	0	0	48,483,330	51,100,000	54,750,000	146,011,085	152,653,013	159,825,118	166,865,305	174,708,725	800,063,246
Water O&M Costs (LE/year)	0	0	14,345,544	18,452,237	19,061,524	35,143,450	37,713,363	40,518,903	43,433,648	46,666,192	203,475,556
Water Cost/m^3 produced			0.30	0.36	0.35	0.24	0.25	0.25	0.26	0.27	
Water Cost/m^3 sold			0.31	0.38	0.36	0.28	0.29	0.30	0.30	0.31	
Wastewater Services											
Total Wastewater Service Usage (m^3/year)	0	0	28,873,294	30,605,690	33,666,260	39,417,713	43,352,239	47,626,967	51,848,979	56,582,468	238,828,366
Total Wastewater Revenues (LE/year)	0	0	4,654,849	4,934,140	5,427,554	16,207,743	17,432,221	18,736,102	19,953,300	21,279,860	93,609,225
Wastewater O&M Cost (LE/year)	0	0	10,254,633	11,383,261	11,423,272	12,141,063	13,429,111	14,871,596	16,389,483	18,090,103	74,921,356
Wastewater Cost/m^3 collected			0.36	0.37	0.34	0.31	0.31	0.31	0.32	0.32	
WW Cost/m^3 of water billed to sewered customers			0.28	0.30	0.27	0.25	0.25	0.25	0.25	0.26	
Tariff Analysis											
Total O&M cost (LE/year)	0	0	24,600,177	29.835,498	30,484,796	47,284,512	51,142,474	55,390,500	59,823,132	64,756,295	278,396,912
Deduction for effluent sales (LE/year)	0	0	1,267,304	1,343,342	1,477,676	1,789,969	1,939,657	2,104,558	2,270,378	2,453,445	11,941,418
Net O&M Costs (LE/year)	0	0	23,332,873	28,492,156	29,007,120	45,494,543	49,202,817	53,285,941	57,552,754	62,302,850	266,455,494
Total R&R (LE/year)	0	0	0	0	0	8,659,323	8,789,329	6,970,953	8,486,673	8,134,393	41,040,669
Total Costs Including R&R (LE/year)	0	0	23,332,873	28,492,156	29,007,120	54,153,865	57,992,146	60,256,894	66,039,426	70,437,243	307,496,163
Total Revenue (LE/year)	0	0	27,825,350	29,426,421	32,254,983	104,007,060	107,908,556	112,064,767	115,996,365	120,309,859	560,286,606
Collection Efficiency Rate			51%	56%	52%	55%	60%	65%	75%	85%	
Net Revenue Collection - Cash (LE/year)			14,168,598	16,381,926	16,686,529	57,203,883	64,745,134	72,842,099	86,997,274	102,263,380	384,051,768
Net Income	**0**	**0**	**-9,164,335**	**-12,110,430**	**-12,320,591**	**3,050,017**	**6,752,988**	**12,585,205**	**20,957,847**	**31,826,137**	**76,555,606**

Proposed Tariff Increase 10%

Assumptions

1- Sheikh Zayed water treatment plant becomes operational in May 2002.

2- Wastewater flows to new WWTP serving southeastern Sixth of October area begin in FY 2007.

3- Sheikh Zayed wastewater is conveyed to an external utility (Abu Rawash WWTP) for treatment. Abu Rawash does not charge Sheikh Zayed for this service at present.

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Worksheet No. 6: Block Rate Design for Residential Customer Class

Table 6-1: Block Rate Design for Residential Customer Class [1]

Estimated Accounting Data 2001					Estimated Average Accounting Data 2003 - 2007 (Use 2005 Numbers)				
Residential Consumers - Water					**Residential Consumers - Water**				
Consumption Block (m^3/month)	Estimated Percentage Breakdown of Customers	No. of Customers by Block	Average Consumption (m^3/month)	Average Consumption Per Block (m^3/month)	No. of Customers by Block	Average Consumption (m3/month)	Change from Average Tariff	**Target Average Tariff (2005) (LE)** **0.33**	Tariffs Per Consumption Block (LE/m^3)
0-10	20.00%	10,018	20,036	200.00%	14,667	29,335	-9.00%	7,040	0.240
>10-20	25.00%	12,523	150,270	1200.00%	18,334	220,010	-7.00%	57,203	0.260
>20-30	20.00%	10,018	220,396	2200.00%	14,667	322,682	-5.00%	90,351	0.280
>30-40	15.00%	7,514	240,432	3200.00%	11,001	352,016	-1.00%	112,645	0.320
>40-50	10.00%	5,009	215,387	4300.00%	7,334	315,348	5.00%	113,525	0.360
>50-100	5.00%	2,505	187,838	7500.00%	3,667	275,013	8.00%	112,755	0.410
>100	5.00%	2,505	262,973	10500.00%	3,667	385,018	13.00%	177,108	0.460
Totals	**100.00%**	50,090	1,295,828	25.9	73,337	1,899,422		8,047,537	
		Check	*1,297,331*			**Target Revenue (2005)**		8,019,848	
Residential Consumers - Wastewater					**Residential Consumers - Wastewater**				
Consumption Block (m3/month)		No. of Customers by Block	Average Consumption (m3/month)	Average Consumption Per Block (m3/month)	No. of Customers by Block	Average Consumption (m3/month)	Change from Average Tariff	**Target Average Tariff (2005) (LE)** **0.12**	Tariffs Per Consumption Block (LE/m3)
0-10		10,018	20,036	2.0	14,667	29,335	-0.03	2,464	0.08
>10-20		12,523	150,270	12.0	18,334	220,010	-0.02	20,021	0.09
>20-30		10,018	220,396	22.0	14,667	322,682	-0.02	31,623	0.10
>30-40		7,514	240,432	32.0	11,001	352,016	0.00	39,426	0.11
>40-50		5,009	215,387	43.0	7,334	315,348	0.01	39,734	0.13
>50-100		2,505	187,838	75.0	3,667	275,013	0.03	39,464	0.14
>100		2,505	262,973	105.0	3,667	385,018	0.05	61,988	0.16
Totals		50,090	1,297,331	25.9	73,337	1,899,422		2,816,638	
						Target Revenue (2005)		2,806,947	

Table 6-2: Residential Class Tariffs, Water/Wastewater (LE/m^3)

Consumption Block (m3/month)	Current (2002)			2003 - 2007			Percentage +/-
	Water	Wastewater	Total	Water	Wastewater	Total	
0-10	0.30	0.03	0.33	0.24	0.08	0.32	-1.82%
>10-20	0.30	0.03	0.33	0.26	0.09	0.35	6.36%
>20-30	0.30	0.03	0.33	0.28	0.10	0.38	14.55%
>30-40	0.30	0.03	0.33	0.32	0.11	0.43	30.91%
>40-50	0.30	0.03	0.33	0.36	0.13	0.49	47.27%
>50-100	0.30	0.03	0.33	0.41	0.14	0.55	67.73%
>100	0.30	0.03	0.33	0.46	0.16	0.62	88.18%

Notes:

(1) In developing block rate calculations *"Estimated Accounting and Consumption Data"* were used.

Worksheet No. 6: Block Rate Design for Residential Customer Class

Table 6-3: Representative Monthly Bills for Residential Use (LE/month)

Water Consumption (m^3/month)	Current (2002)			2003 - 2007			Percentage +/-
	Water	Wastewater	Total	Water	Wastewater	Total	
10	3.00	0.30	3.30	2.40	0.84	3.24	-1.82%
20	6.00	0.60	6.60	5.20	1.82	7.02	6.36%
30	9.00	0.90	9.90	8.40	2.94	11.34	14.55%
40	12.00	1.20	13.20	12.80	4.48	17.28	30.91%
50	15.00	1.50	16.50	18.00	6.30	24.30	47.27%
100	30.00	3.00	33.00	41.00	14.35	55.35	67.73%
120	36.00	3.60	39.60	55.20	19.32	74.52	88.18%

NUCA Data

تحليل التعريفة لمدينتى السادس من أكتوبر والشيخ زايد

البيان / السنوات	2000	2001	2002	2003	2004	2005	2006	2007	2007-2003
كمية المياه المنتجة	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
إستهلاك المياة (م3)									
منزلى (مدينة السادس من أكتوبر)	13148665	13937584.9	15331343.39	16864477.73	18550925.5	20406018.05	22446619.86	24691281.84	102959323
منزلى (مدينة الشيخ زايد)	1521080	1612344.8	1773579.28	1950937.208	2146030.929	2360634.022	2596697.424	2856367.166	11910666.75
تجارى	1296240	1374014.4	1511415.84	1662557.424	1828813.166	2011694.483	2212863.931	2434150.324	10150079.33
منشآت حكومية بها عدادات	1969488	2087657.28	2296423.008	2526065.309	2778671.84	3056539.024	3362192.926	3698412.219	15421881.32
خدمات إستثمارى	459972	487570.32	536327.352	589960.0872	648956.0959	713851.7055	785236.8761	863760.5637	3601765.328
مصانع (مدينة السادس من أكتوبر)	17696172	18757942.32	20633736.55	22697110.21	24966821.23	27463503.35	30209855.69	33230839.03	138568127.5
النشاءات	816924	865939.44	952533.384	1047786.722	1152565.395	1267821.934	1394604.128	1534064.54	6396842.719
رى البلدية	7200000	7632000	8395200	9234720	10158192	11174011.2	12291412.32	13520553.55	56378889.07
إجمالى إستهلاك المياة (م3)	44108541	46755053	51430559	56573615	62230976	68454074	75299481	82829429	345387575
هالك المياة	4374789	4344947	3319441	3651985	4016524	4418176	4859994	5345993	22292072
نسبة الهالك من المياة المنتجة %	9.02%	8.50%	6.06%	6.06%	6.06%	6.06%	6.06%	6.06%	6.06%
نسبة الهالك من المياة المستهلكة %	9.92%	9.29%	6.45%	6.45%	6.45%	6.45%	6.45%	6.45%	6.45%

تعريفة المياة (جنيه/م3)

15												
16												
17	منزلى (مدينة السادس من أكتوبر)	0.3	0.3	0.3								
18	منزلى (مدينة الشيخ زايد)	0.3	0.3	0.3								
19	تجارى	0.5	0.5	0.5								
20	منشآت حكومية بها عدادات	0.3	0.3	0.3								
21	خدمات إستثمارى	0.4	0.4	0.4								
22	مصانع (مدينة السادس من أكتوبر)	0.75	0.75	0.75								
23	إنشاءات	0.75	0.75	0.75								
24	رى البلدية	0	0	0								
25												
26	متوسط تعريفة المياة	0.446822775	0.446822775	0.4468228	0	0	0	0	0	0		
27												
28	إيرادات المياة (جنيه)											
29												
30	منزلى (مدينة السادس من أكتوبر)	4599403.017	4181275.47	3944599.5	0	0	0	0	0	0		
31	منزلى (مدينة الشيخ زايد)	532073.784	483703.44	456324	0	0	0	0	0	0		
32	تجارى	755707.92	687007.2	648120	0	0	0	0	0	0		
33	منشآت حكومية بها عدادات	688926.9024	626297.184	590846.4	0	0	0	0	0	0		
34	خدمات إستثمارى	214530.9408	195028.128	183988.8	0	0	0	0	0	0		
35	مصانع (مدينة السادس من أكتوبر)	15475302.41	14068456.74	13272129	0	0	0	0	0	0		
36	إنشاءات	714400.038	649454.58	612693	0	0	0	0	0	0		
37	رى البلدية	0	0	0	0	0	0	0	0	0		
38												
39	إجمالى إيرادات المياة	27980345.02	20891222.74	19708701	0	0	0	0	0	0		

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إستخدام خدمة الصرف الصحي (م3)

منزلي (مدينة السادس من أكتوبر)	10518932	11150067.92	12265074.71	13491582.18	14840740.4	16324814.44	17957295.89	19753025.47	82367458.39	
منزلي (مدينة الشيخ زايد)	1216864	1289875.84	1418863.424	1560749.766	1716824.743	1888507.217	2077357.939	2285093.733	9528533.399	
تجاري	1036992	1099211.52	1209132.672	1330045.939	1463050.533	1609355.586	1770291.145	1947320.26	8120063.463	
منشآت حكومية بها عدادات	1575590.4	1670125.824	1837138.406	2020852.247	2222937.472	2445231.219	2689754.341	2958729.775	12337505.05	
خدمات إستثماري	367977.6	390056.256	429061.8816	471968.0698	519164.8767	571081.3644	628189.5009	691008.4509	2881412.263	
مصانع (مدينة السادس من أكتوبر)	14156938	15006353.86	16506989.24	18157688.17	19973456.98	21970802.68	24167882.95	26584671.24	110854502	
الشاءات	653539.2	692751.552	762026.7072	838229.3779	922052.3157	1014257.547	1115683.302	1227251.632	5117474.175	
ري البلدية	0	0	0	0	0	0	0	0	0	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]										
منزلي (مدينة السادس من أكتوبر) 10%	0.03	0.03	0.03	0	0	0	0	0		
منزلي (مدينة الشيخ زايد) 10%	0.03	0.03	0.03	0	0	0	0	0		
تجاري 30%	0.15	0.15	0.15	0	0	0	0	0		
منشآت حكومية بها عدادات (معفاه)	0	0	0	0	0	0	0	0		
خدمات إستثماري 30%	0.12	0.12	0.12	0	0	0	0	0		
مصانع (مدينة السادس من أكتوبر) 30%	0.225	0.225	0.225	0	0	0	0	0		
الشاءات	0	0	0	0	0	0	0	0		
ري البلدية (صفر)	0	0	0	0	0	0	0	0		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]										
منزلي (مدينة السادس من أكتوبر)	315567.96	334502.0376	367952.2414	0	0	0	0	0		
منزلي (مدينة الشيخ زايد)	0	0	0	0	0	0	0	0		
تجاري	155548.8	164881.728	181369.9008	0	0	0	0	0		
منشآت حكومية بها عدادات	0	0	0	0	0	0	0	0		
خدمات إستثماري	44157.312	46806.75072	51487.42579	0	0	0	0	0		
مصانع (مدينة السادس من أكتوبر)	3185311	3376429.618	3714072.579	0	0	0	0	0		
الشاءات	0	0	0	0	0	0	0	0		
ري البلدية	0	0	0	0	0	0	0	0		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
كمية المياة الغير محاسب عليها (م3)	11574789	11976947	11714641	12886105	14174716	15592187	17151406	18866347	78670962	
نسبة المياة الغير محاسب عليها إلى إجمالي الانتاج (هالك + مياة الري) %	23.9%	23.4%	21.4%	21.4%	21.4%	21.4%	21.4%	21.4%	21.4%	

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بيانات الاحتياج

	2000	2001	2002	2003	2004	2005	2006	2007
مبيعات المياة بالجملة								
الى مدينة الشيخ زايد	1521080	1521080	1521080	0	0	0	0	0
المنطقة الاستثمارية (ك 14.5 - ك 28.5)	0	0	0	18250000	18250000	18250000	18250000	18250000
مضيةالأهرامات	0	0	0	18250000	18250000	18250000	18250000	18250000
القرية الذكية	0	0	0	3650000	3650000	3650000	3650000	3650000
قوات أمن الجيزة	0	0	0	1825000	1825000	1825000	1825000	1825000
وزارة الداخلية	0	0	0	9490000	9490000	9490000	9490000	9490000
اجمالى مبيعات المياة بالجملة (م3/يوم)	1521080	1521080	1521080	51465000	51465000	51465000	51465000	51465000
اجمالى كمية المياة غير المحاسبة	11574789	11976947	11714641	12886105	14174716	15592187	17151406	18866547
حجم الانتاج اليومى وفقا لنوعية المشتركين								
منازل فى مدينة السادس من اكتوبر	13148665	13937585	15331343	16864478	18550926	20406018	22446620	24691282
منازل فى مدينة الشيخ زايد	1521080	1612345	1773579	1950937	2146031	2360634	2596697	2856367
مجارى فى مدينة 6 اكتوبر (م3/يوم)	1296240	1374014	1511416	1662557	1828813	2011694	2212864	2434150
منشآت حكومية بها عدادات	1969488	2087657	2296423	2526065	2778672	3056539	3362193	3698412
خدمات استثمارى	459972	487570	536327	589960	648956	713852	785237	863761
رى البلدية	7200000	7632000	8395200	9234720	10158192	11174011	12291412	13520554
مصانع (مدينة السادس من اكتوبر)	17696172	18757942	20633737	22697110	24966821	27463503	30209854	33230839
انشاءات	816924	865939	952533	1047787	1152565	1267822	1394604	1534065
اجمالى الاحتياجات	44109541	46758053	51430559	56573615	62230976	68453074	75299481	82829429

الجدول 2-1 تكاليف التشغيل و الصيانة - مياة الشرب

	2000	2001	2002	2003	2004	2005	2006	2007
الأجور و المرتبات	2996237	3445673	3962523	6295200	6295200	6295200	6295200	6295200
كهرباء	9589278	13158569	13158569	21567374	22265443	22999000	23707080	24473665
وقود زيوت بما فى ذلك الكيماويات (ملحوظة1)	1235758	1297546	1362423					
قطع غيار بما فى ذلك بدل الضريبة الداخلية (ملحوظة2)	524271	550485	578009					
اجمالى عناصر التكلفة لمرافق المياة	14345544	18452272	19061524	27862574	28560643	29294200	30002280	30768865
بدل تضخم سنويا 2.5%				696564	731866	769430	807729	849077
اجمالى تكاليف التشغيل و الصيانة التغيرية لمياة الشرب	14345544	18452272	19061524	28559138	29292509	30063630	30810009	31617942

الجدول 2-2 تكاليف التشغيل و الصيانة - الصرف الصحى

	2000	2001	2002	2003	2004	2005	2006	2007
الأجور و المرتبات (ملحوظه1)	1626993	1871042	2151698	1828500	1828500	1828500	1828500	1828500
كهرباء	7415947	8239941	7935683	7997971	8065956	8136752	8205045	8278405
وقود و زيوت بما فى ذلك الكيماويات	220891	231936	243532					
قطع غيار بما فى ذلك بدل الصيانة الداخلية	990802	1040342	1092359	237276	258794	280311	303844	327376
جملة عناصر التكلفة لمرافق الصرف الصحى	10254633	11383261	11423273	10063747	10153250	10245563	10337389	10434281
بدل تضخم سنويا 2.5%				150172	457503	778077	1110780	1456392
[illegible]	10254633	11383261	11423273	10213919	10610753	11023640	11448169	11890673
[illegible]	5461017	6041577	6044797	5377304	5590352	5741987	5920352	6150615
تكلفهم3/كميه المياه المنتجه	0.51	0.58	0.56					
تكلفه م3/ المياه المحاسب عليها	0.67	0.76	0.71					
تكلفه م3/المياه المستهلكه	0.56	0.64	0.59					

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The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-funded Project

BEHEIRA WATER SUPPLY TARIFFS STUDY

May 30, 2002

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

CHEMONICS EGYPT

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ACRONYMS

AWGA	Alexandria Water General Authority
BWC	Beheira Water Company
CAPMAS	Central Agency for Population Mobilization and Statistics
FY	Fiscal Year
GOE	Government of Egypt
LE	Egyptian Pound
LIRR-II	Legal, Institutional and Regulatory Reform II Project
MHUUC	Ministry of Housing, Utilities and New Urban Communities
NOPWASD	National Organization for Potable Water and Sanitary Drainage
NUCA	New Urban Communities Authority
O&M	Operations and Maintenance
R&R	Renewal and Replacement
UFW	Unaccounted-for Water
WTP	Water Treatment Plant

SECTION I

Introduction

This report is the second in a series of four tariff studies conducted in Egyptian utilities that represent a range of physical, economic, and organization conditions found in the sector. The present study addresses water supply in Beheira Governorate.

A. Background and Purpose

The objectives of the Government of Egypt (GOE) water/wastewater sector reform program are to improve the performance of utilities, increase the level of utility cost recovery, and promote service expansion through internal utility cash generation and private sector participation.

The establishment of a regulatory agency is a key element in implementation of the reform program. The existence of an impartial regulator provides assurance to the private sector that justifiable tariff requirements will be approved. Review of tariff applications submitted by government-owned utilities provides a mechanism for economic regulation of these utilities, as well as the systematic increase of tariffs in a transparent manner that increases utility accountability, improves utility financial viability, and protects the interests of consumers.

As part of Legal, Institutional and Regulatory Reform II (LIRR-II) project, assistance to the Ministry of Housing, Utilities, and New Urban Communities (MHUUC), tariff studies are being conducted in four utilities. The purposes of these studies are to develop a basic tariff-setting methodology; adapt the basic model to a range of situations; assist the GOE to assess the tariff implications of various assumptions regarding efficiency, affordability, and other regulatory concerns; and assess personnel and logistical requirements of the regulatory agency with respect to its tariff analysis functions.

B. The Beheira Tariff Study

The present tariff study considers Beheira Governorate water supply. Two tariff models have been developed for this study. The first adopts the cash needs approach to defining revenue requirements. This is the approach that LIRR-II has recommended for new urban communities and most provincial utilities. The second applies a "utility" approach to defining revenue requirements. Although the utility approach is generally applied to privately-owned utilities, it has been demonstrated in this study in recognition of the Beheira Water Company's (BWC's) status as a Law 97/1983 public sector company in which up to 49 percent private ownership is permitted. (The differences between these approaches are reviewed in Section C1., below.)

C. Tariff Analysis Principles and Methodology

This section provides a general discussion of tariff analysis principles and methodology, as well as some general policy assumptions used in the Legal, Institutional and Regulatory Reform II (LIRR-II) study.

C1. Approach to Determining Revenue Requirements

A utility's revenue requirements can be defined in two ways: the *cash needs* approach and the *utility* approach. The two approaches reflect different patterns of utility capital financing and ownership. (The difference between the two approaches is unrelated to the difference between cash-based and accrual-based accounting.)

The *cash-needs approach* is used for government-owned utilities. The utility approach is for privately-owned (investor-owned) utilities.

Under the cash-needs approach, the revenue requirements consist of:

a) Operation and Maintenance (O&M) expenses
b) Capital expenditure financed through current revenue. This category includes routine renewal and replacement projects, "small" expansion and upgrading projects, management system improvements, efficiency improvement projects, *et cetera*. The common feature of these projects are that they are relatively small and can be implemented relatively quickly
c) Debt service (interest and repayment of principal) on loans taken, usually for large, multi-year projects

The *utility approach* reflects the need of privately-owned utilities to attract capital to replace and expand facilities. Under the utility approach, the revenue requirements are defined as:

a) O&M expenses
b) Depreciation: depreciation is a non-cash expense that recognizes the portion of capital assets used up during a time period
c) Taxes: income taxes, general property taxes, gross receipt taxes, *et cetera*
d) Return on rate base. *Rate base* refers to the amount of capital invested by the utility to provide utility services. This capital is defined as the value of all plant "used and useful" in providing water (or wastewater) service. From this value is deducted: accumulated depreciation, accumulated deferred income taxes, and grants or other contributions in aid of construction. This return is usually stated as a percentage or rate. The rate of return on capital is what the utility can offer to attract new investment.

It will be noted that the utility approach makes no distinction between the revenue requirements of small vs. large projects.

The cash needs approach is more appropriate under the current system of utility capital financing and ownership in Egypt. In the first place, major capital works are mostly funded by government loans or soft loans from development banks. In the second place, as long as debt service continues to be born by the central government, the government would likely wish to continue to have approval authority over new investments. Finally, it is easier to separate the revenue requirements of small projects from large projects under the cash needs approach. This is important in view of the GOE's intention, as understood by LIRR-II, to continue to carry most

utilities' debt service through the coming tariff period to lessen the impact of tariff increases on the ordinary citizen's ability to afford an adequate supply of water and wastewater services.

C2. Approach to Setting Cost Recovery Targets

Hence, the general cost recovery target for the first cycle of rate applications includes O&M and renewal and replacement (R&R) (small project) expenses. However, individual utilities are free to propose higher or lower targets for cost recovery based on their circumstances.

C3. Expenses Excluded from Tariff Revenue Requirements

It should also be noted that under both cash-needs and utility approaches, various expenses may be excluded from the tariff revenue requirement. For example, many utilities engage in some income-generating activities (such as sale of workshop products) that are peripheral to their core water/wastewater service delivery mission. There is no justification for recovering these expenses through tariffs. The accounts of most Egyptian utilities do not clearly distinguish such peripheral expenses from core business expenses, but generally do distinguish the revenues generated by these enterprises from tariff revenues, so the method adopted in the LIRR-II case studies is to deduct projected enterprise revenues from the total tariff revenue requirement.

C4. Approach to Economic Regulation of Government-Owned Utilities

Utilities will be expected to propose improvements in efficiency that keep the need for tariff increases to a minimum, and to propose improvements in the quality of service which will increase customers' willingness to pay higher tariffs.

Since improvements in efficiency may require several years to achieve and because higher tariffs may need to increased gradually, the cost recovery target may not be achieved until the second or third year of the rate term.

C5. Approach to Tariff Rate Design

Tariff rate design is largely governed by the objective of assuring that a basic level of service (e.g., 20 m3 per month) should be affordable to all households. At the same time, rates for nondomestic use should not be set at exorbitant levels.

The utility's rate design strategy is typically influenced by local patterns of demand. Where there is significant nondomestic use, rate increases for domestic use can usually be minimized without setting excessively high rates for non-domestic use. However, where demand is overwhelmingly domestic, utilities will usually need also to adopt an inclining (progressive) block rate structure for domestic tariffs. Such structures enable cross-subsidization of low-volume (presumably low-income) domestic users by high-volume (presumably higher-income) domestic users.

Beheira Water Supply Tariffs Analysis

The BWC, established in 1981, is responsible for the supply, treatment, and distribution of safe drinking water in Beheira Governorate. BWC operates nine conventional water treatment plants, 92 groundwater pumping stations, and 38 compact units that collectively produced 167,013,955 m^3 of water in fiscal year (FY) 2000/01. This production was augmented by 7,790,034 m^3 in bulk water purchases. BWC also maintains approximately 6000 kms of transmission and distribution lines and operates 16 district centers for network maintenance, new connections, billing, and collection.

As a public sector company, BWC should be financially self-sustaining. In FY 2000/01, revenues from water tariffs (Egyptian pound (LE) 42,106,592), fixed charges (LE 2,862,284), and non-tariff sources (LE 19,682,968) were equivalent to LE 64,651,844 against O&M costs of LE 57,125,158. When FY 2000/01 company capital expenditure of LE 15,294,663 is included (excluding debt service on large facilities implemented through National Organization of Potable Water and Sanitary Drainage ((NOPWASD) and a World Bank loan), total FY 2001 expenditures are increased to 72,419,821, leaving a cash deficit of LE 7,767,977.

If collections rather than revenues, are examined, the BWC financial position appears somewhat weaker. Collections from all revenue sources were LE 53,094,842, increasing the actual cash deficit to LE 19,324,979.

Consumption-based water tariff charges are the largest source, constituting 65 percent of FY 2001 revenue. The second source of income includes various non-tariff revenues (30 percent), followed by fixed-charge revenues (four percent).

The study estimates revenue requirements under the Cash Needs and Utility approaches and develops revised tariff structures which achieve the cost recovery target by 2004 and 2005 respectively. Under the Cash Needs approach, the costs to be recovered are O&M costs, the Company capital plan costs, and a working capital requirement. The average rate term tariff is LE 0.40 per m3, compared to an estimated LE 0.43 per m3 during 2002, and the average tariff increase is 21 percent. The tariff design maintains the current tariffs for domestic use up to ten m3 per month.

The cost recovery target under the Utility Approach is O&M, working capital, and depreciation. While the O&M and working capital requirements are identical under the two approaches, the depreciation requirement of the utility approach is greater than the small works capital costs of the cash needs approach, resulting in an average tariff of LE 0.56 and an average tariff increase of 70 percent.

Both models apply the same demand and performance improvement assumptions. The unit O&M cost per m3 sold declines from LE 0.49 in 2002 to LE 0.48 in 2007 despite projected annual inflation of 2.5 percent, significant wage inflation, and a 22 percent increase in the volume of treated water production.

The financial models and tariff planning worksheets are provided in Annexes E and F. The text explains the assumptions, efficiency improvement strategies, and tariff design approach. Tables II-1 through II-4 below summarize the efficiency improvement targets, the key operational and financial assumptions used in the analysis, and the proposed tariff structures under the two approaches.

Table II-1: Summary of Beheira Water Supply Business Plan

Objective	Strategies/Program	Indicators	Indicator Values 2002	Indicator Values 2007
1. Meet suppressed domestic water demand	1.1 Extend distribution network 1.2 Operate revolving fund for new connections	• Persons/domestic connection	11.8	8.1
2. Control growth of O&M costs	2.1 Reduce unaccounted-for water 2.2 Control staffing levels 2.3 Conserve power at main treatment plants	• unaccounted-for water (%) • staff per 1000 connections • power cost/m^3 produced (ex inflation) • O&M cost/m^3 produced • O&M cost/m^3 sold	27% 7.4 LE 0.061 LE 0.36 LE 0.49	17% 4.7 LE 0.047 LE 0.39* LE 0.48*
3. Improve revenue collection efficiency	3.1 Increase domestic demand 3.2 Reduce standpipe demand 3.3 Reduce water waste at governmental and religious establishments	• Revenue collection efficiency (%)	79%	90%

*: including 2.5 percent annual inflation

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Table II-2: Summary of Operational and Financial Assumptions

DEMAND ASSUMPTIONS	
Annual growth rates for consumption	
Domestic	10%
Governmental	4%
Religious	3%
Standpipes	-5%
Commercial	8%
Public sector	2%
Annual growth rates for connections	
Domestic	10%
Governmental	4%
Religious	3%
Standpipes	-5%
Commercial	5%
Public sector	2%
COST ASSUMPTIONS	
Staff per 1000 connections (2003-2007 average)	5.6
Annual wage inflation	8%
Annual commodity price inflation	2.5%
Total BWC capital expenditure	79.9 million
Total NOPWASD capital expenditure	730.3 million

Table II-3: Beheira Water Tariffs, 2003-2007 (Cash Needs Approach)

Consumption Block Cubic Meters Per Month	Phased-In Basis						Average Tariff Over Rate Term 2003-2007
	---------- Piasters Per CuM ----------						
Residential Block Rates							
0-10	23	23	23	23	23	23	23
11-20	23	25	28	28	28	28	27
21-30	35	37	39	39	39	39	37
31-50	35	40	45	45	45	45	44
51 - 100	35	42	50	50	50	50	49
> 100	35	45	55	55	55	55	53
Commercial Block Rates							
0-20	75	75	75	75	75	75	75
>20	75	79	82	85	85	85	83
All Other Customer Classes							
Governmental	45	50	60	60	60	60	58
Religious	45	50	60	60	60	60	58
Standpipes	45	50	60	60	60	60	58
Public Sector	75	78	80	80	80	80	80

Table II-4: Beheira Water Tariffs, 2003-2004 (Utility Approach)

Consumption Block CuM/Mo.	Phased-In Basis						Average Tariff Over Rate Term 2003-2007
	---------- Piasters Per CuM ----------						
Residential Block Rates							
0-10	23	25	27	29	31	31	27
11-20	23	32	38	44	49	49	42
21-30	35	43	50	57	66	66	55
31-50	35	45	55	64	74	74	62
51 - 100	35	48	61	74	86	86	72
> 100	35	52	68	83	98	98	82
Commercial Block Rates							
0-20	75	78	80	82	85	85	81
>20	75	92	109	122	130	130	120
All Other Customer Classes							
Governmental	45	55	65	75	80	80	71
Religious	45	55	65	75	80	80	71
Standpipes	45	55	65	75	80	80	71
Public Sector	75	85	95	105	110	110	101

A. Demand

The BWC service area is primarily rural. Seventy-seven (77) percent of the estimated June 2002 population of 4,565,225 live in villages, including many scattered hamlets on the western fringes of the delta. There are 14 cities (*mudun*), of which only two have populations over 200,000.

A1. Consumption

Domestic demand is 64 percent of the total FY 2002 water demand. Institutional or "service" use, including government, places of worship, and village council standpipes, accounts for 33 percent of the total demand (equivalent to half the domestic demand). "Economic" use accounts for only three percent of 2002 demand. The "economic" tariff class (LE 0.75 per m^3) consists of two types of users: "commercial" users (private establishments) and public-sector companies. The typical "commercial" user is a small user, with an average FY 2002 consumption of 14 m^3 per month.

Notwithstanding the 64 percent share of domestic demand in the total, there is a need to expand coverage. The most recent Central Agency for Population Mobilization and Statistics (CAPMAS) census, conducted in November 1995, showed 2,103,978 residents with connections inside their dwellings out of a 1995 population of 3,986,177 (i.e., 53 percent coverage). The low tariff rate of LE 0.23 per m^3 for domestic use up to 20 m^3 monthly suggests that the relatively low percentage of coverage cannot be attributed to the tariff, but possibly to the cost of a new connection, among other factors.

The 2007 demand projections follow the three-year historical trend, except in the governmental, religious, and public sector classes, for which BWC officials have recommended rates of growth lower than the historical trend. The historical absolute decline in standpipe use, as a result of a high rate of recent growth in house connections, is expected to continue during the new tariff period. The result is a 2007 demand composition which is 74 percent domestic, 23 percent service, and three percent economic. From a BWC financial perspective, the relative decline in service-type use as a percentage of total use is a positive development because although service users are charged a higher tariff rate (LE 0.45 per m^3), they have a poor payment rate.

A2. Connections

Historically, there have been three constraints on demand for new house connections.
The first constraint has been the BWC cost of extending the distribution network to the many scattered rural settlements; this constraint is being steadily overcome through a substantial multi-year investment program. The second is the financial hardship of the customer cost of a new connection, which may amount to LE 600. The third constraint is high subsurface water; only five of the 14 towns and a few villages have sewered wastewater collection systems.

To increase domestic connections at BWC's target rate of ten percent annually, the company will continue its program of extending distribution systems to hamlets (*'izab*). Second, the company will work with local development partners such as the *Shuruq* program, the Social Fund for Development, and local community organizations to implement a revolving fund for new water

and sewer connections. The company will also supply meters on installment (*qist*) or at discount according to its policy.

B. O&M Costs and Working Capital Requirements

BWC's audited financial statements for the FYs 1997/98 through FY 2000/21 are provided in Annex A. Historical and projected O&M costs are shown in Table 2-1 of the model.

O&M costs in 2002 are estimated at LE 62 million. Wages and salaries account for 49 percent, electricity accounts for 16 percent, and other commodity costs another 13 percent.

For the 2003-2007 tariff period, the company will control O&M costs through maintaining current staffing levels, reducing unaccounted-for water and increasing the efficiency of power usage.

B1. Staffing Levels

The company's 2002 staffing level of 7.4 per thousand connections compares favorably to other Egyptian provincial water utilities, and the company plans to keep the total staff size constant, resulting in a decrease in the ratio of staffing per thousand customers. However, wages and salaries will increase as a percent of O&M costs to 53 percent during the 2003-2007 period because public sector wages are increasing at the rate of eight percent annually.

B2. Reduction of Unaccounted-for Water

The volume of unaccounted-for water represents a utility water production requirement above water demand. This is shown in Table 1-3 of the model.

Loss reduction reduces the requirement to pump and treat water, so it controls the growth of variable costs such as power and chemicals. The company's water loss reduction program to 2007 focuses on cost-effective rehabilitation of networks. This program began in 1997 and has succeeded in reducing unaccounted-for water by two percent annually in recent years.

BWC will continue its successful program of detecting illegal connections.

Finally, the meter maintenance and replacement program will be strengthened and expanded.

B3. Power Conservation

Power-usage efficiency improvements focus on installation of frequency controllers on pumps in the nine large water treatment plants. Pilot projects at the Damanhour and Idfina Water Treatment Plants (WTPs) have demonstrated that rotation frequency control can reduce pumping power requirements by 30 percent in one year. Annual five percent reductions in the rate of increase in power costs are projected over the tariff period, which, taken together with the power savings of UFW reduction, result in an absolute decline in power costs.

B4. Other O&M Cost Considerations

B4a. Bulk Water Purchases

In 2002, the company obtained approximately five percent of its treated water production requirement through bulk water purchases from the Alexandria Water Authority (AWGA) and the Egyptian Silk Company. During the tariff period, reliance on Silk Company supply is expected to end, as own-production sources are increasingly utilized to satisfy demand in the Kafr il-Dawwar area.

B4b. Inflation

Inflation for O&M inputs other than labor is assumed to be 2.5 percent annually.

B5. Working Capital Requirements

Provision for working capital requirements recognizes that a portion of utility cash needs is determined by the changes that occur in the balances of the utility's current assets and current liabilities. For example, cash is needed to pay down current liabilities, principally accounts payable (accounts 26 and 27 in BWC's balance sheets) from previous years. At the same time, the utility can expect to collect some cash through collection of previous years' revenues and other accounts receivable (account 16 in BWC's balance sheets) and to make use of existing inventory (account 13). In the tariff model, the working capital requirement is calculated as the difference between the year-on-year increase in current liabilities (which reduces cash needs) and the year-on-year increase in current assets (inventory, plus the value of the amounts owned to the utility), which increases the cash requirement.

For a utility to control the growth of working capital requirements, the utility must collect arrears and consume inventory while settling its accounts payable. Arrears collection provides the cash to pay down current liabilities.

The historical pattern of BWC working capital requirements from 1998 to 2002 shows considerable fluctuation. In projecting the working capital needs, it is assumed that:

a) The rate of growth in the size of accounts receivable will decrease by two percent annually, following the study's assumption that the utility's overall revenue collection rate will improve by two percent annually (see Section B.4.3, below);
b) The rate of growth in accounts payable will slow by two percent annually; and
c) Inventory grows at the historical rate. For any projection year, inventory is estimated as the result of the formula "(Last year inventory/prior year inventory) *x* last year inventory", e.g., 2004 inventory is calculated as "(2003 inventory/2002 inventory) *x* 2003 inventory".

Given these assumptions, working capital needs grow over the tariff period (because collection efficiency remains lower than 100 percent) but the current ratio (current assets/current liabilities) improves, indicating a greater degree of financial solvency.

C. Capital Costs

C1. Funding Sources and Levels

BWC has several sources of investment funding. Large capital works, such as new conventional water treatment plants, plant expansions, and transmission mains, are funded and implemented by NOPWASD. Upon completion, the assets are transferred to BWC's accounts.

Smaller projects are funded from several sources, including BWC revenues, grants from NOPWASD and Beheira Governorate, the Social Fund for Development, the *Shuruq* program, and local contributions. These projects are funded on a pay-as-you-go basis and carry no debt service obligations. Approximately 78 percent of the total pay-as-you-go funding has been spent on the distribution network.

Over the FY 1999 to FY 2001 period, the pay-as-you-go project funding levels ranged between LE 29 million and LE 51 million per year. The BWC source has accounted for approximately 50 percent of the three year total and has averaged LE 18 million per year (see Annex B).

C2. Investment Program

The total five-year pay-as-you-go investment program cost is LE 79.9 million. The company proposes to recover these capital costs though the new tariffs. BWC's five-year investment program is detailed in Table 3.1 of the tariff model and summarized as follows:

Table II-5: BWC Capital Improvement Costs, 2003-2007 (in LE millions)

Source of-supply	6.80
Water treatment	3.05
Water distribution	40.50
Customer service	23.30
Finance and administration	6.25
Total	79.90

The other pay-as-you-go funding sources are expected to contribute to additional distribution system improvements.

NOPWASD-managed investment program capital costs will continue to be borne by NOPWASD during the tariff period. These costs were derived from the BWC's submission to NOPWASD of its five-year plan needs (see Annex C). NOPWASD investment costs are estimated at LE 730.3 million, detailed in Table 3.2 of the tariff model and summarized in Table II-6, below:

Table II-6: NOPWASD Project Costs, 2003-2007 (in LE millions)

Source of-supply	4.50
Water treatment	375.0
Transmission	149.5
Treated water storage and pumping	1.3
Unserved Villages Project	200.0
Total	730.3

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C3. Depreciation

As noted in sub-Section C1. of Section I, Introduction, above, depreciation is a revenue requirement under the Utility Approach, although not under the Cash Needs Approach. The depreciation requirement is projected in Table 3-3 of the Utility Approach Model. To arrive at an estimated value of fixed assets in service, the average value of the assets in service at the beginning and end of each financial year is taken. A depreciation rate of 4.11 percent was developed from average composite depreciation rate over the 1998-2001 historical period.

Comparison of the final row of Table 3-3 with the Company Projects row (in the Utility Approach Model, see Annex F) indicates the dramatic increase in revenue requirements entailed in this case by the shift from the cash needs approach to the utility approach. The depreciation requirement for the 2003-2007 period is LE 124 million greater than the R&R requirement. The five-year NOPWASD investment nearly doubles the value of fixed assets over the period.

D. Revenues and Collections

D1. Customer Classification and Tariff Revenues

Two systems of customer classification are used by BWC. One is based on billing frequency and is used to determine fixed charges. The other groups customers by tariff rate. Each classification is based on the same six basic customer class designations: residential; governmental; religious; standpipes; commercial; and public sector.

For purposes of collection and fixed-charge billing, the company groups these user classes into three classes, based on billing frequency and the types of fixed charge applied, as shown in Table II-7 below:

Table II-7: Billing-Cycle Customer Classification

Class	Billings/Year	Meter Maintenance Charge?	Customer Accounting Charge?
Domestic Commercial	12	Yes	Yes
Government Public Sector	6	Yes	Yes
Religious Standpipes	6	Yes	No

The second system groups customers by tariff rate. This grouping is shown in Table II-8 below with estimated percentage of contribution to tariff revenues at current tariff rates.

Table II-8: Customer Classification by Tariff Rate*

Class	Tariff (LE/m^3)	2002			2007		
		% of Users	% of Demand	% of Tariff Revenues	% of Users	% of Demand	% of Tariff Revenues
Domestic:							
up to 20 m^3/mo	*0.23*	77%	44%	30%	78%	51%	36%
over 20 m^3/mo	*0.35*	17%	20%	21%	17%	23%	25%
Service:							
Government	*0.45*	1%	8%	10%	1%	7%	9%
Religious	*0.45*	0.4%	8%	11%	0.3%	7%	10%
Standpipes	*0.45*	0.6%	17%	22%	0.3%	9%	13%
Economic:							
Commercial	*0.75*	4%	2%	4%	3%	2%	5%
Public Sector	*0.75*	0.3%	1%	2%	0.2%	1%	1%

* Totals in some cases do not add up to 100 percent because of rounding and also because demand and revenues include a small amount of "unregistered" use (*bidun isdar*).

Table B.4.2 indicates the following:

a) Domestic use over 20 m^3 per month in 2002 is nearly one-third the total domestic demand, although domestic users of over 20 m^3 per month make up only 18 percent of all domestic users
b) Service-type users, especially of the standpipe and religious classes, have high average use per connection
c) Over the course of the tariff period, total service-type demand declines from the present 33 percent to 23 percent, while domestic demand increases from 64 percent to 74 percent and economic-type demand remains constant at three percent

D2. Non-Tariff Revenues

BWC has three sources of revenues:

1) volume-based tariff revenues from water operations
2) fixed-charge revenues (meter maintenance and accounting charges), related to water operations, but non-tariff in nature
3) non-tariff revenues (from enterprise activities, connection services, and sale of workshop products to individuals) from activities not related to the production and distribution of water

In the tariff model, the expected revenues from the latter two types of charges are deducted from the tariff revenue requirement.

The historical totals for these revenue sources and their projected revenues (at current tariff rates) are given in Tables 4-2, 4-3, and 4-4 respectively of the tariff-setting model. The non-tariff revenues in particular are a significant source of BWC revenue, equal to 29 percent of total 2002 revenue and equivalent to 51 percent of tariff revenue. Growth in fixed-charge revenue over the 2003-2007 tariff period is proportioned to the rate of increase in connections, which is nearly ten percent per year.

Enterprise revenue, calculated as per Company guidance as 25 percent of account 415 in BWC's income statements (internal works at cost), is projected to be flat during the rate period. Connection services revenue is expected to increase as a result of the rapid growth of connections. Sales of workshop products are expected to follow the historical trend of strong growth, increasing by LE one million annually.

D3. Collection Efficiency

A BWC customer's bill includes several types of charges:

- volume-based tariff charge, based on consumption and class tariff rate
- fixed charge, including meter maintenance charge and/or customer accounting charge
- miscellaneous duties and fees, such as stamp fees and contributions to the governorate Local Services and Development Fund (these billings are not retained by the utility)
- wastewater tariff surcharge (not retained by the utility)

The components of the customer's bill are shown in Annex D.

Though some of these charges are merely collected by the utility on behalf of other agencies of government, they must be included in the total utility billings to determine the utility's revenue collection efficiency rate (collections/billings); see Tables 4-5 and 4-6 in the tariff model.

Table 4-6 in the tariff model shows significant inter-annual variation in collection efficiency, from 74 percent to 88 percent. Review of BWC's financial statements shows that collection problems are class-specific. Table II-9 below compares actual collections with billings in FY 2001. Although this was a year of comparative weakness in the company's collection efficiency, the class variation is typical of most historical years. (For purposes of this discussion, billings and collections from the *bidun isdar* category, which covers the estimated use by newly discovered illegal connections and by new connections prior to meter installation, have not been included.) The table clearly indicates the importance of improving collection efficiency in the service classes (religious, standpipes, and government).

The tariff model projects that the rate of collection efficiency will improve by two percent annually from an estimated 2002 rate of 80 percent to a 2007 rate of 90 percent (see Table 4-6 in the model). These rates affect the annual size of the working capital requirement, discussed in Section B5. above and reflected in Table 2-2 of the model.

Table II-9: Collection Efficiency, by Class (FY 2000/01)

Classes	Collections	Billings	Collections/Billings
Domestic and Commercial	33,196,028	32,479,735	102%
Government and Public Sector	3,000,000	5,271,801	57%
Religious and Standpipes	2,361,756	14,568,977	16%

D4. Collection Efficiency Improvement Strategies

The company plans to maintain its high levels of collection from domestic and commercial users. In addition, two programs have been developed to address the special collection problems posed by institutional users:

a) Replacing Standpipes with House Connections: As noted in Section A., above, increasing the number of house connections is a priority objective for the company. The total collection rate can be expected to improve as demand is shifted from standpipe and religious users to domestic users; and

b) Water Waste Minimization for Governmental and Religious Users: The company will initiate a program of water audits for selected governmental and religious establishments, followed as appropriate by repair and retrofitting works. This program does not entail reduction in the level of service to these users, but only reduction of water waste on these premises. (The audit and retrofit program can also be offered on a cost-plus basis to non-institutional users.)

E. Tariff Design

E1. Tariffs for Recovery of Cash Needs

The cost recovery target for 2003-2007 tariff setting under the Cash Needs approach is to cover O&M costs, the costs of the Company's capital plan, and needs for working capital. NOPWASD is expected to continue servicing the existing BWC debt as well as the new debt service obligations of the NOPWASD 2003-2007 capital plan.

E1a. The Tariff Revenue Requirement

In 2002, O&M and Company capital costs plus working capital needs were LE 79.2 million (see the "Total Costs" row in Table 5-1 of the Cash Needs model). LE 25 million are expected to be recovered through non-tariff and fixed-charge revenues, leaving a tariff revenue requirement of LE 54 million. In 2002, LE 43 million in tariff revenues are estimated to be billed resulting in an operating deficit of LE 11 million.

The revenue requirements for the new cost recovery target are calculated in Table 5-1 of the model, where they appear as the row named "Cash Requirement from Tariffs". The calculation is summarized in Table II-10 below.

Table II-10: Tariff Revenue Requirements, 2003-2007 (Cash Needs Model)

Item	LE (2003-2007)
O&M	376,107,067
Working capital	13,956,074
Company capital investment	79,900,000
Non-tariff revenue deduction	(140,305,585)
Fixed-charge revenue deduction	(20,737,746)
Total	308,919,810

Under present operating conditions, the average tariff required to recover O&M, company capital costs, and working capital needs is LE 0.43 per m^3. As explained in the previous sections, the company expects to be able to mitigate this tariff requirement over the tariff period through higher fixed charge revenue from new connections, limitation of new hiring, reduction of unaccounted-for water, power conservation, and improved collection efficiency. The effect of these measures is a steady reduction in the average tariff requirement over the course of the rate term from LE 0.44 to LE 0.38 (including provision for 2.5 percent annual inflation).

E1b. Tariff Rate Design

The average tariff increase required is only 27 percent. But the utility faces a challenge in mitigating the impact of the increase on low-volume users (who are assumed to be low-income users), because residential users of under 20 m^3 per month constitute 48 percent of the average annual billed consumption during the rate term; moreover, the share of domestic demand in total demand grows over the rate term. High-paying "economic-class" demand is only three percent of the total demand; moreover, some 90 percent of the commercial class users appear to be small users who also use only 20 m^3 per month or less.

Under these circumstances, cross-subsidization without exorbitant increases in economic class rates can only be achieved by maintaining the current inter-class rate differentials (i.e., spreads between the rates of different classes), while also adding a highly differentiated block structure, at least in the domestic and commercial classes where metering is widespread. The proposed domestic structure has six blocks, with intervals at 10, 20, 30, 50, and 100 m^3. (Consumption and number of customers per block were estimated from detailed Beheira bill tabulations provided for the months of September to December 2001.) The effect of cross-class and cross-block subsidization through this structure is to keep rates for domestic use up to 20 m^3 below the average required tariff and to maintain the current LE 0.23 rate as a lifeline rate for domestic use up to ten m^3 per month. Under this structure, households could expect monthly tariff changes in the ranges shown in Table II-11, below.

Table II-11: Representative Monthly Household Water Tariff Charges, 2005 (Cash Needs Model)

Monthly Use	Tariff Charge
10 m^3	LE 2.30
20 m^3	LE 5.80
30 m^3	LE 13.20

Two consumption blocks are proposed for the commercial class. Tariffs for small commercial users, up to 20 m^3 per month, are maintained at the current high rate of LE 0.75, while tariffs for use of over 20 m^3 are gradually increased to LE 0.85.

Tariffs are stepped up gradually to the target cost recovery level in 2005, allowing two years for customers of all classes to adjust to the increases.

The suggested tariff schedule for all classes and blocks is shown in Table 5-4 of the Cash Needs Model in Annex E.

E2. Tariffs for Recovery of O&M and Depreciation (Utility Approach)

The cost recovery target for 2003-2007 tariff setting under the Utility Approach is O&M, the working capital requirement, and depreciation.

E2a. The Tariff Revenue Requirement

BWC five-year revenue requirements under the Utility Approach are as follows:

Table II-12: Tariff Revenue Requirement, 2003-2007 (Utility Approach)

Item	LE (2003-2007)
O&M	376,107,067
Working capital	13,956,074
Depreciation	204,269,935
Non-tariff revenue deduction	(140,305,585)
Fixed-charge revenue deduction	(20,737,746)
Total	433,289,744

This revenue requirement is 40 percent higher than the Cash-Needs revenue requirement. The difference between the two results is entirely accounted for by the size of the depreciation requirement as opposed to the R&R (company capital projects) requirement: LE 204 million vs. LE 80 million.

The average tariff required is LE 0.56. The average tariff increase is approximately 70 percent.

E2b. Tariff Rate Design

The same rate design strategies have been applied to the Utility Approach revenue requirement, namely:

a) maintenance of existing rate differentials between customer classes
b) application of an inclining block rate structure to the domestic and commercial classes
c) two- or three-year graduation to the full cost recovery tariff level

Applying the same block intervals to the domestic class, it is possible to keep the rates for "lifeline" domestic consumption (up to 10 m3 per month) to LE 0.31 per m3 (from the present LE 0.23) in FY 2006, the year in which domestic rates reach their final level. But in view of the overwhelmingly domestic composition of total Beheira water demand (as noted in B.5.1.2

above), rates for over ten m3 must increase significantly. Rates for use up to 20 m3 reach LE 0.49 in 2006, from the present LE 0.23. Rates for over 20 m3 per month, currently LE 0.35, reach LE 0.66 and higher by 2006. Representative monthly charges are shown in Table II-13 below.

Table II-13: Representative Monthly Household Water Tariff Charges, 2006 (Utility Approach)

Monthly Use	Tariff Charge
10 m3	LE 3.10
20 m3	LE 9.80
30 m3	LE 19.80

In the commercial class, "small commercial" use (up to 20 m3), presently LE 0.75, reaches LE 0.85, while higher levels of consumption are charged at LE 1.30. As noted above, all commercial use constitutes only three percent of total water demand.

Service-type use rates increase from the present LE 0.45 to LE 0.80 per m3.

Annual rates for each class and block under the Utility Approach are given in Table 5-4 of the Utility Approach Model in Annex F.

ANNEX A

BWC Financial Statements

ANNEX A-1

BWC BALANCE SHEET

Description	2001	2000	1999	1998
Assets				
Fixed Assets				
Land	5,588,740.62	5,039,027.91	6,608,472.35	6,507,807.12
Buildings, Constructions, Utilities, and Roads	114,683,317.76	112,584,296.92	154,905,671.29	154,331,617.30
Machines & Equipment	113,556,379.60	111,597,996.93	162,168,963.57	161,943,142.90
Means of Transport and Transportation	270,089,163.71	214,584,849.54	263,420,982.76	236,889,258.39
Tools and Instruments	3,357,862.80	3,197,936.71	4,616,126.80	4,461,196.26
Office Furniture and Installations	9,148,800.59	7,843,019.00	7,168,098.70	5,997,933.23
Subtotal, Fixed Assets	516,424,265.08	454,847,127.01	598,888,315.47	570,130,955.20
Projects in Progress				
Investment (material) Formation	29,129,125.30	22,268,957.48	38,560,475.80	22,635,425.96
Investment Expenditure	383,890.47	1,165,812.32	381,045.00	768,458.75
Subtotal, Projects in Progress	29,513,015.77	23,434,769.80	38,941,520.80	23,403,884.71
Inventory (Stock)				
Raw Materials	1,277,545.43	799,985.40	963,914.83	765,302.22
Fuel & Oil	275,373.89	303,176.95	278,969.48	214,780.50
Spare parts & Supplies	12,079,151.63	11,741,317.64	10,681,184.61	9,453,520.54
Scrap (wastes & junk)	125,808.75	422,872.18	63,268.97	119,926.33
Goods Purchased for Sale Purpose	3,148,426.90	2,805,566.56	2,246,915.37	2,809,267.34
Materials and Spare Parts under Formation	59,945.05	8,200.50	193,774.32	181,191.93
Subtotal, Inventory	16,966,251.65	16,081,119.23	14,428,027.58	13,543,988.86
Debtors				
Customers (Clients)	125,414,749.40	112,600,491.34	108,053,053.03	100,688,920.68
Receivables	9,357.15	0.00	0.00	2,754.00
Miscellaneous Debtors	2,144,193.41	2,141,438.41	291,724.41	319,310.61
Subtotal, Debtors	127,568,299.96	114,741,929.75	108,344,777.44	101,010,985.29
Miscellaneous Debit Accounts				
Asset Sale Debtors	5,136.00	9,192.00	0.00	0.00
Other debit Accounts	2,093,635.45	2,591,713.29	2,617,694.41	2,647,290.91
Accrued Current & Appropriation Revenues	3,150,943.45	70,253.46	2,155,240.82	344,212.32
Subtotal, Miscellaneous Debit Accounts	5,249,714.90	2,671,158.75	4,772,935.23	2,991,503.23
Cash in Hand & in Bank				
Cash in Hand	52,333.87	0.00	0.00	0.00
Bank (current account)	2,315,593.51	2,651,345.29	1,375,554.95	1,213,612.34
Bank (term deposit)	12,750,000.00	6,050,000.00	12,600,000.00	17,300,000.00
Subtotal, Cash in Hand & in Bank	15,117,927.38	8,701,345.29	13,975,554.95	18,513,612.34
Other Balances				
Suppliers	78,941.16	145,757.33	287,011.09	147,389.55
Miscellaneous Creditors	0.00	0.00	0.00	2,000,000.00
Other Credit Accounts	101.00	0.00	0.00	13.80
Subtotal, of Other Balances	79,042.16	145,757.33	287,011.09	2,147,403.35
Carried Losses	43,681,411.76	23,224,931.38	68,751,685.90	43,124,909.54
Total Assets	754,599,928.66	643,848,138.54	848,389,828.46	774,867,242.52

Description	2001	2000	1999	1998
Liabilities & Owners' Equity				
Capital				
Issued Capital	395,416,355.17	331,635,090.08	431,731,047.81	399,782,836.99
Subtotal, Capital	**395,416,355.17**	**331,635,090.08**	**431,731,047.81**	**399,782,836.99**
Reserves				
Reserves for Higher Prices of Assets	4,179,405.77	3,785,256.81	3,443,090.92	2,944,040.78
Other Reserves	3,160,967.34	3,147,827.05	3,096,733.10	3,049,655.09
Subtotal, Reserves	**7,340,373.11**	**6,933,083.86**	**6,539,824.02**	**5,993,695.87**
Allowances (Provisions)				
Depreciation Allowance	125,854,639.75	105,686,657.34	130,119,310.97	107,246,686.18
Disputed Taxes' Allowance	3,081,504.29	2,569,122.29	150,520.00	150,520.00
Bad Debts' Allowance	9,100,000.00	5,500,000.00	7,000,000.00	6,714,807.48
Other Allowances	2,540,000.00	2,540,000.00	1,140,000.00	583,026.00
Subtotal, Allowances (Provisions)	**140,576,144.04**	**116,295,779.63**	**138,409,830.97**	**114,695,039.66**
Long Term Loans				
Domestic long-Term Loans	98,953,996.55	98,953,996.55	161,414,971.12	162,213,748.70
External Long-Term Loans				
Subtotal, Long-Term Loans	**98,953,996.55**	**98,953,996.55**	**161,414,971.12**	**162,213,748.70**
Creditors				
Suppliers	25,661,641.41	16,369,797.73	11,670,487.43	8,613,639.53
Miscellaneous Creditors	24,867,484.85	21,033,537.31	25,346,174.61	21,756,876.79
Subtotal, Creditors	**50,529,126.26**	**37,403,335.04**	**37,016,662.04**	**30,370,516.32**
Miscellaneous Credit Accounts				
Creditors	2,777,884.63	3,967,709.22	5,722,148.21	6,015,666.92
Other Credit Accounts	17,686,236.76	13,083,855.67	13,411,386.57	11,578,207.22
Accrued Current & Appropriation Expenses	41,319,812.14	35,575,289.41	54,143,958.46	44,082,450.98
Subtotal, Miscellaneous Credit Accounts	**61,783,933.53**	**52,626,854.30**	**73,277,493.24**	**61,676,325.12**
Other Balances				
Customers	0.00	0.00	0.00	87,729.00
Miscellaneous Debtors	0.00	0.00	0.00	37,255.40
Checking Account	0.00	0.00	0.00	10,095.46
Subtotal, Other Balances	**0.00**	**0.00**	**0.00**	**135,079.86**
Total Liabilities & Owners' Equity	**754,599,928.66**	**643,848,139.46**	**848,389,829.20**	**774,867,242.52**

ANNEX B

BWC Capital Expenditure

ANNEX A-2

BWC INCOME STATEMENTS

Beheira Potable Water and Sanitary Drainage Company's Income Statement (2001, 2000, 1999, 1998)

Description	2001	2000	1999	1998
Revenues				
Revenues of Current Activities				
Net Sales of water	40,371,737.76	38,956,468.01	37,221,019.38	36,637,405.72
Internally Manufactured Articles at Cost	2,386,275.03	3,337,874.86	2,543,075.48	2,099,783.94
Rendered Services	8,303,175.84	7,169,867.47	5,460,978.56	4,912,916.67
Goods for Sale				
Net Sales	10,783,222.90	8,982,429.95	8,238,745.78	7,289,132.02
Change in Stocks of Goods for Sale at Cost	342,860.34	558,651.19	-562,351.97	-45,494.23
Evaluation Difference of Change in Stocks of Goods for Sale	85,715.09	139,662.80	-140,587.99	-11,373.56
Subtotal, Goods for Sale	11,211,798.33	9,680,743.94	7,535,805.82	7,232,264.23
Remnants of Production	149,953.58	449,421.76	91,724.43	0.00
Subsidies				
Production Subsidies	2,980,749.14	2,000,000.00	2,000,000.00	2,000,000.00
Export Subsidies	0.00	0.00	0.00	0.00
Subtotal, Subsidies	2,980,749.14	2,000,000.00	2,000,000.00	2,000,000.00
Total Revenues of Current Activities	65,403,689.68	61,594,376.04	54,852,603.67	52,882,370.56
Transfer Revenues				
Credit interest	993,105.47	835,392.51	1,314,377.37	1,899,835.31
Credit rents	3,960.00	4,336.63	6,767.60	6,945.80
Capital profit	13,140.29	51,093.95	47,078.01	52,728.05
Prior years revenues	372,488.75	792,048.70	733,573.91	3,028,004.88
Fines & Compensations	314,861.18	544,243.35	373,710.74	263,041.75
Miscellaneous Revenues	2,665,780.55	2,845,885.74	2,078,012.47	1,698,035.30
Imputed Rent Difference	4,521,197.40	4,497,769.81	6,133,435.90	6,100,549.96
Imputed Interest Difference	81,232,130.13	69,767,832.42	83,330,615.93	78,331,808.65
Total Transfer Revenues	90,116,663.77	79,338,603.11	94,017,571.93	91,380,949.70
Total Revenues	155,520,353.45	140,932,979.15	148,870,175.60	144,263,320.26
Expenses				
Wages				
Wages in Cash	23,440,136.59	21,602,734.74	18,588,062.56	15,874,288.06
Wages in Kind	416,030.54	390,785.84	210,712.86	192,849.08
Social Insurance	3,359,505.43	3,013,319.21	2,648,366.84	2,419,156.07
Subtotal, Wages	27,215,672.56	25,006,839.79	21,447,142.26	18,486,293.21
General Expenses				
Material Inputs	18,906,447.94	18,428,082.90	18,293,382.96	17,123,871.42
Service Inputs	2,702,832.51	1,880,051.26	2,183,716.94	1,887,992.29
Purchases for Sale	7,698,917.81	6,599,252.35	5,159,057.59	4,980,949.99
Subtotal, General Expenses	29,308,198.26	26,907,386.51	25,636,157.49	23,992,813.70
Current Transfer Payment				
Commodity Duties				
Custom Duties on Used Inputs	587,877.88	517,171.88	620,437.08	562,591.23
Other Duties	13,753.15	20,324.40	21,400.48	12,158.70
Subtotal, Commodity Duties	601,631.03	537,496.28	641,837.56	574,749.93
Depreciation Expenses				

Beheira Potable Water and Sanitary Drainage Company's Income Statement (2001, 2000, 1999, 1998)

Description	2001	2000	1999	1998
Building and Construction	3,102,043.83	3,009,906.65	4,193,719.35	4,175,033.26
Machines and Equipment	8,350,745.19	8,350,725.00	11,893,801.24	11,901,851.57
Means of Transport	7,952,036.75	6,073,243.83	7,885,337.88	7,084,743.70
Instruments and Tools	211,045.92	180,587.70	374,545.33	434,206.75
Office Furniture and Equipment	840,608.69	717,038.30	654,254.34	559,244.38
Subtotal, Depreciation Expenses	**20,456,480.38**	**18,331,501.48**	**25,001,658.14**	**24,155,079.66**
Rent Expenses				
Actual Rent	0.00	133.70	0.00	603.30
Imputed Rent Difference	4,521,197.40	4,497,769.81	6,133,435.90	6,100,549.96
Subtotal, Rent Expenses	**4,521,197.40**	**4,497,903.51**	**6,133,435.90**	**6,101,153.26**
Interest Expense				
Domestic Interest	5,937,239.79	5,937,239.79	9,684,898.27	9,477,010.40
Interest Differences	81,232,130.13	69,767,832.42	83,330,615.93	78,331,808.65
Evaluation Difference of Change in Stock of Goods for Sale	85,715.09	139,662.80	-140,587.99	-11,373.56
Subtotal, Interest Expenses	**87,255,085.01**	**75,844,735.01**	**92,874,926.21**	**87,797,445.49**
Subtotal, Current Transfer Payments	**112,834,393.82**	**99,211,636.28**	**124,651,857.81**	**118,628,428.34**
Appropriation Transfer Payments				
Donations	21,000.00	0.00	0.00	1,000.00
Fines & Compensations	2,179.00	7,832.90	5,627.55	6,600.00
Capital losses	340,626.21	1,219,603.88	777,039.05	1,172,475.07
Prior years expenses	2,129,241.69	1,436,676.01	1,069,883.27	1,694,337.43
Other Allowances	4,112,382.00	3,818,602.29	862,166.52	4,647,624.72
Subtotal, Appropriation Transfer Payments	**6,605,428.90**	**6,482,715.08**	**2,714,716.39**	**7,522,037.22**
Other provisions	**13,140.29**	**51093.95**	**47,078.01**	**52,728.05**
Total Expenses	**175,976,833.83**	**157,659,671.61**	**174,496,951.96**	**168,682,300.52**
Net Income	**-20,456,480.38**	**-16,726,692.46**	**-25,626,776.36**	**-24,418,980.26**

ANNEX B

BWC CAPITAL EXPENDITURE, FYs 1998/99 through FY 2000/01

Type of Asset	1999	2000	2001
Buildings and fences	3,908,294	4,263,033	3,163,401
R&R of equipment and machinery	868,953	1,960,521	1,145,177
Electrical connections	202,021	268,560	244,851
Lab furnishings and equipment, chlorine cylinder	331,567	212,045	303,107
Computer equipment	384,403	1,138,966	1,338,996
Office furnishings and equipment	411,982	312,022	112,816
Vehicles	478,240	588,164	2,459
Networks	11,421,110	11,932,356	8,857,191
Tools and instruments	93,715	71,709	126,665
TOTAL	18,100,285	20,747,376	15,294,663

Source: BWC Adjusted General Budgets:
FY 1998/99, FY 1999/2000, FY 2000/01

ANNEX C

NOPWASD Projects Plan

ANNEX C

Beheira Water and Sanitary Drainage Company
Planning and Projects Sector

Water Sector Needs of Governorate Districts in the 2002-2007 Plan

S.	Description	Unit	Distance (km)							Cost (mln)
			250	300	400	500	600	700	1000	
1-	Implementation of Mahmudiya WTP (34000 m3/ day), assigned to Arab Contractors Co.									
	* Mahmudiya Line - Samakhrat on Nile Bridge	km	-	-	15	-	-	-	-	75
	* Mahmudiya Line - to Khazan Al Ataf	km	-	-	3	-	3	-	-	
	* Mahmudiya Line - to Abu Hawash Bridge	km	-	-	18	-	2	-	-	
2-	Implementation of Dilingat WTP (34000 m3/ day), assigned to Arab Contractors Co.									45
	* 1,000 mm Force Main	km	-	-	-	-	-	-	5	6
	* Line from WTP to Kom Hamada Town	km	-	-	-	-	15	-	-	9
	* LINe from WTP to Dilingat	km	-	-	-	-	15	-	-	9
	* LINe from WTP Nubariya WTP	km	-	8	10	-	-	-	-	8.5
3-	Implementation of Nubariya WTP extensions, assigned to Hassan Alam Co. The extensions will add 34000 m3/ day.									50
	* Line from WTP to filtering site in Hosh Issa	km	-	-	-	-	-	10	-	8
	* Line from filtering site to Al Kom Al Akhdar	km	-	-	-	-	6	-	-	4.5
	* Line from Al Kom Al Akhdar entry to Nudeyba	km	-	-	10	-	-	-	-	5
4-	Implementation of Abu Homos WTP extensions, assigned to Arab Contractors Co. The extensions will add 51000 m3/ day.									55
	* Line from Abu Homos to Zaweyet Gazal	km	-	-	-	-	-	-	10	12
	* Line from Abu Homos to Berket Gatas entry	km	-	-	-	-	-	-	6	7
5-	Implementation of Kafr El Dawwar WTP extensions, assigned to Projects Co. The extensions will add 43000 m3/ day.									50
	* Line from Kafr El Dawwar to Berket Entry	km	-	-	-	-	-	-	15	18
	* R&R of city 30 km network, 100 mm up to 600 mm(*)	km	-	-	-	-	-	-		6.5
	* Line from Kafr El Dawwar to Aly Maher line crossing	km	-	-	-	-	-	-	6	8
6-	Implementation of Idfina WTP extensions, assigned to Projects Co. The extensions will add 43000 m3/ day.									50

Water Sector Needs of Governorate Districts in the 2002-2007 Plan

S.	Description	Unit	Distance (km)							Cost (mln)
			250	300	400	500	600	700	1000	
	* Line from WTP to El Busseily	km	-	-	-	-	-	15	-	12
	* Line from Dibuno to connection with the other existing 700 mm line	km	-	-	5	-	-	-	-	3
7-	Implementation of 25 artesian wells, including pump stations in governorate southern districts									2.5
	* Implementation of alleviated water tanks for ten storage tanks (*)	no.	-	-	-	-	-	-	-	4
8-	R&R of networks for Damanhur, Kom Hamada, Badr, and Wadi El Natrun, and completion of Itay El Barud and Shubrakheit 150 km sewers, 100 mm to 400 mm pipelines(*)		-	-	-	-	-	-	-	20
9-	R&R of village 200 km networks, 100 mm to 250 mm(*)		-	-	-	-	-	-	-	20
	Total									488

(*) Projects shaded and marked with an asterisk are expected to be implemented by the Company, in addition to other projects in the Company's plan. The unmarked projects are expected to be implemented by NOPWASD

ANNEX D

CURRENT BWC SCHEDULE OF CHARGES AND OTHER BILL CONSTITUENTS

Water Tariffs

Name of Tariff Class	Tariff				Other Elements		
	First Block		Second Block		Flat Rate *(mumarsa)* LE	Meter Maintenance LE	Minimum Consumption (m^3)
	Up to __ m^3	LE m^3	More than __ m^3	LE/m^3			
Domestic	20 m^3	0.23	20 m^3	0.35	5.00	0.30	10
Service	(any)	0.45			5.00	1.00	10
Economic	(any)	0.75			5.00	1.00	10

Notes:

- Flat monthly charges (*mumarsa*) are applied to certain users
- All users are assumed to consume at least 10 m^3 per month

Fees and Stamp Duties

		Notes
Accounting charge	LE 0.15	(1)
Receipt stamp duites	LE 0.30	(2)
Contracting stamp duties	LE 3.00	(2)
Local Development Fund	LE 0.10	(2)
Governorate services	LE 0.01	(2)
Wastewater surcharge	35% (domestic)	(2)
	60% (non domestic)	(2)
Administrative expenses	20%	(1)

Notes:

(1) These charges are retained by BWC.
(2) These charges are not retained by BWC.

All these charges, as well as meter maintenance charge, are applied to each bill. Domestic and commercial users are billed monthly; all other classes are billed once every two months.

ANNEX E

Tariff Model: Cash Needs Approach

List of Tables (Cash Needs Model)

Table 1. Water Demand

Table 1-1 Water Consumption, by Type of User
Table 1-2 Number of Water Customers
Table 1-3 Unaccounted-for Water and Treated Water Production Requirements

Table 2. Operation and Maintenance Costs

Table 2-1 O&M Costs
Table 2-2 Working Capital Requirements

Table 3. Capital Costs

Table 3-1 Company Projects
Table 3-2 NOPWASD Projects

Table 4. Revenues and Collections Analysis

Table 4-1 Current Water Tariffs
Table 4-2 Water Tariff Revenue, at current tariffs
Table 4-3 Fixed-Charge Water Revenues
Table 4-4 Water Non-Tariff Revenues
Table 4-5 Non-Retained Billings
Table 4-6 Collection Efficiency

Table 5. Tariff Analysis

Table 5-1 Calculation of Revenue Requirement and Average Tariff Increase
Table 5-2 Average Class Tariff Planning Worksheet
Table 5-2-1 Proposed Average Tariff, by class
Table 5-2-2 Expected Tariff Revenue
Table 5-3 Block Rate Designs
Table 5-4 Summary of Beheira Water Tariffs, 2003-2007

Table 1: WATER DEMAND

Table 1-1: Water Consumption, by Type of User (m^3/year)

Year	Historical Data			
	1999	2000	2001	2002
Retail Water Consumption				
Residential 0-20 m3/month	50,052,618	51,004,594	54,028,573	55,772,044
Calculated Annual Increase %	#DIV/0!	1.9%	5.9%	3.2%
Residential >20 m3/month	22,060,618	22,539,772	24,422,396	25,446,169
Calculated Annual Increase %	#DIV/0!	2.2%	8.4%	4.2%
Governmental	7,969,571	8,611,304	8,969,382	9,573,771
Calculated Annual Increase %	#DIV/0!	8.1%	4.2%	6.7%
Religious	9,106,440	9,563,148	9,922,461	10,378,320
Calculated Annual Increase %	#DIV/0!	5.0%	3.8%	4.6%
Standpipes	23,069,764	22,573,712	21,976,541	21,467,658
Calculated Annual Increase %	#DIV/0!	-2.2%	-2.6%	-2.3%
Commercial	2,043,347	2,201,573	2,359,681	2,537,975
Calculated Annual Increase %	#DIV/0!	7.7%	7.2%	7.6%
Public Sector	791,833	827,206	866,173	905,569
Calculated Annual Increase %	#DIV/0!	4.5%	4.7%	4.5%
Bidoun Isdar	911,402	1,647,874	1,110,820	1,000,000
Calculated Annual Increase %	#DIV/0!	80.8%	-32.6%	-10.0%
BBB				
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
CCC				
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
DDD				
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Retail Consumption	**116,005,593**	**118,969,183**	**123,656,027**	**127,081,506**
Bulk Water Consumption (m^3/year)				
AAA				
BBB				
CCC				
Total Bulk Water Consumption	**0**	**0**	**0**	**0**
Total Billed Water Consumption	**116,005,593**	**118,969,183**	**123,656,027**	**127,081,506**

Year	Projections					Total	Average Year
	2003	2004	2005	2006	2007		
Retail Water Demand							
Residential 0-20 m3/month	61,349,248	67,484,173	74,232,591	81,655,850	89,821,435	374,543,296	74,908,659
Assumed Annual Increase %	10.0%	10.0%	10.0%	10.0%	10.0%	1	10.0%
Residential >20 m3/month	27,990,786	30,789,864	33,868,851	37,255,736	40,981,310	170,886,547	34,177,309
Assumed Annual Increase %	10.0%	10.0%	10.0%	10.0%	10.0%	1	10.0%
Governmental	9,956,722	10,354,991	10,769,190	11,199,958	11,647,956	53,928,817	10,785,763
Assumed Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%	0	4.0%
Religious	10,689,670	11,010,360	11,340,670	11,680,891	12,031,317	56,752,908	11,350,582
Assumed Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%	0	3.0%
Standpipes	20,823,628	19,990,683	18,991,149	17,851,680	16,602,062	94,259,203	18,851,841
Assumed Annual Increase %	-3.0%	-4.0%	-5.0%	-6.0%	-7.0%	0	-5.0%
Commercial	2,741,013	2,960,294	3,197,118	3,452,887	3,729,118	16,080,429	3,216,086
Assumed Annual Increase %	8.0%	8.0%	8.0%	8.0%	8.0%	0	8.0%
Public Sector	923,680	942,154	960,997	980,217	999,821	4,806,870	961,374
Assumed Annual Increase %	2.0%	2.0%	2.0%	2.0%	2.0%	0	2.0%
Bidoun Isdar	1,050,000	1,102,500	1,157,625	1,215,506	1,276,282	5,801,913	1,160,383
Assumed Annual Increase %	5.0%	5.0%	5.0%	5.0%	5.0%	0	5.0%
BBB	0	0	0	0	0	0	0
Assumed Annual Increase %						0	#DIV/0!
CCC	0	0	0	0	0	0	0
Assumed Annual Increase %						0	#DIV/0!
DDD	0	0	0	0	0	0	0
Assumed Annual Increase %						0	#DIV/0!
Total Retail Demand	**135,524,747**	**144,635,019**	**154,518,191**	**165,292,724**	**177,089,301**	**777,059,983**	**155,411,997**
Bulk Water Demand (m^3/year)							
AAA							0
BBB							0
CCC							0
Total Bulk Water Demand	**0**	**0**	**0**	**0**	**0**		**0**
Total Billed Water Demand	**135,524,747**	**144,635,019**	**154,518,191**	**165,292,724**	**177,089,301**	**777,059,983**	**155,411,997**

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Table 1: WATER DEMAND

Table 1-2: Number of Water Customers

Year	Historical Data				Projections						Average Year
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Retail Water Customers											
Residential 0-20 m3/month	238,852	261,928	289,809	318,755	350,631	385,694	424,263	466,689	513,358		428,127
Calculated Annual Increase %	#DIV/0!	9.7%	10.6%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%		10.0%
Residential >20 m3/month	54,598	57,632	63,456	69,857	76,843	84,527	92,980	102,278	112,505		93,826
Calculated Annual Increase %	#DIV/0!	5.6%	10.1%	10.1%	10.0%	10.0%	10.0%	10.0%	10.0%		10.0%
Governmental	4,864	5,186	5,363	5,660	5,943	6,181	6,428	6,621	6,819		6,398
Calculated Annual Increase %	#DIV/0!	6.6%	3.4%	5.5%	5.0%	4.0%	4.0%	3.0%	3.0%		3.8%
Religious	1,500	1,530	1,589	1,630	1,679	1,729	1,781	1,835	1,890		1,783
Calculated Annual Increase %	#DIV/0!	2.0%	3.9%	2.6%	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Standpipes	2,518	2,414	2,413	2,346	2,229	2,117	2,011	1,911	1,815		2,017
Calculated Annual Increase %	#DIV/0!	-4.1%	0.0%	-2.8%	-5.0%	-5.0%	-5.0%	-5.0%	-5.0%		-5.0%
Commercial	13,615	14,393	14,699	15,361	16,129	16,936	17,782	18,671	19,605		17,825
Calculated Annual Increase %	#DIV/0!	5.7%	2.1%	4.5%	5.0%	5.0%	5.0%	5.0%	5.0%		5.0%
Public Sector	848	919	969	1,041	1,062	1,083	1,105	1,127	1,149		1,105
Calculated Annual Increase %	#DIV/0!	8.4%	5.4%	7.4%	2.0%	2.0%	2.0%	2.0%	2.0%		2.0%
BBB					0	0	0	0	0		0
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!							#DIV/0!
CCC					0	0	0	0	0		0
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!							#DIV/0!
DDD					0	0	0	0	0		0
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!							#DIV/0!
Total Retail Customers	316,795	344,003	378,298	414,650	454,515	498,266	546,350	599,131	657,142		551,081
Bulk Water Customers (m^3/year)											
AAA											0
BBB											0
CCC											0
Total Bulk Water Customers	0	0	0	0	0	0	0	0	0		0
Total Water Customers	316,795	344,003	378,298	414,650	454,515	498,266	546,350	599,131	657,142		551,081
Population Growth Rate %		2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%		
Total Population	4,289,285	4,379,360	4,471,327	4,565,224	4,661,094	4,758,977	4,858,916	4,960,953	5,065,133		

Table 1-3: Unaccounted-for Water and Treated Water Production Requirements

Year	Historical Data				Projections						Average Year
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Unaccounted-for Water Rate (%)	33%	30%	29%	27%	25%	23%	21%	19%	17%		21%
											Total
Unaccounted-for Water (m^3)	58,406,482	51,949,140	51,147,962	47,020,160	45,174,916	43,202,668	41,074,456	38,772,367	36,271,303		204,495,710
Production Sources (m^3)											
Own Production (m^3)	166,301,318	163,323,501	167,013,955	166,071,666	172,519,663	179,537,687	187,192,647	195,565,092	204,610,604		939,425,693
Bulk Purchase, AWGA (m^3)	7,530,257	7,045,822	7,242,534	7,500,000	7,750,000	8,000,000	8,250,000	8,500,000	3,750,000		41,250,000
Bulk Purchase, Silk Co (m^3)	580,500	549,000	547,500	550,000	430,000	300,000	150,000	0	0		880,000
Total Production	174,412,075	170,918,323	174,803,989	174,101,666	180,699,663	187,837,687	195,592,647	204,065,092	213,360,604		981,555,693

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Table 2: OPERATION AND MAINTENANCE COSTS

Table 2-1: Operation and Maintenance Costs

Year	Historical Data				Projections					Total
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Labor										
Number of Employees	2,556	2,785	2,939	3,062	3,062	3,062	3,062	3,062	3,062	
Number of Staff per 1,000 Connections	8.1	8.1	7.8	7.4	6.7	6.1	5.6	5.1	4.7	
Average Staff Salary	8,391	8,620	9,260	9,991	10,790	11,654	12,586	13,593	14,680	
Average Staff Salary Annual Increase %	#DIV/0!	2.73%	7.43%	7.89%	8.0%	8.0%	8.0%	8.0%	8.0%	
Total Wages and Salaries	21,447,142	24,005,740	27,215,673	30,392,680	33,040,094	35,683,302	38,537,966	41,621,003	44,950,684	193,833,050
Commodities										
Electricity	9,453,010	9,870,448	10,451,958	10,594,373	10,455,431	10,336,715	10,238,570	10,161,679	10,100,105	51,292,500
Fuel and Oil	503,468	610,222	581,107	689,025	611,348	635,497	661,734	690,398	721,847	3,320,823
Chemicals	2,953,792	2,776,684	3,121,059	3,163,585	3,286,416	3,420,106	3,565,929	3,725,421	3,897,733	17,895,606
Spare parts	3,487,454	2,376,683	2,262,820	2,293,052	2,380,575	2,474,613	2,576,779	2,688,396	2,810,858	12,931,221
Other Commodities	2,794,739	794,046	2,489,504	2,523,425	2,619,056	2,722,515	2,834,915	2,957,714	3,092,443	14,226,643
0										
0										
0										
Services										
Maintenance	1,174,300	814,917	1,449,748	1,493,240	1,549,830	1,611,051	1,677,564	1,750,231	1,829,957	8,418,634
Transportation	283,027	316,669	450,310	360,819	374,493	389,286	405,358	422,917	442,182	2,034,236
Other Services	729,389	1,052,331	902,788	929,866	965,105	1,003,229	1,044,648	1,089,899	1,139,546	5,242,427
Water Purchases for Sale										
AWGA Water Purchases for Sale (LE 0.23/m3)	1,731,950	1,621,270	1,665,783	1,665,783	1,782,500	1,840,000	1,897,500	1,955,000	2,012,500	9,487,500
Silk Company Purchases for Sale (LE 0.135/m3)	78,368	74,120	73,913	93,913	58,050	40,500	20,250	0	0	118,800
Non-Water Purchases for Sale	4,147,701	4,903,863	5,938,500	7,000,000	7,500,000	8,000,000	8,500,000	9,000,000	9,500,000	42,500,000
Taxes and Duties	537,496	537,496	602,000	625,178	648,871	674,502	702,350	732,773	766,152	3,524,648
Total O&M Costs for Water Supply	47,619,765	51,754,289	57,125,158	61,905,539	32,231,675	33,148,016	34,125,597	35,174,428	36,313,322	170,993,038
Multipliers for annual inflation at 2.8%					402,896	1,253,409	2,175,773	3,178,071.414	4,270,829.795	-
Total O&M Costs for Water Supply					65,674,665	70,084,727	74,839,337	79,973,503	85,534,835	376,107,067

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Table 2-2: Working Capital Requirements

Current Accounts	Historical Data			
	1998	1999	2000	2001
Current Assets (excl. cash)				
Accounts receivable (debtors)	101,010,985	108,344,777	114,741,930	127,568,300
Inventory	13,543,989	14,428,028	16,081,119	16,966,252
Sub-total current assets	114,554,974	122,772,805	130,823,049	144,534,552
Changes in current assets		8,217,831	8,050,244	13,711,503
Current Liabilities				
Accounts Payable	30,370,516	37,016,662	37,403,335	50,529,126
Miscellaneous credit accounts	-	-	-	-
Sub-total current liabilities	30,370,516	37,016,662	37,403,335	50,529,126
Changes in current liabilities		6,646,146	386,673	13,125,791
Working capital requirements		1,571,685	7,663,571	585,712

Current Accounts	Projections					Total
	2003	2004	2005	2006	2007	
Current Assets (excl. cash)						
Accounts receivable (debtors)	143,997,886	151,699,464	158,817,293	165,270,271	170,967,840	
Inventory	18,885,357	19,924,841	21,021,539	22,178,601	23,399,350	
Sub-total current assets	162,883,243	171,624,304	179,838,831	187,448,872	194,367,191	
Changes in current assets	9,196,337	8,741,061	8,214,527	7,610,041	6,918,319	
Current Liabilities						
Accounts Payable	64,118,502	70,530,352	76,172,781	80,743,147	83,972,873	
Miscellaneous credit accounts	-	-	-	-	-	
Sub-total current liabilities	64,118,502	70,530,352	76,172,781	80,743,147	83,972,873	
Changes in current liabilities	6,869,840	6,411,850	5,642,428	4,570,367	3,229,726	
Working capital requirements	2,326,497	2,329,211	2,572,099	3,039,674	3,688,593	13,956,074

Current Assets (Excl. cash)	2002
Accounts receivable (debtors)	
Inventory	135,786,802
Sub-total current assets	17,900,104
Changes in current assets	153,686,906
Current Liabilities	9,152,354
Accounts Payable	
Miscellaneous credit accounts	57,248,663
Sub-total current liabilities	-
Changes in current liabilities	57,248,663
Working capital requirements	6,719,537
	2,432,818

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Table 3. CAPITAL COSTS (in LE)

Table 3.1: Company Projects	2003	2004	2005	2006	2007	TOTAL (2003-2007)
Source of Supply						
Rehabilitation of groundwater works (25 wells)	500,000	500,000	500,000	500,000	500,000	2,500,000
New small filtration plants civil works (8 x 120 l/s)	2,500,000					2,500,000
Relocation of compressor units (10 units)	100,000	100,000	100,000	100,000	100,000	500,000
Structures	100,000	100,000	100,000	100,000	100,000	500,000
Electrical connections	200,000	200,000	200,000	100,000	100,000	800,000
Water Treatment						
R&R of large treatment plants	1,000,000	200,000	200,000	200,000	200,000	1,800,000
Iron and manganese removal projects (10 sites)	250,000	250,000	250,000	250,000	250,000	1,250,000
Laboratory facilities and equipment	100,000	100,000	100,000	100,000	100,000	500,000
Water Distribution						
R&R of urban networks	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	20,000,000
R&R of rural networks	3,000,000	4,000,000	4,000,000	4,000,000	5,000,000	20,000,000
New elevated storage tanks (10 tanks)	800,000	800,000	800,000	800,000	800,000	4,000,000
Customer Service						
Equipment and tools for meter maintenance and repair	200,000	100,000	100,000	100,000		500,000
New meters (72 - 10,000)	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	12,500,000
Means of transportation	300,000	300,000	300,000	200,000	200,000	1,300,000
R&R of customer service centers/meter workshops	1,000,000	1,000,000	1,000,000	1,000,000	500,000	4,500,000
Service class user audit and retrofitting program tools	100,000	100,000	100,000	100,000	100,000	500,000
Finance and Administration						
Office equipment and furnishings	250,000	250,000	250,000	250,000	250,000	1,250,000
Computer equipment	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	5,000,000
Total, Company Projects	17,900,000	15,500,000	15,500,000	15,300,000	15,700,000	79,900,000

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Table 3.2: NOPWASD Projects	2003	2004	2005	2006	2007	TOTAL (2003-2007)
Source-of-Supply						
Bani Salama wells (4 wells), pumps, booster, & building	2,000,000					2,000,000
Southern Beheira wells	2,500,000					2,500,000
Water Treatment						
Damanhour WTP expansion (400 to 800 l/s)	40,000,000					40,000,000
Shubrakhit WTP expansion (400 to 800 l/s)	40,000,000					40,000,000
Abu Hommos WTP expansion (by 51,000 m³/d)		55,000,000				55,000,000
Mahmudiya WTP expansion (by 34,000 m3/d)		40,000,000				40,000,000
Dilingat WTP expansion (by 34,000 m3/d)			45,000,000			45,000,000
Nubariya WTP expansion (by 34,000 m3/d)			50,000,000			50,000,000
Kafr il-Dawwar WTP expansion (by 43,000 m3/d)				55,000,000		55,000,000
Idfina WTP expansion (by 43,000 m3/d)					50,000,000	50,000,000
Water Transmission Lines						
Abu Hommos district (16 km)		19,000,000				19,000,000
Mahmudiya district (41 km)		35,000,000				35,000,000
Dilingat district (58 km)			32,500,000			32,500,000
Nubariya district (26 km)			17,500,000			17,500,000
Kafr il-Dawwar district (21 km)				30,500,000		30,500,000
Idfina district (20 km)					15,000,000	15,000,000
Treated Water Storage and Pumping						
South Tahrir elevated tank (500 m³), pumps, and booster	1,300,000					1,300,000
Unserved Villages Project (46 villages)	30,000,000	42,500,000	42,500,000	42,500,000	42,500,000	200,000,000
Total, NOPWASD Projects	115,800,000	191,500,000	187,500,000	128,000,000	107,500,000	730,300,000
TOTAL CAPITAL EXPENDITURE	133,700,000	207,000,000	203,000,000	143,300,000	123,200,000	810,200,000

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Table 4: REVENUES AND COLLECTIONS ANALYSIS

Table 4-1: Current Water Tariffs (LE/m³)

Year	Historical Data				Projections				
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Retail Water Tariff Rates									
Residential 0-20 m3/month	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230
Residential >20 m3/month	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
Governmental	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450
Religious	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450
Standpipes	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450
Commercial	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Public Sector	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Bidoun Isdar					0.000	0.000	0.000	0.000	0.000
BBB					0.000	0.000	0.000	0.000	0.000
CCC					0.000	0.000	0.000	0.000	0.000
DDD					0.000	0.000	0.000	0.000	0.000
Bulk Water Tariff Rates									
AAA					0.000	0.000	0.000	0.000	0.000
BBB					0.000	0.000	0.000	0.000	0.000
CCC					0.000	0.000	0.000	0.000	0.000

Table 4-2: Water Tariff Revenue (LE), at current tariffs

Year	Historical Data				Projections					Total
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Residential 0-20 m3/month	11,512,102	11,731,057	12,426,572	12,827,570	14,110,327	15,521,360	17,073,496	18,780,845	20,658,930	86,144,958
Residential >20 m3/month	7,721,216	7,888,920	8,547,839	8,906,159	9,796,775	10,776,453	11,854,098	13,039,508	14,343,458	59,810,291
Governmental	3,586,307	3,875,087	4,036,222	4,308,197	4,480,525	4,659,746	4,846,136	5,039,981	5,241,580	24,267,968
Religious	4,097,898	4,303,417	4,465,107	4,670,244	4,810,351	4,954,662	5,103,302	5,256,401	5,414,093	25,538,808
Standpipes	10,381,394	10,158,170	9,889,443	9,660,446	9,370,633	8,995,807	8,546,017	8,033,256	7,470,928	42,416,641
Commercial	1,532,510	1,651,180	1,769,761	1,903,481	2,055,760	2,220,221	2,397,838	2,589,665	2,796,838	12,060,322
Public Sector	593,875	620,405	649,630	679,177	692,760	706,615	720,748	735,163	749,866	3,605,152
Bidoun Isdar	549,093	379,011	322,018	300,000	300,000	300,000	300,000	300,000	300,000	1,500,000
BBB	0	0	0	0	0	0	0	0	0	0
CCC	0	0	0	0	0	0	0	0	0	0
DDD	0	0	0	0	0	0	0	0	0	0
Total Retail Water Tariff Revenue	39,974,395	40,607,246	42,106,592	43,255,274	45,617,131	48,134,864	50,841,634	53,774,819	56,975,694	255,344,142
Bulk Water Tariff Rates										
AAA	0	0	0	0	0	0	0	0	0	
BBB	0	0	0	0	0	0	0	0	0	
CCC	0	0	0	0	0	0	0	0	0	
Total Bulk Water Sale Revenue	0	0	0	0	0	0	0	0	0	0
Total Billed Water Tariff Revenue	39,974,395	40,607,246	42,106,592	43,255,274	45,617,131	48,134,864	50,841,634	53,774,819	56,975,694	255,344,142

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Table 4: REVENUES AND COLLECTIONS ANALYSIS

Table 4-3: Fixed-Charge Water Revenues

Year	Historical Data				Projections					Total
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Meter Maintenance Charges										
Residential & Commercial	1,222,912	1,327,187	1,450,542	1,592,492	1,748,713	1,920,406	2,109,108	2,316,514	2,544,485	10,639,227
Government & Public Sector	69,971	75,348	78,647	83,230	87,004	90,220	93,560	96,229	98,976	465,989
Religious & Standpipes	48,132	48,066	43,600	43,317	42,572	41,906	41,318	40,805	40,364	206,965
Customer Accounting Charges										
Residential & Commercial	1,069,219	1,156,778	1,266,483	1,390,421	1,526,820	1,676,726	1,841,484	2,022,572	2,221,616	9,289,218
Government & Public Sector	20,318	21,733	23,012	24,353	25,457	26,398	27,375	28,157	28,960	136,348
Total Fixed-Charge Revenues	**2,430,552**	**2,629,112**	**2,862,284**	**3,133,813**	**3,430,566**	**3,755,656**	**4,112,846**	**4,504,277**	**4,934,402**	**20,737,746**

Table 4-4: Water Non-Tariff Revenues (LE)

Year	Historical Data				Projections					Total
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Enterprise activities (25% of 415)	635,769	834,469	596,569	639,466	700,000	700,000	700,000	700,000	700,000	3,500,000
Connection services (417)	5,460,979	7,169,867	8,303,176	9,206,968	10,248,854	11,414,661	12,713,079	14,159,191	15,769,800	64,305,585
increase in connections from prior yr.		26,111	33,704	35,347	38,861	42,747	47,022	51,724	56,897	
average revenue per service		275	246	260	264	267	270	274	277	
Sold manufactures (4181)	8,238,746	8,982,430	10,783,223	12,140,092	12,500,000	13,500,000	14,500,000	15,500,000	16,500,000	72,500,000
Other	0	0	0	0	0	0	0	0	0	0
Total Non-Tariff Revenues	**14,335,494**	**16,986,766**	**19,682,968**	**21,986,527**	**23,448,854**	**25,614,661**	**27,913,079**	**30,359,191**	**32,969,800**	**140,305,585**

Table 4-5: Non-Retained Billings (LE)

Year	Historical Data				Projections					Total
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Miscellaneous (stamps, local fund, etc.)	3,833,724	3,567,319	5,166,042	5,200,000	5,200,000	5,200,000	5,200,000	5,200,000	5,200,000	26,000,000
Wastewater	2,428,603	2,305,528	2,387,379	2,500,000	2,750,000	3,000,000	3,250,000	3,500,000	3,750,000	16,250,000
Total Non-Retained Billings	**6,262,327**	**5,872,847**	**7,553,421**	**7,700,000**	**7,950,000**	**8,200,000**	**8,450,000**	**8,700,000**	**8,950,000**	**42,250,000**

Table 4-6: Collection Efficiency

Year	Historical Data				Projections					Total
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Total Billings										
Water Tariff Revenue	39,974,395	40,607,246	42,106,592	43,255,274	45,617,131	48,134,864	50,841,634	53,774,819	56,975,694	255,344,142
Fixed-Charge Revenue	2,430,552	2,629,112	2,862,284	3,133,813	3,430,566	3,755,656	4,112,846	4,504,277	4,934,402	20,737,746
Non-Retained Billings	6,262,327	5,872,847	7,553,421	7,700,000	7,950,000	8,200,000	8,450,000	8,700,000	8,950,000	42,250,000
Total Billings	**48,667,274**	**49,109,205**	**52,522,297**	**54,089,087**	**56,997,697**	**60,090,520**	**63,404,480**	**66,979,096**	**70,860,096**	**318,331,888**
Total Collections	39,921,985	43,598,879	39,025,539	43,000,000	46,738,111	50,476,037	54,527,853	58,941,604	63,774,086	274,457,691
Collection Efficiency (%)	82.03%	88.78%	74.30%	79.50%	82%	84%	86%	88%	90%	86%
Water Tariff Revenue Collection	**32,791,177**	**36,050,887**	**31,286,378**	**34,387,284**	**37,406,047**	**40,433,285**	**43,723,805**	**47,321,841**	**51,278,125**	**220,163,103**

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Table 5-1: Calculation of Revenue Requirement and Average Tariff Increase

Year	Historical Data				Projections					Total
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Total Consumption (m3)	116,005,593	118,969,183	123,656,027	127,081,506	135,524,747	144,635,019	154,518,191	165,292,724	177,089,301	777,059,983
Unaccounted for Water (%)	33%	30%	29%	27%	25%	23%	21%	19%	17%	21%
Total Production (m3)	174,412,075	170,918,323	174,803,989	174,101,666	180,699,663	187,837,687	195,592,647	204,065,092	213,360,604	981,555,693
O&M Costs (LE)	47,619,765	51,754,289	57,125,158	61,905,539	65,674,665	70,084,727	74,839,337	79,973,503	85,534,835	376,107,067
O&M Costs / m3 Produced	0.27	0.30	0.33	0.36	0.36	0.37	0.38	0.39	0.40	0.38
O%M Costs / m3 Sold	0.41	0.44	0.46	0.49	0.48	0.48	0.48	0.48	0.48	0.48
Capital Costs (LE)	20,747,376	18,100,285	15,294,663	15,000,000	17,900,000	15,500,000	15,500,000	15,300,000	15,700,000	79,900,000
Working Capital Requirements	1,571,685	7,663,571	585,712	2,432,818	2,326,497	2,329,211	2,572,099	3,039,674	3,688,593	13,956,074
Total Costs (LE)	69,938,826	77,518,145	73,005,533	79,338,357	85,901,163	87,913,938	92,911,435	98,313,177	104,923,428	469,963,141
Non-Tariff Revenue Deduction	14,335,494	16,986,766	19,682,968	21,986,527	23,448,854	25,614,661	27,913,079	30,359,191	32,969,800	140,305,585
Fixed-Charge Revenue Deduction	2,430,552	2,629,112	2,862,284	3,133,813	3,430,566	3,755,656	4,112,846	4,504,277	4,934,402	20,737,746
Cash Requirement from Tariffs	*53,172,780*	*57,902,267*	*50,460,281*	*54,218,017*	*59,021,743*	*58,543,621*	*60,885,511*	*63,449,708*	*67,019,227*	*308,919,810*
Cash Requirement / m3 Sold	*0.46*	*0.49*	*0.41*	*0.43*	*0.44*	*0.40*	*0.39*	*0.38*	*0.38*	*0.40*
Average Tariff Increase Factor	*1.33*	*1.43*	*1.20*	*1.25*	*1.29*	*1.22*	*1.20*	*1.18*	*1.18*	*1.21*
Tariff Revenue at Current Tariffs	39,974,395	40,607,246	42,106,592	43,255,274	45,617,131	48,134,864	50,841,634	53,774,819	56,975,694	255,344,141.52
AverageTariff Revenue/m3 sold	0.34	0.34	0.34	0.34	0.34	0.33	0.33	0.33	*1.31*	0.33
Collection Efficiency Rate	82.0%	88.8%	74.3%	79.5%	82.0%	84.0%	86.0%	88.0%	90.0%	86.2%
Water Tariff Revenue Collection	32,791,177	36,050,887	31,286,378	34,387,284	37,406,047	40,433,285	43,723,805	47,321,841	51,278,125	220,163,103
Average Collection/m3 sold	0.28	0.30	0.25	0.27	0.28	0.28	0.28	0.29	0.29	0.28
Net Income at Current Tariffs	-20,381,603	-21,851,380	-19,173,903	-19,830,733	-21,615,695	-18,110,335	-17,161,706	-16,127,868	-15,741,102	-88,756,706
Revenue Requirement for Break-Even	64,820,781	65,220,354	67,911,679	68,200,071	63,766,652	61,993,209	63,679,277	65,648,963	68,768,238	323,856,338
Average Tariff Required for Positive Cash (LE)	0.56	0.55	0.55	0.54	0.47	0.43	0.41	0.40	0.39	0.42
Average Tariff Increase Factor for Positive Cash	1.62	1.61	1.61	1.58	1.40	1.29	1.25	1.22	1.21	1.27

Table 5-2 Average Class Tariff Planning Worksheet

Table 5-2-1: Proposed Average Tariff, by class

Year	Historical Data				Projections					Average Year
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Residential 0-20 m3/month	0.23	0.23	0.23	0.23	0.26	0.26	0.26	0.26	0.26	0.260
Residential >20 m3/month	0.35	0.35	0.35	0.35	0.40	0.45	0.45	0.45	0.45	0.440
Governmental	0.45	0.45	0.45	0.45	0.50	0.60	0.60	0.60	0.60	0.580
Religious	0.45	0.45	0.45	0.45	0.50	0.60	0.60	0.60	0.60	0.580
Standpipes	0.45	0.45	0.45	0.45	0.50	0.60	0.60	0.60	0.60	0.580
Commercial	0.75	0.75	0.75	0.75	0.77	0.80	0.80	0.80	0.80	0.794
Public Sector	0.75	0.75	0.75	0.75	0.78	0.80	0.80	0.80	0.80	0.796

Table 5-2-2: Expected Tariff Revenue

Year	Historical Data				Projections					Average Year
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Residential 0-20 m3/month	11,512,102	11,731,057	12,426,572	12,827,570	15,950,805	17,545,885	19,300,474	21,230,521	23,353,573	19,476,251
Residential >20 m3/month	7,721,216	7,888,920	8,547,839	8,906,159	11,196,314	13,855,439	15,240,983	16,765,081	18,441,589	15,099,881
Governmental	3,586,307	3,875,087	4,036,222	4,308,197	4,978,361	6,212,994	6,461,514	6,719,975	6,988,774	6,272,324
Religious	4,097,898	4,303,417	4,465,107	4,670,244	5,344,835	6,606,216	6,804,402	7,008,534	7,218,790	6,596,556
Standpipes	10,381,394	10,158,170	9,889,443	9,660,446	10,411,814	11,994,410	11,394,689	10,711,008	9,961,237	10,894,632
Commercial	1,532,510	1,651,180	1,769,761	1,903,481	2,110,580	2,368,235	2,557,694	2,762,310	2,983,294	2,556,423
Public Sector	593,875	620,405	649,630	679,177	720,471	753,723	768,798	784,174	799,857	765,404
Bidoun Isdar	549,093	379,011	322,018	300,000	300,000	300,000	300,000	300,000	300,000	300,000
Total Tariff Revenue	39,974,395	40,607,246	42,106,592	43,255,274	51,013,180	59,636,903	62,828,554	66,281,602	70,047,112	61,961,471
Surplus (Deficit)	-13,198,385	-17,295,021	-8,353,690	-10,962,743	-8,008,563	1,093,282	1,943,043	2,831,894	3,027,889	887,544

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Table 5-3: Block Rate Designs

Residential Consumers, 2001				Average Residential Consumers, 2003 - 2007				
Consumption Block (m^3/month)	No. of Customers	Average Consumption (m^3/month)	Average Consumption Per Block (m^3/month)	No. of Customers	Average Consumption (m^3/month)	Change from Average Tariff	**Tgt. Avg. Tff. (2003-2007) (LE), 0-20 and > 20**	Tariffs Per Consumption Block (LE/m^3)
							0.260	
							0.440	
0-10	72,452	675,357	9.3	131,438	936,358	-0.034	211,617	0.23
11-20	222,357	3,827,024	17.2	306,689	5,306,030	-0.006	1,411,404	0.27
21-30	24,931	589,389	23.6	37,256	824,805	-0.065	309,055	0.37
31-50	22,464	709,515	31.6	30,215	992,913	-0.002	434,896	0.44
51 - 100	9,500	541,795	57.0	14,047	758,201	0.047	369,092	0.49
>100	1,561	194,501	124.6	2,308	272,189	0.094	145,240	0.53
Totals	353,265	6,537,581	18.5	521,953	9,090,497		19,476,251	15,099,398
				Target Revenue (Avg. 2003-2007), 0-20			19,476,251	
				Target Revenue (Avg. 2003-2007), <21				15,099,881

Commercial Customers, 2001				Average Commercial Customers, 2003 - 2007				
Consumption Block (m^3/month)	No. of Customers	Average Consumption (m^3/month)	Average Consumption Per Block (m^3/month)	No. of Customers	Average Consumption (m^3/month)	Change from Average Tariff	**Tgt. Avg. Tff. (2003-2007) (LE)**	Tariffs Per Consumption Block (LE/m^3)
							0.794	
0-20	12,788	90,341	7.1	15,507	123,129	-0.04	92,593	0.75
>20	1,801	106,299	59.0	2,318	144,879	0.04	120,467	0.83
Totals	14,699	196,640	13.4	17,825	268,007		2,556,711	
				Target Revenue (Avg. 2003-2007))			2,556,423	

Residential Tariffs, If Applied Uniformly Over Rate Period, Water (Piasters/m^3)

Consumption Block (m^3/month)	Current (2002)			Average for 2003 - 2007			Percentage +/-
	Water	Wastewater	Total	Water	Wastewater	Total	
0-10	23		23	23		23	-2%
11-20	23		23	27		27	16%
21-30	35		35	37		37	7%
31-50	35		35	44		44	25%
51 - 100	35		35	49		49	39%
>100	35		35	53		53	52%

Commercial Tariffs, If Applied Uniformly Over Rate Period, Water (Piasters/m^3)

Consumption Block	Current (2002)			Average for 2003 - 2007			Percentage +/-
	Water	Wastewater	Total	Water	Wastewater	Total	
0-20	75		75	75		75	0%
>20	75		75	83		83	11%

Table 5-4: Schedule of Proposed Tariffs, 2003-2007

Residential Tariffs, Water, Phased-In				
Consumption Block CuM/Mo.	Year			
	Current (2002)	2003	2004	2005 & Beyond
	Piasters Per CuM			
0-10	23	23	23	23
11-20	23	25	28	28
21-30	35	37	39	39
31-50	35	40	45	45
51 - 100	35	42	50	50
> 100	35	45	55	55

Commercial Tariffs, Water, Phased-In				
Consumption Block CuM/Mo.	Year			
	Current (2002)	2003	2004	2005 & Beyond
	Piasters Per CuM			
0-20	75	75	75	75
>20	75	79	82	85

All Other Customer Classifications, Water, Flat Rate, Phased-In				
Customer Classification	Year			
	Current (2002)	2003	2004	2005 & Beyond
	Piasters Per CuM			
Governmental	45	50	60	60
Religious	45	50	60	60
Standpipes	45	50	60	60
Public Sector	75	78	80	80

Beheira Water Tariffs, 2003-2007 (Cash Needs Approach)							
Consumption Block CuM/Mo.	Phased-In Basis						Average Tariff Over Rate Term 2003-2007
	Current (2002)	2003	2004	2005	2006	2007	
	--------- Piasters Per CuM ----------						
Residential Block Rates							
0-10	23	23	23	23	23	23	23
11-20	23	25	28	28	28	28	27
21-30	35	37	39	39	39	39	37
31-50	35	40	45	45	45	45	44
51 - 100	35	42	50	50	50	50	49
> 100	35	45	55	55	55	55	53
Commercial Block Rates							
0-20	75	75	75	75	75	75	75
>20	75	79	82	85	85	85	83
All Other Customer Classes							
Governmental	45	50	60	60	60	60	58
Religious	45	50	60	60	60	60	58
Standpipes	45	50	60	60	60	60	58
Public Sector	75	78	80	80	80	80	80

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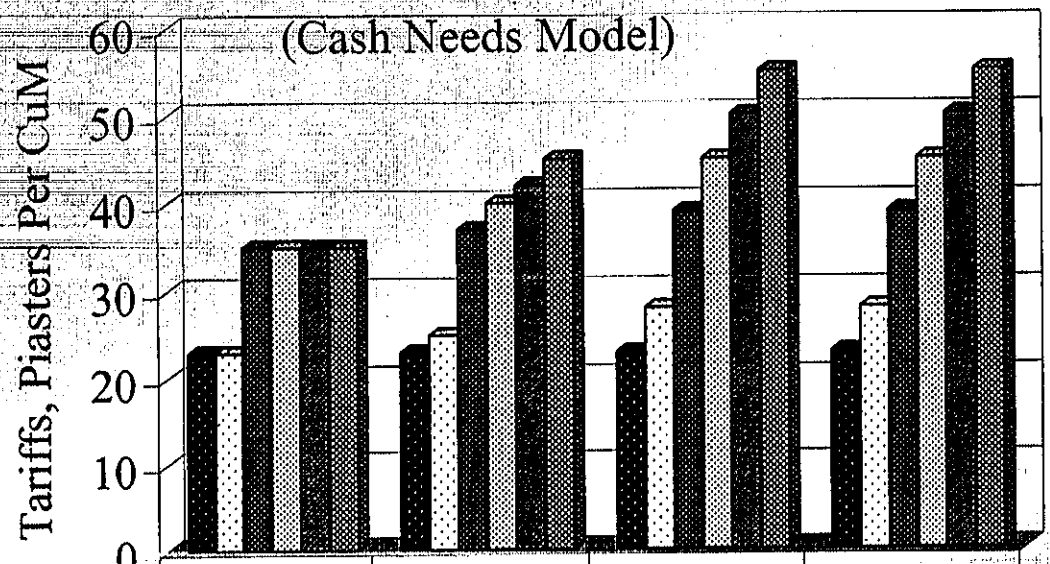
Beheira Block Rate Residential Water Tariffs Phase-In 2003-2005
(Cash Needs Model)



	2002	2003	2004	2005
0-10	23	23	23	23
11-20	23	25	28	28
21-30	35	37	39	39
31-50	35	40	45	45
51 - 100	35	42	50	50
> 100	35	45	55	55

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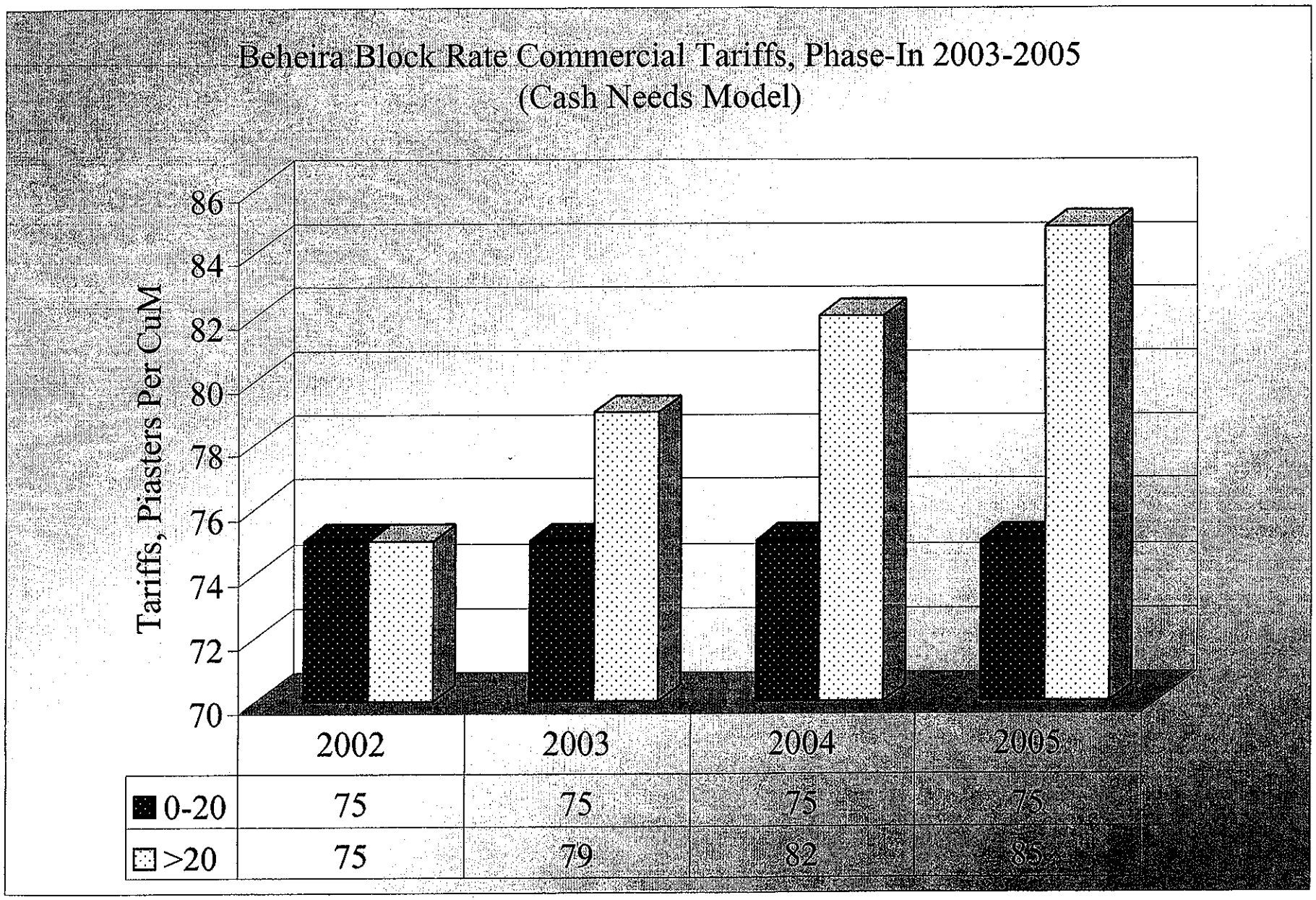
Beheira Block Rate Commercial Tariffs, Phase-In 2003-2005
(Cash Needs Model)
Tariffs, Piasters Per CuM
86
84
82
80
78
76
74
72
70
2002
2003
2004
2005
0-20
75
75
75
75
>20
75
79
82
85

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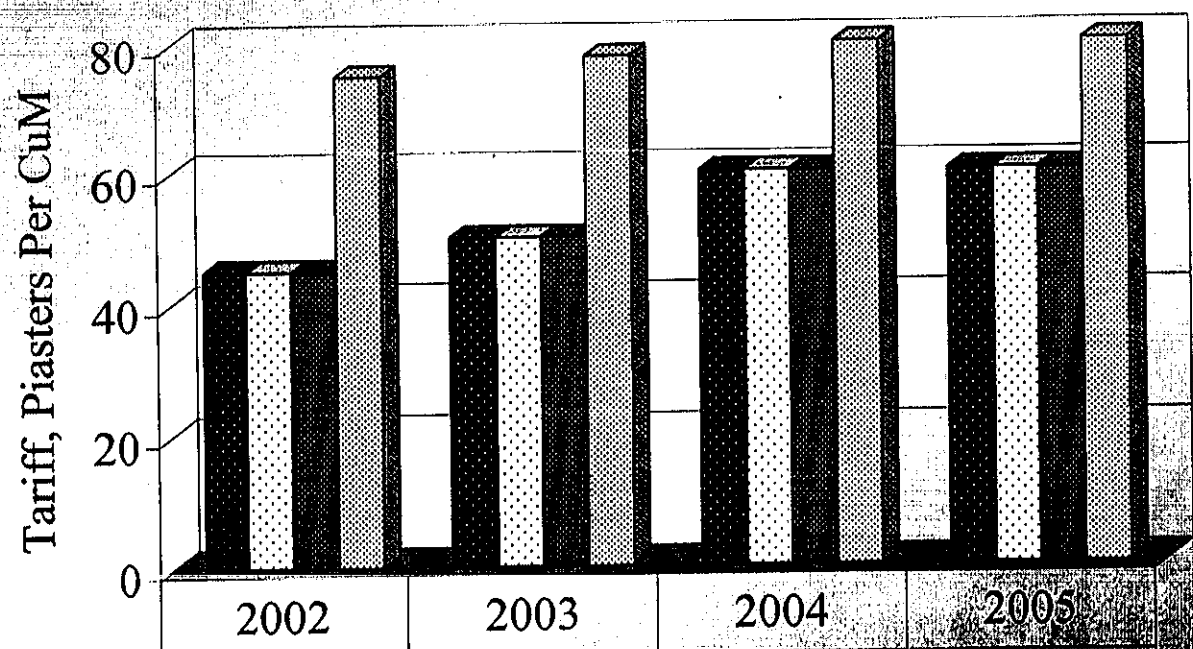
Beheira Tariffs for Other Consumer Categories, Flat Rate Phase-In, 2003-2005
(Cash Needs Model)



	2002	2003	2004	2005
Governmental	45	50	60	60
Religious	45	50	60	60
Standpipes	45	50	60	60
Public Sector	75	78	80	[illegible]

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Egyptian Water/Wastewater Sector Regulatory Agency
Name of Utility: BEHEIRA WATER COMPANY
Attachment: BC Block Consumption

Date Prepared:_____
Rate Term:_____

Average Connections and Consumption, September 2001 - December 2001

Blocks	Class A DOMESTIC			Class B COMMERCIAL			Class C GOVERNMENTAL			Class D PUBLIC SECTOR			Class E			Class F		Total	
Total Billed Consumption of User	Avgerage No. of users ending in this block	Total consumption of users ending in this block (m^3)	Average consumption per block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	Average consumption per block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	Average consumption per block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	Average consumption per block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	Average consumption per block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)
0-20	269,980	3,164,295	11.7	12,050	111,674	9.3	1,446	14,460	10.0	442	4,420	10.0	22	220	10.0	0	0	283,941	3,295,069
21-30	29,070	779,727	26.8	694	18,550	26.7	245	3,092	12.6	53	658	12.5	5	57	12.6	0	0	30,066	802,083
31-50	21,818	938,647	43.0	622	27,110	43.6	279	6,690	24.0	73	1,216	16.8	10	200	21.0	0	0	22,801	973,862
51-100	9,227	716,762	77.7	306	26,353	86.2	474	14,798	31.2	81	2,968	36.6	27	1,011	37.4	0	0	10,115	761,891
>100	1,516	257,313	169.7	180	59,388	329.9	1,073	302,847	282.4	196	55,404	282.7	73	9,071	125.1	0	0	3,037	684,023
Total	331,612	5,856,744	17.7	13,852	243,075	17.5	3,516	341,886	97.2	844	64,665	76.6	136	10,558	77.9	-	-	349,959	6,516,928

89.9%

Data does not match consumption blocks
(Note - this data looks like it may have been manufactured)

BEST AVAILABLE COPY

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Tariff Model: Utility Approach

List of Tables (Utility Approach Model)

Table 1. Water Demand

Table 1-1 Water Consumption, by Type of User
Table 1-2 Number of Water Customers
Table 1-3 Unaccounted-for Water and Treated Water Production Requirements

Table 2. Operation and Maintenance Costs

Table 2-1 O&M Costs
Table 2-2 Working Capital Requirements

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Table 1: WATER DEMAND

Table 1-1: Water Consumption, by Type of User (m^3/year)

Year	Historical Data			
	1999	2000	2001	2002
Retail Water Consumption				
Residential 0-20 m3/month	50,052,618	51,004,594	54,028,573	55,772,044
Calculated Annual Increase %	#DIV/0!	1.9%	5.9%	3.2%
Residential >20 m3/month	22,060,618	22,639,772	24,422,396	26,446,168
Calculated Annual Increase %	#DIV/0!	2.2%	8.4%	4.2%
Governmental	7,989,571	8,611,304	8,969,382	9,573,771
Calculated Annual Increase %	#DIV/0!	8.1%	4.2%	6.7%
Religious	9,106,440	9,563,148	9,922,461	10,378,320
Calculated Annual Increase %	#DIV/0!	5.0%	3.8%	4.6%
Standpipes	23,069,764	22,573,712	21,976,541	21,467,658
Calculated Annual Increase %	#DIV/0!	-2.2%	-2.6%	-2.3%
Commercial	2,043,347	2,201,573	2,359,681	2,537,975
Calculated Annual Increase %	#DIV/0!	7.7%	7.2%	7.6%
Public Sector	791,833	827,206	866,173	905,569
Calculated Annual Increase %	#DIV/0!	4.5%	4.7%	4.5%
Bidoun Isdar	911,402	1,647,874	1,110,820	1,000,000
Calculated Annual Increase %	#DIV/0!	80.8%	-32.6%	-10.0%
BBB				
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
CCC				
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
DDD				
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Retail Consumption	**116,005,593**	**118,969,183**	**123,656,027**	**127,081,506**
Bulk Water Consumption (m^3/year)				
AAA				
BBB				
CCC				
Total Bulk Water Consumption	0	0	0	0
Total Billed Water Consumption	**116,005,593**	**118,969,183**	**123,656,027**	**127,081,506**

Year	Projections					Total	Average Year
	2003	2004	2005	2006	2007		
Retail Water Demand							
Residential 0-20 m3/month	61,349,248	67,484,173	74,232,591	81,655,850	89,821,435	374,543,296	74,908,659
Assumed Annual Increase %	10.0%	10.0%	10.0%	10.0%	10.0%	1	10.0%
Residential >20 m3/month	27,990,786	30,789,864	33,868,851	37,255,736	40,981,310	170,886,547	34,177,309
Assumed Annual Increase %	10.0%	10.0%	10.0%	10.0%	10.0%	1	10.0%
Governmental	9,956,722	10,354,991	10,769,190	11,199,958	11,647,956	53,928,817	10,785,763
Assumed Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%	0	4.0%
Religious	10,689,670	11,010,360	11,340,670	11,680,891	12,031,317	56,752,908	11,350,582
Assumed Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%	0	3.0%
Standpipes	20,823,628	19,990,683	18,991,149	17,851,680	16,602,062	94,259,203	18,851,841
Assumed Annual Increase %	-3.0%	-4.0%	-5.0%	-6.0%	-7.0%	0	-5.0%
Commercial	2,741,013	2,960,294	3,197,118	3,452,887	3,729,118	16,080,429	3,216,086
Assumed Annual Increase %	8.0%	8.0%	8.0%	8.0%	8.0%	0	8.0%
Public Sector	923,680	942,154	960,997	980,217	999,821	4,806,870	961,374
Assumed Annual Increase %	2.0%	2.0%	2.0%	2.0%	2.0%	0	2.0%
Bidoun Isdar	1,050,000	1,102,500	1,157,625	1,215,506	1,276,282	5,801,913	1,160,383
Assumed Annual Increase %	5.0%	5.0%	5.0%	5.0%	5.0%	0	5.0%
BBB	0	0	0	0	0	0	0
Assumed Annual Increase %						0	#DIV/0!
CCC	0	0	0	0	0	0	0
Assumed Annual Increase %						0	#DIV/0!
DDD	0	0	0	0	0	0	0
Assumed Annual Increase %						0	#DIV/0!
Total Retail Demand	**135,524,747**	**144,635,019**	**154,518,191**	**165,292,724**	**177,089,301**	**777,059,983**	**155,411,997**
Bulk Water Demand (m^3/year)							
AAA							0
BBB							0
CCC							0
Total Bulk Water Demand	0	0	0	0	0		0
Total Billed Water Demand	**135,524,747**	**144,635,019**	**154,518,191**	**165,292,724**	**177,089,301**	**777,059,983**	**155,411,997**

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Table 1: WATER DEMAND

Table 1-2: Number of Water Customers

Year	Historical Data				Projections						Average Year
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Retail Water Customers											
Residential 0-20 m3/month	238,852	261,928	289,809	318,755	350,631	385,694	424,263	466,689	513,358		428,127
Calculated Annual Increase %	#DIV/0!	10%	11%	10%	10.0%	10.0%	10.0%	10.0%	10.0%		10.0%
Residential >20 m3/month	54,598	57,633	63,456	69,857	76,843	84,527	92,980	102,278	112,505		93,826
Calculated Annual Increase %	#DIV/0!	6%	10%	10%	10.0%	10.0%	10.0%	10.0%	10.0%		10.0%
Governmental	4,864	5,186	5,363	5,660	5,943	6,181	6,428	6,621	6,819		6,398
Calculated Annual Increase %	#DIV/0!	7%	3%	6%	5.0%	4.0%	4.0%	3.0%	3.0%		3.8%
Religious	1,600	1,530	1,589	1,630	1,679	1,729	1,781	1,835	1,890		1,783
Calculated Annual Increase %	#DIV/0!	2%	4%	3%	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Standpipes	2,518	2,414	2,413	2,346	2,229	2,117	2,011	1,911	1,815		2,017
Calculated Annual Increase %	#DIV/0!	-4%	0%	-3%	-5.0%	-5.0%	-5.0%	-5.0%	-5.0%		-5.0%
Commercial	13,615	14,393	14,699	15,361	16,129	16,936	17,782	18,671	19,605		17,825
Calculated Annual Increase %	#DIV/0!	6%	2%	5%	5.0%	5.0%	5.0%	5.0%	5.0%		5.0%
Public Sector	848	919	969	1,041	1,062	1,083	1,105	1,127	1,149		1,105
Calculated Annual Increase %	#DIV/0!	8%	5%	7%	2.0%	2.0%	2.0%	2.0%	2.0%		2.0%
BBB					0	0	0	0	0		0
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!							#DIV/0!
CCC					0	0	0	0	0		0
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!							#DIV/0!
DDD					0	0	0	0	0		0
Calculated Annual Increase %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!							#DIV/0!
Total Retail Customers	**316,795**	**344,003**	**378,298**	**414,650**	**454,515**	**498,266**	**546,350**	**599,131**	**657,142**		**551,081**
Bulk Water Customers (m^3/year)											=
AAA											0
BBB											0
CCC											0
Total Bulk Water Customers	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		0
Total Water Customers	**316,795**	**344,003**	**378,298**	**414,650**	**454,515**	**498,266**	**546,350**	**599,131**	**657,142**		**551,081**
Population Growth Rate %		2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%		
Total Population	**4,289,285**	**4,379,360**	**4,471,327**	**4,565,224**	**4,661,094**	**4,758,977**	**4,858,916**	**4,960,953**	**5,065,133**		

Table 1-3: Unaccounted-for Water and Treated Water Production Requirements

Year	Historical Data				Projections						Average Year
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Unaccounted-for Water Rate (%)	33%	30%	29%	27%	25%	23%	21%	19%	17%		21%
											Total
Unaccounted-for Water (m^3)	58,406,482	51,949,140	51,147,962	47,020,160	45,174,916	43,202,668	41,074,456	38,772,367	36,271,303		204,495,710
Production Sources (m^3)											
Own Production (m^3)	166,301,918	163,323,501	167,013,955	168,071,666	172,519,663	179,537,687	187,192,647	195,565,092	204,610,604		939,425,693
Bulk Purchase, AWGA (m^3)	7,530,257	7,045,822	7,242,534	7,500,000	7,750,000	8,000,000	8,250,000	8,500,000	8,750,000		41,250,000
Bulk Purchase, Silk Co (m^3)	580,500	549,000	547,500	530,000	430,000	300,000	150,000	0	0		880,000
Total Production	**174,412,075**	**170,918,323**	**174,803,989**	**174,101,666**	**180,699,663**	**187,837,687**	**195,592,647**	**204,065,092**	**213,360,604**		**981,555,693**

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Table 2: OPERATION AND MAINTENANCE COSTS

Table 2-1: Operation and Maintenance Costs

Year	Historical Data			
	1999	2000	2001	2002
Labor				
Number of Employees	2,566	2,765	2,939	3,062
Number of Staff per 1,000 Connections	8.1	8.1	7.8	7.4
Average Staff Salary	8,391	8,620	9,260	9,991
Average Staff Salary Annual Increase %	#DIV/0!	2.73%	7.43%	7.89%
Total Wages and Salaries	21,447,142	24,008,740	27,215,873	30,592,680
Commodities				
Electricity	9,453,010	9,870,448	10,451,958	10,594,873
Fuel and Oil	503,468	610,222	581,407	589,025
Chemicals	2,053,792	2,775,684	3,124,059	3,163,586
Spare parts	3,487,394	4,376,669	2,262,820	2,293,652
Other Commodities	2,795,719	794,046	2,489,604	2,523,426
Services				
Maintenance	1,171,300	814,747	1,449,748	1,493,240
Transportation	283,027	318,669	350,310	360,819
Other Services	728,389	1,052,531	902,783	929,866
Water Purchases for Sale				
AWGA Water Purchases for Sale (LE 0.23/m	1,731,959	1,621,270	1,665,783	1,665,783
Silk Company Purchases for Sale (LE 0.135/	78,868	74,120	73,913	73,913
Non-Water Purchases for Sale	3,347,701	4,803,863	5,958,500	7,000,000
Taxes and Duties	537,496	537,496	602,000	625,176
Total O&M Costs for Water Supply	47,619,765	51,754,289	57,125,158	61,905,539

Year	Projections					Total
	2003	2004	2005	2006	2007	
Labor						
Number of Employees	3,062	3,062	3,062	3,062	3,062	
Number of Staff per 1,000 Connections	6.7	6.1	5.6	5.1	4.7	
Average Staff Salary	10,790	11,654	12,586	13,593	14,680	
Average Staff Salary Annual Increase %	8.00%	8.00%	8.00%	8.00%	8.00%	
Total Wages and Salaries	33,040,094	35,683,302	38,537,986	41,621,003	44,950,684	193,833,050
Commodities						
Electricity	10,455,431	10,336,715	10,238,570	10,161,679	10,100,105	51,292,500
Fuel and Oil	611,348	635,497	661,734	690,398	721,847	3,320,823
Chemicals	3,286,416	3,420,108	3,565,929	3,725,421	3,897,733	17,895,606
Spare parts	2,380,575	2,474,613	2,576,779	2,688,396	2,810,858	12,931,221
Other Commodities	2,619,056	2,722,515	2,834,915	2,957,714	3,092,443	14,226,643
0						
0						
0						
Services						
Maintenance	1,549,830	1,611,051	1,677,564	1,750,231	1,829,957	8,418,634
Transportation	374,493	389,286	405,358	422,917	442,182	2,034,236
Other Services	965,105	1,003,229	1,044,648	1,089,899	1,139,546	5,242,427
Water Purchases for Sale						
AWGA Water Purchases for Sale (LE 0.23/	1,782,500	1,840,000	1,897,500	1,955,000	2,012,500	9,487,500
Silk Company Purchases for Sale (LE 0.135	58,050	40,500	20,250	0	0	118,800
Non-Water Purchases for Sale	7,500,000	8,000,000	8,500,000	9,000,000	9,500,000	42,500,000
Taxes and Duties	648,871	674,502	702,350	732,773	766,152	3,524,848
Base O&M Costs for Water Supply (excluding labor)	32,231,675	33,148,016	34,125,597	35,174,428	36,313,322	170,993,038
Multipliers for annual inflation at						
2.5%	402,896	1,253,409	2,175,773	3,178,071.414	4,270,829.795	-
Total O&M Costs for Water Supply	65,674,665	70,084,727	74,639,337	79,973,503	85,534,835	376,107,067

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Table 2-2: Working Capital Requirements

Current Accounts	Historical Data			
	1998	1999	2000	2001
Current Assets (excl. cash)				
Accounts receivable (debtors)	101,010,985	108,344,777	114,741,930	127,568,300
Inventory	13,543,989	14,428,028	16,081,119	16,966,252
Sub-total current assets	114,554,974	122,772,805	130,823,049	144,534,552
Changes in current assets		8,217,831	8,050,244	13,711,503
Current Liabilities				
Accounts Payable	30,370,516	37,016,662	37,403,335	50,529,126
Miscellaneous credit accounts	-	-	-	-
Sub-total current liabilities	30,370,516	37,016,662	37,403,335	50,529,126
Changes in current liabilities		6,646,146	386,673	13,125,791
Working capital requirements		**1,571,685**	**7,663,571**	**585,712**

Current Accounts	Projections					Total
	2003	2004	2005	2006	2007	
Current Assets (excl. cash)						
Accounts receivable (debtors)	143,997,886	151,699,464	158,817,293	165,270,271	170,967,840	
Inventory	18,885,357	19,924,841	21,021,539	22,178,601	23,399,350	
Sub-total current assets	162,883,243	171,624,304	179,838,831	187,448,872	194,367,191	
Changes in current assets	9,196,337	8,741,061	8,214,527	7,610,041	6,918,319	
Current Liabilities						
Accounts Payable	64,118,502	70,530,352	76,172,781	80,743,147	83,972,873	
Miscellaneous credit accounts	-	-	-	-	-	
Sub-total current liabilities	64,118,502	70,530,352	76,172,781	80,743,147	83,972,873	
Changes in current liabilities	6,869,840	6,411,850	5,642,428	4,570,367	3,229,726	
Working capital requirements	**2,326,497**	**2,329,211**	**2,572,099**	**3,039,674**	**3,688,593**	**13,956,074**

	2002
Current Assets (Excl. cash)	
Accounts receivable (debtors)	135,786,802
Inventory	17,900,104
Sub-total current assets	153,686,906
Changes in current assets	9,152,354
Current Liabilities	
Accounts Payable	57,248,663
Miscellaneous credit accounts	-
Sub-total current liabilities	57,248,663
Changes in current liabilities	6,719,537
Working capital requirements	**2,432,818**

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Table 3: CAPITAL COSTS (in LE)

Table 3.1:Company Projects	2003	2004	2005	2006	2007	TOTAL (2003-2007)
Source of Supply						
Rehabilitation of groundwater works (25 wells)	500,000	500,000	500,000	500,000	500,000	2,500,000
New small filtration plants, civil works (3 x 120 l/s)	2,500,000					2,500,000
Relocation of compact units (10 units)	100,000	100,000	100,000	100,000	100,000	500,000
Structures	100,000	100,000	100,000	100,000	100,000	500,000
Electrical connections	200,000	200,000	200,000	100,000	100,000	800,000
Water Treatment						
R&R of large treatment plants	1,000,000	200,000	200,000	200,000	200,000	1,800,000
Iron and manganese removal projects (10 sites)	250,000	250,000	250,000	250,000	250,000	1,250,000
Laboratory facilities and equipment	100,000	100,000	100,000	100,000	100,000	500,000
Water Distribution						
R&R of urban network	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	20,000,000
R&R of rural network	3,000,000	4,000,000	4,000,000	4,000,000	5,000,000	20,000,000
New elevated storage tanks (10 tanks)	800,000	800,000	800,000	800,000	800,000	4,000,000
Customer Service						
Equipment and tools for meter maintenance and repair	200,000	100,000	100,000	100,000		500,000
New meters 1/2" (10,000)	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	12,500,000
Means of transportation	300,000	300,000	300,000	200,000	200,000	1,300,000
R&R of customer service centers/meter workshops	1,000,000	1,000,000	1,000,000	1,000,000	500,000	4,500,000
Service class user audit and retrofitting program tools	100,000	100,000	100,000	100,000	100,000	500,000
Finance and Administration						
Office equipment and furnishings	250,000	250,000	250,000	250,000	250,000	1,250,000
Computer equipment	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	5,000,000
Total, Company Projects	17,900,000	15,500,000	15,500,000	15,300,000	15,700,000	79,900,000

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Table 3.2: NOPWASD Projects	2003	2004	2005	2006	2007	TOTAL (2003-2007)
Source of Supply						
Bani Salama wells (4 wells), pumps, booster, & building	2,000,000					2,000,000
Southern Beheira wells	2,500,000					2,500,000
Water Treatment						
Damanhour WTP expansion (400 to 800 l/s)	40,000,000					40,000,000
Shubrakhit WTP expansion (400 to 800 l/s)	40,000,000					40,000,000
Abu Hommos WTP expansion (by 61,000 m3/d)		55,000,000				55,000,000
Mahmudiya WTP expansion (by 34,000 m3/d)		40,000,000				40,000,000
Dilingat WTP expansion (by 34,000 m3/d)			45,000,000			45,000,000
Nubariya WTP expansion (by 34,000 m3/d)			50,000,000			50,000,000
Kafr Il Dawwar WTP expansion (by 43,000 m3/d)				55,000,000		55,000,000
Idfina WTP expansion (by 43,000 m3/d)					50,000,000	50,000,000
Water Transmission Lines						
Abu Hommos district (16 km)		19,000,000				19,000,000
Mahmudiya district (41 km)		35,000,000				35,000,000
Dilingat district (53 km)			32,500,000			32,500,000
Nubariya district (26 km)			17,500,000			17,500,000
Kafr Il Dawwar district (21 km)				30,500,000		30,500,000
Idfina district (20 km)					15,000,000	15,000,000
Treated Water Storage and Pumping						
South Tahrir elevated tank (500 m^3), pumps, and booster	1,300,000					1,300,000
Unserved Villages Project (46 villages)	30,000,000	42,500,000	42,500,000	42,500,000	42,500,000	200,000,000
Total, NOPWASD Projects	115,800,000	191,500,000	187,500,000	128,000,000	107,500,000	730,300,000
TOTAL CAPITAL EXPENDITURE	133,700,000	207,000,000	203,000,000	143,300,000	123,200,000	810,200,000

Table 3.3 Fixed Assets and Depreciation	2003	2004	2005	2006	2007
Fixed Assets in Service at June 30,2001	516,424,265				
Works in Progress at June 30,2001	29,513,016				
Fixed Assets in Service at June 30,2002 - and onward	545,937,281	708,567,281	915,567,281	1,118,567,281	1,261,867,281
Works in Progress at June 30,2002 (est)	28,930,000	-	-	-	-
Works added - Company projects	17,900,000	15,500,000	15,500,000	15,300,000	15,700,000
Works added - NOPWASD projects	115,800,000	191,500,000	187,500,000	128,000,000	107,500,000
Fixed Assets in Service at June 30, 2003 - and onward	708,567,281	915,567,281	1,118,567,281	1,261,867,281	1,385,067,281
Average value of fixed assets in service during the year	627,252,281	812,067,281	1,017,067,281	1,190,217,281	1,323,467,281
Depreciation - average composite rate during 1998-2001 = 4.11%	**25,780,069**	**33,375,965**	**41,801,465**	**48,917,930**	**54,394,505**

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Table 5-1: Calculation of Revenue Requirement and Average Tariff Increase

Year	Historical Data				Projections					Total
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Total Consumption (m3)	116,005,593	118,969,183	123,656,027	127,081,506	135,524,747	144,635,019	154,518,191	165,292,724	177,089,301	777,059,983
Unaccounted for Water (%)	33%	30%	29%	27%	25%	23%	21%	19%	17%	21%
Total Production (m3)	174,412,075	170,918,323	174,803,989	174,101,666	180,699,663	187,837,687	195,592,647	204,065,092	213,360,604	981,555,693
O&M Costs (LE)	47,619,765	51,754,289	57,125,158	61,905,539	65,674,665	70,084,727	74,839,337	79,973,503	85,534,835	376,107,067
O&M Costs / m3 Produced	0.27	0.30	0.33	0.36	0.36	0.37	0.38	0.39	0.40	0.38
O%M Costs / m3 Sold	0.41	0.44	0.46	0.49	0.48	0.48	0.48	0.48	0.48	0.48
Capital Costs (LE)	20,747,376	16,100,285	15,294,663	15,000,000	17,900,000	15,500,000	15,500,000	15,300,000	15,700,000	79,900,000
Working Capital Requirements	1,571,685	7,663,571	585,712	2,432,818	2,326,497	2,329,211	2,572,099	3,039,674	3,688,593	13,956,074
Depreciation (substitute for R&R/capital costs)	25,001,658	16,331,501	20,456,480	22,488,022	25,780,069	33,375,965	41,801,465	48,917,930	54,394,505	204,269,935
Total Costs (LE)	74,193,108	77,749,361	78,167,350	86,776,379	93,781,231	105,789,903	119,212,901	131,931,107	143,617,933	594,333,075
Non-Tariff Revenue Deduction	14,335,494	16,986,766	19,682,968	21,986,527	23,448,854	25,614,661	27,913,079	30,359,191	32,969,800	140,305,585
Fixed-Charge Revenue Deduction	2,430,552	2,629,112	2,862,284	3,133,813	3,430,566	3,755,656	4,112,846	4,504,277	4,934,402	20,737,746
Revenue Requirement from Tariffs	*57,427,062*	*58,133,483*	*55,622,098*	*61,656,039*	*66,901,812*	*76,419,586*	*87,186,976*	*97,067,639*	*105,713,732*	*433,289,744*
Revenue Requirement / m3 Sold	*0.50*	*0.49*	*0.45*	*0.49*	*0.49*	*0.53*	*0.56*	*0.59*	*0.60*	*0.56*
Average Tariff Increase Factor	*1.44*	*1.43*	*1.32*	*1.43*	*1.47*	*1.59*	*1.71*	*1.81*	*1.86*	*1.70*
Tariff Revenue at Current Tariffs	39,974,395	40,607,246	42,106,592	43,255,274	45,617,131	48,134,864	50,841,634	53,774,819	56,975,694	255,344,141.52
AverageTariff Revenue/m3 sold	0.34	0.34	0.34	0.34	0.34	0.33	0.33	0.33	2.06	0.33
Collection Efficiency Rate	82.0%	88.8%	74.3%	79.5%	82.0%	84.0%	86.0%	88.0%	90.0%	86.2%
Water Tariff Revenue Collection	32,791,177	36,050,887	31,286,378	34,387,284	37,406,047	40,433,285	43,723,805	47,321,841	51,278,125	220,163,103
Average Collection/m3 sold	0.28	0.30	0.25	0.27	0.28	0.28	0.28	0.29	0.29	0.28
Net Income at Current Tariffs	-24,635,885	-22,082,596	-24,335,720	-27,268,756	-29,495,764	-35,986,301	-43,463,171	-49,745,798	-54,435,607	-213,126,641
Revenue Requirement for Break-Even	70,007,004	65,480,792	74,858,680	77,556,253	73,376,492	83,274,120	94,262,376	103,851,156	111,762,133	466,526,276
Average Tariff Required for Positive Cash (LE)	0.60	0.55	0.61	0.61	0.54	0.58	0.61	0.63	0.63	0.60
Average Tariff Increase Factor for Positive Cash	1.75	1.61	1.78	1.79	1.61	1.73	1.85	1.93	1.96	1.83

Table 5-2 Average Class Tariff Planning Worksheet

Table 5-2-1: Proposed Average Tariff, by class

Year	Historical Data				Projections					Average Year
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Residential 0-20 m3/month	0.23	0.23	0.23	0.23	0.30	0.35	0.40	0.45	0.45	0.390
Residential >20 m3/month	0.35	0.35	0.35	0.35	0.45	0.55	0.65	0.75	0.75	0.630
Governmental	0.45	0.45	0.45	0.45	0.55	0.65	0.75	0.80	0.80	0.710
Religious	0.45	0.45	0.45	0.45	0.55	0.65	0.75	0.80	0.80	0.710
Standpipes	0.45	0.45	0.45	0.45	0.55	0.65	0.75	0.80	0.80	0.710
Commercial	0.75	0.75	0.75	0.75	0.85	0.95	1.05	1.10	1.10	1.010
Public Sector	0.75	0.75	0.75	0.75	0.85	0.95	1.05	1.10	1.10	1.010

Table 5-2-2: Expected Tariff Revenue

Year	Historical Data				Projections					Average Year
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Residential 0-20 m3/month	11,512,102	11,731,057	12,426,572	12,827,570	18,404,775	23,619,461	29,693,036	36,745,132	40,419,646	29,776,410
Residential >20 m3/month	7,721,216	7,888,920	8,547,839	8,906,159	12,595,854	16,934,425	22,014,753	27,941,802	30,735,982	22,044,563
Governmental	3,586,307	3,875,087	4,036,222	4,308,197	5,476,197	6,730,744	8,076,893	8,959,986	9,318,365	7,712,433
Religious	4,097,898	4,303,417	4,465,107	4,870,244	5,879,318	7,156,734	8,505,503	9,344,712	9,625,054	8,102,264
Standpipes	10,381,394	10,158,170	9,889,443	9,660,446	11,452,996	12,993,944	14,243,362	14,281,344	13,281,850	13,250,659
Commercial	1,532,510	1,651,180	1,769,761	1,903,481	2,329,861	2,812,279	3,356,973	3,798,176	4,102,030	3,279,864
Public Sector	593,875	620,405	649,630	679,177	785,128	895,046	1,009,047	1,078,239	1,099,803	973,453
Bidoun Isdar	549,093	379,011	322,018	300,000	300,000	300,000	300,000	300,000	300,000	300,000
Total Tariff Revenue	39,974,395	40,607,246	42,106,592	43,255,274	57,224,128	71,442,634	87,199,567	102,449,372	108,882,530	85,439,646
Surplus (Deficit)	-17,452,667	-17,526,237	-13,515,507	-18,400,765	-9,677,683	-4,976,953	12,591	5,381,733	3,168,798	-6,091,514

Table 5-3: Block Rate Designs

Residential Consumers, 2001				Average Residential Consumers, 2003 - 2007				
Consumption Block (m^3/month)	No. of Customers	Average Consumption (m^3/month)	Average Consumption Per Block (m^3/month)	No. of Customers	Average Consumption (m^3/month)	Change from Average Tariff	Tgt. Avg. Tff. (2003-2007) (LE), 0-20 and > 20	Tariffs Per Consumption Block (LE/m^3)
							0.390	
							0.630	
0-10	72,452	675,357	9.3	131,438	936,358	-0.124	249,071	0.27
11-20	222,357	3,827,024	17.2	306,689	5,306,030	-0.031	2,233,839	0.42
21-30	24,931	589,389	23.6	37,256	824,805	-0.082	451,993	0.55
31-50	22,464	709,515	31.6	30,215	992,913	-0.010	615,606	0.62
51 - 100	9,500	541,795	57.0	14,047	758,201	0.090	545,905	0.72
>100	1,561	194,501	124.6	2,308	272,189	0.190	223,195	0.82
Totals	353,265	6,537,581	18.5	521,953	9,090,497		29,794,919	22,040,396
				Target Revenue (Avg. 2003-2007), 0-20			29,776,410	
				Target Revenue (Avg. 2003-2007), <21				22,044,563

Commercial Customers, 2001				Average Commercial Customers, 2003 - 2007				
Consumption Block (m^3/month)	No. of Customers	Average Consumption (m^3/month)	Average Consumption Per Block (m^3/month)	No. of Customers	Average Consumption (m^3/month)	Change from Average Tariff	Tgt. Avg. Tff. (2003-2007) (LE)	Tariffs Per Consumption Block (LE/m^3)
							1.010	
0-20	12,788	90,341	7.1	15,507	123,129	-0.20	99,734	0.81
>20	1,801	106,299	59.0	2,318	144,879	0.19	173,854	1.20
Totals	14,699	196,640	13.4	17,825	268,007		3,283,062	
				Target Revenue (Avg. 2003-2007))			3,279,864	

Residential Tariffs, If Applied Uniformly Over Rate Period, Water (Piasters/m^3)

Consumption Block (m^3/month)	Current (2002)			Average for 2003 - 2007			Percentage +/-
	Water	Wastewater	Total	Water	Wastewater	Total	
0-10	23		23	27		27	16%
11-20	23		23	42		42	83%
21-30	35		35	55		55	57%
31-50	35		35	62		62	77%
51 - 100	35		35	72		72	106%
>100	35		35	82		82	134%

Commercial Tariffs, If Applied Uniformly Over Rate Period, Water (Piasters/m^3)

Consumption Block	Current (2002)			Average for 2003 - 2007			Percentage +/-
	Water	Wastewater	Total	Water	Wastewater	Total	
0-20	75		75	81		81	8%
>20	75		75	120		120	60%

Table 5-4: Schedule of Proposed Tariffs, 2003-2007

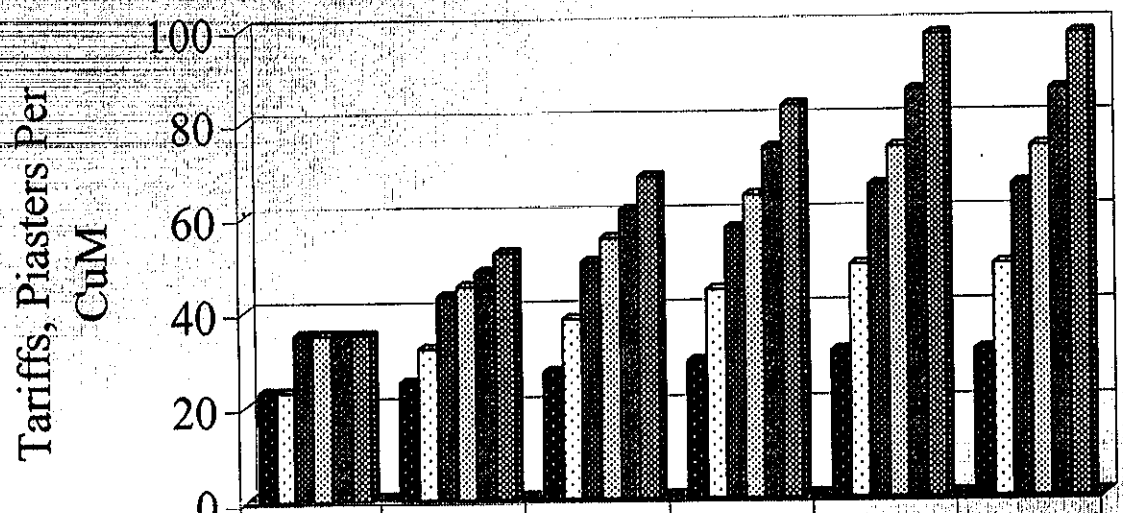
Residential Tariffs, Water, Phased-In						
Consumption Block CuM/Mo.	Year					
	Current (2002)	2003	2004	2005	2006	2007
	Piasters Per CuM					
0-10	23	25	27	29	31	31
11-20	23	32	38	44	49	49
21-30	35	43	50	57	66	66
31-50	35	45	55	64	74	74
51 - 100	35	48	61	74	86	86
> 100	35	52	68	83	98	98

Commercial Tariffs, Water, Phased-In						
Consumption Block CuM/Mo.	Year					
	Current (2002)	2003	2004	2005	2006	2007
	Piasters Per CuM					
0-20	75	78	80	82	85	85
>20	75	92	109	122	130	130

All Other Customer Classifications, Water, Flat Rate, Phased-In						
Customer Classification	Year					
	Current (2002)	2003	2004	2005	2006	2007
	Piasters Per CuM					
Governmental	45	55	65	75	80	80
Religious	45	55	65	75	80	80
Standpipes	45	55	65	75	80	80
Public Sector	75	85	95	105	110	110

Beheira Water Tariffs, 2003-2007 (Utility Approach)							
Consumption Block CuM/Mo.	Phased-In Basis						Average Tariff Over Rate Term 2003-2007
	Current (2002)	2003	2004	2005	2006	2007	
	--------- Piasters Per CuM ---------						
Residential Block Rates							
0-10	23	25	27	29	31	31	27
11-20	23	32	38	44	49	49	42
21-30	35	43	50	57	66	66	55
31-50	35	45	55	64	74	74	62
51 - 100	35	48	61	74	86	86	72
> 100	35	52	68	83	98	98	82
Commercial Block Rates							
0-20	75	78	80	82	85	85	81
>20	75	92	109	122	130	130	120
All Other Customer Classes							
Governmental	45	55	65	75	80	80	71
Religious	45	55	65	75	80	80	71
Standpipes	45	55	65	75	80	80	71
Public Sector	75	85	95	105	110	110	101

Beheira Block Rate Residential Water Tariffs Phase-In 2003-2007
(Utility Approach Model)



	2002	2003	2004	2005	2006	2007
0-10	23	25	27	29	31	31
11-20	23	32	38	44	49	49
21-30	35	43	50	57	66	66
31-50	35	45	55	64	74	74
51 - 100	35	48	61	74	86	86
> 100	35	52	68	82	[illegible]	[illegible]

Beheira / UTILITY APPROACH MODEL

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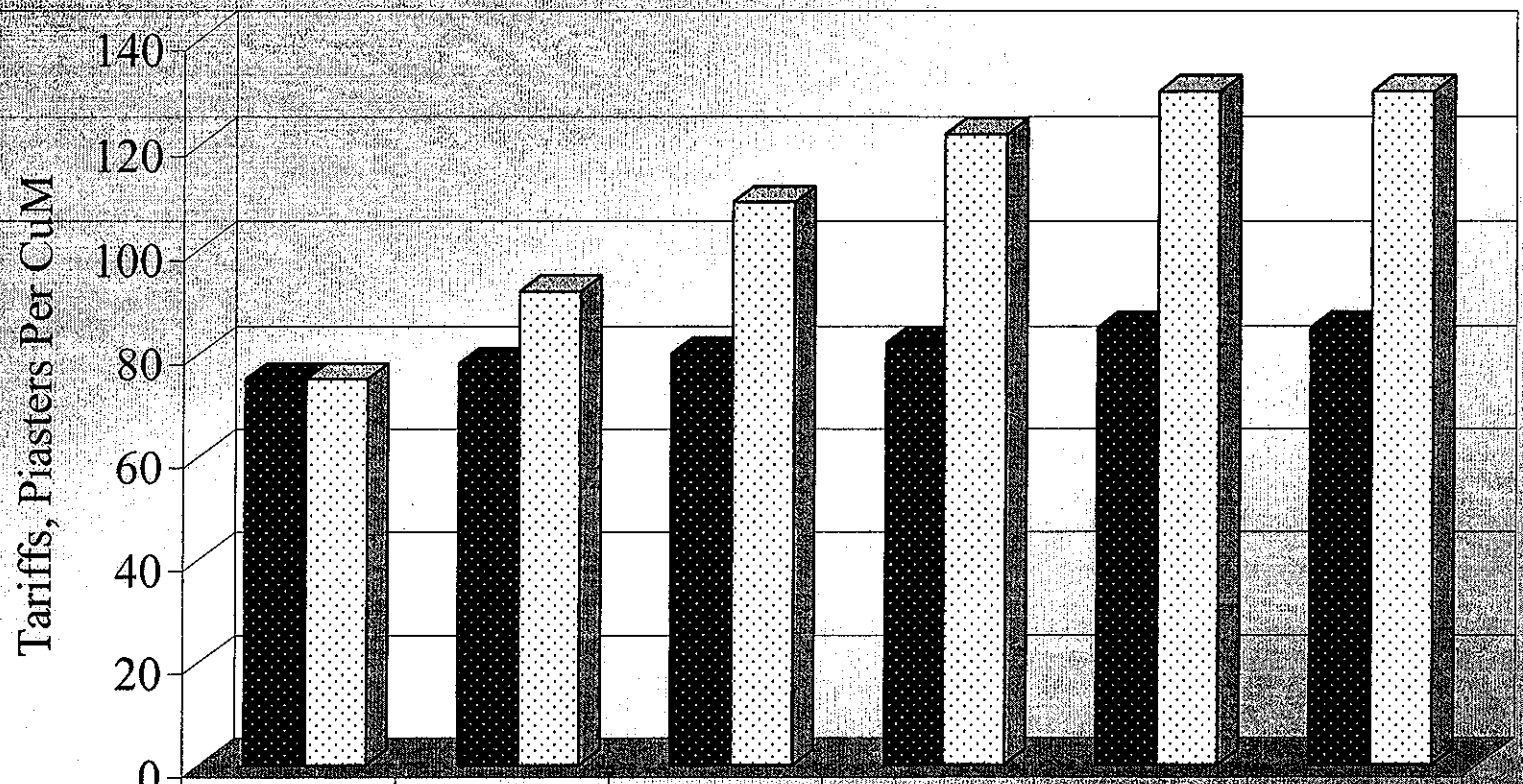
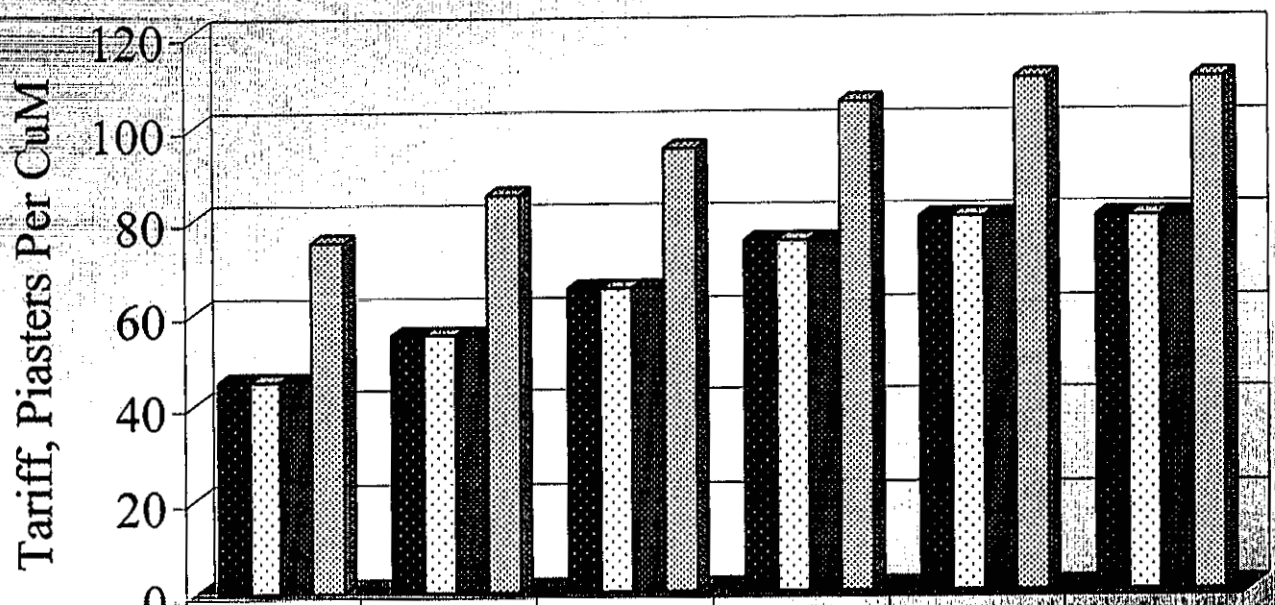
Beheira Block Rate Commercial Tariffs, Phase-In 2003-2007
(Utility Approach Model)



	2002	2003	2004	2005	2006	2007
0-20	75	78	80	82	85	85
>20	75	92	109	122	130	130

Beheira Tariffs for Other Consumer Categories, Flat Rate Phase-In, 2003-2007
(Utility Approach Model)



	2002	2003	2004	2005	2006	2007
Governmental	45	55	65	75	80	80
Religious	45	55	65	75	80	80
Standpipes	45	55	65	75	80	80
Public Sector	75	85	95	105	[illegible]	[illegible]

Egyptian Water/Wastewater Sector Regulatory Agency
Name of Utility: BEHEIRA WATER COMPANY
Attachment: BC Block Consumption

Date Prepared:_____
Rate Term:_____

Average Connections and Consumption, September 2001 - December 2001

Blocks	Class A DOMESTIC			Class B COMMERCIAL			Class C GOVERNMENTAL			Class D PUBLIC SECTOR			Class E			Class F		Total	
Total Billed Consumption of User	Avgerage No. of users ending in this block	Total consumption of users ending in this block (m^3)	Average consumption per block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	Average consumption per block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	Average consumption per block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	Average consumption per block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	Average consumption per block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)	No. of users ending in this block	Total consumption of users ending in this block (m^3)
0-20	269,980	3,164,295	11.7	12,050	111,674	9.3	1,446	14,460	10.0	442	4,420	10.0	22	220	10.0	0	0	283,941	3,295,069
21-30	29,070	779,727	26.8	694	18,550	26.7	245	3,092	12.6	53	658	12.5	5	57	12.6	0	0	30,066	802,083
31-50	21,818	938,647	43.0	622	27,110	43.6	279	6,690	24.0	73	1,216	16.8	10	200	21.0	0	0	22,801	973,862
51-100	9,227	716,762	77.7	306	26,353	86.2	474	14,798	31.2	81	2,968	36.6	27	1,011	37.4	0	0	10,115	761,891
>100	1,516	257,313	169.7	180	59,388	329.9	1,073	302,847	282.4	196	55,404	282.7	73	9,071	125.1	0	0	3,037	684,023
Total	331,612	5,856,744	17.7	13,852	243,075	17.5	3,516	341,886	97.2	844	64,665	76.6	136	10,558	77.9	-	-	349,959	6,516,928

89.9%

Data does not match consumption blocks
(Note - this data looks like it may have been manufactured)

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Instructions on Operation of the Tariff Model

The models are each composed of seven linked worksheets:

Worksheet 1: Water Demand
Worksheet 2: Operation and Maintenance Costs
Worksheet 3: Capital Costs
Worksheet 4: Revenues and Collections Analysis
Worksheet 5: Tariff Analysis
Worksheet 6: Block Rate Designs
Worksheet 7: Rates-Summary

The Cash Needs Model and the Utility Approach Model differ in only one respect — namely, the elements of which the total revenue requirement is composed. In the Cash Needs Model, the "Cash Requirement from Tariffs" row in the Tariff Analysis worksheet uses the "Company Capital Cost" total from the Capital Costs Worksheet as one of the components of the cash requirement. In the Utility Approach Model, the "Revenue Requirement from Tariffs" row in the Tariff Analysis uses the depreciation expense from Table 3-3 of the Capital Costs Worksheet instead of the "Company Capital Costs" row of that worksheet.

The worksheets are divided into historical years and projection years. The current year is treated as a historical year, though the input data for this year may require estimation.

1. Water Demand Worksheet

This worksheet calculates the total projected billable water demand, the unaccounted-for water, and the utility water production requirement.

Tables 1-1 and 1-2 distinguish between retail and bulk use. "Retail" use refers to supply delivered to an end-user's connection, such that the utility is responsible for all costs of supply. "Bulk use" refers to supply to a user who then retails the water within to supply to a user who then retails the water within the bulk user's own service area; in this case, use is responsible for costs of distribution, customer billing, collection, *et cetera*. (At present, BWC has no bulk customers.)

Table 1-1: Water Demand

Inputs Required:

- Historical annual billed consumption, by tariff class (plus any unclassified usage, such as "*bidun isdar*" in Beheira); and
- Projected annual rate of growth of consumption, by tariff class.

The model calculates the rate of growth of consumption for the historical years. The model generates the m^3 demand per class for the projection years from the growth rates as these are input by the utility.

Table 1-2: Water Customers

This table shows the number of historical customers, and projects the number of future customers. The number of projected customers is significant for the projection of fixed-change revenues and certain non-tariff revenues in the Revenues and Collections Analysis Worksheet.

Inputs Required:

- Historical annual of customers, by class (or unclassified billing category such as "*bidun isdar*" in Beheira); and
- Projected rate of growth in number of customers, by class.

In the historical section, the model calculates the average rate of growth of customers. In the projections section, the model calculates the number of customers from the growth rate which has been input.

Table 1-3: Unaccounted-for Water and Production Requirements

In the model, unaccounted-for water (UFW) represents a production requirement in excess of customer demand. The total production requirement is a driving force in the O&M cost projections. Hence, reducing UFW reduces (some) O&M costs. In the historical section, the utility inputs the annual total water production, or strictly speaking, the total supply to the network, since the utility may have its own bulk suppliers (as in Beheira). Where there are several sources of supply (i.e., own production and bulk purchases), care should be taken to input each source individually. The model then calculates the historical unaccounted-for water, as quantity and rate, as the difference between consumption and production.

In the projection years, the utility inputs the target *rate* of unaccounted-for water. The model utilizes a formula which converts this rate into a quantity of water to be provided by the utility which is added to the projection year water demand to calculate the total production requirement.

Where a utility has several supply sources, care must be taken to assure that the projection year production requirement is allocated to the various supply sources in such a way that the contributions from all sources are neither greater nor less than the total requirement. In the Beheira model, this has been controlled for by requiring inputs for the bulk supply sources and then deriving the own-production requirement by subtracting these source contributions from the production requirement.

2. O&M Costs Worksheet

The O&M Costs Worksheet develops both O&M costs and a working capital requirement. The worksheet has two tables.

Table 2-1: O&M Costs

The O&M Costs table in the Beheira model covers the following types of cost:

- wages and salaries
- commodities
- services
- bulk water purchases
- other (non-water) purchases for sale
- taxes and duties

Historical Year Inputs:

- number of employees
- total wages and salaries
- commodity costs (by line item)
- services costs (by line item)
- water purchase costs (by source)
- non-water purchases for sale

Projections:

To project *wages and salaries*, input the expected number of staff per year and the expected annual wage inflation rate. The model calculates the number of staff per thousand customers and the annual cost of wages and salaries.

The *commodity and service* cost projections are formula-based, but will accept modifications by the operator.

The formulas for *electricity and chemicals* increase the annual costs of these line items in proportion of the rate of growth in the utility's own water production. In the Beheira case, a factor for reduction of the rate of growth in electricity costs has been added to the formula for this row. It appears as "0.95" in the formula bar, which indicates that the growth of electricity costs will be five percent less than expected from the base formula. This is an expected effect of the utility's power-usage efficiency program. It is indicated in the line item title column in the projection years by the works "(five percent annual reduction)".

All *commodity and service costs other than electricity and chemicals* are increased in proportion to the growth of the production requirement, rather than own-production only.

Water purchases for sale. The formulas for these rows multiply the expected bulk water purchases (from Table 1-3 in the Demand worksheet) by the unit price of the bulk water source. This unit price must be entered in the formula bar for each year and should be written in the line item title column.

Non-water purchases for sale are inputs which rely on utility judgment; no formulas are provided in the model.

Taxes and duties are projected in proportion to the growth of production.

Inflation. Enter the expected annual rate of inflation in the line item title column for the projection section. The model will apply this formula to calculate the cumulative incremental inflation for all non-labor costs.

Table 2-2: Working Capital Requirements

This table calculates annual working capital requirements as the inter-annual changes in current liabilities minus the inter-annual change in current assets.

Historical Year Inputs:

- accounts receivable (from account 16 in BWC's balance sheets);
- inventory (from account 13 in BWC's balance sheet); and
- accounts payable (from account 26 in BWC's balance sheet).

From these inputs, the model calculates the amounts of increase (or decrease) in these items from year to year, and then calculates the working capital requirement as the result of subtracting the increase (or decrease) in current assets from the increase (or decrease) in current liabilities.

Projections:

Accounts receivable ("*debtors*"): to project this item, the model uses the historical rate of change. The utility may modify this rate in the formula bar to show the impact of improved collection efficiency. For example, adding a multiplier of 0.8 to the formula for accounts receivable in a year will produce a 20 percent reduction in the growth of accounts receivable.

The projection of *inventory* is based on the historical trend in the growth of inventory. This may be modified in the formula bar by inputting a multiplier, though this was not done in the Beheira model. (Any multiplier with a value less than "1" will reduce the growth rate.)

The projection of *accounts payable* is based on the historical trend. In the Beheira case, multipliers with a value greater than "1" have been added to the formula to indicate a growing rate of payment of current debts to suppliers.

3. Capital Costs Worksheet

This worksheet has two tables in the Cash Needs Model and three tables in the Utility Approach Model.

Table 3-1: Company Projects

This table provides data on the works the utility intends to implement through its own funds. These are typically renewal and replacement projects, though they may include small plants, equipment, vehicles, meters, *et cetera*.

Inputs:

The entire table, except for the column and row totals, requires inputs, including the row titles used to describe the type of project. The project types should be described in sufficient detail to give the regulatory agency a clear idea of the proposed works, and quantities should be provided where it is possible to do so succinctly.

The column totals from this table are carried over by the model to Table 5-1 in the Tariff Analysis Worksheet where they constitute part of the revenue requirement in the Cash Needs model. They are also carried over by the model to Table 3-3 in the Utility Approach model where they enter into the calculation of the expected annual depreciation.

Table 3-2: NOPWASD Projects

This table requires input of all projects to be implemented by NOPWASD (or equivalent central authority, such as NUCA) and funded through NIB loans, soft loans, or grants. As in Table 3-1, all cells other than the column and row totals require inputs by the utility.

The Table 3-2 row totals are chiefly important for calculation of expected depreciation in the Utility Approach Model, but Table 3-2 should be completed in either model in order to enable the regulatory authority to assess the types and level of service improvement to be expected over the rate term.

Table 3-3: Fixed Assets and Depreciation

This table appears only in the Utility Approach mode, in which depreciation is a tariff revenue requirement.

Inputs required are the value of fixed assets and value of work in progress in the latest historical year for which audited financial statements are available (in this case, 2001), plus the estimated value of work in progress in the current year. The model then carries over the value of works from Table 3-1 and Table 3-2, adds them to the prior year value of fixed assets and then derives the yearly value of fixed assets derives the yearly value of fixed assets as the average of the previous and current year values of fixed assets.

One further input is needed for the calculation of the annual depreciation: this is the average depreciation rate. In the Beheira study, it was calculated as the total depreciation 1998-2001 divided by the total value of fixed assets 1998-2001. This rate is then applied to the average value of fixed assets for each year to arrive at the annual depreciation, which is carried over to Tariff Analysis Worksheet Table 5-1 for inclusion in the revenue requirement.

4. Revenues and Collection Analysis Worksheet

This worksheet consists of six tables.

Table 4-1: Current Water Tariffs

Input the utility's current water tariffs in the historical section. These are carried over to the projection section to enable calculation of the water tariff revenue that could be expected from current tariffs applied to the projected demand.

Table 4-2: Water Tariff Revenues at Current Tariffs

No inputs are needed to this table (except revenues from any unclassified use, such as the "*bidun isdar*" category in Beheira). The model calculates the tariff revenues that would be expected from the current tariffs if when they are applied to the historical and projected demand.

Table 4-3: Fixed-Charge Water Revenues

Fixed-charge revenues are deducted from the tariff revenue requirement in Table 5-1 of the Tariff Analysis Worksheet.

The types of fixed charge vary from one utility to another. Input the relevant row titles and historical data.

In the Beheira case, the growth projections for each type are proportional to the growth in number of customers, which is derived from Table 1-2.

Table 4-4: Water Non-Tariff Revenues

Non-tariff revenues are revenues earned by the utility from activities in which it is behaving as a private enterprise. These revenues are based on sales of goods or services not included in the tariff or posted on the water bill.

These types of revenue are also deducted from the tariff revenue requirement in Table 5-1.

In the Beheira case, the inputs for the historical years have been derived from various items in the Current Activity Revenues account (41) of BWC's financial statements. There are three row inputs: "enterprise activities" (estimated as 25 percent of the value of "internal works at cost"), "connection services" (equivalent to "sold services"), and sold manufactures (*sina'a bi ghardd il-biaa*).

For the projections of the enterprise revenues and sold manufactures, estimates based on historical trends are used. The connection services revenue has been projected based on the increase in customers (derived from Table 1-2) and the estimated revenue per service (an input).

Table 4-5: Non-Retained Billings

These are charges posted on the utility bill, but not retained by the utility. They are needed to determine the overall collection efficiency rate (in Table 4-6) which is used to estimate the cash to be derived from water tariff billings.

The historical data were available in Beheira's annual reports. The projections are inputs based on estimates.

Table 4-6: Collection Efficiency

This table calculates the historical and projected cash collections from water tariff billings under current water tariffs. The main historical input is the actual total collections from all billings. The model calculates the overall collection efficiency (collections/billings) and then applies this percentage to the water tariff revenue billings to derive the water tariff cash receipts.

Inputs:

In the projection section, the only input required is the projected collection efficiency rate. This is applied by the model to the billings to derive the total collection and the water tariff revenue collection (again, under current tariffs).

5. Tariff Analysis Worksheet

The Tariff Analysis Worksheet is the central worksheet of the model. It is the place where all preceding data are consolidated in summary forms, the tariff revenue requirement is calculated, and class tariffs are planned.

Table 5-1: Calculation of Revenue Requirement and Average Tariff Increase

Table 5-1 consolidates all summary data from preceding worksheets that are needed to calculate the revenue requirement.

In the Cash Needs model, the revenue requirement is derived from the following formula:

- O&M costs;
- plus capital costs (i.e., company project costs);
- plus working capital requirements;
- minus non-tariff revenues; and
- minus fixed-change revenues.

The tariff revenue requirement is shown in the "Cash Requirement from Tariff" row, and followed by the calculation of the average tariff required per m^3 sold, and the average tariff required per m^3 sold, and the average tariff multiplier (i.e. the numerical factor by which current rates should be multiplied to arrive at the new tariffs).

It is important to note that the average tariff increase factor is only an indicative number. Utilities may adjust current tariffs in more complex ways than a uniform increase.

In the Utility Approach model, the tariff revenue requirement is calculated in the following way:

- O&M costs;
- plus working capital requirement;
- plus depreciation;
- minus non-tariff revenues; and
- minus fixed-charge revenues.

The result is shown in the row labeled "Revenue Requirement from Tariffs", followed by the average m^3 tariff and the indicative average tariff increase factor.

The remaining rows in Table 5-1 merely provide some calculations related to the expected collections and some indications of the revenue requirement that would need to be used for tariff planning purposes if the utility intended that tariffs be set at a level which compensated for expected shortcomings in collection efficiency.

Inputs:

No inputs are required for the projection section of Table 5-1.

In the historical section, the utility is asked to input its historical self-financed capital expenditure and its annual depreciation expense. These are not necessary for the tariff projection, but provide for a comparison of average tariff requirements between the historical and projection periods.

Table 5-2: Average Class Tariff Planning

This table is the area in which new class tariffs are developed. The table is made up of two sub-tables.

In Table 5-2-1, input the historical tariffs by class Table 5-2-2 will show the tariff revenue and the surplus or deficit of tariff revenue in relation to the Cash Requirement from Tariffs (Table 5-1 in the Cash Need model) or "Revenue Requirement from Tariffs" (in the Utility Approach model).

For the projection years, input possible new tariffs in Table 5-2-1 until a set of tariffs is achieved which results in a surplus, at least by the third or fourth year of the new rate term.

Table 5-3: Block Rate Designs

Block rates are developed in Table 5-3 through the following process:

1) Develop the class-specific monthly consumption blocks. In the Beheira case, for residential use, six blocks are used (0-10, 11-20, 21-30, 31-50, 51-100 and over 100 m^3). Two commercial-use blocks (up to 20 m^3 and over 20 m^3) are also used;
2) Use utility records or estimates to determine the number of users whose average monthly usage ends in each block and the total volume of monthly consumption that block represents. This is done both for historic years and for one or more projection years. Derive the average consumption of the block user;
3) In the "Target Average Tariff" box, enter the average residential tariff for the design year from the Tariff Analysis Worksheet; and
4) In the "Change from Average Tariff" column, assign the "discount" or "penalty" to the average residential tariff that the utility wishes to apply to the block. The model will show the resulting block rate per m^3 in the "Tariff per Consumption Block" column.

The total block revenues should add up the target average monthly revenue requirement of the class. Several trials may be required to arrive at a balanced set of block rates.

Table 5-4: Schedule of Proposed Tariffs

This table, which requires input by the utility, enables the utility to gradualize the tariff increase over time.

6. Rates Summary Worksheet

This worksheet is set of three tables which display the tariff schedule for each year by class and block. The schedule contains no new information and requires no inputs. It is merely a re-presentation of material from Table 5-3 and other sources in on a single sheet in a format more presentable to the public and useful as an insert in utility reports.

7. Graphics

These provide bar chart presentations of the tariff schedule. As with the Rates Summary, they are provided mainly for presentation effect. No inputs are required.

The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

USAID Funded Project

ALEXANDRIA WATER AND WASTEWATER TARIFF STUDIES

July 2002

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

CHEMONICS EGYPT

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ACRONYMS, ABBREVIATIONS AND DEFINITIONS

AGOSD	Alexandria General Organization for Sanitary Drainage
AWGA	Alexandria Water General Authority
BOY	Beginning of Year
BWC	Beheira Potable Water and Sanitary Drainage Company
CDM	Camp Dresser & McKee
DM	Deutsche Mark
ECG	Engineering Consultants Group
EIB	European Investment Bank
EOY	End of Year
EQI	Environmental Quality International
FRF	French Francs
FY	Fiscal Year
LE	Egyptian Pound
LIRR-II	Legal, Institutional and Regulatory Reform II Project
MHUUC	Ministry of Housing Utilities and Urban Communities
MOF	Ministry of Finance
MOP	Ministry of Planning
NIB	National Investment Bank
NUCA	New Urban Communities Authority
O&M	Operations and Maintenance
PEA	Public Economic Authority
R&R	Renewal and Replacement
RR	Revenue Requirements
UFW	Unaccounted-for Water
US	United States

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SECTION I

Introduction

This report includes the third and fourth of a series of four tariff studies conducted in Egyptian utilities that represent a range of physical, economic, and organizational conditions found in the sector. The present study addresses two large metropolitan utilities, the Alexandria Water General Authority (AWGA) and the Alexandria General Organization for Sanitary Drainage (AGOSD).

A. Background and Purpose

The objectives of the Government of Egypt (GOE) water/wastewater sector reform program are to improve the performance of utilities, increase the level of utility cost recovery, and promote service expansion through internal utility cash generation and private sector participation.

The establishment of a regulatory agency is a key element in implementation of the reform program. The existence of an impartial regulator provides assurance to the private sector that justifiable tariff requirements will be approved. Review of tariff applications submitted by government-owned utilities provides a mechanism for economic regulation of these utilities, as well as the systematic increase of tariffs in a transparent manner that increases utility accountability, improves utility financial viability, and protects the interests of consumers.

As part of Legal, Institutional and Regulatory Reform II (LIRR II) Project assistance to the Ministry of Housing, Utilities, and Urban Communities (MHUUC), tariff studies are being conducted in four utilities. The purposes of these studies are to develop a basic tariff-setting methodology, to customize the basic model to a range of situations, to assist the GOE to assess the tariff implications of various assumptions regarding efficiency, affordability, and other regulatory concerns, and to assess personnel and logistical requirements of the regulatory agency with respect to its tariff analysis functions.

B. The Alexandria Tariff Studies

AWGA and AGOSD are government-owned utilities of the public economic authority type. AGOSD was converted from a public service authority to a public economic authority in 1994.

The AGOSD service area is coterminous with the boundaries of Alexandria Governorate, although the sewer system does not yet extend to all parts of the city. Extension of the sewer system is an important part of the utility's 2003-2007 business plan and is addressed in the tariff study. Indeed, the LIRR II tariff study has a particular practical significance for AGOSD, since foreign development credit agencies have made their offers of assistance to AGOSD in financing these expansions conditional upon AGOSD achievement of operation and maintenance (O&M) cost recovery.

The AWGA service area extends beyond the boundaries of Alexandria Governorate. AWGA provides water from its own treatment plants to several villages in Beheira Governorate, as well as selling water in excess of AWGA needs to the Beheira Potable Water and Sanitary

Drainage Company (BWC). Moreover, AWGA operates and maintains several MHUUC assets to sell water in bulk and retail forms to most of the populated areas of Matruh Governorate.

The study is composed of five sections. Following this introductory section, Section B addresses the AWGA revenue requirement. Section C addresses the AGOSD revenue requirement. Section D presents the tariff rate designs. It is logical to develop the AWGA and AGOSD rate designs together because in most cases the rate payers are the same users. Section E concludes the report with some general recommendations on tariffs and future tariff studies in Egypt based on experience gained in the four LIRR II pilot case studies.

The tariff model software is attached to the report. The annexes include print versions of the two models, as well as summary utility financial reports and current tariff schedules. Instructions on the operation of the models are provided throughout the text.

C. Tariff Analysis Principles and Methodology

This section provides a general discussion of tariff analysis principles and methodology, as well as some general policy assumptions used in the Legal, Institutional and Regulatory Reform II (LIRR II) study.

C1. Approach to Determining Revenue Requirements

There are two ways of defining a utility's revenue requirements: the *cash needs* approach and the *utility* approach. (The difference between the two approaches is unrelated to the difference between cash-based and accrual-based accounting.) The two approaches reflect different patterns of utility capital financing and ownership.

The *cash-needs approach* is used for government-owned utilities. The utility approach is used for privately owned (investor-owned) utilities. Under the cash-needs approach, the revenue requirements consist of:

a) O&M expenses;
b) Capital expenditure financed through current revenue. This category includes routine renewal and replacement projects, "small" expansion and upgrading projects, management system improvements, efficiency improvement projects, *et cetera*. The common feature of these projects are that they are relatively small and can be implemented relatively quickly; and
c) Debt service (interest and repayment of principal) on loans taken, usually for large, multi-year projects.

The *utility approach* reflects the need of privately owned utilities to attract capital to replace and expand facilities. Under the utility approach, the revenue requirements are defined as:

a) O&M expenses;
b) Depreciation: depreciation is a non-cash expense that recognizes the portion of capital assets used up during a time period;
c) Taxes: income taxes, general property taxes, gross receipt taxes, *et cetera*; and
d) Return on rate base. *Rate base* refers to the amount of capital invested by the utility to provide utility services. This capital is defined as the value of all plant "used and useful" in providing water (or wastewater) service. From this value the

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following are deducted: accumulated depreciation, accumulated deferred income taxes, and grants or other contributions in aid of construction. This return is usually stated as a percentage or rate. The rate of return on capital is what the utility can offer to attract new investment.

The cash needs approach is more appropriate for government-owned utilities under the current system of utility capital financing and ownership in Egypt. Major capital works are mostly funded by government loans or soft loans from development banks. Moreover, the utility approach makes no explicit provision for repayment of principal. This reflects a United States (US) approach to utility financing, which relies on the issuance of bonds with maturities as long as 40 years, whereas National Investment Bank (NIB) loans have a ten-year repayment schedule.

C2. Approach to Setting Cost Recovery Targets

MHUUC officials have requested that the minimum cost recovery target for the first cycle of rate applications include O&M and renewal and replacement (R&R) expenses. This is the target set for AGOSD in these studies. However, individual utilities are free to propose higher or lower targets for cost recovery based on their circumstances. In the case of AWGA, a full cost recovery target (including debt service) has been set, partly reflecting the high current levels of cost recovery and partly to provide MHUUC with guidance on debt service modeling in tariff studies.

C3. Expenses Excluded From Tariff Revenue Requirements

It should also be noted that under both cash-needs and utility approaches, various expenses may be excluded from the tariff revenue requirement. For example, many utilities engage in some income-generating activities (such as sale of workshop products) that are peripheral to their core water/wastewater service delivery mission. There is no justification for recovering these expenses through tariffs. The accounts of most Egyptian utilities do not clearly distinguish such peripheral expenses from core business expenses, but generally do distinguish the revenues generated by these enterprises from tariff revenues, so the method adopted in the LIRR II case studies is to deduct projected enterprise revenues from the total tariff revenue requirement.

C4. Approach to Economic Regulation of Government-Owned Utilities

Utilities will be expected to propose improvements in efficiency that keep the need for tariff increases to a minimum, and to propose improvements in the quality of service that will increase customers' willingness to pay higher tariffs.

Since improvements in efficiency may require several years to achieve, and because tariffs may need to be increased gradually, the cost recovery target may not be achieved until the second or third year of the rate term.

C5. Approach to Tariff Rate Design

Tariff rate design is largely governed by the objective of assuring that a basic level of service (e.g., 20 m^3 per month) should be affordable to all households. At the same time, rates for non-domestic use should not be set at exorbitant levels.

The utility's rate design strategy is typically influenced by local patterns of demand. Where there is significant non-domestic use, rate increases for domestic use can usually be minimized without setting excessively high rates for non-domestic use. However, where demand is overwhelmingly domestic, utilities will usually need also to adopt an inclining (progressive) block rate structure for domestic tariffs. Such structures enable cross-subsidization of low-volume (presumably low-income) domestic users by high-volume (presumably higher-income) domestic users.

D. Tariff Model Conventions

Most worksheets in the model are vertically separated into a historical years section, which covers three historical years plus the most recent financial year, and a projections section that covers the five-year period for which the new tariffs are planned. The projections section includes columns that provide five-year totals and/or averages where meaningful.

Values for cells in the model template (i.e. the model prior to any data inputs) that feature a "0" or "Div/0" symbol are calculated by the model from inputs to other cells.

In the electronic version of the models, cells requiring data inputs by the utility are color-coded. Yellow color means a datum should be entered by the utility. Blue color signifies a water utility data input that must also be provided to the wastewater utility. Green color signifies a wastewater utility data input that must also be provided to the water utility.

It should be noted that inputs to row titles as well as numerical values may also be required of the utility, particularly in the Demand table (Table 1) and in the Non-Tariff Revenues table (Table 4.4). This is because customer classifications and sources of non-tariff revenue often vary from one utility to another. The assistance of regulatory agency personnel should be sought when making such changes, since some of these changes may affect formulas.

SECTION II

AWGA Revenue Requirements

A. Water Demand

A1. Historical Consumption Patterns

The AWGA service area covers the city of Alexandria proper and communities along the North Coast of Matruh Governorate, ending in the city of Marsa Matruh. Total billed consumption in fiscal year (FY) 2001 was 479 million m^3. Over the three-year period from FY 1999 to FY 2001, North Coast consumption has accounted for ten percent of the total AWGA consumption, but increased at a rate of approximately six percent annually, compared to an average 3.5 percent growth in Alexandria city use. Approximately 7.5 million m^3 per year are sold in bulk to Beheira, part directly to Beheira villages and part as bulk sales to the BWC network. The Beheira supply is a negligible percent of the AWGA total, and AWGA accounts include the Beheira supplies in the Alexandria city service area.

The customer classification is highly differentiated. The AWGA tariff table (see Annex A) lists some 41 types of users. But there are only 11 distinct tariff rates. In practice, AWGA applies as many as 18 tariff rates, with special rates negotiated for some users. Moreover, some types of users who have the same water rate have different wastewater surcharge rates. To keep the model and the rate design manageable, the types of users have all been grouped into the smallest number of customer classes needed to distinguish users with the same water rate and wastewater surcharge rate and ignoring the negotiated rates (see Annex B). The simpler classification yields estimates of demand within 0.35 percent of AWGA's published consumption figures and within 8.6 percent of AWGA's published tariff revenue figures. (The high degree of variance between the revenue figures appears to be due to higher reported revenue from domestic minimum-charge use than would be expected from the LE 0.23 tariff rate for that class and block.)

AWGA applies the same rates to city and North Coast users. In the future, AWGA should conduct a cost-of-service study to determine a fair allocation of costs between city and North Coast users. (North Coast supply entails higher unit pumping and storage costs but may also entail lower unit distribution and customer service costs.) All Beheira supply is billed at the first-block domestic rate of LE 0.23.

The historical consumption figures can show very large changes in class demand from one year to the next. In some cases, this appears to be due to erroneous classification or reporting, and in these cases, consumption has been shifted between related classes according to historical averages.

A clearer sense of the composition of demand is obtained when the classes are grouped into a few basic categories or "major classes," as in Table II-1, which shows the total water consumption over the three years from FY 1999 to FY 2001:

Table II-1 Three-Year Billed Water Consumption, FYs 1999-2001
(in millions m^3)

Sector/Major Class	Consumption (m/n m3)	% of Sector	% of Total AWGA
City Sector			
Domestic	830.0	66.9%	60.1%
Service	119.0	9.6%	8.6%
Commercial	269.9	21.8%	19.6%
Beheira	22.0	1.8%	1.6%
Subtotal, City Sector	1,240.8	100%	
North Coast Sector			
Domestic	13.2	9.5%	1.0%
Service	26.9	19.3%	1.9%
Commercial	99.4	71.2%	7.2%
Subtotal, North Coast Sector	139.5	100%	
TOTAL AWGA	1,380.3		100%

Total domestic demand is 61 percent of the total (63 percent if Beheira demand is included), followed by commercial demand (27 percent) and service demand (11 percent).

A2. Water Demand Projections

As noted earlier, the historical class consumption data often shows extreme fluctuations (and even large decreases) from one year to the next. Since it is unlikely that actual class demands have fluctuated so widely, methods other than continuation of the historical trend must be found to project future water demand. Therefore, the study has relied on the demand projections in Volume II, Section 3.4 of the United States Agency for International Development (USAID)-funded AWGA *Water Master Plan Report* (CDM/ECG/EQI/Pitometer Associates: September 2000). Based on this source and the reported views of AWGA management, an annual growth rate of three percent for the city sector and four percent for the North Coast sector has been applied to the reported 2001 consumption to generate the class demands for each year from 2002 onward. The one exception is the Beheira demand, where the study uses demand growth rates derived from the LIRR-II *Beheira Water Tariffs Study* (May 2002). The AWGA-wide result is an annual 3.1 percent growth in demand.

A3. Water Production Requirements

A water utility's annual water production requirement is calculated as water demand plus water losses. Since the production requirement drives variable costs, a reduction in unaccounted-for water will typically reduce the rate of growth of O&M costs.

Historical water production totals for all years from 1999 through 2002 were taken from AWGA records. Historical unaccounted-for water (UFW) (m^3) is calculated as the difference between demand and production. Note that the 2002 demand figure is an estimate.

A two percent annual decrease in the AWGA UFW rate is projected. UFW reduction will be achieved by renewal and replacement of networks (see Section 3 below), meter repair and maintenance, new meter installation, and water theft detection. The model converts the projected UFW rate into a corresponding UFW volume (m^3) by increasing the production requirement over demand by the formula "Demand (100 percent minus UFW percent)."

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In the AWGA case, the combination of a 3.1 percent rate of growth in demand and a 2003-2007 average UFW rate of 31.2 percent leads to only marginal increases in the projected annual growth rate of the production requirement, though the production requirement does increase in absolute terms from 784.7 million m^3 per year in 2003 to 790.1 million m^3 in 2007.

B. O&M Costs

Historical and projected O&M costs are given in Annex F, Table 2.1 of the model.

B1. Historical O&M Costs

All line item inputs for FYs 1999 through 2001 are taken from AWGA's annual reports. The total number of employees in FYs 99 through 2002 is taken from annual AWGA budget documents.

Wages and salaries for 2002 are calculated as the product of the number of employees multiplied by the average 2002 annual salary, which has been estimated as the 2001 average salary multiplied by the average of the rates of average salary increase from FY 1999 to 2000 and from 2000 to 2001. The comparatively low staffing ratio (staff per 1000 water accounts) of 3.8 (in 2002) is remarkable and no doubt contributes to AWGA's good financial situation. On the other hand, the AWGA average salary (LE 11,879 in FY 2001) is considerably higher than AGOSD's (LE 7,618) or BWC's (LE 9,260).

Non-labor O&M costs for 2002 were derived by applying the three-year historical average growth rate for the line item to the 2001 line item costs. This approach was taken because few line item costs manifest a historical trend.

B2. O&M Cost Projections

Projected wage and salary costs are calculated as the product of the number of employees multiplied by the average staff salary. AWGA plans to reduce total staff to 4000 by FY 2007, resulting in a world-class water utility staffing ratio of 3.1 employees per 1000 water accounts. However, average staff salary growth of eight percent will result in an increase in the percentage of wages and salaries in total O&M costs from 40.4 percent in 2001 to 45.3 percent in 2007.

There are three elements in the formulas for projections of non-labor O&M costs in the model:

a) The model "automatically" increases these costs in proportion to the rate of increase in water production. (Since the projected water production requirement is composed of projected demand plus projected losses, reduction in the level of UFW reduces the rate of growth of non-labor O&M costs);
b) In the projection rows labeled "Annual Efficiency Improvement percent," the utility is able to indicate a percentage reduction in the annual line item cost (by inputting a percentage with a negative sign) or increase in the cost (by inputting a percentage with a positive sign). This element works together with the production-based increase to reduce (or increase) the rate of growth of the cost; and
c) An annual inflation factor of 2.5 percent is added to all O&M costs other than labor.

In the AWGA case, the efficiency factors indicate:

- A reduced rate of growth in variable costs such as electricity and chemicals, as a result of improved maintenance, training of operators, and renewal and replacement;
- An increased rate of expenditure on spare parts, maintenance materials, and maintenance services;
- An increased rate of expenditure on "Other Services," reflecting increased training activity; and
- Increased "taxes and duties," reflecting MOF orders for payment of taxes owed.

It is worth noting that one result of these efficiencies is that non-labor O&M costs actually decrease over the rate term when 2002 prices are held constant (see the row labeled "Base O&M Costs ....."). Nevertheless, total O&M costs do increase by LE five to six million per year, primarily on account of price inflation.

C. Capital Costs

In Annex F, Tables 3.1 and 3.2 in the model show the utility's planned capital expenditure over the rate term. Table 3.1 shows the planned expenditure on renewal and replacement projects and performance improvement programs. These costs are included in the five-year revenue requirement. Table 3.2 lists AWGA's planned completion projects and new projects. These projects are expected to be financed by loans. Table 3.2 is provided mainly to indicate the types of service improvement planned by AWGA over the rate term; the annual debt service revenue requirements associated with these projects are given in the "New Debt" section of the Debt Service worksheet (Table 3.4). The data were derived from AWGA's summary five-year plan submission to the Ministry of Planning (MOP) and AWGA's first-year (2003) capital plan expenditure projection.

The five-year plan submission shows a total of LE 600 million, but AWGA intends to cut the investment program back to LE 500 million. The excess LE 100 million has been deducted from the "new projects" component of the program. 2003 expenditure projections for all projects were taken from AWGA's Ministry of Planning (MOP) submission.

Forty percent of planned expenditure is on network improvements. This percentage increases to 46.2 percent when North Coast pumping and storage projects are included in this category. Forty-two point four percent will be invested in treatment plant improvements, and the remaining 11.4 percent on various types of equipment and facilities.

C1. Renewal and Replacement Project Costs

AWGA and MOP have agreed that 60 percent of the total capital investment program will be funded through loans and 40 percent through current revenues. The model assumes that all the renewal and replacement (R&R) projects (see Table 3.1) will be funded through current revenues. The R&R program accounts for 40.4 percent of the projected LE 500 million expenditure.

C2. Transfers to the Ministry of Finance

As AWGA has moved into a condition of full cost recovery, the Ministry of Finance (MOF)as begun to require payments of part of the annual "surplus." In 1999, the LE

6,116,921 transfer was equivalent to the reported net income of LE 6,616,921 minus LE 500,000. The 2000 transfer of LE 21,071,391 represents approximately 80 percent of the net income of LE 26,606,921, and the 2001 transfer of LE 10,510,553 represented 67.5 percent of the 2001 net income of LE 15,564,925.

LIRR-II has been advised that AWGA and MOF have now agreed upon a formula under which the payment will be calculated as the previous year's payment multiplied by the inter-annual increase in water production. In Table 3.3 of the AWGA model, this formula has been used to calculate the transfer amount for each year from 2002 onward.

C3. Debt Service

The debt service worksheet (Table 3.4 in the AWGA model) is structured based upon separate calculations of the principal and interest payments from each utility's existing debt and its projected future borrowings during the rate term period.

C3a. Existing Debt

The model's debt service worksheet requires input information for each loan according the following data:

- initial principal borrowed;
- interest rate;
- loan term; and
- grace period.

The data inputs for each of the above four categories was researched and provided by the USAID institutional support contractor for AWGA. From this input data, the model calculates over the projected 2003-2007 rate term the following output data:

- annual interest payments;
- annual principal payments; and
- end of year balances.

The existing debt level for AWGA, as of the end of FY 2001, consists of a balance of LE 336,351,356 owed to the NIB. AWGA recently restructured its balances of multiple NIB loans, including capitalized interest, incurred from prior to 1980 up through FY 2001 by packing them into a single balance of LE 336,351,356 to be repaid at an interest rate of 13 percent over a loan term of eight years. AWGA has also received LE 30,891,450 from the Ministry of Finance from FY 1990 to FY 1993. It is currently undetermined whether this balance will treated as either loan to be repaid or as an equity-type investment in AWGA's capital base. For purposes of determining AWGA's revenue requirement, the capital from the Ministry of Finance will not be treated as a loan.

C3b. New Debt

The calculation of new debt service obligations that AWGA plans to incur during the 2003-2007 rate term requires the same input data as required for the calculations of existing debt service obligations, as listed above. The debt service model calculates the annual interest payments based upon the average principal balance outstanding during the year. Therefore, if

AWGA begins a year with a loan balance of LE 0.00 and ends that year with a balance of LE 1,000,000 owed, interest is calculated based upon the average principal balance of LE 500,000 ([LE 0.00 + LE 1,000,000]/2 = LE 500,000) for that year.

AWGA plans that all LE 300,000,000 of new borrowing during the 2003-2007 rate term will come from the NIB in consistent tranches of LE 60 million for each year at an interest rate of 13 percent with a two-year grace period and principal repayment within ten years of the start of each loan.

For AWGA, debt service represents one of the larger components of its total revenue requirement and the component that varies the most from year to year. For AWGA, debt service cash needs vary from a low of LE 44,999,108 for FY 2001, accounting for 27 percent of the cash requirement to achieve break-even status, to a high of LE 120,712,507 in FY 2007, accounting for 39 percent of the cash requirement for break-even status. This represents an increase in cash needs of 268 percent over six years. While water tariff rates for the 2003-2007 period may be set such that they will recover all of these planned for cash needs, it will be important that AWGA's performance in adhering to this borrowing and its associated capital improvement and construction plan. In the event that this borrowing and construction plans proves to be too ambitious, and AWGA ends up borrowing less than the LE 300,000,000 it plans for 2003-2007, then AWGA's actual cash needs will be less than projected, its cash surpluses will be greater than planned and overall water tariffs will have been set higher than needed.

D. Revenues And Collections

The Revenues and Collections Analysis Worksheet is composed of several tables whose common purpose is to enable projection of water tariff revenues and revenue collection assuming that current tariff rates are held constant throughout the rate term. This facilitates the determination in Annex E, Tariff Analysis Worksheet Table 5.1 of the tariff increase required.

D1. Current Tariffs

Annex E, Table 4.1 of the AWGA model shows the current tariffs for each of the customer class. As explained in Section B.1.1 above, the "official" AWGA customer classification has been reduced to the minimum number of classes needed to capture real differences in water and wastewater charges.

Some types of user in the service category are entitled by law to tariff discounts. These include places of worship, charities, playgrounds, and youth welfare centers (entitled to 50 percent discount) and sports clubs (entitled to 75 percent discount). By law, syndicates are also entitled to a 75 percent discount, but this rule appears not to be observed in Alexandria. The discounts are extremely difficult to model in a tariff analysis, because they are expressed as a percentage of whatever tariff rate is assigned to the class; as a result, no matter what rate is assigned, the utility will never recover all of what it bills to these users. The model assumes that the discounted portion of these revenues will be made up through payments by the central or local agency of government to which these entities are affiliated.

A second note concerns the rate assigned to North Coast users in the "government-investment" class. Officially, the rate is LE 1.02, but review of three years of billing data show that the average tariff for this class is closer to LE 1.05.

D2. Water Tariff Revenue at Current Rates

Since tariffs are kept constant in this worksheet, the revenue projections simply reflect changes in demand. As noted in Section B.1., the growth of demand in the North Coast sector is slightly higher than in the city sector and the composition of North Coast demand features a considerably higher percentage of commercial-type use than the city sector. These factors entail a higher percentage of AWGA-wide commercial-type demand in 2007 than in 2001, but the overall difference is slight.

D3. Fixed-Charge Revenues

Fixed-charge revenues, such as meter maintenance charges, are revenues derived from users through charges posted on the water bill but not based on the volume of water consumed. They are of interest to the tariff analyst because they may be deducted from the total tariff revenue requirement.

The only fixed charge used by AWGA is a meter maintenance charge. Unfortunately, the fixed-charge revenues are not reported as discrete amounts in the AWGA annual reports. They have been estimated in the model as the difference between the total reported water sales revenue and the calculated total water tariff revenue. Logically, the fixed charge revenues should increase in proportion to the number of accounts. Since the year 2001 data are anomalous, a three-year (1999-2001) total was calculated and divided by the sums of the number of accounts for three years. This yields a yearly average fixed charge per account of LE 6.83. This figure is multiplied by the expected number of accounts to project fixed-charge revenues for 2002 onwards.

D4. Non-Tariff Revenues

"Non-tariff revenues" are revenues earned by the utility from the sale of goods and services other than the basic water or wastewater service. As with fixed-charge revenues, they are deducted from the tariff revenue requirement. Most of the non-tariff revenue items shown for AWGA are typical of Egyptian water utilities. The exception is the AGOSD billing service revenue. The wastewater surcharge is posted to a customer's water bill, and so is both billed and collected by AWGA on behalf of AGOSD and then transferred to AGOSD. In return for these services, AWGA keeps five percent of the AGOSD revenue collection. The projections of the various non-tariff items have relied on several methods:

a) The projection of AGOSD billing revenue has had to rely on the projected AGOSD revenue collections, which are a function of the expected AGOSD revenue (at adjusted tariff rates) multiplied by the AWGA collection efficiency rate, which is expected to increase 90 percent in 2002 to 95 percent in 2007;
b) Customer contributions are one-time charges levied on applicants for new connections; AWGA places these in a capital reserve for R&R works. A three-year historical average was calculated for 2002 and projected forward in proportion to the rate of growth of accounts; and
c) For most other items, the three-year historical average has been used (since there is no clear trend in the historical revenues of these items), but has been increased annually by the standard price inflation rate of 2.5 percent.

D5. Total Revenues

Annex E, Table 4.5 merely summarizes the utility's revenue by source (tariff revenue, fixed-charge revenue, and non-tariff revenue) to provide an indication of each source's contribution to total operating revenue.

D6. Collection Efficiency

Under the cash-needs approach to determining revenue requirements, an adjustment factor is applied to the total cash need to compensate for shortfalls in collection efficiency. Hence, if a utility only collects 67 percent of what it bills, its cash needs are adjusted upward by a factor of 1.5 (100 percent per 67 percent). The result is a hypothetical "revenue requirement" used to determine the level of tariff needed to assure that cash collected covers cash needs.

AWGA shows levels of collection efficiency at 90 percent or higher, which is excellent compared to other Egyptian utilities, though still short of developed country standards of 97 percent or 98 percent. It is known that in the early 1990s, AWGA's collection efficiency achieved 95 percent, so this has been set as a 2007 target to be achieved gradually.

E. Calculation of Revenue Requirements and Average Tariff

The Tariff Analysis Worksheet (Annex E, Table 5.1 in the model) is the central worksheet of the model, consolidating all the preceding data in the model in a summary form. The annual revenue requirement, average tariff, and average tariff increase factor to achieve the utility's rate term cost recovery level are calculated. Only two new inputs are required in Annex E, Table 5.1, namely, the historical expenditure on R&R projects and historical debt service obligations. These data elements are not necessary for the determination of the rate-term revenue requirement, but including them enables the utility and the regulator to compare average tariff requirement between historical and projection periods. The five-year AWGA cost recovery target is all cash needs O&M costs, and existing and new debt service obligations plus a "transfer" to the MOF. The calculation of the five-year AWGA revenue requirement is summarized in Table II-2:

Table II-2. AWGA Revenue Requirement, FY 03-FY 07(in million LE)

Operation and maintenance	LE 784.4
Renewal and replacement	202.0
Debt service	499.2
Transfer to MOF	55.3
minus non-tariff revenue	(220.5)
minus fixed-charge revenue	(41.7)
Cash needs	1,278.8
x average collection efficiency adjustment factor	100/93
Revenue requirement for positive cash	1,373.4

The average tariff required for positive cash grows from LE 0.35 in FY 2001 to LE 0.53 in FY 2007, with rate term average of LE 0.51.

The sources of the increase in the average tariff are clear when the full nine-year costs sequence in Annex E, Table 5.1 of the AWGA model is examined. (To see the trend, it is better to ignore FY 2002 costs, since this was a year with extraordinary debt service costs.) Comparison of the historical and projection periods shows that AWGA has planned to double and even triple its capital expenditure over historical levels. These expenditures are the source of the tariff increase. The average unit O&M cost is stable throughout the rate term.

A regulatory agency reviewing such a rate application would want to consider 1) the need for the much higher levels of investment, and 2) the capacity of the utility to implement the ambitious program within the five years.

The average tariff increase required is 24 percent. The AWGA rate design is presented in Section D of this report.

B. O&M Costs

In FY 2001, wages and salaries made up 69.3 percent of AWGA's total O&M costs. Historical trends in staffing per 1000 accounts are expected to continue, bringing the staffing ratio down from 8.2 in FY 2001 to 5.7 in FY 2007. Average salaries are expected to continue to increase at the historical average rate of 8 percent annually. Wages and salaries make up 62.7 percent of FY 2007 O&M costs.

Non-labor O&M costs are projected in the same manner as in the AWGA model (except that the UFW considerations in the water model are irrelevant to the wastewater model). The primary area in which efficiencies are expected is power usage, where AGOSD expects to achieve some efficiencies in the first three years as a consequence of treatment plant improvements. On the other hand, new chemicals costs are expected to appear and increase dramatically as chlorination is added to wastewater treatment processes, on a test basis in 2003 and then in full starting in 2004. This new cost, plus the effect of higher labor costs and non-labor input price inflation, results in a significant jump in O&M costs in 2004 with increases of five to six million LE annually thereafter.

C. Capital Costs

C1. Renewal and Replacement Project Costs

R&R project costs are included in the 2003-2007 tariff revenue requirement. AGOSD projects a relatively constant level of annual R&R expenditure averaging LE 19 million per year throughout the rate term. Approximately two-thirds will be spent on R&R of the collection systems, the other third to be spent on various performance improvement projects and programs including:

- closure of remaining raw sewage outfalls;
- flow meter purchase and installation;
- GIS development; and
- purchase of sewer cleaning equipment.

Annex F, Table 3.2 in the model shows the planned expenditure on completion projects and new projects. These projects will be funded through loans and grants. Table 3.2 is provided for informational purposes only, since AGOSD is not expected to recover any debt service costs during the 2003-2007 rate term. The debt service costs are shown in Table 3.3 of the model, which includes service of both existing and new debt.

C2. Debt Service

The 2003-2007 cost recovery target for AGOSD does not include debt service (unlike the AWGA case). Nevertheless, the AGOSD debt service obligation for the rate term has been modeled in order to show its hypothetical implications for tariffs and in order to provide debt service modeling tools for the future agency.

The debt service worksheet (Annex F, Table 3.3 in the AGOSD model) calculates the principal and interest payments from the utility's existing debt and its projected future borrowings during the rate term period.

SECTION III

AGOSD Revenue Requirements

A. Sewer Service Demand

A1. Water Consumption of Sewered Users

The new wastewater tariff rates will be applied to the *water consumption of sewered users.* Historical and projected flows are shown in Annex F, Table 1.1 of the AGOSD model. As in the AWGA model, the number of classes has been reduced to the minimum required to capture differences in water tariffs and wastewater surcharges (see Annex B). The thirteen classes used are common to both models; inherently unsewered users such as port users and AWGA customers outside the city boundaries are not included.

Since wastewater revenues are posted to the water bill, AGOSD is completely dependent upon AWGA for information about the water consumption of sewered users and about wastewater surcharge revenue. Only in recent years has AWGA begun to make this information available to AGOSD, and the data is provided only in the form of manual tables that summarize the billed water consumption of sewered users by class. As in the case of the AWGA class demand data, the total annual consumption figures show a regular progression, but the pattern of inter-annual change for certain classes is irregular, with FY 1999 being particularly anomalous. In order to provide a more probable representation of annual class consumption, the model has shifted consumption between classes among which misclassification of users is likely to have occurred.

Table III-1 below compares the total water consumption of sewered users with the total water consumption of the same types of users in the AWGA Alexandria city sector (excluding port users and Beheira) to provide a rough indication the percentage of sewer service coverage. (Note that raw water is used in Alexandria for industrial purposes and so flows to the sewer.)

Table III-1. Estimated Sewer Service Coverage

	FY 99	FY00	FY01
Water consumption of sewerable types of city users (m^3)	391,739,274	405,431,030	420,966,708
Water consumption of sewered users (m^3)	276,332,470	279,991,151	290,834,762
Sewered water use/total water use	70.5%	69.1%	69.1%

A2. Sewer Service Demand

For non-domestic uses, the water consumption of sewered users is expected to grow at the same rate as city water consumption in general, namely, at three percent annually. Somewhat higher rates of growth are projected for domestic use, especially in FYs 2006 and 2007, as AGOSD extends the collection system to the districts of Agami and Ameriya in West Alexandria, which is currently mostly unsewered.

C2a. Existing Debt

The model's debt service worksheet requires input information for each loan according the following data:

- initial principal borrowed;
- interest rate;
- loan term; and
- grace period.

The data inputs for each of the above four categories was researched and provided by the USAID institutional support contractor for AGOSD. From this input data, the model calculates over the projected 2003-2007 rate term the following output data:

- annual interest payments;
- annual principal payments; and
- end-of-year balances.

AGOSD's existing debt consists of LE 390,880,704 as of the end of FY 2002. AGOSD owes 23 percent of this to the MOF, 68 percent to the NIB, and nine percent to foreign lenders. The LE 89,424,844 that the MOF historically contributed to AGOSD is being treated as a loan.

C2b. New Debt

The calculation of new debt service obligations that AGOSD plans to incur during the 2003-2007 rate term requires the same input data as required for the calculation of existing debt service obligations. The debt service model calculates the annual interest payments based upon the average principal balance outstanding during the year. Therefore, if AGOSD begins a year with a balance of LE 0.00 for a given loan and ends that year with a balance of LE 1,000,000 owed, interest is calculated based upon the average principal balance - of LE 500,000 - for that year. As AGOSD was able to provide data on the specific months when future borrowing and construction would begin, the model has been able to calculate interest and principal payments based upon those partial-year periods.

AGOSD plans to source its future borrowing needs of LE 1,355,500,000 from a combination of NIB (66 percent) and foreign sources (33 percent). The LE 1,021,000,000 NIB loan will be served at the customary borrowing terms of a 13 percent interest rate, a ten-year loan term, and a two-year grace period on the repayment of principal. The LE 334,500,000 AGOSD plans to borrow from foreign sources are being provided by official lenders including the Government of France, the European Investment Bank (EIB), and the Government of Spain. As shown in the debt service worksheet, the foreign loans have interest rates that range from 5.5 percent to 0.1 percent, grace periods on the repayment of principal that range from six months up to ten years, and in the case of the French loan there is an associated grant to support the development of AGOSD's capital projects. It may be noted that, because these foreign loans are denominated in French Francs, Euros, and US dollars, they expose AGOSD to foreign currency risk.

For AGOSD debt service represents the component of revenue requirement that varies the most from year to year and that would account for the greatest share of the revenue requirement for full cost recovery. The cash needs for debt service range from a historic low of LE 53,188,955 in FY 1999, accounting for 44 percent of the cash needs to achieve full cost

recovery, to a projected high of LE 221,043,992 in FY 2007 accounting for 65 percent of cash needs.

D. Revenue and Collections

The Revenues and Collections Analysis Worksheet is composed of several tables whose common purpose is to enable projection of water tariff revenues and revenue collection assuming that current tariff rates are held constant throughout the rate term. This facilitates the determination in Tariff Analysis Worksheet Table 5.1 of the tariff increase required.

D1. Current Tariffs

Historically, wastewater tariffs have been billed as a surcharge on the water bill, specifically, as a percentage (usually from 35 percent to 60 percent depending on the customer class) of the customer's volume-based water charge. This approach ties wastewater tariffs directly to water tariffs and so does not account for the actual cost of wastewater service. The LIRR II Project recommends the use of a proper wastewater tariff, based on the wastewater revenue requirement and applied to the water consumption of sewered users. The wastewater tariff would still be posted to the water bill and collected by the water authority. Some programming modifications would need to be made to the water utility's billing system so that the wastewater charge is based on the water consumption rather than the water charge.

For ease of calculation, the current wastewater surcharge rates have been converted to unit tariffs by multiplying the class water tariff by the wastewater surcharge percentage (see Annex B).

Finally, it should be noted that the model assumes that wastewater charges will be applied to the minimum-use block of the domestic class, though this has not been AWGA's historical practice.

D2. Wastewater Tariff Revenue at Current Rates

Table 4.2 simply applies the current wastewater tariff rates given in Table 4.1 to the historical and projected water consumption of sewered users to estimate historical and projected wastewater tariff revenues at current wastewater tariff rates. This is needed to project the future revenue shortfall from revenue requirements if current rates are kept.

D3. Fixed-Charge Revenues

No fixed charges are applied to wastewater service in Alexandria.

D4. Wastewater Non-Tariff Revenues

The concept of "non-tariff revenues" is explained in Section B.4.4 above. Their significance is their use as an offset to tariff revenue requirements. AGOSD non-tariff revenues are significant and diverse. They accounted for nearly 30 of AGOSD's operating revenues in FY 2001.

FY 2002 non-tariff revenues have been estimated in two ways: 1) Where a clear historical trend is evident from the three-year historical data, the historical growth rate has been applied. 2) Where no historical trend is evident, a three-year historical average has been used.

For the projections:

a) Revenue from inspections is increased by LE 1,000 annually;
b) "Sample analysis" and rental revenue are essentially viewed as unchanging, but increased at 2.5 percent a year for inflation;
c) Septic hauling revenue is expected to increase from 2002 to 2005 on account of greater efficiency and increased charges, but is held stable from 2006 on to reflect the growth of sewer service demand in presently unsewered areas of West Alexandria;
d) "Connections" revenue increases in proportion to the increase in sewer accounts;
e) "Other services and contributions" revenue increase ten percent annually, reflecting the strong historical growth in this revenue source.

D5. Total Revenues

Annex F, Table 4.5 in the model simply summarizes the contributions of tariff revenue and non-tariff revenue, assuming that current tariff rates are kept. Note that under these assumptions, non-tariff revenue would account for 40.5 percent of 2007 revenue.

D6. Collection Efficiency

Collection efficiency is important in the cash needs model because the revenue requirement is adjusted upward to enable the rates to be set at a level that compensates for a certain level of shortfall in revenue collection.

Since Egyptian wastewater utilities depend on their associated water utilities for billing and collection, the water utility's collection efficiency rate is the wastewater utility's collection efficiency rate too, at least for projection purposes. That the historical data do not clearly reflect this pattern is no doubt a function of delays in AWGA transfers to AGOSD.

The projected AWGA collection efficiency rates increase from 91 percent in 2003 to 95 percent in 2007.

It should be noted that AWGA keeps 5 percent of the total AGOSD collection as a billing and collection service fee. The calculation of the cost to AGOSD is carried out in Annex F, Table 5.1, while the same amount should be treated as an AWGA non-tariff revenue item in the AWGA model. Model operators should note that the AWGA and AGOSD models are not linked, so the AWGA service fee must be input to AWGA Annex F, Table 4.4 once it has been calculated in the AGOSD model.

E. Calculation of Revenue Requirements and Average Tariff

The five-year AGOSD revenue requirement, average tariff, and average tariff increase factor are calculated for the rate-term cost recovery target of O&M costs and R&R project costs in Annex F, Table 5.1.1 of the AGOSD model and summarized in Table III-2 below:

Table III-2 AGOSD Revenue Requirements, FY 03-FY 07 (in million LE)

Operation and maintenance	LE 419.0
Renewal and replacement	95.0
minus non-tariff revenue	124.5
Cash needs	389.5
x collection efficiency adjustment factor	100/93
Revenue requirement for positive cash	418.4

The average tariff required for positive cash grows from LE 0.22 in 2001 to LE 0.25 in 2006, then declines to LE 0.24 in 2007. The rate term average tariff is LE 0.25, and the average actual 2001 tariff of LE 0.11 needs to be increased by a multiple of 2.08 to achieve the total rate term revenue requirement. The proposed tariff rate design for AGOSD is presented in Section D.2, below.

Annex F, Table 5.1.2 of the AGOSD model, provided for illustrative purposes only, shows the tariff implications of a full cash-needs cost recovery target, including service of existing and new debt. The rate implications of the higher cost recovery target are substantial, requiring a seven-fold increase in tariffs.

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Rate Designs

A relatively simple approach to rate design, based on an average increase, was adopted in the two Alexandria utilities. This is partly because the relatively high levels of non-domestic types of consumption make it possible to keep domestic rates affordable. Under these conditions, there is less need for block rates than there was in Beheira, where commercial types of use constitute only a fraction of the total revenue base.

A. Water Rates Design

The AWGA revenue requirements analysis (section B.5 above) concluded that the average tariff required over the rate term is LE 0.51, an average tariff increase of 24 percent.

Class tariffs are developed in Table 6, Annex F, of the worksheet by adjusting the values in the "Proposed Average Tariffs" section of Table 6.1 until an adequate level of total water revenue is generated in the penultimate row of Table 6.2 to produce positive net income in the final row of Table 6.2, at least in the five-year total.

In the AWGA case, positive net income for the five-year total and for each of the first four years was achieved basically by applying the average tariff increase factor. Minimum-use domestic users (consumption of 10 m^3 per month or less) were exempted from any increase in water rates, and the deficit caused by that exemption was made up by increasing the North Coast rates for all classes (except the domestic minimum-use block) by an additional ten percent. There is an intuitive cost-of-service justification for higher North Coast rates, since AWGA incurs above-average pumping and storage costs in meeting North Coast demands. (Note that the average tariff for North Coast shown in the Projections section of Table 6.1 in the model is high because of the high proportion of commercial types of use in the total North Coast demand.)

Although a slightly higher average increase could have eliminated the year 2007 deficit, the deficit has been kept. As noted in Section B.5, the increase in the average tariff required for positive net income in 2007 is a function of the rapid growth of debt service costs. The discussion in Section B.5 raised doubts about AWGA's capacity to meet its planned investment targets. Hence, a 2007 deficit has been kept, on the expectation that the full 2007 debt service costs will not be incurred. If EWRA annual reviews find that AWGA is consistently meeting its investment targets, an appropriate interim tariff adjustment can be made in 2006.

B. Wastewater Rates Design

As discussed in Section C.5, the average tariff required for recovery of AGOSD O&M and R&R costs over the period FY 2002/03 to 2006/07 is LE 0.25, which represents an average increase of 208 percent.

Although the average tariff is low, the percentage increase is high in view of the historically low wastewater tariff levels. In order to mitigate the impact on customers, the wastewater tariff increase can be effected in two stages, an initial two-year increase equivalent to a 180

percent increase over current tariffs, with a second increase in 2005 that increases the rates by 33 percent again (equivalent to a 240 percent increase over the current tariffs).
The minimum domestic use block (up to 10 m^3 per month water use) is currently exempted from any wastewater charge. The rate design proposes that these users be charged the equivalent of the current domestic lifeline wastewater tariff rate of LE 0.081 per m^3 water consumed. This would result in a wastewater charge of LE 0.81 for water use of ten m^3 per month.

C. Average Household Bills

Table IV-1 below shows the monthly tariff charges that would appear on the bills of domestic users at several typical levels of water consumption. Fixed charges are not included, but would add an average of LE 0.50 to the total bill.

Table IV-1. Average Monthly Bills for Domestic Users (City only)

	Current (2002)	2003	2005
Monthly Water Usage			
10 m^3			
Water bill	2.30	2.30	2.30
Wastewater bill	0.00	0.81	0.81
Total bill	*2.30*	*3.11*	*3.11*
20 m^3			
Water bill	4.60	4.60	4.60
Wastewater bill	1.61	2.90	3.85
Total bill	*6.21*	*7.50*	*8.45*
30 m^3			
Water bill	6.90	8.53	8.53
Wastewater bill	2.42	4.35	5.78
Total bill	*9.32*	*12.88*	*14.31*
40 m^3			
Water bill	12.00	14.83	14.83
Wastewater bill	4.20	7.56	10.05
Total bill	*16.20*	*22.39*	*24.88*

SECTION V

Recommendations on Tariff-Setting and Future Tariff Studies

The LIRR II tariff studies have provided MHUUC and the future regulatory agency with a tariff-setting methodology based on a general approach to economic regulation but flexible enough to be applied to a wide range of utility situations. The general approach to economic regulation is grounded in the notion that utility revenue requirements should incorporate commitments to increased efficiency in terms of standard utility performance indicators such as the staffing ratio, the level of unaccounted-for water, control of electricity costs, collection efficiency, *et cetera*. As the regulatory agency gains capacity and imposes its reporting requirements on utilities, a foundation will be laid for more rigorous benchmarking of utility performance.

The Beheira case study demonstrated the modeling requirements and tariff impacts of two different accounting approaches to determining revenue requirements, namely, the cash needs approach and the utility approach.

The models have provided two approaches to modeling the tariff implications of shortfalls in revenue collection: an approach based on a collection efficiency adjustment factor (used in the Sixth of October and Alexandria studies) and an approach based on working capital requirements (used in the Beheira study).

A number of other variations have been addressed. Models were developed for a combined water/wastewater utility operation (the Sixth of October model) and for separate water and wastewater utilities (the Alexandria models). The studies have explored situations in which a utility sells water in bulk to external customers (Sixth of October) and situations in which a utility purchases water in bulk from a neighboring utility (Beheira model).

The tariff studies have covered a range of utility organizational forms, such as public economic authority forms (Alexandria), public sector company forms (Beheira), and the New Urban Communities Authority (NUCA) municipal form (Sixth of October). Although the differences in organizational form have not entailed significant differences in modeling requirements, the various forms have all featured different systems of customer classification and tariff structure that require careful customizations of individual models. An important lesson learned is that no single tariff model is likely to be applicable in all its particulars to two utilities, i.e., each tariff study will require a greater or lesser degree of customization of a previous model. The staff of the concerned regulatory agency departments will therefore need to have two competencies (either individually or in combination), namely an understanding of the basic tariff-setting methodology and skills in spreadsheet design.

Three recommendations on tariff-setting have emerged from the pilot studies:

A. Include Review of Capital Programs in Rate Reviews

The Alexandria studies, in which full capital cost recovery was considered, showed the dramatic impact of ambitious capital spending plans on the tariff requirement. The regulatory agency must review such plans whatever the utility's target cost recovery level.

It is likely that past experience has taught the utilities to propose ambitious five-year plans to assure that NIB budgets an adequate amount for the utility. However, once debt service is included in the tariff revenue requirement, such a strategy results in high tariffs. The regulator will of course review utility annual expenditure, but the need for mid-term rate adjustments can be minimized if rates are based on real needs.

Hence the regulator must ask:

1) Is there a real need for increased rates of capital investment; and
2) Does the utility have the capacity to implement the capital plan?

No single answer applies to all utilities. For while the historical data indicate that utilities do not spend as much as they plan to, transfers of finds to the utilities have often been delayed, so a utility's "absorptive capacity" may be greater than it appears.

Equally important is the question of whether an investment responds to real needs. Again, there is no single answer. On the one hand, it appears that utilities are prone to perhaps unwarranted insecurity about their treatment capacity, when supply problems may actually be local in nature and better solved through distribution system improvements. On the other hand, budget tightness in the past may have led to under-funding of maintenance and rehabilitation, resulting in accelerated decrepitude of facilities.

B. Create Incentives for Greater Efficiency

"Economic regulation" in its full sense signifies not only the insistence on efficiency improvements but also a mode of regulation that influences utility behavior as much by creating incentives as imposing rules. An effective way to simulate market forces in the government-owned utility sector might be to allow utilities to keep a percentage of earnings in excess of the approved revenue requirement. Since tariffs would be regulated, the way for a utility to earn a "surplus" would be to exceed its efficiency targets. The MOF and AWGA appear to be in the process of negotiating a formula for sharing "excess" revenue.

C. Rationalize the Tariff Structure

The LIRR II project holds that utilities should be given latitude to develop tariff structures that suit local conditions under general regulatory supervision to assure that:

1) proposed tariff structures generate the revenue requirement;
2) no class of user is subjected to an undue share of the tariff burden; and
3) a minimum level of service is affordable to low-income households.

The following recommendations relate to the existing tariff structures. There appear to be three basic structures:

1) the "Ministry of Urbanization" (*wizarit il-ta'mir*) structure issued in 1992, applied by the PEAs;
2) the NUCA tariff structure; and
3) the structure found in Beheira.

In LIRR II's view, the Beheira structure is significantly better than the first two, but all suffer to a greater or lesser extent from the following shortcomings:

1) The customer classification is excessively complicated (especially in the PEA tariff structure) and/or ambiguous (especially the NUCA structure);
2) While the customer classification is highly differentiated, use of consumption blocks is limited to two domestic blocks (or no blocks at all in the NUCA structure);
3) The low-price domestic block in the PEA structure is set at 30 m^3 per month, a level of consumption far beyond a family's minimum needs. (Moreover, the domestic block structure is often applied to each user's total consumption so that all domestic users pay the low rate on their first 30 m^3, not just users whose consumption is 30 m^3 or less.)

Tariff policy makers should reduce the number of customer classes, apply block rates more extensively, and set lifeline rates to target vulnerable households, not all households.

The most equitable and systematic approach to rate design is a cost-of-service approach. A cost-of-service study analyzes the impact of different patterns of class demand on the utility's operating and capital costs, particularly through investigation of the costs of meeting class peak demands. The data requirements of a cost-of-service study are considerable, and sometimes must rely on engineering judgments, but well-designed cost-based rates communicate the cost of service to the user and the demand for service to the utility. A shortcoming of cost-based rates in the Egyptian context is that domestic rates tend to be higher than under rate structures that give greater weight to social objectives under a cost-of-service approach, since domestic users are typically responsible for a large part of capital costs associated with meeting maximum hour demands.

An appropriate general tariff structure for Egypt would feature three classes domestic, service, and commercial with three blocks in the domestic class and two or three blocks in the commercial class. The three classes are derived from a combination of two criteria, as shown in Figure V-1.

Figure V-1. Customer Classification Criteria

	Responsiveness of Demand to Price Increases	Ability to Pass Price Increases to Others
Domestic	Yes	No
Service	No	No
Commercial	Yes	Yes

Both domestic and commercial users can conserve water in order to keep their bills low. Commercial users can incorporate the price of water into the prices they charge for their products.

Service users cannot respond to price increases because most of the consumption in these establishments is by persons who do not pay the utility bill. Because service users cannot control their consumption, block rates may not be suitable for them.

One difficulty with service users, which are mainly governmental or quasi-governmental establishments, is that historically they *have* passed their water costs on to others, either taxpayers or the utility itself. The collection efficiency adjustment used in the tariff models is a way to distribute these costs to the other customers. While this is not particularly fair, it creates the conditions for bottom-up pressure from customers through utility managers to the governors to solve the nationwide problem of low levels of utility bill payment by service-type users.

What block levels should be used for the domestic and commercial classes? For commercial use, blocks could be set at 20 and 100 m^3 per month. The 20 m^3 block would capture small businesses, which have limited resources and pricing power, the 21-100 m^3 block would capture medium-sized businesses, and the greater than 100 m^3 block would cover large-scale industrial use, for which utility services will make up only a fraction of production costs.

In the domestic class, blocks could be set at 15 m^3 and 30 m^3. The 1-15 m^3 block would be the rate paying segment protected by lifeline rates. A first block ceiling as low as ten m^3 is considered acceptable by some Egyptian utility managers; moreover, the utility billing systems have an easier time of reporting 10 m^3 consumption than 15 m^3, since 10 m^3 is often the basis for minimum charges. The 11 to 30 (or 16 to 30 m^3) block would capture the consumption of average households, while the over-30 m^3 block would capture "luxury" use.

Critics of the use of block rates have observed that the poor often live in multi-family households or multi-family apartment buildings that are billed off a single meter, hence they become ineligible for the lifeline rate. This problem may be addressed by "calibrating" the blocks to the number of apartments.

ANNEX A

AWGA Water Tariffs

ANNEX B

Water Tariffs, Wastewater Surcharges, Equivalent Wastewater Tariffs, and Simplified Customer Classification

Alexandria Water Authority (AWGA)
Customer Classification and Water Tariff Rates (in piasters)

Type of User	Cairo	Provincial Cities	Suez Canal Cities	Other Governorates	Alexandria
1 - Domestic Use					
Up to 30 m3	12	23	23	23	23
Greater than 30 m3	16	30	30	30	30
Building and construction works	34	50	50	50	60
2 - Non-Domestic Use					
Places of worship	8	35	30	35	**42
Charity organizations		35	40	35	**42
Playgrounds	30	35	30	35	**42
Youth welfare centers	30	35	30	35	**42
Sports clubs					
-clubs (a)	*200	40	40	40	***48
-clubs (b)	*40	40	40	40	***48
Syndicates	25	40	40	40	48
Embassies	75	40	85	40	48
Abu Qir Port (ships - day/night)					700/Ton
Alex. Port (sidewalk taps - day/night)					700/Ton
Alex. Port (ships - day)					700/Ton
Alex. Port (ships - night)					1,200/Ton
Dekhiela Port (ships - day/night)					1,000/Ton
ship supply companies			325/Ton		
public taps - free up to 80 m3, >80m3			40		
3 - Companies & Enterprises					
Small factories, workshops	36	50	50	50	60
Popular cafes & restaurants	36	50	50	50	60
Big factories	60	53	50	53	60
Filling stations, 2 and 3 star hotels	60	50	50	50	60
Private schools, health insurance hospitals	60	50	50	50	60
Garages, mills	60	50	50	50	60
Bakeries	23	50	23-30	50	60
Large factories with feeding pipe more than 30 mm diameter					64
4 - Production & Investment					
Private hospitals	125	85	85	85	102
First class restaurants and first class hotels	125	85	85	85	102
Investment companies	125	85	85	85	102
Free zones, travel agencies	125	85	85	85	102
5 - Raw Water					
Governorates	10	16	16	16	19
Companies	15				
6 - Government					
Factories, agencies	30	40	40	40	48
Local government	30	40	40	40	48
7 - Distilled Water					
	20	18		18	22
8 - Fixed Tariff for Governorate Constructed Housing					
1 bedroom	120	250		250	300
2 bedrooms	150	300		300	360
3 bedrooms	180	400		400	480
more than 3 bedrooms	240	500		500	600

* Exempted from 75 % of the cost ** discounted 50 % of the cost *** discounted 75% of the cost

ANNEX C

AWGA Financial Statements

WATER TARIFF RATES, WASTEWATER SURCHARGE RATES, EQUIVALENT WASTEWATER TARIFFS, AND SIMPLIFIED CUSTOMER CLASSIFICATION				
Type of User	**Water Tariff**	**WW Surcharge**	**WW Tariff**	**New Classification**
CITY OF ALEXANDRIA				
Domestic Use				
Minimum charge	0.23	n/a		domestic-minimum use
Up to 30 m^3	0.23	35%	0.081	domestic- up to 30 m3/mo
Greater than 30 m^3	0.30	35%	0.105	domestic-over 30m3/mo
Building and construction works	0.60	35%	0.210	small commercial
Non-Domestic Use (Service Use)				
Places of worship	0.42	35%	0.147	service-50% discount
Charity organizations	0.42	35%	0.147	service-50% discount
Playgrounds	0.42	35%	0.147	service-50% discount
Youth welfare centers	0.42	35%	0.147	service-50% discount
Sports clubs	0.48	35%	0.168	service-75% discount
Syndicates	0.48	35%	0.168	service-no discount
Embassies	0.48	35%	0.168	service-no discount
Abu Qir Port (ships - day.night)	0.70	n/a		port users@LE 7.00
Alex. Port (sidewalk taps - day/night)	0.70	n/a		port users@LE 7.00
Alex. Port (ships - day)	0.70	n/a		port users@LE 7.00
Alex. Port (ships - night	1.20	n/a		port users@LE 12.00
Dekhiela Port (ships - day/night)	1.00	n/a		port users@LE 10.00
Companies & Enterprises				
Small factories, workshops	0.60	50%	0.300	small industry
Popular cafes & restaurants	0.60	35%	0.210	small commercial
Filling stations, 2- and 3-star hotels	0.60	35%	0.210	small commercial
Private schools, health insurance hospitals	0.60	35%	0.210	small commercial
Garages, mills	0.60	50%	0.300	small industry
Bakeries	0.60	50%	0.300	small industry
Large factories with feeling pipe more than 30 mm diameter	0.64	50%	0.320	large factories
Production & Investment				
Private hospitals	1.02	35%	0.357	investment
First class restaurants and first class hotels	1.02	50%	0.510	tourism
Investment companies	1.02	35%	0.357	investment
Free zones, travel agencies	1.02	35%	0.357	investment
Raw Water				
Companies	0.19	50%	0.095	large factories
Government				
Factories, agencies	0.48	50%	0.240	government-agencies and companies
Local government	0.48	35%	0.168	government-local government
Distilled Water	0.22	n/a		
Unmetered Use (avg historical rate/m3)	0.43	n/a		unmetered use
Beheira Water Company and Governorate	0.23	n/a		Beheira Water Company & Gov'te

WATER TARIFF RATES

Type of User	Water Tariff			
NORTH COAST				
Domestic- minimum use	0.23			
Domestic- up to 30m3/mo	0.23			
Domestic- over 30 m3/mo	0.30			
Service- 50% discount	0.42			
Service- 75% discount	0.48			
Small commercial and small industrial	0.60			
Large factories	0.64			
Investment, tourism, and free zones	1.02			
Government- service	0.48			
Government- investment (average)	1.05			

Notes:

All tariff rates shown in LE/m3 of water sold.

"Equivalent wastewater tariff" calculated as the water tariff multiplied by the wastewater surcharge rate, and is meant to be applied to the billed

The new classification is intended to reduce the number of tariff classes to the minimum needed to group all types of users to whom the same

At present, the wastewater surcharge is not applied to Domestic - Minimum Use consumption. The tariff study expects wastewater charges to

ANNEX C(1)

AWGA Income Statements

AWGA INCOME STATEMENTS FOR FYs 1998/99 to 2000/01			
	98/99 (LE)	99/00 (LE)	00/01 (LE)
Operating Revenue			
Sales of water	184,990,640	193,932,249	203,645,807
Sales of services	16,030,571	17,419,680	15,342,654
Other revenue	861,633	551,612	439,886
Total Operating Revenues	201,882,844	211,903,541	219,428,347
Operating expenses			
Salaries	43,583,918	48,072,191	51,484,888
Commodities	57,500,087	60,696,119	65,991,304
Services	6,905,656	9,510,689	8,434,294
Indirect taxes	91,677	1,847,223	1,685,243
Depreciation	27,464,962	29,682,390	31,491,105
Maintenance	163,000	706,000	706,000
Total Operating Expenses	135,709,300	150,514,612	159,792,834
Operating profit	66,173,544	61,388,929	59,635,513
Non Operating Revenues			
Capital profit	0	0	0
Credit interest	7,178,039	8,919,579	11,479,329
Prior years revenues	1,913,407	2,341,570	2,518,860
Investment revenues	2,036	2,036	2,036
Credit rent	33,437	36,283	32,772
Fines & copensation	455,775	147,135	388,720
Other revenues	28,202,559	33,751,764	35,063,381
Total Non Operating Revenues	37,785,253	45,198,367	49,485,098
Profit before non operating expenses	103,958,797	106,587,296	109,120,611
Non Operating Expenses			
Rent	5,413	5,347	5,347
Interest	45,439,779	45,489,112	44,999,108
Other provisions	7,765,010	4,564,911	12,040,077
Prior years expenses	17,679,722	3,893,369	1,690,136
Donations	15,803	15,696	17,265
Fines & compensations	625	12,274	459
Capital losses	15,749	21,117	41,371
Other transfers	26,419,775	31,513,762	32,280,749
Income tax	0	0	7,611,090
Total non operating expenses	97,341,876	85,515,588	98,685,602
NET INCOME	**6,616,921**	**21,071,708**	**10,435,009**

Source: AWGA Annual Reports

ANNEX C(2)

AWGA Balance Sheets

AWGA BALANCE SHEETS for FYs 1998/1999 to 2000/2001			
Description	98/99	99/00	00/01
Assets			
Fixed Assets	680,214,815	756,225,014	834,273,804
Works in Progress	213,549,486	204,168,039	187,449,205
Inventory	24,231,673	25,555,022	25,706,999
Debtors	164,064,689	186,736,985	231,911,315
Miscellaneous Debit Accounts	17,843,287	8,742,703	12,625,820
Cash in Hand & in Bank	129,109,438	135,038,863	128,534,710
Other Balances	4,466,818	4,296,157	4,569,278
Carried Losses	*198,113,806*	*198,113,583*	*198,113,664*
Total Assets	1,233,480,206	1,320,762,783	1,425,071,131
Total Assets + Carried Losses	1,431,594,012	1,518,876,366	1,623,184,795
Liabilities & Owners' Equity			
Capital	363,753,533	363,753,533	363,753,533
Reserves	237,465,311	278,497,721	315,467,201
Allowances (Provisions)	248,552,492	281,523,348	323,299,638
Long-Term Loans	379,067,214	369,444,763	368,809,696
Creditors	85,652,463	102,006,950	116,914,104
Miscellaneous Credit Accounts	112,170,963	117,892,881	128,343,612
Other Balances	4,932,036	5,757,170	6,597,011
Total Liabilities & Owners' Equity	1,431,594,012	1,518,876,366	1,623,184,795

ANNEX D(1)

AGOSD Income Statements

AGOSD INCOME STATEMENTS FOR FYs 1998/99 to 2000/01

	98/99 (LE)	99/00 (LE)	00/01 (LE)
Operating Revenue			
Tariff revenue (received)*	27,839,037	29,873,282	36,394,631
Sales of services	596,184	334,092	302,349
Other revenue	1,207,530	1,348,000	1,704,908
Total operating revenues	**29,642,751**	**31,555,374**	**38,401,888**
Operating Expenses			
Salaries	34,914,964	38,007,353	40,809,280
Commodities	14,336,441	15,729,945	16,481,515
Services	2,181,900	1,203,230	1,504,650
Indirect taxes	148,723	157,874	87,962
Depreciation	57,511,284	50,280,395	57,365,158
Total operating expenses	**109,093,312**	**105,378,797**	**116,248,565**
Operating profit	*-79,450,561*	*-73,823,423*	*-77,846,677*
Non-Operating Revenues			
Capital profit	0	0	0
Credit interest	0	0	0
Prior years revenues	218,307	2,473,000	5,019,509
Investment revenues	0	0	0
Credit rent	50,194	52,000	128,518
Fines & compensation	976,568	621,000	414,474
Other revenues	3,948,264	4,888,000	6,234,421
Total non-operating revenues	**5,193,333**	**8,034,000**	**11,796,922**
Profit before non-operating expenses	*-74,257,228*	*-65,789,423*	*-66,049,755*
Non-Operating Expenses			
Rent	655	2,631	0
Interest	39,177,832	42,654,232	47,423,917
Other provisions	0	10,000	0
Prior years expenses	778,798	327,559	270,929
Donations	1,791	2,025	2,215
Fines & compensation	105	2,193	35,043
Capital losses	43,743	506,860	371,454
Other transfers	1,884,399	1,453,000	1,749,393
Total non-operating expenses	**41,887,323**	**44,958,500**	**49,852,951**
NET INCOME	***-116,144,551***	***-110,747,923***	***-115,902,706***

Source: AGOSD Annual Reports

* surcharge revenue collected, after subtraction of AWGA 5% collection fee.

ANNEX D(2)

AGOSD Balance Sheets

AGOSD Balance Sheets for FYs 1998/1999 to 2000/2001			
Description	98/99 (LE)	99/00 (LE)	00/01 (LE)
Assets			
Fixed Assets			
Land	7,019,051,850	7,019,051,850	7,019,051,850
Buildings, Structures, Utilities, and Roads	119,356,073,226	122,432,484,478	125,190,109,304
Machinery & Equipment	21,514,696,043	21,440,774,293	21,733,163,209
Means of Transport and Transportation	2,938,857,825	2,983,947,521	3,034,536,921
Tools and Instruments	282,285,372	292,928,897	290,467,484
Office Furniture and Equipment and Deferred Revenue Expenses	230,629,156	322,828,354	336,241,646
Subtotal, Fixed Assets	**151,341,593,472**	**154,492,015,393**	**157,603,570,414**
Works in Progress			
Materiel Formation (investment)	20,592,612,716	25,498,812,118	34,116,254,773
Investment Expenditure	743,340,402	1,781,963,603	1,982,554,353
Subtotal, Works in Progress	***21,335,953,118***	***27,280,775,721***	***36,098,809,126***
Inventory (Stock)			
Raw Materials			
Fuel & Oil	173,498,190	99,643,937	88,265,413
Spare parts & Supplies	2,640,064,844	2,673,377,013	2,445,045,531
Scrap	39,294,006	49,736,915	50,342,015
Goods Purchased for Sale Purpose			
Printing supplies and clerical materials			
Subtotal, Inventory	***2,852,857,040***	***2,822,757,865***	***2,583,652,959***
Debtors			
Customers (Clients)	270,425,694	609,593,050	1,009,674,891
Receivables			
Miscellaneous Debtors	5,371,066	3,248,188	1,649,080
Subtotal, Debtors	***275,796,760***	***612,841,238***	***1,011,323,971***
Miscellaneous Debit Accounts			
Asset Sale Debtors			
Other Debit Accounts	6,493,606,092	7,164,368,439	7,086,094,821
Accrued Current & Appropriation Revenues	2,975,835,133	3,497,153,901	4,131,147,607
Subtotal, Miscellaneous Debit Accounts	***9,469,441,225***	***10,661,522,340***	***11,217,242,428***
Cash in Hand & in Bank			
Finance Investments	884,189,412	726,285,888	789,689,385
Bank (current account)	63,014,906	383,861,726	922,051,929
Bank (term deposit)	21,417,961	243,355,192	448,595,719
Subtotal, Cash in Hand & in Bank	***968,622,279***	***1,353,502,806***	***2,160,337,033***
Other Balances			
Suppliers	337,157,944	336,273,715	356,940,779
Miscellaneous Creditors	174,474,206		
Other Credit Accounts (Accrued Current & Appropriation Expenses)	213,785	213,785	213,825
Subtotal, Other Balances	***511,845,935***	***336,487,500***	***357,154,604***
Carried Losses	***49,396,831,588***	***60,479,280,199***	***72,069,450,714***

AGOSD Balance Sheets for FYs 1998/1999 to 2000/2001

Description	98/99 (LE)	99/00 (LE)	00/01 (LE)
TOTAL ASSETS	*236,152,941,417*	*258,039,183,062*	*283,101,541,249*
Liabilities & Owners' Equity			
Capital			
Issued Capital	102,775,183,520	102,775,183,520	102,775,183,520
Government Contribution	30,954,157,297	37,532,790,697	41,601,406,236
Subtotal, Capital	*133,729,340,817*	*140,307,974,217*	*144,376,589,756*
Reserves			
Reserves for Higher Prices of Assets	358,465,338	632,845,402	724,740,699
Other Reserves	19,610,583,077	22,120,881,490	29,716,072,754
Subtotal, Reserves	*19,969,048,415*	*22,753,726,892*	*30,440,813,453*
Allowances (Provisions)			
Depreciation	29,320,353,180	33,773,716,083	39,346,213,943
Disputed Taxes' Allowance			
Bad Debts' Allowance	2,940,647,195	2,940,647,195	2,939,332,644
Other Provisions	146,551,200	156,551,200	156,551,200
Subtotal, Allowances (Provisions)	*32,407,551,575*	*36,870,914,478*	*42,442,097,787*
Long Term Loans			
Domestic long-term Loans	20,518,652,160	25,894,467,160	29,732,703,160
External long-term Loans	18,791,965,592	17,296,011,390	15,688,395,466
Subtotal, Long-Term Loans	*39,310,617,752*	*43,190,478,550*	*45,421,098,626*
Creditors			
Suppliers	720,113,329	1,078,832,860	1,842,518,327
Miscellaneous Creditors	857,731,790	1,027,901,763	1,331,629,143
Subtotal, Creditors	*1,577,845,119*	*2,106,734,623*	*3,174,147,470*
Miscellaneous Credit Accounts			
Creditors	732,733,978	1,317,538,583	1,701,961,184
Other Credit Accounts	5,459,217,849	6,184,265,912	6,533,911,150
Accrued Current & Appropriation Expenses	2,909,920,246	5,248,221,294	8,939,659,402
Subtotal, Miscellaneous Credit Accounts	*9,101,872,073*	*12,750,025,789*	*17,175,531,736*
Other Balances			
Customers	49,752,217	59,297,050	71,262,421
Miscellaneous Debtors	6,913,449	31,463	
Checking Account			
Subtotal, Other Balances	*56,665,666*	*59,328,513*	*71,262,421*
TOTAL LIABILITIES & OWNERS' EQUITY	*236,152,941,417*	*258,039,183,062*	*283,101,541,249*

ANNEX E

AWGA Tariff Model

Table 1: AWGA: WATER DEMAND

Table 1.1.1: Water Consumption under Existing Categories, by Type of Account (m^3/year)

Year	Historical Data			Estimated Data
	1999	2000	2001	2002
Water Consumption (m3/year)				
City of Alexandria				
Domestic - Minimum Use	22,822,013	23,672,183	25,483,202	26,247,698
Calculated Annual Increase %		3.7%	7.7%	3.0%
Domestic - Up to 30 m3/month	181,688,113	186,836,543	191,745,573	197,497,940
Calculated Annual Increase %		2.8%	2.6%	3.0%
Domestic - Over 30 m3 month	64,213,231	63,448,113	70,026,212	72,126,998
Calculated Annual Increase %		-1.2%	10.4%	3.0%
Service (50% Discount)	2,024,030	2,001,019	2,133,450	2,197,464
Calculated Annual Increase %		-1.1%	6.6%	3.0%
Service (75% Discount)	1,737,812	425,466	593,818	1,023,627
Calculated Annual Increase %		-18.0%	-30.3%	3.0%
Service (No Discount)	1,919,918	773,775	29,195	30,071
Calculated Annual Increase %		-59.7%	-96.2%	3.0%
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	26,084,929	27,877,906	30,130,477	31,034,391
Calculated Annual Increase %		6.9%	8.1%	3.0%
Small Industry (factories & workshops, garages, mills, bakeries)	3,223,968	3,445,984	3,722,992	3,835,712
Calculated Annual Increase %		6.9%	8.1%	3.0%
Large Factories	32,462,340	34,760,234	32,349,416	33,319,898
Calculated Annual Increase %		7.1%	-6.9%	3.0%
Investment (private hospitals, investment companies, free zones)	15,587,760	17,405,578	17,459,196	17,962,372
Calculated Annual Increase %		11.6%	0.3%	3.0%
Tourism (five-star hotels and restaurants)	920,408	606,249	1,706,246	1,561,948
Calculated Annual Increase %		-34.4%	181.7%	3.0%
Government - Agencies and Companies	32,075,715	34,734,006	35,598,560	36,666,517
Calculated Annual Increase %		8.3%	2.5%	3.0%
Government - Local government	992,052	1,447,280	1,100,938	1,134,016
Calculated Annual Increase %		45.9%	-23.9%	3.0%
Raw Water	8,087,008	9,970,236	8,696,134	8,957,059
Calculated Annual Increase %		16.2%	23.0%	3.0%
Port Users @ L.E. 7.00	244,213	222,560	211,588	211,588
Calculated Annual Increase %		-8.9%	-4.9%	0.0%
Port Users @ L.E. 10.00	0	0	0	0
Calculated Annual Increase %		0.0%	0.0%	0.0%
Port Users @ L.E. 12.00	5,808	270	1,272	1,310
Calculated Annual Increase %		-92.9%	371.1%	3.0%
Beheira Water Company and Governorate	7,933,168	7,066,741	7,387,765	7,684,320
Calculated Annual Increase %		-6.2%	4.5%	4.0%
Total, City of Alexandria	399,820,463	412,723,478	428,568,337	441,492,927
Calculated Annual Increase %		3.3%	3.8%	3.0%

Year	Projections					Total (2003 - 2007)	Average Year (2003-2007)
	2003	2004	2005	2006	2007		
Water Consumption (m3/year)							
City of Alexandria							
Domestic - Minimum Use	27,035,129	27,846,183	28,681,568	29,542,015	30,428,276	143,533,172	28,706,634
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Domestic - Up to 30 m3/month	203,422,878	209,525,565	215,811,332	222,285,672	228,954,242	1,079,999,688	215,999,938
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Domestic - Over 30 m3 month	74,290,808	76,519,533	78,815,119	81,179,572	83,614,959	394,419,991	78,883,998
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Service (50% Discount)	2,263,388	2,331,289	2,401,228	2,473,265	2,547,463	12,016,633	2,403,327
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Service (75% Discount)	1,054,336	1,085,966	1,118,545	1,152,102	1,186,665	5,597,614	1,119,523
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Service (No Discount)	30,973	31,902	32,859	33,845	34,860	164,440	32,888
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	31,965,423	32,924,386	33,912,117	34,929,481	35,977,365	169,708,772	33,941,754
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Small Industry (factories & workshops, garages, mills, bakeries)	3,950,783	4,069,307	4,191,386	4,317,127	4,446,641	20,975,244	4,195,049
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Large Factories	34,319,495	35,349,080	36,409,553	37,501,839	38,626,894	182,206,862	36,441,372
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Investment (private hospitals, investment companies, free zones)	18,501,243	19,056,280	19,627,969	20,216,808	20,823,312	98,225,612	19,645,122
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Tourism (five-star hotels and restaurants)	1,608,804	1,657,068	1,706,780	1,757,983	1,810,723	8,541,359	1,708,272
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Government - Agencies and Companies	37,766,512	38,899,508	40,065,493	41,268,488	42,506,542	200,507,543	40,101,509
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Government - Local government	1,168,036	1,203,077	1,239,169	1,276,345	1,314,635	6,201,262	1,240,252
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Raw Water	9,225,771	9,502,544	9,787,620	10,081,249	10,383,687	48,980,871	9,796,174
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Port Users @ L.E. 7.00	211,588	211,588	211,588	211,588	211,588	1,057,940	211,588
Projected Annual Increase %	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
Port Users @ L.E. 10.00	0	0	0	0	0	0	0
Projected Annual Increase %	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
Port Users @ L.E. 12.00	1,349	1,390	1,432	1,475	1,519	7,164	1,433
Projected Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Beheira Water Company and Governorate	7,937,902	8,263,356	8,618,681	9,006,521	9,420,821	43,247,282	8,649,456
Projected Annual Increase %	3.3%	4.1%	4.3%	4.5%	4.6%		4.2%
Total, City of Alexandria	454,754,420	468,478,022	482,633,439	497,235,375	512,290,193	2,415,391,448	483,078,290
Calculated Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%

Table 1: AWGA: WATER DEMAND

North Coast:						***North Coast:***							
Domestic - minimum charge	921,270	155,006	1,138,263	1,183,794		Domestic - minimum charge	1,231,145	1,280,391	1,331,607	1,384,871	1,440,266	6,668,280	1,333,656
Calculated Annual Increase %		-83.2%	634.3%	4.0%		Projected Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Domestic - up to 30 m3/month	2,949,918	2,805,099	3,110,265	3,234,676		Domestic - up to 30 m3/month	3,364,063	3,498,625	3,638,570	3,784,113	3,935,477	18,220,848	3,644,170
Calculated Annual Increase %		-4.9%	10.9%	4.0%		Projected Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Domestic - over 30 m3/ month	301,447	321,850	610,152	530,558		Domestic - over 30 m3/ month	551,780	573,852	596,806	620,678	645,505	2,988,621	597,724
Calculated Annual Increase %		6.8%	58.5%	4.0%		Projected Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Service - 50% discount	11,625	14,320	20,224	21,033		Service - 50% discount	21,874	22,749	23,659	24,606	25,590	118,478	23,696
Calculated Annual Increase %		23.2%	41.2%	4.0%		Projected Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Service - 75% discount	1,215,713	1,457,350	1,757,601	1,827,905		Service - 75% discount	1,901,021	1,977,062	2,056,145	2,138,390	2,223,926	10,296,544	2,059,309
Calculated Annual Increase %		19.9%	20.6%	4.0%		Projected Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Small Commercial	1,450,858	1,352,184	1,560,227	1,622,636		Small Commercial	1,687,542	1,755,043	1,825,245	1,898,255	1,974,185	9,140,269	1,828,054
Calculated Annual Increase %		-6.8%	15.4%	4.0%		Projected Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Large Factories	6,028,432	5,982,537	5,851,473	6,084,932		Large Factories	6,307,321	6,559,614	6,821,999	7,094,879	7,378,674	34,162,486	6,832,497
Calculated Annual Increase %		-0.8%	-2.5%	4.0%		Projected Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Investment and Tourism	19,641,302	20,012,143	20,358,115	21,172,440		Investment and Tourism	22,019,337	22,900,111	23,816,115	24,768,760	25,759,510	119,263,833	23,852,767
Calculated Annual Increase %		1.9%	1.7%	4.0%		Projected Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Government - Services	8,655,559	6,821,024	6,935,813	7,213,245		Government - Services	7,501,773	7,801,844	8,113,918	8,438,475	8,776,014	40,632,023	8,126,405
Calculated Annual Increase %		-21.2%	1.7%	4.0%		Projected Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Government - Investment	3,984,076	3,651,398	8,744,780	9,094,571		Government - Investment	9,458,354	9,836,688	10,230,156	10,639,362	11,064,936	51,229,496	10,245,899
Calculated Annual Increase %		-7.6%	139.5%	4.0%		Projected Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Total, North Coast	45,130,200	42,573,315	49,966,911	51,965,587		Total, North Coast	54,044,211	56,205,979	58,454,219	60,792,387	63,224,083	292,720,879	58,544,176
Calculated Annual Increase %		-5.7%	17.4%	4.0%		Calculated Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Total AWGA	**444,650,663**	**455,296,793**	**478,535,248**	**493,458,515**		**Total AWGA**	**508,798,631**	**524,684,002**	**541,087,657**	**558,027,762**	**575,514,275**	**2,708,112,327**	**541,622,465**
Calculated Annual Increase %		2.4%	5.1%	3.1%		Calculated Annual Increase %	3.1%	3.1%	3.1%	3.1%	3.1%		3.1%

Table 1.1.2: Summary of Water Demand under Aggregated Classification

Year	Historical Data			Estimated Data	Year	Projections					Total (2003 - 2007)	Average Year (2003-2007)
	1999	2000	2001	2002		2003	2004	2005	2006	2007		
Alexandria City												
Domestic Class	276,256,625	281,023,587	294,643,756	303,556,956	Domestic Class	312,686,718	322,154,636	331,926,699	342,013,780	352,418,298	1,661,200,132	332,240,026
Calculated Annual Increase %		1.7%	4.8%	3.0%	Calculated Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Service Class	38,749,507	40,381,514	39,856,014	41,051,694	Service Class	42,283,245	43,551,743	44,858,295	46,204,044	47,590,165	224,487,492	44,897,498
Calculated Annual Increase %		4.2%	-1.3%	3.0%	Calculated Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Commercial Class	84,514,331	91,318,377	94,068,567	96,884,276	Commercial Class	99,784,457	102,771,643	105,848,445	109,017,550	112,281,729	529,703,825	105,940,765
Calculated Annual Increase %		8.1%	3.0%	3.0%	Calculated Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Total Alexandria City Annual Demand	**399,520,463**	**412,723,478**	**428,568,337**	**441,492,927**	**Total Alexandria City Annual Demand**	**454,754,420**	**468,478,022**	**482,633,439**	**497,235,375**	**512,290,193**	**2,415,391,448**	**483,078,290**
Calculated Annual Increase %		3.3%	3.8%	3.0%	Calculated Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
North Coast:					***North Coast:***							
Domestic Class	4,172,635	3,281,955	4,758,680	4,949,027	Domestic Class	5,146,988	5,352,868	5,566,983	5,789,662	6,021,248	27,877,749	5,575,550
Calculated Annual Increase %		-21.3%	45.0%	4.0%	Calculated Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Service Class	9,882,897	8,292,694	8,713,636	9,062,181	Service Class	9,424,669	9,801,655	10,193,722	10,601,471	11,025,529	51,047,046	10,209,409
Calculated Annual Increase %		-16.1%	5.1%	4.0%	Calculated Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Commercial Class	31,074,668	30,998,666	36,494,595	37,954,379	Commercial Class	39,472,554	41,051,456	42,693,514	44,401,255	46,177,305	213,796,084	42,759,217
Calculated Annual Increase %		-0.2%	17.7%	4.0%	Calculated Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Total North Coast Demand	**45,130,200**	**42,573,315**	**49,966,911**	**51,965,587**	**Total North Coast Demand**	**54,044,211**	**56,205,979**	**58,454,219**	**60,792,387**	**63,224,083**	**292,720,879**	**58,544,176**
Calculated Annual Increase %		-5.7%	17.4%	4.0%	Calculated Annual Increase %	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Total AWGA Annual Demand	**444,650,663**	**455,296,793**	**478,535,248**	**493,458,515**	**Total AWGA Annual Demand**	**508,798,631**	**524,684,002**	**541,087,657**	**558,027,762**	**575,514,275**	**2,708,112,327**	**541,622,465**
Calculated Annual Increase %		2.4%	5.1%	3.1%	Calculated Annual Increase %	3.1%	3.1%	3.1%	3.1%	3.1%		3.1%
Percent of Total Consumption					**Percent of Total Consumption**							
Domestic	63%	62%	63%	63%	Domestic	62%	62%	62%	62%	62%		62.4%
Service	11%	11%	10%	10%	Service	10%	10%	10%	10%	10%		10.2%
Commercial	26%	27%	27%	27%	Commercial	27%	27%	27%	27%	28%		27.5%
Total	100%	100%	100%	100%	Total	100%	100%	100%	100%	100%		100.0%

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Table 1: AWGA: WATER DEMAND

Table 1.1.3: Population & Growth of Served Areas

Year	Historical Data			Estimated Data	Projections					Total (2003 - 2007)	Average Year (2003-2007)
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Population:											
Alexandria City	3,583,272	3,688,000	3,795,789	3,906,729	4,020,911	4,138,430	4,259,384	4,383,873	4,512,000		4,262,919
Calculated Annual Increase %		2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%		2.9%
Beheira Served Population	229,610	236,000	242,568	249,319	256,258	263,390	270,721	278,256	286,000		270,925
Calculated Annual Increase %		2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%		2.8%
Matruh City	212,435	219,000	225,768	232,745	239,937	247,352	254,996	262,876	271,000		255,232
Calculated Annual Increase %		3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%		3.1%
Total Population of Served Area	4,025,316	4,143,000	4,264,125	4,388,793	4,517,106	4,649,172	4,785,101	4,925,005	5,069,000		4,789,077
Calculated Annual Increase %		2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%		2.9%

Table 1.2: Number of Water Accounts

Year	Historical Data			Estimated Data	Projections					Total (2003 - 2007)	Average Year (2003-2007)
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Total AWGA	993,270	1,035,613	1,077,312	1,110,908	1,145,443	1,181,205	1,218,134	1,256,271	1,295,638	6,096,692	1,219,338
Calculated Annual Increase %		4.2%	4.0%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%		3.1%

Table 1.3: Unaccounted-for Water and Treated Water Production Requirements

Year	Historical Data			Estimated Data	Projections					Total (2003 - 2007)	Average Year
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Total Unaccounted-for Water Rate (%)	35.4%	36.1%	35.9%	37.2%	35.2%	33.2%	31.2%	29.2%	27.2%		31.2%
Total Unaccounted-for Water (m^3)	244,149,337	257,303,207	268,464,752	291,778,572	275,876,127	260,277,815	244,897,400	229,680,008	214,571,736	1,225,303,085	245,060,617
Total Production (m^3)	690,100,000	712,000,000	747,000,000	785,257,087	784,674,758	784,961,816	785,985,057	787,707,769	790,086,011	3,933,415,412	786,683,082
Calculated Annual Increase %		3.5%	4.8%	5.1%	-0.1%	0.0%	0.1%	0.2%	0.3%		0.1%

Table 2: OPERATION AND MAINTENANCE COSTS

Table 2.1: Operation and Maintenance Costs

Year	Historical Data			Estimated Data
	1999	2000	2001	2002
Labor				
Number of Employees	4,349	4,292	4,334	4,244
Number of Staff per 1,000 Accounts	4.4	4.1	4.0	3.8
Annual Rate of Change in Number of Employees %		-1.3%	1.0%	-2.1%
Average Staff Salary	10,022	11,200	11,879	12,938
Average Staff Salary Annual Increase %		11.76%	6.06%	8.91%
Total Wages and Salaries	43,583,918	48,072,191	51,484,885	54,908,810
Commodities		10.3%	7.1%	6.7%
Electricity	37,941,803	41,964,069	46,549,491	52,993,208
Annual Increase %	20%	11%	11%	14%
Fuel and Oil	1,362,267	1,103,335	1,162,940	1,129,582
Annual Increase %	5%	-19%	5%	-3%
Chemicals	9,375,039	8,228,046	10,749,736	11,696,177
Annual Increase %	8%	-12%	31%	9%
Spare parts & Maintenance Materials	8,135,466	6,656,277	7,169,313	7,038,487
Annual Increase %	5%	-18%	8%	-2%
Other Commodities	685,512	2,744,992	359,824	654,224
Annual Increase %	32%	300%	-87%	82%
Services				
Maintenance	4,344,722	5,231,990	6,920,987	8,529,052
Annual Increase %	17%	20%	32%	23%
Transportation	862,102	704,446	969,285	1,328,915
Annual Increase %	92%	-18%	38%	37%
Other Services	1,698,832	3,574,253	544,022	606,794
Annual Increase %	9%	110%	-85%	12%
Purchases for Sale	0	0	0	0
Annual Increase %	0%	0%	0%	0%
Taxes & Duties	0	0	1,685,243	1,769,505
Annual Increase %	0%	0%		5%
Total O&M Costs for Water Supply	107,989,661	118,278,999	127,595,726	140,654,754

Year	Projections					Total	Average per Year (2003-07)
	2003	2004	2005	2006	2007		
Labor							
Number of Employees	4,195	4,146	4,098	4,049	4,000		4,098
Number of Staff per 1,000 Accounts	3.7	3.5	3.4	3.2	3.1		3.4
Annual Rate of Change in Number of Employees %	1.2%	1.2%	1.2%	1.2%	1.2%		1.2%
Average Staff Salary	13,973	15,091	16,298	17,602	19,010		16,395
Average Staff Salary Annual Increase %	8.0%	8.0%	8.0%	8.0%	8.0%		8.0%
Total Wages and Salaries	58,619,631	62,572,768	66,783,240	71,266,922	76,040,581	335,283,142	67,056,628
Commodities							
Electricity	51,896,153	50,876,835	49,414,861	48,037,473	46,737,032	246,962,354	49,392,471
Annual Efficiency Improvement %	-2%	-2%	-3%	-3%	-3%		-3%
Fuel and Oil	1,128,773	1,129,186	1,130,658	1,133,136	1,136,558	5,658,312	1,131,662
Annual Efficiency Improvement %	0%	0%	0%	0%	0%		0%
Chemicals	11,454,045	11,229,071	10,906,397	10,602,392	10,315,371	54,507,276	10,901,455
Annual Efficiency Improvement %	-2%	-2%	-3%	-3%	-3%		-3%
Spare parts & Maintenance Materials	7,385,119	7,683,333	7,924,149	8,179,763	8,368,548	39,540,912	7,908,182
Annual Efficiency Improvement %	-5%	-4%	-3%	-3%	-2%		-3%
Other Commodities	653,755	653,994	654,847	656,282	658,264	3,277,143	655,429
Annual Efficiency Improvement %	0%	0%	0%	0%	0%		0%
Services							
Maintenance	8,949,091	9,310,460	9,602,274	9,912,020	10,140,785	47,914,631	9,582,926
Annual Efficiency Improvement %	-5%	-4%	-3%	-3%	-2%		-3%
Transportation	1,327,964	1,328,450	1,330,181	1,333,097	1,337,122	6,656,813	1,331,363
Annual Efficiency Improvement %	0%	0%	0%	0%	0%		0%
Other Services	630,613	649,769	670,135	671,604	673,631	3,295,753	659,151
Annual Efficiency Improvement %	-4%	-3%	-3%	-0%	-0%		-2%
Purchases for Sale	0	0	0	0	0	0	0
Annual Increase %	0%	0%	0%	0%	0%		0%
Taxes & Duties	1,803,603	1,840,348	1,879,602	1,883,721	1,889,409	9,296,682	1,859,336
Annual Efficiency Improvement %	-2%	-2%	-2%	-0%	-0%		-1%
Base O&M Costs for Water Supply (excluding labor)	85,229,116	84,701,446	83,513,105	82,409,489	81,256,720	417,109,876	83,421,975
Multipliers for annual inflation at 2.5%	2,130,728	4,288,011	6,421,375	8,555,167	10,677,800	32,073,081	6,414,616
Total O&M Costs for Water Supply	**145,979,475**	**151,562,224**	**156,717,720**	**162,231,578**	**167,975,101**	**784,466,099**	**156,893,220**

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Table 2.2: O&M Cost Proportions

Year	Historical			Estimated Data	Projections					Average
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Labor	40.4%	40.6%	40.4%	39.0%	40.2%	41.3%	42.6%	43.9%	45.3%	42.7%
Commodities:										
Electricity	35.1%	35.5%	36.5%	37.7%	36.4%	34.4%	32.3%	30.4%	28.5%	32.4%
Fuel and Oil	1.3%	0.9%	0.9%	0.8%	0.8%	0.8%	0.7%	0.7%	0.7%	0.7%
Chemicals	8.7%	7.0%	8.4%	8.3%	8.0%	7.6%	7.1%	6.7%	6.3%	7.2%
Spare Parts & Maintenance Mate	7.5%	5.6%	5.6%	5.0%	5.2%	5.2%	5.2%	5.2%	5.1%	5.2%
Other Commodities	0.6%	2.3%	0.3%	0.5%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%
Services:										
Maintenance	4.0%	4.4%	5.4%	6.1%	6.3%	6.3%	6.3%	6.3%	6.2%	6.3%
Transportation	0.8%	0.6%	0.8%	0.9%	0.9%	0.9%	0.9%	0.8%	0.8%	0.9%
Other Services	1.6%	3.0%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Purchases for Sale	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Taxes and Duties	0.0%	0.0%	1.3%	1.3%	1.3%	1.2%	1.2%	1.2%	1.2%	1.2%
Total O&M Costs:	100.0%	100.0%	100.0%	100.0%	100%	100%	100%	100%	100%	100.0%

Table 3. CAPITAL COSTS (in LE)

Table 3.1: Renewal & Replacement Projects:

	2003	2004	2005	2006	2007	Total (2003-2007)
R&R of workshops & workshop equipment	1,000,000	3,000,000	3,000,000	3,000,000	3,000,000	13,000,000
R&R of networks	14,500,000	14,300,000	14,300,000	14,400,000	14,500,000	72,000,000
R&R of Miscellaneous Equipment & Facilities	1,500,000	2,500,000	3,000,000	3,000,000	3,000,000	13,000,000
R&R of Eastern Water Treatment Plant	1,200,000	4,500,000	4,750,000	6,550,000	14,000,000	31,000,000
R&R of Manshia Water Treatment Plant	3,000,000	5,900,000	5,900,000	5,900,000	300,000	21,000,000
R&R of Maamura Water Treatment Plant	2,000,000	3,900,000	3,900,000	3,900,000	300,000	14,000,000
R&R of Siyuf Water Treatment Plant	3,500,000	6,000,000	6,000,000	6,000,000	11,500,000	33,000,000
R&R of Chlorine Storage Facilities	500,000	1,000,000	1,000,000	1,250,000	1,250,000	5,000,000
Total Renewal & Replacement Projects:	**27,200,000**	**41,100,000**	**41,850,000**	**44,000,000**	**47,850,000**	**202,000,000**

Table 3.2: Completion Projects and New Projects

Completion Projects:	**Total***	**Average per Year (2003-2007)**
Network Extensions	77,000,000	15,400,000
North Coast Pumping and Storage	31,000,000	6,200,000
Miscellaneous Equipment and Facilities	26,000,000	5,200,000
Eastern Water Treatment Plant	11,000,000	2,200,000
Mikatikiya Water Treatment Plant	19,000,000	3,800,000
Maryut Water Treatment Plant (First Stage)	72,000,000	14,400,000
Nuzha Water Treatment Plant	11,000,000	2,200,000
New Projects:		
New Projects: New Networks	51,000,000	10,200,000
Total Completion Projects and New Projects	**298,000,000**	**59,600,000**

** Totals include grant funding and therefore may not correspond with new borrowing balances shown in Debt Service Table 3.4*

Table 3.3: Transfers to Ministry of Finance

Year	1999	2000	2001	2002
Historical Transfers to Ministry of Finance	6,116,921	21,071,391	10,510,553	11,048,562

Year	2003	2004	2005	2006	2007
Annual Growth in Water Production	-0.07%	0.04%	0.13%	0.22%	0.30%
Projected Transfers to Ministry of Finance	11,040,650	11,044,689	11,059,086	11,083,326	11,116,788

Table 3.4.: Debt Service

3.4.1. Existing Debt End 2002

Year		2002	2003	2004	2005	2006	2007
2002	Existing NIB Debt to be Rescheduled End FY2002						
	Balance B.O.Y.	336,351,356	332,577,356	291,005,187	249,433,017	207,860,848	166,288,678
	New Loan Amount	56,818,000	0	0	0	0	0
	Interest Rate 13.00%		0	0	0	0	0
	Interest Payment	54,000,000	40,532,865	35,128,483	29,724,101	24,319,719	18,915,337
	Capitalized Interest Additions		0	0	0	0	0
	Principal Payments	60,592,000	41,572,170	41,572,170	41,572,170	41,572,170	41,572,170
	Balance E.O.Y.	332,577,356	291,005,187	249,433,017	207,860,848	166,288,678	124,716,509

Total Existing Debt at End 2002, Incl. Capitalized Interest Loans

Year	2002	2003	2004	2005	2006	2007
Balance B.O.Y.	336,351,356	332,577,356	291,005,187	249,433,017	207,860,848	166,288,678
New Loan Amount	56,818,000	0	0	0	0	0
Interest Payments	54,000,000	40,532,865	35,128,483	29,724,101	24,319,719	18,915,337
Capitalized Interest Additions	0	0	0	0	0	0
Principal Payments	60,592,000	41,572,170	41,572,170	41,572,170	41,572,170	41,572,170
Balance E.O.Y.	332,577,356	291,005,187	249,433,017	207,860,848	166,288,678	124,716,509

3.4.2: New Debt

Year			2002	2003	2004	2005	2006	2007
2003	Loan 1	Source: NIB						
	Balance B.O.Y.	0		0	60,000,000	60,000,000	52,500,000	45,000,000
	New Loan Amount	60,000,000		60,000,000	0	0	0	0
	Repayment Period	10						
	Grace Period	2						
	Interest Rate	13.00%		13.00%	13.00%	13.00%	13.00%	13.00%
	Interest Payment			3,900,000	7,800,000	7,312,500	6,337,500	5,362,500
	Principal Installment			0	0	7,500,000	7,500,000	7,500,000
	Balance E.O.Y.			60,000,000	60,000,000	52,500,000	45,000,000	37,500,000
	Loan 2	Source:						
	Balance B.O.Y.							
	New Loan Amount							
	Repayment Period							
	Grace Period							
	Interest Rate							
	Interest Payment							
	Principal Installment							
	Balance E.O.Y.							

Table 3.4.: Debt Service

Year			2002	2003	2004	2005	2006	2007
2004	Loan 1	NIB						
	Balance B.O.Y.	0			0	60,000,000	60,000,000	52,500,000
	New Loan Amount	60,000,000			60,000,000	0	0	0
	Repayment Period	10						
	Grace Period	2						
	Interest Rate	13.00%			13.00%	13.00%	13.00%	13.00%
	Interest Payment				3,900,000	7,800,000	7,312,500	6,337,500
	Principal Installment				0	0	7,500,000	7,500,000
	Balance E.O.Y.				60,000,000	60,000,000	52,500,000	45,000,000
	Loan 2	Source:						
	Balance B.O.Y.							
	New Loan Amount							
	Repayment Period							
	Grace Period							
	Interest Rate							
	Interest Payment							
	Principal Installment							
	Balance E.O.Y.							

Year			2002	2003	2004	2005	2006	2007
2005	Loan 1	Source: NIB						
	Balance B.O.Y.					0	60,000,000	60,000,000
	New Loan Amount	60,000,000				60,000,000	0	0
	Repayment Period	10						
	Grace Period	2						
	Interest Rate	13.00%				13.00%	13.00%	13.00%
	Interest Payment					3,900,000	7,800,000	7,312,500
	Principal Installment					0	0	7,500,000
	Balance E.O.Y.					60,000,000	60,000,000	52,500,000
	Loan 2	Source:						
	Balance B.O.Y.							
	New Loan Amount							
	Repayment Period							
	Grace Period							
	Interest Rate							
	Interest Payment							
	Principal Installment							
	Balance E.O.Y.							

Table 3.4.: Debt Service

Year			2002	2003	2004	2005	2006	2007
2006	Loan 1	Source: NIB						
	Balance B.O.Y.	0					0	60,000,000
	New Loan Amount	60,000,000					60,000,000	0
	Repayment Period	10						
	Grace Period	2						
	Interest Rate	13.00%					13.00%	13.00%
	Interest Payment						3,900,000	7,800,000
	Principal Installment						0	0
	Balance E.O.Y.						60,000,000	60,000,000
	Loan 2	Source:						
	Balance B.O.Y.							
	New Loan Amount							
	Repayment Period							
	Grace Period							
	Interest Rate							
	Interest Payment							
	Principal Installment							
	Balance E.O.Y.							

Year			2002	2003	2004	2005	2006	2007
2007	Loan 1	Source: NIB						
	Balance B.O.Y.	0						0
	New Loan Amount	60,000,000						60,000,000
	Repayment Period	8						
	Grace Period	0						
	Interest Rate	13.00%						13.00%
	Interest Payment							3,412,500
	Principal Installment							7,500,000
	Balance E.O.Y.							52,500,000
	Loan 2	Source:						
	Balance B.O.Y.							
	New Loan Amount							
	Repayment Period							
	Grace Period							
	Interest Rate							
	Interest Payment							
	Principal Installment							
	Balance E.O.Y.							

Table 3.4.: Debt Service

Total New Debt	2002	2003	2004	2005	2006	2007
Balances B.O.Y.	0	0	60,000,000	120,000,000	172,500,000	217,500,000
New Loan Amounts	0	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000
Interest Payments	0	3,900,000	11,700,000	19,012,500	25,350,000	30,225,000
Principal Installments	0	0	0	7,500,000	15,000,000	30,000,000
Balances E.O.Y.	0	60,000,000	120,000,000	172,500,000	217,500,000	247,500,000

Total Debt: Existing + New	2002	2003	2004	2005	2006	2007
Balances B.O.Y.	336,351,356	332,577,356	351,005,187	369,433,017	380,360,848	383,788,678
New Loan Amounts	56,818,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000
Interest Payments	54,000,000	44,432,865	46,828,483	48,736,601	49,669,719	49,140,337
Capitalized Interest Additions	0	0	0	0	0	0
Principal Payments	60,592,000	41,572,170	41,572,170	49,072,170	56,572,170	71,572,170
Balances E.O.Y.	332,577,356	351,005,187	369,433,017	380,360,848	383,788,678	372,216,509
Debt Service (Principal + Interest)	**114,592,000**	**86,005,035**	**88,400,653**	**97,808,771**	**106,241,889**	**120,712,507**

Table 4: REVENUES AND COLLECTIONS ANALYSIS

Table 4.1: Current Water Tariffs (LE/m³)

Year	Historical Data			Estimated Data
	1999	2000	2001	2002
Water Tariff Rates (LE/m3)				
City of Alexandria				
Domestic - Minimum Use	0.23	0.23	0.23	0.23
Domestic - Up to 30 m3/month	0.23	0.23	0.23	0.23
Domestic - Over 30 m3 month	0.30	0.30	0.30	0.30
Service (50% Discount)	0.42	0.42	0.42	0.42
Service (75% Discount)	0.48	0.48	0.48	0.48
Service (No Discount)	0.48	0.48	0.48	0.48
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	0.60	0.60	0.60	0.60
Small Industry (factories & workshops, garages, mills, bakeries)	0.60	0.60	0.60	0.60
Large Factories	0.64	0.64	0.64	0.64
Investment (private hospitals, investment companies, free zones)	1.02	1.02	1.02	1.02
Tourism (five-star hotels and restaurants)	1.02	1.02	1.02	1.02
Government - Agencies and Companies	0.48	0.48	0.48	0.48
Government - Local government	0.48	0.48	0.48	0.48
Raw Water	0.19	0.19	0.19	0.19
Port Users @ L.E. 7.00	7.00	7.00	7.00	7.00
Port Users @ L.E. 10.00	10.00	10.00	10.00	10.00
Port Users @ L.E. 12.00	12.00	12.00	12.00	12.00
Beheira Water Company and Governorate	0.23	0.23	0.23	0.23
North Coast:				
Domestic - minimum charge	0.23	0.23	0.23	0.23
Domestic - up to 30 m3/month	0.23	0.23	0.23	0.23
Domestic - over 30 m3/ month	0.30	0.30	0.30	0.30
Service - 50% discount	0.42	0.42	0.42	0.42
Service - 75% discount	0.48	0.48	0.48	0.48
Small Commercial	0.60	0.60	0.60	0.60
Large Factories	0.64	0.64	0.64	0.64
Investment and Tourism	1.05	1.05	1.05	1.05
Government - Services	0.48	0.48	0.48	0.48
Government - Investment	1.02	1.02	1.02	1.02

Year	Projections					Total	Average per Year (2003-07)
	2003	2004	2005	2006	2007		
Water Tariff Rates (LE/m3)							
City of Alexandria							
Domestic - Minimum Use	0.23	0.23	0.23	0.23	0.23		0.23
Domestic - Up to 30 m3/month	0.23	0.23	0.23	0.23	0.23		0.23
Domestic - Over 30 m3 month	0.30	0.30	0.30	0.30	0.30		0.30
Service (50% Discount)	0.42	0.42	0.42	0.42	0.42		0.42
Service (75% Discount)	0.48	0.48	0.48	0.48	0.48		0.48
Service (No Discount)	0.48	0.48	0.48	0.48	0.48		0.48
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	0.60	0.60	0.60	0.60	0.60		0.60
Small Industry (factories & workshops, garages, mills, bakeries)	0.60	0.60	0.60	0.60	0.60		0.60
Large Factories	0.64	0.64	0.64	0.64	0.64		0.64
Investment (private hospitals, investment companies, free zones)	1.02	1.02	1.02	1.02	1.02		1.02
Tourism (five-star hotels and restaurants)	1.02	1.02	1.02	1.02	1.02		1.02
Government - Agencies and Companies	0.48	0.48	0.48	0.48	0.48		0.48
Government - Local government	0.48	0.48	0.48	0.48	0.48		0.48
Raw Water	0.19	0.19	0.19	0.19	0.19		0.19
Port Users @ L.E. 7.00	7.00	7.00	7.00	7.00	7.00		7.00
Port Users @ L.E. 10.00	10.00	10.00	10.00	10.00	10.00		10.00
Port Users @ L.E. 12.00	12.00	12.00	12.00	12.00	12.00		12.00
Beheira Water Company and Governorate	0.23	0.23	0.23	0.23	0.23		0.23
North Coast:							
Domestic - minimum charge	0.23	0.23	0.23	0.23	0.23		0.23
Domestic - up to 30 m3/month	0.23	0.23	0.23	0.23	0.23		0.23
Domestic - over 30 m3/ month	0.30	0.30	0.30	0.30	0.30		0.30
Service - 50% discount	0.64	0.64	0.64	0.64	0.64		0.64
Service - 75% discount	0.48	0.48	0.48	0.48	0.48		0.48
Small Commercial	0.60	0.60	0.60	0.60	0.60		0.60
Large Factories	0.64	0.64	0.64	0.64	0.64		0.64
Investment and Tourism	1.05	1.05	1.05	1.05	1.05		1.05
Government - Services	0.48	0.48	0.48	0.48	0.48		0.48
Government - Investment	1.02	1.02	1.02	1.02	1.02		1.02

Table 4: REVENUES AND COLLECTIONS ANALYSIS

Table 4.2.1: Water Tariff Revenue (LE) at Current Tariffs under Existing Classes

Year	Historical Data			Estimated Data
	1999	2000	2001	2002
City of Alexandria				
Domestic - Minimum Use	5,249,063	5,444,602	5,861,136	6,036,971
Domestic - Up to 30 m3/month	41,788,266	42,972,428	44,101,482	45,424,526
Domestic - Over 30 m3 month	19,263,999	19,033,534	21,007,864	21,638,100
Service (50% Discount)	850,093	840,428	896,053	922,935
Service (75% Discount)	834,150	684,224	477,030	491,341
Service (No Discount)	921,561	371,411	14,014	14,434
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	15,650,897	16,726,744	18,078,286	18,620,635
Small Industry (factories & workshops, garages, mills, bakeries)	1,934,381	2,067,350	2,234,395	2,301,427
Large Factories	20,775,898	22,246,550	20,703,626	21,324,735
Investment (private hospitals, investment companies, free zones)	15,899,515	17,751,446	17,787,980	18,321,619
Tourism (five-star hotels and restaurants)	836,816	549,014	1,546,781	1,593,184
Government - Agencies and Companies	15,396,343	16,672,323	17,087,309	17,599,928
Government - Local government	476,175	694,680	528,473	544,327
Raw Water	1,156,531	1,343,343	1,652,273	1,701,841
Port Users @ L.E. 7.00	1,709,491	1,557,710	1,481,116	1,481,116
Port Users @ L.E. 10.00	0	0	0	0
Port Users @ L.E. 12.00	45,696	3,240	15,264	15,722
Beheira Water Company and Governorate	1,732,629	1,626,019	1,699,417	1,767,394
Total, City of Alexandria	**144,521,504**	**150,585,045**	**155,172,500**	**159,800,235**
North Coast:				
Domestic - minimum charge	211,892	35,651	261,800	272,273
Domestic - up to 30 m3/month	678,481	645,173	715,361	743,975
Domestic - over 30 m3/ month	90,434	96,555	153,046	159,167
Service - 50% discount	4,883	6,014	8,494	8,834
Service - 75% discount	583,542	699,528	843,648	877,394
Small Commercial	870,515	811,313	936,136	973,582
Large Factories	3,858,196	3,828,824	3,732,143	3,881,428
Investment and Tourism	20,623,367	21,012,750	21,376,021	22,231,062
Government - Services	4,154,668	3,274,092	3,329,189	3,462,357
Government - Investment	4,033,158	3,724,834	8,919,676	9,276,463
Total, North Coast	**35,109,136**	**34,134,734**	**40,275,514**	**41,886,535**
Total AWGA	**179,630,640**	**184,719,778**	**195,448,014**	**201,686,770**

Year	Projections					Total	Average per Year (2003-07)
	2003	2004	2005	2006	2007		
City of Alexandria							
Domestic - Minimum Use	6,218,080	6,404,622	6,596,761	6,794,664	6,998,503	33,012,629	6,602,525.89
Domestic - Up to 30 m3/month	46,787,262	48,190,880	49,636,606	51,125,704	52,659,476	248,399,928	49,679,985.66
Domestic - Over 30 m3 month	22,287,242	22,955,860	23,644,536	24,353,872	25,084,488	118,325,997	23,665,199.45
Service (50% Discount)	950,623	979,142	1,008,516	1,038,771	1,069,934	5,046,986	1,009,397.15
Service (75% Discount)	506,081	521,264	536,902	553,009	569,599	2,686,855	537,370.96
Service (No Discount)	14,867	15,313	15,772	16,246	16,733	78,931	15,786.21
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	19,179,254	19,754,631	20,347,270	20,957,688	21,586,419	101,825,263	20,365,052.66
Small Industry (factories & workshops, garages, mills, bakeries)	2,370,470	2,441,584	2,514,831	2,590,276	2,667,985	12,585,146	2,517,029.29
Large Factories	21,964,477	22,623,411	23,302,114	24,001,177	24,721,212	116,612,392	23,322,478.36
Investment (private hospitals, investment companies, free zones)	18,871,268	19,437,406	20,020,528	20,621,144	21,239,778	100,190,124	20,038,024.83
Tourism (five-star hotels and restaurants)	1,640,980	1,690,209	1,740,916	1,793,143	1,846,937	8,712,186	1,742,437.14
Government - Agencies and Companies	18,127,926	18,671,764	19,231,917	19,808,874	20,403,140	96,243,621	19,248,724.12
Government - Local government	560,657	577,477	594,801	612,645	631,025	0	595,321.15
Raw Water	1,752,896	1,805,483	1,859,648	1,915,437	1,972,900	9,306,366	1,861,273.10
Port Users @ L.E. 7.00	1,481,116	1,481,116	1,481,116	1,481,116	1,481,116	7,405,580	1,481,116.00
Port Users @ L.E. 10.00	0	0	0	0	0	0	0.00
Port Users @ L.E. 12.00	16,194	16,679	17,180	17,695	18,226	85,974	17,194.78
Beheira Water Company and Governorate	1,825,718	1,900,572	1,982,297	2,071,500	2,166,789	9,946,875	1,989,374.96
Total, City of Alexandria	**164,555,111**	**169,467,414**	**174,531,710**	**179,752,962**	**185,134,262**	**873,441,459**	**174,688,292**
North Coast:							
Domestic - minimum charge	283,163	294,490	306,270	318,520	331,261	1,533,704	306,740.87
Domestic - up to 30 m3/month	773,734	804,684	836,871	870,346	905,160	4,190,795	838,159.02
Domestic - over 30 m3/ month	165,534	172,155	179,042	186,203	193,652	896,586	179,317.24
Service - 50% discount	14,000	14,560	15,142	15,748	16,377	75,826	15,165.20
Service - 75% discount	912,490	948,990	986,949	1,026,427	1,067,484	4,942,341	988,468.25
Small Commercial	1,012,525	1,053,026	1,095,147	1,138,953	1,184,511	5,484,162	1,096,832.31
Large Factories	4,036,686	4,198,153	4,366,079	4,540,722	4,722,351	21,863,991	4,372,798.22
Investment and Tourism	23,120,304	24,045,116	25,006,921	26,007,198	27,047,486	125,227,024	25,045,404.88
Government - Services	3,600,851	3,744,885	3,894,681	4,050,468	4,212,487	19,503,371	3,900,674.24
Government - Investment	9,647,521	10,033,422	10,434,759	10,852,149	11,286,235	52,254,086	10,450,817.27
Total, North Coast	**43,566,808**	**45,309,481**	**47,121,860**	**49,006,734**	**50,967,004**	**235,971,887**	**47,194,377**
Total AWGA	**208,121,919**	**214,776,894**	**221,653,570**	**228,759,697**	**236,101,265**	**1,109,413,346**	**221,882,669**

Table 4: REVENUES AND COLLECTIONS ANALYSIS

Table 4.2.2: Summary of Water Revenue at Current Tariffs under Aggregated Classification

Year	Historical Data			Estimated Data	Projections					Total	Average Year (2003-2007)
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Alexandria City:											
Domestic Class	68,033,957	69,076,583	72,669,899	74,866,990	77,118,302	79,451,934	81,860,199	84,345,740	86,909,256	409,685,430	81,937,086
Calculated Annual Increase %		1.5%	5.2%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Service Class	18,478,322	19,263,066	19,002,879	19,572,965	20,160,154	20,764,959	21,387,908	22,029,545	22,690,431	107,032,998	21,406,600
Calculated Annual Increase %		4.2%	-1.4%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Commercial Class	58,009,225	62,245,396	63,499,722	65,360,280	67,276,655	69,250,521	71,283,603	73,377,678	75,534,575	356,723,031	71,344,606
Calculated Annual Increase %		7.3%	2.0%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%		2.9%
Total Alexandria City Annual Revenue	**144,521,504**	**150,585,045**	**155,172,500**	**159,800,235**	**164,555,111**	**169,467,414**	**174,531,710**	**179,752,962**	**185,134,262**	**873,441,459**	**174,688,292**
Calculated Annual Increase %		4.2%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
#REF!											
Domestic Class	980,807	777,379	1,130,207	1,175,415	1,222,432	1,271,329	1,322,182	1,375,070	1,430,072	6,621,086	1,324,217
Calculated Annual Increase %		-20.7%	45.4%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Service Class	4,743,093	3,979,634	4,181,332	4,348,585	4,527,341	4,708,434	4,896,772	5,092,643	5,296,348	24,521,538	490430768.7%
Calculated Annual Increase %		-16.1%	5.1%	4.0%	4.1%	4.0%	4.0%	4.0%	4.0%		4.0%
Commercial Class	29,385,236	29,377,721	34,963,975	36,362,534	37,817,036	39,329,717	40,902,906	42,539,022	44,240,583	204,829,263	40,965,853
Calculated Annual Increase %		0.0%	19.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Total N. Coast/Desert Tariff Revenue	**35,109,136**	**34,134,734**	**40,275,514**	**41,886,535**	**43,566,808**	**45,309,481**	**47,121,860**	**49,006,734**	**50,967,004**	**235,971,887**	**47,194,377**
Calculated Annual Increase %		-2.8%	18.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%		4.0%
Total AWGA Water Tariff Revenue	**179,630,640**	**184,719,778**	**195,448,014**	**201,686,770**	**208,121,919**	**214,776,894**	**221,653,570**	**228,759,697**	**236,101,265**	**1,109,413,346**	**221,882,669**
Calculated Annual Increase %		2.8%	5.8%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%		3.2%

Table 4.2.3: Proportion of Revenue under Aggregated Classification

Year	Historical Data			Estimated Data	Projections					Total	Average Year (2003-2007)
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Alexandria City:											
Domestic Class	47.1%	45.9%	46.8%	46.9%	46.9%	46.9%	46.9%	46.9%	46.9%		46.9%
Service Class	12.8%	12.8%	12.2%	12.2%	12.3%	12.3%	12.3%	12.3%	12.3%		12.3%
Commercial Class	40.1%	41.3%	40.9%	40.9%	40.9%	40.9%	40.8%	40.8%	40.8%		40.8%
Total Alexandria City Annual Revenue	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%
North Coast Water Tariff Revenue											
Domestic Class	2.8%	2.3%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%		2.8%
Service Class	13.5%	11.7%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%	10.4%		10.4%
Commercial Class	83.7%	86.1%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%	86.8%		86.8%
Total N. Coast/Desert Tariff Revenue	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%

Table 4.3: Fixed-Charge Water Revenues

Year	Historical Data			Estimated Data	Projections					Total	Average Year (2003-2007)
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Meter Maintenance Charges:					**Meter Maintenance Charges:**						
Calculated AWGA Water Tariff Revenues	179,630,640	184,719,778	195,448,014	201,686,770							
Reported Water Sales (from AWGA Fin Sts.)	184,990,640	193,932,249	203,645,807								
Estimation of Fixed Charge Revenues	5,360,000	9,212,471	8,197,793	7,590,088							
Average Annual Fixed Charge per Account	5.39	8.90	7.61	6.83	Average Annual Fixed Charge per Account	6.83	6.83	6.83	6.83	6.83	6.83
Total Fixed-Charge Revenues	**5,360,000**	**9,212,471**	**8,197,793**	**7,590,088**	**Total Fixed-Charge Revenues**	**7,826,041**	**8,070,380**	**8,322,691**	**8,583,254**	**8,852,221**	**41,654,588**	**8,330,918**

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Table 4: REVENUES AND COLLECTIONS ANALYSIS

Table 4.4: Water Non-Tariff Revenues (LE)

Year	Historical Data			Estimated Data	Year	Projections					Total	Average Year (2003-2007)
	1999	2000	2001	2002		2003	2004	2005	2006	2007		
AGOSD Billing Service Revenue	1,830,952	1,493,564	1,819,732	1,495,740	AGOSD Billing Service Revenue	1,015,501	1,015,701	1,015,905	1,016,109	1,016,315	18,133,900	3,626,780
Sold services	16,029,196	17,419,680	15,144,646	16,197,841	Sold services	16,602,787	17,017,856	17,443,303	17,879,385	18,326,370	87,269,701	17,453,940
Connections	827,568	517,976	413,885	586,476	Connections	601,138	616,167	631,571	647,360	663,544	3,159,780	631,956
Sales of Scrap	34,065	33,636	26,000	31,234	Sales of Scrap	32,015	32,815	33,635	34,476	35,338	168,279	33,656
Customer Contributions	14,102,980	25,010,318	21,997,121	20,370,140	Customer Contributions	21,003,385	21,659,139	22,336,287	23,035,581	23,757,430	111,791,822	22,358,364
Total Non-Tariff Revenues	**32,385,761**	**44,475,274**	**39,401,384**	**38,681,431**	**Total Non-Tariff Revenues**	**41,254,715**	**42,839,764**	**44,079,691**	**45,454,291**	**46,895,020**	**220,523,481**	**44,104,696**

Table 4.5: Total Revenue

Year	Historical Data			Estimated Data	Year	Projections					Total	Average Year (2003-2007)
	1999	2000	2001	2002		2003	2004	2005	2006	2007		
Total Water Tariff Revenues	179,630,640	184,719,778	195,448,014	201,686,770	Total Water Tariff Revenues	208,121,919	214,776,894	221,653,570	228,759,697	236,101,265	1,109,413,346	221,882,669
Total Fixed-Charge Revenues	5,360,000	9,212,471	8,197,793	7,590,088	Total Fixed-Charge Revenues	7,826,041	8,070,380	8,322,691	8,583,254	8,852,221	41,654,588	8,330,918
Total Non-Tariff Revenues	32,385,761	44,475,274	39,401,384	38,681,431	Total Non-Tariff Revenues	41,254,715	42,839,764	44,079,691	45,454,291	46,895,020	220,523,481	44,104,696
Total Revenue	**217,376,401**	**238,407,523**	**243,047,191**	**247,958,289**	**Total Revenue**	**257,202,675**	**265,687,039**	**274,055,952**	**282,797,242**	**291,848,507**	**1,371,591,415**	**274,318,283**

Table 4.6: Collection Efficiency

Year	Historical Data			Estimated Data	Year	Projections					Total	Average Year (2003-2007)
	1999	2000	2001	2002		2003	2004	2005	2006	2007		
Total Billings												
Water Tariff Revenue	179,630,640	184,719,778	195,448,014	201,686,770								
Fixed-Charge Revenue	5,360,000	9,212,471	8,197,793	7,590,088								
Total Billings	184,990,640	193,932,249	203,645,807	209,276,858								
Total Collections (AWGA Stmnt Cash Flows)	171,082,758	181,153,747	184,084,691	189,174,854								
Collection Efficiency (%)	92%	93%	90%	90%	Projected Collection Efficiency (%)	91%	92%	93%	94%	95%		93.0%
Water Revenue Collection	**166,125,731**	**172,548,301**	**176,674,333**	**182,313,828**								

Table 5.1.: Calculation of Revenue Requirement and Average Tariff Increase

Year	Historical Data			Estimated Data	Projections					Totals (2003-07)	Averages (2003-07)
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Total Consumption (m3)	444,650,663	455,296,793	478,535,248	493,458,515	508,798,031	524,684,002	541,087,657	558,027,762	575,514,275	2,708,112,327	541,622,465
Unaccounted for Water (%)	35.4%	36.1%	35.9%	37.2%	35.2%	33.2%	31.2%	29.2%	27.2%		31.2%
Total Production (m3)	688,800,000	712,000,000	747,000,000	785,237,087	784,674,758	784,961,816	785,985,057	787,707,769	790,086,011	3,933,415,412	786,683,082
O&M Costs (LE)	107,989,661	118,278,999	127,595,726	140,654,754	145,979,475	151,562,224	156,717,720	162,231,578	167,975,101	784,466,099	156,893,220
O&M Costs / m3 Produced	0.16	0.17	0.17	0.18	0.19	0.19	0.20	0.21	0.21		0.20
O&M Costs / m3 Sold	0.24	0.26	0.27	0.29	0.29	0.29	0.29	0.29	0.29		0.29
Renewal & Replacement Capital Costs (LE)	[illegible]	[illegible]	[illegible]	20,232,200	27,200,000	41,100,000	41,850,000	44,000,000	47,850,000	202,000,000	40,400,000
Debt Service Costs	[illegible]	[illegible]	[illegible]	114,592,000	86,005,035	88,400,653	97,808,771	106,241,889	120,712,507	499,168,853	99,833,771
Transfer to Ministry of Finance	6,116,921	21,071,391	10,510,553	11,048,562	11,040,650	11,044,689	11,059,086	11,083,326	11,116,788	55,344,540	11,068,908
Total Costs (LE)	187,174,785	204,001,140	197,011,926	286,527,516	270,225,160	292,107,566	307,435,577	323,556,793	347,654,396	1,540,979,492	308,195,898
Non-Tariff Revenue Deduction	32,385,761	44,475,274	39,401,384	38,681,431	41,254,715	42,839,764	44,079,691	45,454,291	46,895,020	220,523,481	44,104,696
Fixed-Charge Revenue Deduction	5,360,000	9,212,471	8,197,793	7,590,088	7,826,041	8,070,380	8,322,691	8,583,254	8,852,221	41,654,588	8,330,918
Cash Requirement from Tariffs	149,429,024	150,313,395	149,412,749	240,255,998	221,144,405	241,197,422	255,033,194	269,519,248	291,907,154	1,278,801,423	255,760,285
Cash Requirement / m3 Sold	0.34	0.33	0.31	0.49	0.43	0.46	0.47	0.48	0.51		0.47
Average Tariff Increase Percentage (%)	83%	81%	70%	119%	106%	112%	115%	118%	124%		115%
Tariff Revenue at Current Tariffs	179,630,640	184,719,778	195,448,014	201,686,770	208,121,919	214,776,894	221,653,570	228,759,697	236,101,265	1,109,413,346	221,882,669
Average Tariff at Current Tariff Rates (LE/m3)	0.40	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41		0.41
Collection Efficiency Rate	92.5%	93.4%	90.4%	90.4%	91.0%	92.0%	93.0%	94.0%	95.0%		93%
Water Tariff Revenue Collection	166,125,731	172,548,301	176,674,333	182,313,828	189,390,947	197,594,743	206,137,830	215,034,135	224,306,202	1,032,453,857	206,490,765
Average Collection/m3 of Demand	0.37	0.38	0.37	0.37	0.37	0.38	0.38	0.39	0.39		0.38
Net Income at Current Tariffs	16,696,707	22,224,005	27,261,584	-57,942,160	-31,753,458	-43,602,679	-48,895,374	-54,485,133	-67,610,952	-246,347,596	-49,269,519
Revenue Requirement for Positive Cash	*161,576,608*	*160,916,433*	*165,289,572*	*263,785,961*	*243,015,830*	*262,171,111*	*276,229,241*	*286,222,604*	*307,270,689*	*1,375,409,474*	*274,681,895*
Average Tariff Required for Positive Cash (LE)	*0.36*	*0.35*	*0.35*	*0.54*	*0.48*	*0.50*	*0.51*	*0.53*	*0.53*		*0.51*
Average Tariff Percentage Change for Positive Cash	*90%*	*87%*	*85%*	*132%*	*117%*	*122%*	*124%*	*125%*	*130%*		*124%*

Table 6: Average Class Tariff Planning Worksheet

Table 6.1: Average Historical Tariffs

Year	Historical Data			Estimated Data	Proposed Average Tariffs						
					Projections					Totals (2003-07)	Average
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
City of Alexandria					*City of Alexandria*						
Domestic - Minimum Use	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23		0.23
Domestic - Up to 30 m3/month	0.23	0.23	0.23	0.23	0.28	0.28	0.28	0.28	0.28		0.28
Domestic - Over 30 m3 month	0.30	0.30	0.30	0.30	0.37	0.37	0.37	0.37	0.37		0.37
Service (50% Discount)	0.42	0.42	0.42	0.42	0.52	0.52	0.52	0.52	0.52		0.52
Service (75% Discount)	0.48	0.48	0.48	0.48	0.59	0.59	0.59	0.59	0.59		0.59
Service (No Discount)	0.48	0.48	0.48	0.48	0.59	0.59	0.59	0.59	0.59		0.59
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	0.60	0.60	0.60	0.60	0.74	0.74	0.74	0.74	0.74		0.74
Small Industry (factories & workshops, garages, mills, bakeries)	0.60	0.60	0.60	0.60	0.74	0.74	0.74	0.74	0.74		0.74
Large Factories	0.64	0.64	0.64	0.64	0.79	0.79	0.79	0.79	0.79		0.79
Investment (private hospitals, investment companies, free zones)	1.02	1.02	1.02	1.02	1.26	1.26	1.26	1.26	1.26		1.26
Tourism (five-star hotels and restaurants)	1.02	1.02	1.02	1.02	1.26	1.26	1.26	1.26	1.26		1.26
Government - Agencies and Companies	0.48	0.48	0.48	0.48	0.59	0.59	0.59	0.59	0.59		0.59
Government - Local government	0.48	0.48	0.48	0.48	0.59	0.59	0.59	0.59	0.59		0.59
Raw Water	0.19	0.19	0.19	0.19	0.23	0.23	0.23	0.23	0.23		0.23
Port Users @ L.E. 7.00	7.00	7.00	7.00	7.00	8.65	8.65	8.65	8.65	8.65		8.65
Port Users @ L.E. 10.00	10.00	10.00	10.00	10.00	12.36	12.36	12.36	12.36	12.36		12.36
Port Users @ L.E. 12.00	12.00	12.00	12.00	12.00	14.83	14.83	14.83	14.83	14.83		14.83
Beheira Water Company and Governorate	0.23	0.23	0.23	0.23	0.28	0.28	0.28	0.28	0.28		0.28
Average Tariff, City of Alexandria	**0.36**	**0.36**	**0.36**	**0.36**	**0.44**	**0.44**	**0.44**	**0.44**	**0.44**		0.44
North Coast:					*North Coast:*						
Domestic - minimum charge	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23		0.23
Domestic - up to 30 m3/month	0.23	0.23	0.23	0.23	0.31	0.31	0.31	0.31	0.31		0.31
Domestic - over 30 m3/ month	0.30	0.30	0.30	0.30	0.41	0.41	0.41	0.41	0.41		0.41
Service - 50% discount	0.42	0.42	0.42	0.42	0.57	0.57	0.57	0.57	0.57		0.57
Service - 75% discount	0.48	0.48	0.48	0.48	0.65	0.65	0.65	0.65	0.65		0.65
Small Commercial	0.60	0.60	0.60	0.60	0.82	0.82	0.82	0.82	0.82		0.82
Large Factories	0.64	0.64	0.64	0.64	0.87	0.87	0.87	0.87	0.87		0.87
Investment and Tourism	1.05	1.05	1.05	1.05	1.43	1.43	1.43	1.43	1.43		1.43
Government - Services	0.48	0.48	0.48	0.48	0.65	0.65	0.65	0.65	0.65		0.65
Government - Investment	1.02	1.02	1.02	1.02	1.39	1.39	1.39	1.39	1.39		1.39
Average Tariff, North Coast	**0.78**	**0.80**	**0.81**	0.81	1.09	1.09	1.09	1.09	1.09		1.09
Average Tariff, AWOA	0.40	0.41	0.41	0.41	0.51	0.51	0.51	0.51	0.51		0.51

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Table 6.2.1: Historical Tariff Revenue under Existing Classes | **Projected Tariff Revenue at Proposed Tariffs under Existing Classes**

Year	Historical Data 1999	Historical Data 2000	Historical Data 2001	Estimated Data 2002		Projections 2003	Projections 2004	Projections 2005	Projections 2006	Projections 2007	Totals (2003-07)	Average per Year
City of Alexandria						*City of Alexandria*						
Domestic - Minimum Use	5,249,063	5,444,602	5,861,126	6,036,971		6,218,080	6,404,622	6,596,761	6,794,664	6,998,503	33,012,629	6,602,526
Domestic - Up to 30 m3/month	41,788,266	42,972,428	44,101,482	45,424,526		57,832,243	59,567,211	61,354,227	63,194,854	65,090,699	307,039,234	61,407,847
Domestic - Over 30 m3 month	19,263,999	19,033,534	21,007,864	21,638,100		27,548,550	28,375,007	29,226,257	30,103,044	31,006,136	146,258,994	29,251,799
Service (50% Discount)	850,093	840,428	896,053	922,935		1,175,035	1,210,286	1,246,594	1,283,992	1,322,512	6,238,418	1,247,684
Service (75% Discount)	834,150	684,224	477,030	491,341		625,551	644,318	663,647	683,557	704,063	3,321,136	664,227
Service (No Discount)	921,561	371,411	14,014	14,434		18,377	18,928	19,496	20,081	20,683	97,564	19,513
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	15,650,897	16,726,744	18,078,286	18,620,635		23,706,864	24,418,070	25,150,612	25,905,131	26,682,285	125,862,962	25,172,592
Small Industry (factories & workshops, garages, mills, bakeries)	1,934,381	2,067,350	2,234,595	2,301,427		2,930,062	3,017,964	3,108,503	3,201,758	3,297,811	15,556,098	3,111,220
Large Factories	20,775,898	22,246,550	20,703,626	21,324,735		27,149,590	27,964,078	28,803,000	29,667,090	30,557,103	144,140,861	28,828,172
Investment (private hospitals, investment companies, free zones)	15,899,515	17,751,446	17,787,980	18,321,619		23,326,173	24,025,958	24,746,737	25,489,139	26,253,813	123,841,819	24,768,364
Tourism (five-star hotels and restaurants)	836,816	549,014	1,546,781	1,592,184		2,028,363	2,089,214	2,151,890	2,216,447	2,282,941	10,768,855	2,153,771
Government - Agencies and Companies	15,396,343	16,672,323	17,087,309	17,599,928		22,407,351	23,079,572	23,771,959	24,485,118	25,219,671	118,963,672	23,792,734
Government - Local government	476,175	694,680	528,473	544,327		693,011	713,801	735,215	757,271	779,990		735,858
Raw Water	1,156,531	1,343,343	1,652,273	1,701,841		2,166,699	2,231,700	2,298,651	2,367,611	2,438,639	11,503,302	2,300,660
Port Users @ L.E. 7.00	1,709,491	1,557,710	1,481,116	1,481,116		1,830,760	1,830,760	1,830,760	1,830,760	1,830,760	9,153,801	1,830,760
Port Users @ L.E. 10.00	0	0	0	0		0	0	0	0	0	0	0
Port Users @ L.E. 12.00	45,696	3,240	15,264	15,722		20,016	20,617	21,235	21,872	22,529	106,270	21,254
Sphere Water Company and Governorate	1,732,629	1,626,019	1,699,417	1,767,394		2,256,711	2,349,236	2,450,254	2,560,515	2,678,299	12,295,015	2,450,003
Total Water Tariff Revenues, City of Alexandria	**144,521,504**	**150,585,045**	**155,172,500**	**159,800,235**		**201,933,427**	**207,961,341**	**214,175,799**	**220,582,904**	**227,186,436**	**1,071,839,918**	**214,367,984**
North Coast:						*North Coast:*						
Domestic - minimum charge	211,892	35,651	261,800	272,273		283,163	294,490	306,270	318,520	331,261	1,533,704	306,741
Domestic - up to 30 m3/month	678,481	645,173	715,361	743,975		1,052,027	1,094,108	1,137,873	1,183,388	1,230,723	5,698,119	1,139,624
Domestic - over 30 m3/ month	90,434	96,555	153,046	159,167		225,073	234,075	243,439	253,176	263,303	1,219,066	243,813
Service - 50% discount	4,833	6,014	8,494	8,834		12,492	12,991	13,511	14,051	14,613	67,659	13,532
Service - 75% discount	583,542	699,528	843,648	877,394		1,240,690	1,290,318	1,341,930	1,395,608	1,451,432	6,719,978	1,343,996
Small Commercial	870,515	811,313	936,136	973,582		1,376,705	1,431,773	1,489,044	1,548,606	1,610,550	7,456,677	1,491,335
Large Factories	3,858,196	3,828,824	3,732,143	3,881,428		5,488,580	5,708,123	5,936,448	6,173,906	6,420,863	29,727,921	5,945,584
Investment and Tourism	20,623,267	21,012,759	21,376,021	22,231,062		31,436,098	32,693,542	34,001,284	35,361,335	36,775,788	170,268,047	34,053,609
Government - Services	4,154,668	3,274,092	3,329,189	3,462,357		4,895,087	5,091,827	5,295,500	5,507,320	5,727,612	26,518,245	5,303,649
Government - investment	4,033,158	3,724,834	8,919,676	9,276,463		13,117,493	13,642,192	14,187,880	14,755,395	15,345,611	71,048,572	14,209,714
Total Water Tariff Revenues, North Coast	**35,109,136**	**34,134,734**	**40,275,514**	**41,886,535**		**59,128,308**	**61,493,440**	**63,953,178**	**66,511,305**	**69,171,757**	**320,257,986**	**64,051,597**
Total Water Tariff Revenues, AWGA	**179,630,640**	**184,719,778**	**195,448,014**	**201,686,770**		**261,061,745**	**269,454,781**	**278,128,976**	**287,094,208**	**296,358,192**	**1,392,097,904**	**278,419,581**
Surplus (Deficit)	**18,054,037**	**23,803,345**	**30,158,441**	**(64,099,191)**	0	**18,045,915**	**7,383,671**	**5,899,735**	**571,605**	**(10,912,496)**	**18,688,450**	**3,737,686**
Surplus (Deficit) as Percentage of Total Costs (Revenue Requirement for Break-Even)	**11.2%**	**14.8%**	**18.3%**	**-34.1%**	#DIV/0!	**7.4%**	**2.8%**	**1.4%**	**0.1%**	**-3.6%**	**1.4%**	**1.6%**

Table 6.2.2: Summary of Water Revenue at Current Tariffs under Aggregated Classification

Year	Historical Data 1999	Historical Data 2000	Historical Data 2001	Estimated Data 2002
Alexandria City:				
Domestic Class	68,033,957	218,035,609	226,142,981	232,899,831
Calculated Annual Increase %		220.5%	3.7%	3.0%
Service Class	18,478,322	19,911,729	20,126,679	20,730,479
Calculated Annual Increase %		7.8%	1.1%	3.0%
Commercial Class	58,009,225	62,528,072	63,546,865	65,425,832
Calculated Annual Increase %		7.8%	1.6%	3.0%
Total Alexandria City Annual Demand	**144,521,504**	**300,475,409**	**309,816,526**	**319,056,143**
Calculated Annual Increase %		107.9%	3.1%	3.0%
North Coast:				
Domestic Class	773,798	747,742	876,901	911,977
Calculated Annual Increase %		-3.4%	17.3%	4.0%
Service Class	5,487,215	5,235,675	10,699,460	11,127,439
Calculated Annual Increase %		-4.6%	104.4%	4.0%
Commercial Class	63,745,368	62,250,399	68,712,867	71,461,382
Calculated Annual Increase %		-2.3%	10.4%	4.0%
Total N. Coast/Desert Water Tariff Revenue	**70,006,381**	**68,233,816**	**80,289,228**	**83,500,797**
Calculated Annual Increase %		-2.5%	17.7%	4.0%
Total AWGA Annual Water Tariff Revenue	**214,527,884**	**368,709,225**	**390,105,754**	**402,556,940**
Calculated Annual Increase %		71.9%	5.8%	3.2%

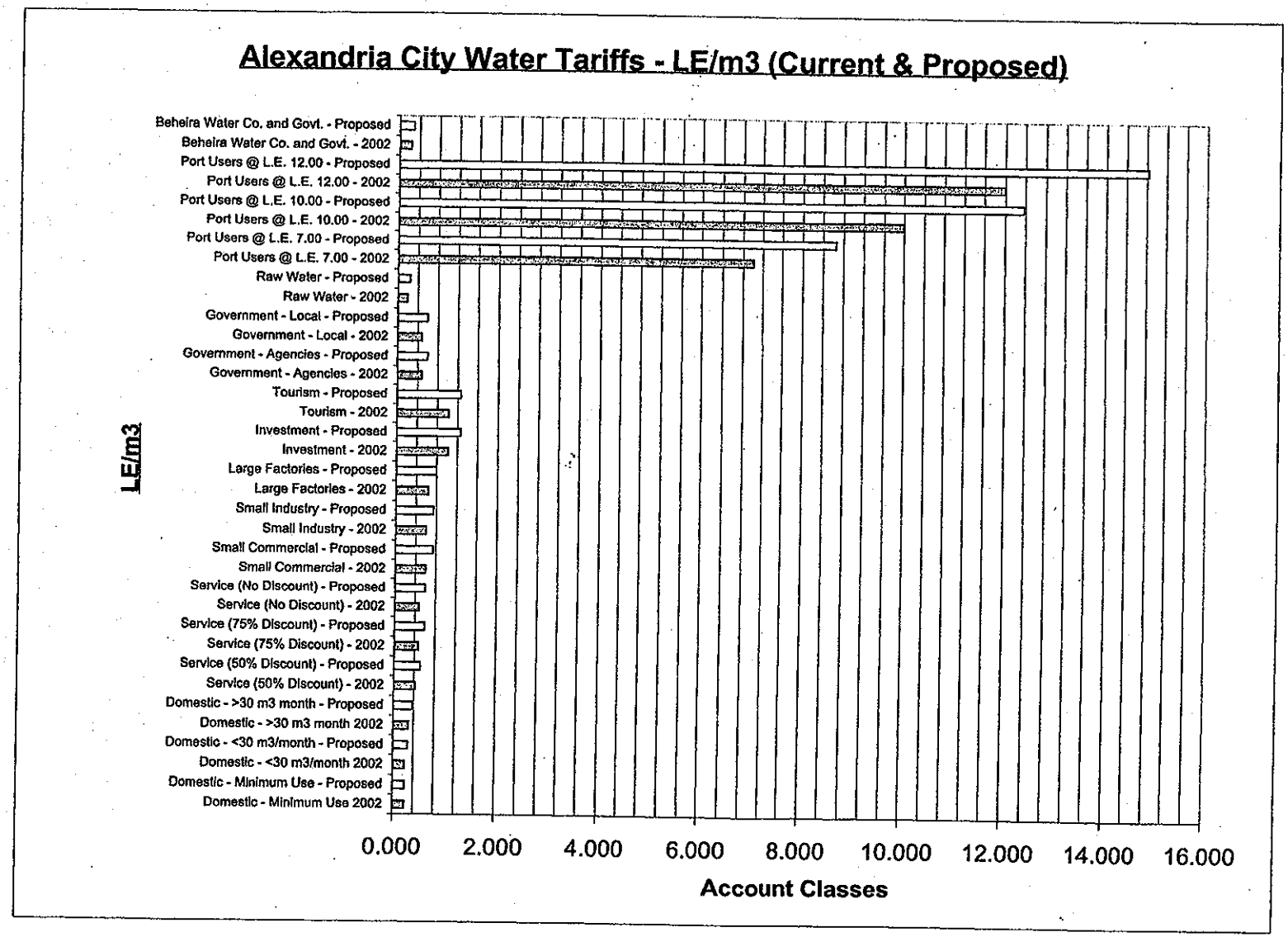
Summary of Water Revenue at Proposed Tariffs under Aggregated Classification

Year	Projections 2003	Projections 2004	Projections 2005	Projections 2006	Projections 2007	Totals (2003-07)	Average per Year
Alexandria City:							
293,532,310	302,308,181	311,353,043	320,675,466	330,281,775	1,558,150,775	311,630,155	
26.0%	3.0%	6.1%	6.1%	6.1%	385.9%	9.4%	
26,393,013	27,184,804	28,000,348	28,840,358	29,705,569	140,124,092	28,024,818	
27.3%	3.0%	6.1%	6.1%	6.1%	385.9%	9.7%	
83,248,540	85,715,898	88,262,992	90,892,712	93,605,559	441,725,681	88,345,136	
27.2%	3.0%	6.0%	6.0%	6.1%	386.0%	9.7%	
403,173,864	**415,208,882**	**427,616,383**	**440,408,536**	**453,592,883**	**2,140,000,548**	**428,000,110**	
26.4%	3.0%	6.1%	6.1%	6.1%	385.9%	9.5%	
North Coast:							
1,289,591	1,341,175	1,394,822	1,450,615	1,508,640	6,984,843	1,396,969	
41.4%	4.0%	8.2%	8.2%	8.2%	381.5%	14.0%	
15,734,888	16,364,283	17,018,854	17,699,608	18,407,593	85,225,226	17045045 23,1%	
41.4%	4.0%	8.2%	8.2%	8.2%	381.5%	14.0%	
100,948,973	104,986,932	109,186,409	113,553,865	118,096,020	546,772,199	109,354,440	
41.3%	4.0%	8.2%	8.2%	8.2%	381.5%	13.9%	
117,973,452	122,692,390	127,600,085	132,704,089	138,012,252	638,982,268	127,796,454	
41.3%	4.0%	8.2%	8.2%	8.2%	381.5%	14.0%	
521,147,316	**537,901,272**	**555,216,468**	**573,112,625**	**591,605,136**	**2,778,982,816**	**555,796,563**	
29.5%	3.2%	6.5%	6.5%	6.6%	384.9%	10.5%	

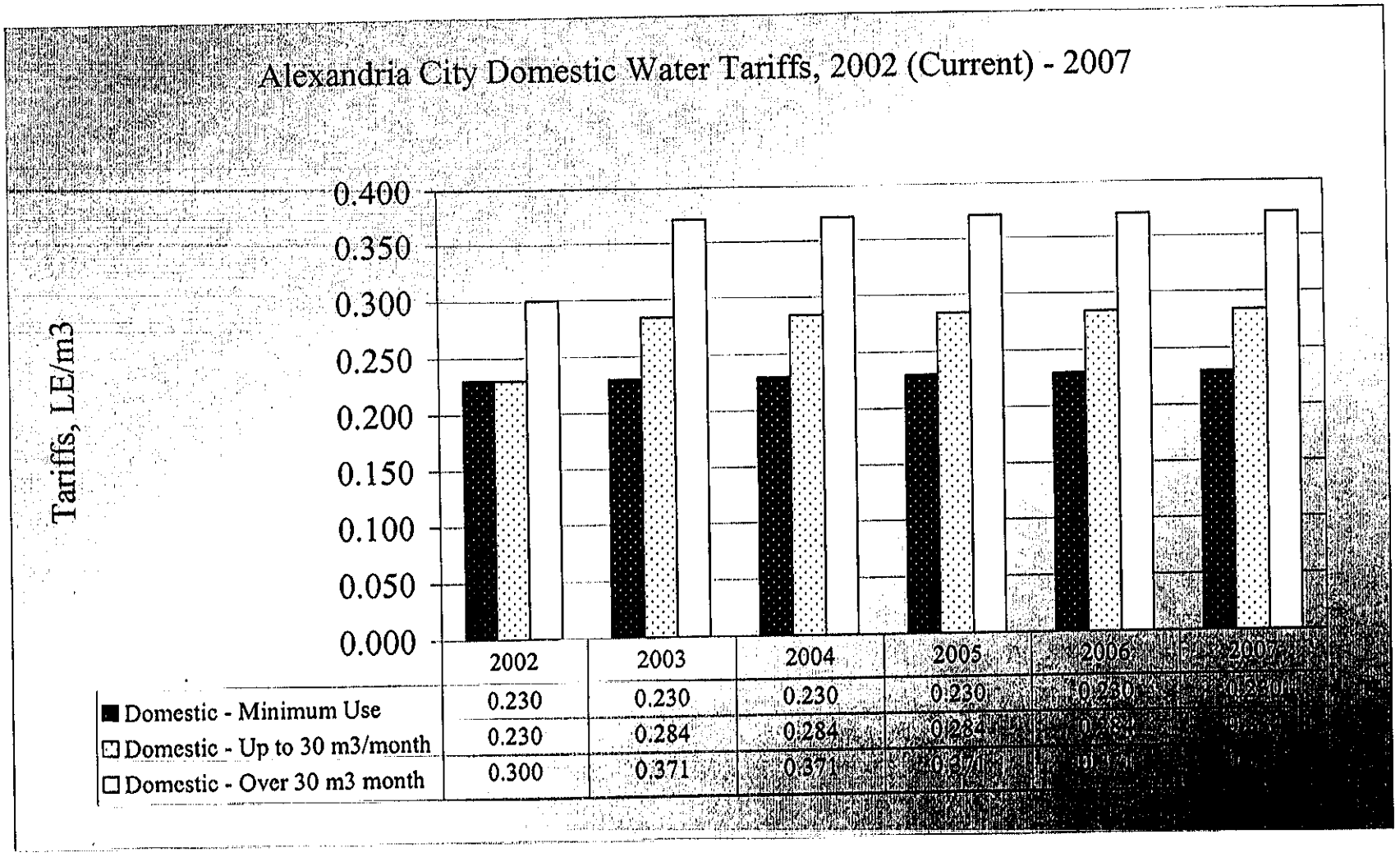
AWGA Water Tariffs, 2003-2007

Class/Block	Current (2002)	2003	2004	2005	2006	2007	Average Tariff over Rate Term (2003-07)
	— LE/m3 —						
City of Alexandria							
Domestic - Minimum Use	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Domestic - Up to 30 m3/month	0.23	0.28	0.28	0.28	0.28	0.28	0.28
Domestic - Over 30 m3 month	0.30	0.37	0.37	0.37	0.37	0.37	0.37
Service (50% Discount)	0.42	0.52	0.52	0.52	0.52	0.52	0.52
Service (75% Discount)	0.48	0.59	0.59	0.59	0.59	0.59	0.59
Service (No Discount)	0.48	0.59	0.59	0.59	0.59	0.59	0.59
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	0.60	0.74	0.74	0.74	0.74	0.74	0.74
Small Industry (factories & workshops, garages, mills, bakeries)	0.60	0.74	0.74	0.74	0.74	0.74	0.74
Large Factories	0.64	0.79	0.79	0.79	0.79	0.79	0.79
Investment (private hospitals, investment companies, free zones)	1.02	1.26	1.26	1.26	1.26	1.26	1.26
Tourism (five-star hotels and restaurants)	1.02	1.26	1.26	1.26	1.26	1.26	1.26
Government - Agencies and Companies	0.48	0.59	0.59	0.59	0.59	0.59	0.59
Government - Local government	0.48	0.59	0.59	0.59	0.59	0.59	0.59
Raw Water	0.19	0.23	0.23	0.23	0.23	0.23	0.23
Port Users @ L.E. 7.00	7.00	8.65	8.65	8.65	8.65	8.65	8.65
Port Users @ L.E. 10.00	10.00	12.36	12.36	12.36	12.36	12.36	12.36
Port Users @ L.E. 12.00	12.00	14.83	14.83	14.83	14.83	14.83	14.83
Beheira Water Company and Governorate	0.23	0.28	0.28	0.28	0.28	0.28	0.28
North Coast:							
Domestic - minimum charge	0.230	0.230	0.23	0.23	0.23	0.23	0.23
Domestic - up to 30 m3/month	0.230	0.313	0.31	0.31	0.31	0.31	0.31
Domestic - over 30 m3/ month	0.300	0.408	0.41	0.41	0.41	0.41	0.41
Service - 50% discount	0.420	0.571	0.57	0.57	0.57	0.57	0.57
Service - 75% discount	0.480	0.653	0.65	0.65	0.65	0.65	0.65
Small Commercial	0.600	0.816	0.82	0.82	0.82	0.82	0.82
Large Factories	0.640	0.870	0.87	0.87	0.87	0.87	0.87
Investment and Tourism	1.050	1.428	1.43	1.43	1.43	1.43	1.43
Government - Services	0.480	0.653	0.65	0.65	0.65	0.65	0.65
Government - Investment	1.020	1.387	1.39	1.39	1.39	1.39	1.39

Representative Monthly Domestic Bills Monthly Usage (m3)	Current (2002)	2003	2004	2005	2006	2007	Average Tariff over
City of Alexandria							
10	2.30	2.30	2.30	2.30	2.30	2.30	2.30
20	4.60	5.69	5.69	5.69	5.69	5.69	5.69
30	6.90	8.53	8.53	8.53	8.53	8.53	8.53
40	12.00	14.83	14.83	14.83	14.83	14.83	14.83
North Coast:							
10	2.30	2.30	2.30	2.30	2.30	2.30	2.30
20	4.60	6.25	6.25	6.25	6.25	6.25	6.25
30	6.90	9.38	9.38	9.38	9.38	9.38	9.38
40	12.00	16.32	16.32	16.32	16.32	16.32	16.32

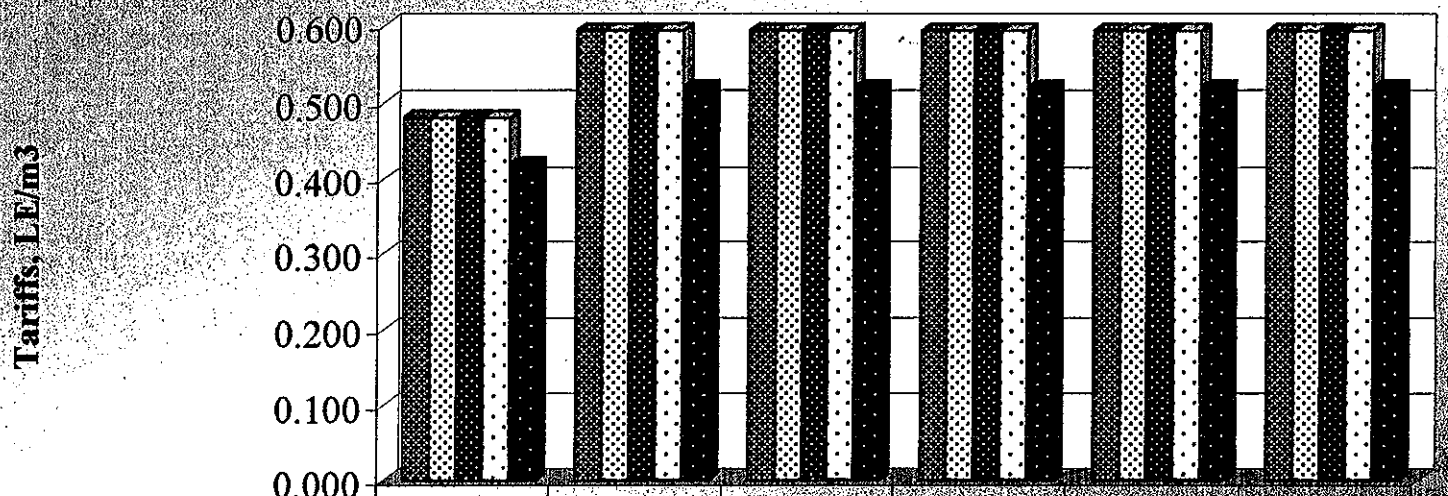

Alexandria City Water Tariffs - LE/m3 (Current & Proposed)
LE/m3
Beheira Water Co. and Govt. - Proposed
Beheira Water Co. and Govt. - 2002
Port Users @ L.E. 12.00 - Proposed
Port Users @ L.E. 12.00 - 2002
Port Users @ L.E. 10.00 - Proposed
Port Users @ L.E. 10.00 - 2002
Port Users @ L.E. 7.00 - Proposed
Port Users @ L.E. 7.00 - 2002
Raw Water - Proposed
Raw Water - 2002
Government - Local - Proposed
Government - Local - 2002
Government - Agencies - Proposed
Government - Agencies - 2002
Tourism - Proposed
Tourism - 2002
Investment - Proposed
Investment - 2002
Large Factories - Proposed
Large Factories - 2002
Small Industry - Proposed
Small Industry - 2002
Small Commercial - Proposed
Small Commercial - 2002
Service (No Discount) - Proposed
Service (No Discount) - 2002
Service (75% Discount) - Proposed
Service (75% Discount) - 2002
Service (50% Discount) - Proposed
Service (50% Discount) - 2002
Domestic - >30 m3 month - Proposed
Domestic - >30 m3 month 2002
Domestic - <30 m3/month - Proposed
Domestic - <30 m3/month 2002
Domestic - Minimum Use - Proposed
Domestic - Minimum Use 2002
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
Account Classes

139



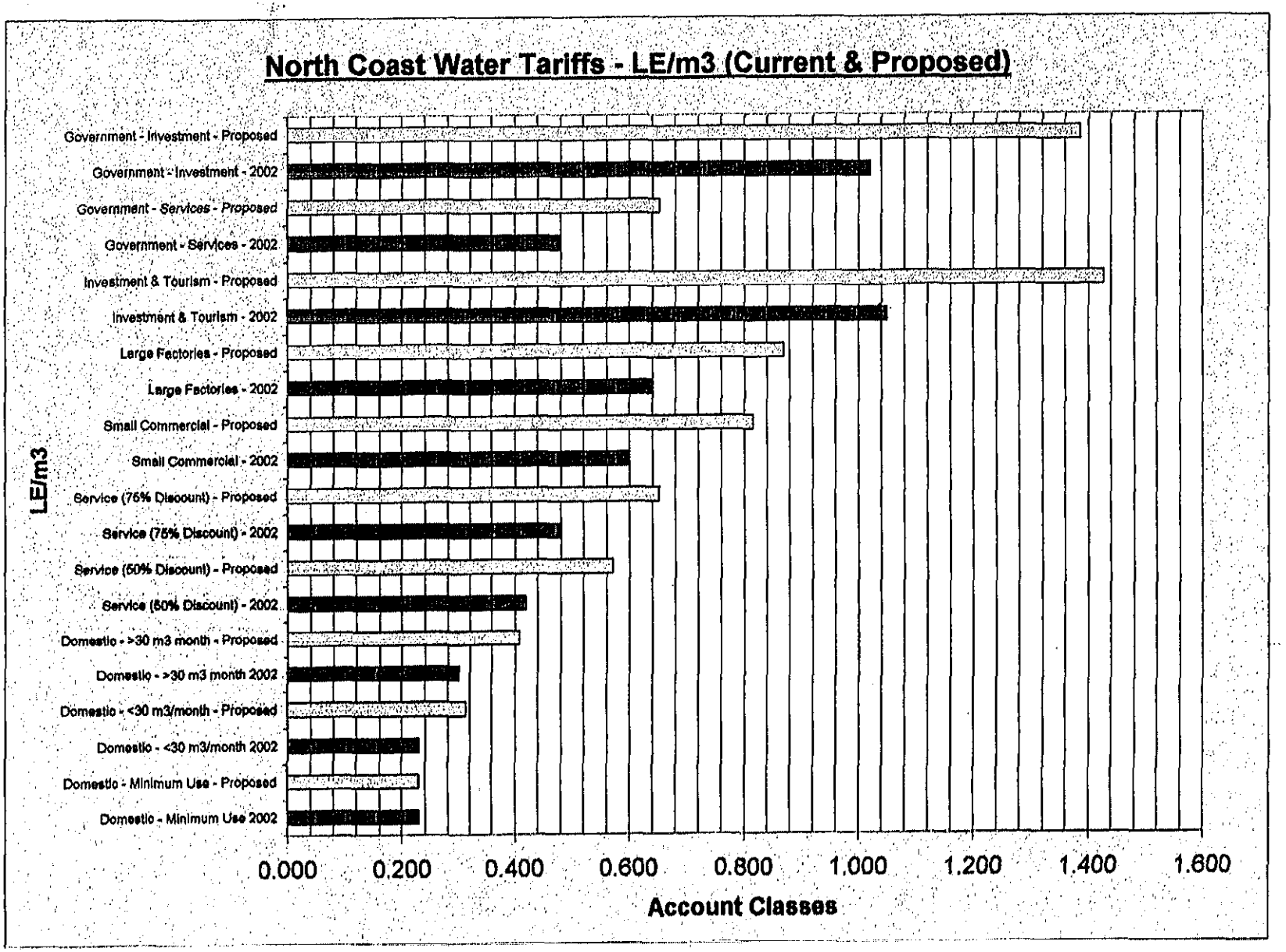
	2002	2003	2004	2005	2006	2007
Domestic - Minimum Use	0.230	0.230	0.230	0.230	0.230	0.230
Domestic - Up to 30 m3/month	0.230	0.284	0.284	0.284	0.284	0.284
Domestic - Over 30 m3 month	0.300	0.371	0.371	0.371	0.371	0.371

Alexandria City Tariffs for Service Class Accounts, 2002-2007



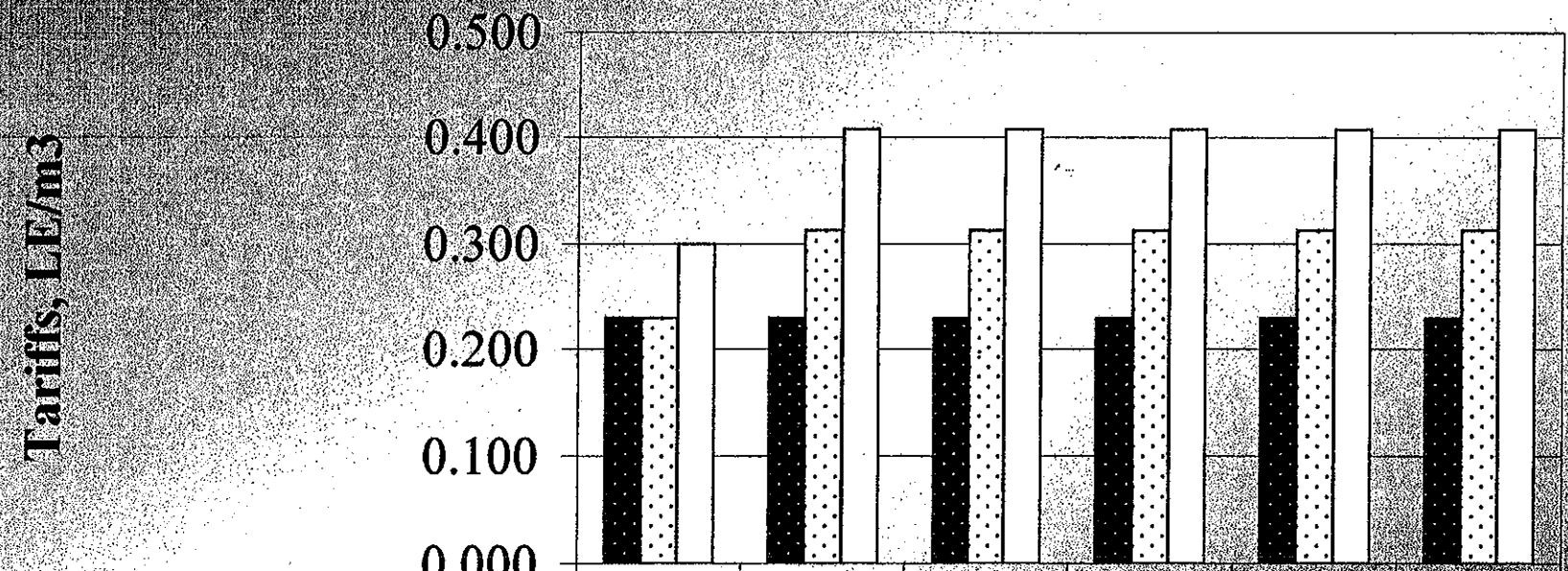
	2002	2003	2004	2005	2006	2007
Service (50% Discount)	0.420	0.519	0.519	0.519	0.519	0.519
Service (75% Discount)	0.480	0.593	0.593	0.593	0.593	0.593
Service (No Discount)	0.480	0.593	0.593	0.593	0.593	0.593
Government - Agencies and Companies	0.480	0.593	0.593	0.593	0.593	0.593
Government - Local government	0.480	0.593	0.593	0.593	0.593	0.593

741


North Coast Water Tariffs - LE/m3 (Current & Proposed)
Government - Investment - Proposed
Government - Investment - 2002
Government - Services - Proposed
Government - Services - 2002
Investment & Tourism - Proposed
Investment & Tourism - 2002
Large Factories - Proposed
Large Factories - 2002
Small Commercial - Proposed
Small Commercial - 2002
Service (75% Discount) - Proposed
Service (75% Discount) - 2002
Service (50% Discount) - Proposed
Service (50% Discount) - 2002
Domestic - >30 m3 month - Proposed
Domestic - >30 m3 month 2002
Domestic - <30 m3/month - Proposed
Domestic - <30 m3/month 2002
Domestic - Minimum Use - Proposed
Domestic - Minimum Use 2002
LE/m3
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
Account Classes

742

North Coast Domestic Water Tariffs, 2002 (Current) - 2007



	2002	2003	2004	2005	2006	2007
Domestic - Minimum Use	0.230	0.230	0.230	0.230	0.230	0.230
Domestic - Up to 30 m3/month	0.230	0.313	0.313	0.313	0.313	0.313
Domestic - Over 30 m3 month	0.300	0.408	0.408	0.408	0.408	0.408

ANNEX F

AGOSD Tariff Model

Table 1: AGOSD: SEWER SERVICE DEMAND

Table 1.1.1.: Water Consumption of Sewered Users for Existing Catogories, by Type of Account (m^3/year)

Year	Historical Data			Estimated Data
	1999	2000	2001	2002
Water Consumption of Sewered Users (m3/year)				
Domestic - Minimum Use	20,701,642	20,906,231	21,718,792	22,370,356
Calculated Annual Increase %		1%	4%	3%
Domestic - up to 30 m3/month	159,243,397	160,817,160	167,067,634	172,079,663
Calculated Annual Increase %		1%	4%	3%
Domestic - Over 30 m3/month	37,660,527	38,341,031	42,139,186	43,403,362
Calculated Annual Increase %		2%	10%	3%
Service (50% Discount)	1,555,695	1,669,698	1,853,911	1,909,528
Calculated Annual Increase %		7%	11%	3%
Service (75% Discount)	1,964,224	1,321,944	887,171	913,786
Calculated Annual Increase %		-33%	-33%	3%
Service (No Discount)	64,368	50,750	51,478	53,022
Calculated Annual Increase %		-21%	1%	3%
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	14,879,613	15,829,376	16,778,925	17,282,293
Calculated Annual Increase %		6%	6%	3%
Small Industry (factories & workshops, garages, mills, bakeries)	1,834,732	2,021,742	2,128,604	2,192,462
Calculated Annual Increase %		10%	5%	3%
Large Factories	14,237,675	13,266,969	12,615,637	12,994,106
Calculated Annual Increase %		-7%	-5%	3%
Investment (private hospitals, investment companies, free zones)	2,779,633	4,350,475	3,691,127	4,007,861
Calculated Annual Increase %		57%	-11%	3%
Tourism (five-star hotels and restaurants)	150,590	119,373	347,784	358,218
Calculated Annual Increase %		-21%	191%	3%
Government - Local government	641,691	744,780	737,663	759,783
Calculated Annual Increase %		10%	-1%	3%
Government - Agencies and Companies	20,618,483	20,531,622	20,616,660	21,235,366
Calculated Annual Increase %		0%	0%	3%
AAA				
Calculated Annual Increase %		#DIV/0!	#DIV/0!	#DIV/0!
Total Water Consumption of Sewered Users	276,332,470	279,991,151	290,634,762	299,659,605
Calculated Annual Increase %		1.3%	3.9%	3.0%

Year	Projections					Total (2003 - 2007)	Average Year (2003-2007)
	2003	2004	2005	2006	2007		
Water Consumption of Sewered Users (m3/year)							
Domestic - Minimum Use (10 m3/mo.)	23,175,627	23,930,176	24,966,321	26,904,031	29,342,912	128,319,066	25,663,813
Projected Annual Increase %	4%	3%	4%	8%	9%		6%
Domestic - up to 30 m3/month	178,274,053	184,078,274	192,048,623	206,954,081	225,714,704	987,069,735	197,413,947
Projected Annual Increase %	4%	3%	4%	8%	9%		6%
Domestic - Over 30 m3/month	44,705,462	46,046,626	47,428,025	48,850,866	50,316,392	237,347,371	47,469,474
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
Service (50% Discount)	1,966,614	2,025,619	2,086,593	2,149,191	2,213,667	10,442,084	2,088,417
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
Service (75% Discount)	941,200	969,436	998,519	1,028,474	1,059,329	4,996,957	999,391
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
Service (No Discount)	54,613	56,251	57,939	59,677	61,467	289,948	57,990
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	17,800,762	18,334,784	18,884,828	19,451,373	20,034,914	94,506,660	18,901,332
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
Small Industry (factories & workshops, garages, mills, bakeries)	2,258,236	2,325,983	2,395,763	2,467,635	2,541,664	11,989,282	2,397,856
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
Large Factories	13,383,929	13,785,447	14,199,011	14,624,981	15,063,730	71,057,098	14,211,420
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
Investment (private hospitals, investment companies, free zones)	4,128,097	4,251,939	4,379,498	4,510,863	4,646,209	21,916,625	4,383,325
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
Tourism (five-star hotels and restaurants)	368,964	380,033	391,434	403,177	415,272	1,958,881	391,776
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
Government - Local government	782,676	806,053	830,235	855,142	880,796	4,154,803	830,961
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
Government - Agencies and Companies	21,872,427	22,528,600	23,204,458	23,900,591	24,617,609	116,123,684	23,224,737
Projected Annual Increase %	3%	3%	3%	3%	3%		3%
AAA	0	0	0	0	0	0	-
Projected Annual Increase %							#DIV/0!
Total Water Consumption of Sewered Users	309,712,759	319,519,422	331,871,245	352,160,102	376,908,665	1,690,172,194	338,034,439
Calculated Annual Increase %	3.4%	3.2%	3.9%	6.1%	7.0%		4.7%

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Table 1: AGOSD: SEWER SERVICE DEMAND

Table 1.1.2: Summary of Water Consumption of Sewered Users under Aggregated Classes

Year	Historical Data 1999	Historical Data 2000	Historical Data 2001	Estimated Data 2002
Domestic	217,605,566	220,064,422	230,925,612	237,853,381
Calculated Annual Increase %		1.1%	4.9%	3.0%
Service	24,844,461	24,318,794	24,147,073	24,871,485
Calculated Annual Increase %		-2.1%	-0.7%	3.0%
Commercial	33,882,443	35,607,935	35,762,077	36,834,939
Calculated Annual Increase %		5.1%	0.4%	3.0%
Total Water Consumption of Sewered Users	276,332,470	279,991,151	290,834,762	299,559,805
Calculated Annual Increase %		1.3%	3.9%	3.0%
Percent of Total Demand				
Domestic	78.7%	78.6%	79.4%	79.4%
Service	9.0%	8.7%	8.3%	8.3%
Commercial	12.3%	12.7%	12.3%	12.3%

Year	Projections 2003	Projections 2004	Projections 2005	Projections 2006	Projections 2007	Total (2003 - 2007)	Average Year (2003-2007)
Domestic	246,155,142	254,055,076	264,442,969	282,708,978	305,374,007	1,352,736,172	270,547,234
Calculated Annual Increase %	3.5%	3.2%	4.1%	6.9%	8.0%		5.1%
Service	25,617,630	26,386,159	27,177,743	27,993,076	28,832,868	136,007,475	27,201,495
Calculated Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Commercial	37,939,987	39,078,187	40,250,533	41,458,049	42,701,790	201,428,546	40,285,709
Calculated Annual Increase %	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Total Water Consumption of Sewered Users	309,712,759	319,519,422	331,871,245	352,160,102	376,908,665	1,690,172,194	338,034,439
Calculated Annual Increase %	3.4%	3.2%	3.9%	6.1%	7.0%		4.7%
Percent of Total Demand							
Domestic	79.5%	79.5%	79.7%	80.3%	81.0%		80.0%
Service	8.3%	8.3%	8.2%	7.9%	7.6%		8.1%
Commercial	12.3%	12.2%	12.1%	11.8%	11.3%		11.9%

Table 1.2: Number of Sewered Accounts

Year	Historical Data 1999	Historical Data 2000	Historical Data 2001	Estimated Data 2002
Total Sewered Accounts	618,328	625,560	654,738	674,380
Calculated Annual Increase %		1.2%	4.7%	3.0%

Year	Projections 2003	Projections 2004	Projections 2005	Projections 2006	Projections 2007	Total (2003 - 2007)	Average Year (2003-2007)
Total Sewered Accounts	698,051	720,513	750,268	803,277	869,215	3,841,344	768,269
Calculated Annual Increase %	3.5%	3.2%	4.1%	7.1%	8.2%		5.2%

Table 1.3: Population & Growth of Served Areas

Year	Historical Data 1999	Historical Data 2000	Historical Data 2001	Estimated Data 2002
Population:				
Alexandria City	3,583,272	3,688,000	3,795,789	3,906,729
Calculated Annual Increase %		2.9%	2.9%	2.9%

Year	Projections 2003	Projections 2004	Projections 2005	Projections 2006	Projections 2007	Total (2003 - 2007)	Average Year (2003-2007)
Population:							
Alexandria City	4,020,911	4,138,430	4,259,384	4,383,873	4,512,000		4,262,919
Calculated Annual Increase %	2.9%	2.9%	2.9%	2.9%	2.9%		2.9%

Table 2: OPERATION AND MAINTENANCE COSTS

Table 2.1.1: Operation and Maintenance Costs

Year	Historical Data			Estimated Data	Projections					Total	Average
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Labor											
Number of Employees	5,540	5,412	5,357	5,320	5,283	5,220	5,156	5,075	4,987		5,144
Number of Staff per 1,000 Accounts	9.0	8.7	8.2	7.9	7.6	7.2	6.9	6.3	5.7		6.7
Annual Rate of Change in Number of Employees %		-2.3%	-1.0%	0.7%	-0.7%	-1.2%	-1.2%	-1.6%	-1.7%		-1.3%
Average Staff Salary	6,302	7,023	7,618	8,285	8,947	9,883	10,438	11,271	12,173		10,498
Average Staff Salary Annual Increase %		11.4%	8.5%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%		8.0%
Total Wages and Salaries	34,914,964	38,007,353	40,809,280	44,074,022	47,268,892	50,441,625	53,809,038	57,200,803	60,705,662	269,426,021	53,885,204
Commodities											
Electricity	7,290,037	7,338,823	7,727,720	8,000,000	8,105,720	8,236,942	8,427,031	8,942,216	9,570,643	43,282,552	8,656,510
Annual Increase %		1%	5%	4%	-2%	-1.5%	-1.5%	0%	0%		-1.0%
Fuel and Oil	1,331,033	1,347,634	1,237,174	1,300,000	1,344,061	1,386,619	1,440,222	1,528,270	1,635,671	7,334,842	1,466,968
Annual Increase %		1%	-8%	5%	0%	0%	0%	0%	0%		0.0%
Chemicals	0	0	0	0	7,880	7,449,750	7,737,739	8,210,783	8,787,808	32,193,960	6,438,792
Annual Increase %		0%	0%	0%	0%	0%	0%	0%	0%		0.0%
Spare parts & Maintenance Materials	4,380,821	5,671,007	6,560,957	7,000,000	7,237,250	7,466,409	7,755,041	8,229,144	8,807,459	39,495,303	7,899,061
Annual Increase %		29%	16%	7%	0%	0%	0%	0%	0%		0.0%
Other Commodities	1,333,650	1,371,620	955,664	1,000,000	1,033,893	1,066,630	1,107,883	1,175,592	1,258,208	5,642,186	1,128,437
Annual Increase %		3%	-30%	5%	0%	0%	0%	0%	0%		0.0%
Services											
Maintenance	1,077,047	644,098	838,808	900,000	930,504	959,967	997,077	1,058,033	1,132,388	5,077,968	1,015,594
Annual Increase %		-40%	30%	7%	0%	0%	0%	0%	0%		0.0%
Transportation	113,498	117,208	131,844	140,000	144,745	149,328	155,101	164,583	176,149	789,906	157,981
Annual Increase %		3%	12%	6%	0%	0%	0%	0%	0%		0.0%
Other Services	991,355	441,924	534,198	655,828	678,054	699,523	726,565	770,983	825,165	3,700,291	740,058
Annual Increase %		-55%	21%	23%	0%	0%	0%	0%	0%		0.0%
Purchases for Sale	0	0	0	0	0	0	0	0	0	0	0
Annual Increase %		0%	0%	0%	0%	0%	0%	0%	0%		0.0%
Taxes and Duties	148,068	165,242	87,962	100,000	103,389	106,663	110,786	117,559	125,821	564,219	112,844
Annual Increase %		5%	-43%	14%	0%	0%	0%	0%	0%		0.0%
Total O&M Costs for Sewer Service Supply (from AGOSD Fin. Sts.)	51,581,373	55,095,769	58,883,407	63,169,648	19,585,498	27,521,831	28,457,426	30,197,162	32,319,312	138,081,226	27,616,245
Multipliers for annual inflation at 2.5%					489,637	1,303,293	2,188,109	3,134,855	4,247,023	10,239,809	2,200,583
Total O&M Costs for Wastewater Service					67,344,025	79,356,748	84,454,673	90,532,820	97,271,997	423,747,056	83,792,033

Table 2.1.2: O&M Cost Proportions

Year	Historical Data			Estimated Data	Projections						Average
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Labor	67.7%	69.0%	69.3%	69.8%	70.2%	63.6%	63.7%	63.2%	62.4%		64.6%
Commodities:											
Electricity	14.1%	13.3%	13.1%	12.7%	12.3%	10.9%	10.7%	10.9%	11.1%		11.2%
Fuel and Oil	2.6%	2.4%	2.1%	2.1%	2.0%	1.8%	1.8%	1.9%	1.9%		1.9%
Chemicals	0.0%	0.0%	0.0%	0.0%	0.0%	9.9%	9.9%	10.0%	10.2%		8.0%
Spare Parts & Maintenance M	8.5%	10.3%	11.1%	11.1%	11.0%	9.9%	9.9%	10.0%	10.2%		10.2%
Other Commodities	2.6%	2.5%	1.6%	1.6%	1.6%	1.4%	1.4%	1.4%	1.5%		1.5%
Services:											
Maintenance	2.1%	1.2%	1.4%	1.4%	1.4%	1.3%	1.3%	1.3%	1.3%		1.3%
Transportation	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%		0.2%
Other Services	1.9%	0.8%	0.9%	1.0%	1.0%	0.9%	0.9%	0.9%	1.0%		1.0%
Purchases for Sale	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
Taxes and Duties	0.3%	0.3%	0.1%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%		0.1%
Total O&M Costs:	100.0%	100.0%	100.0%	100.0%	100%	100%	100%	100%	100%		100.0%

Table 3. CAPITAL COSTS (in LE)

Table 3.1: Renewal & Replacement Projects

	2003	2004	2005	2006	2007	Total (2003-2007)	Average
R&R of Sewers	3,400,000	4,000,000	4,000,000	4,300,000	4,300,000	20,000,000	4,000,000
R&R of Pump Stations & Force Mains	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000	45,000,000	9,000,000
Performance Improvement Programs	9,000,000	9,000,000	9,200,000	8,850,000	8,950,000	30,000,000	6,000,000
Total Renewal & Replacement Projects:	**18,400,000**	**19,000,000**	**19,200,000**	**19,150,000**	**19,250,000**	**95,000,000**	**19,000,000**

Table 3.2: Completion Projects and New Projects

	Totals*	Average per Year (2003-2007)
Wastewater Treatment Plant Expansion Projects:		
Expansion of East WWTP (from 410,000 m3/day to 607,000 m3/day) and West WWTP (from 180,000 m3/day to 460,000 m3/day)	397,300,000	79,460,000
m3/day)	35,000,000	7,000,000
Ard Il-Helsh WWTP Expansion (from 20,000 m3/day to 50,000 m3/day)	50,000,000	10,000,000
Collection System Projects:		
Mex, Dekhiela, and Umm Zghayo Collection Systems	120,000,000	24,000,000
King Maryut Collection Systems	70,000,000	14,000,000
Khorshid and Zuwayda Collection Systems	70,000,000	14,000,000
Siyuf Collection Systems	90,000,000	18,000,000
Abis Collection Systems	106,000,000	21,200,000
New Wastewater System Projects:		
Agami Wastewater System	668,350,000	133,670,000
Amreya Wastewater System	70,000,000	14,000,000
Total Completion Projects and New Projects	**1,676,650,000**	**335,330,000**

Table 3.3: Debt Service

Table 3.3.1: Debt Service Summary

Loan Type/ Elements		2001	2002	2003	2004	2005	2006	2007
Summary of Existing Loans								
Local Loans: MOF								
Initial/ BOY Balance	89,424,844	123,046,178	105,508,902	89,424,844	72,235,199	55,783,372	36,011,957	14,832,324
New Borrowing		0	0	0	0	0	0	0
Interest	7.3%	7,913,699	7,832,051	6,656,413	5,429,282	4,114,695	2,706,375	1,196,953
Loan Period/ Annual Installment		17,537,275	16,084,059	17,189,848	16,451,027	15,797,714	21,179,633	14,832,324
Loan Date/ Grace Period	Ends in 2007							
EOY Balance		105,508,902	89,424,844	72,235,199	55,783,372	36,011,957	14,832,324	0
Local Loans: NIB (Summary)								
Initial/ BOY Balance		297,327,032	297,327,032	265,074,032	224,710,625	181,286,167	146,253,317	117,990,430
New Borrowing		0	40,000,000	40,000,000	40,000,000	0	0	0
Interest		38,057,000	40,714,000	52,838,638	29,212,381	23,567,202	19,012,931	15,338,756
Loan Period/ Annual Installment		0	32,253,000	40,363,407	43,424,458	35,032,850	28,262,887	22,801,194
Loan Date/ Grace Period		0	0	0	0	0	0	0
EOY Balance		297,327,032	265,074,032	224,710,625	181,286,167	146,253,317	117,990,430	95,189,237
Foreign Loans (Summary)								
Initial/ BOY Balance		33,874,917	38,143,176	41,839,102	39,752,331	37,602,488	35,387,667	33,105,901
New Borrowing		0	0	0	0	0	0	0
Interest		1,016,248	1,144,295	1,255,173	1,192,570	1,128,075	1,061,630	993,177
Loan Period/ Annual Installment		1,453,218	1,761,348	2,086,772	2,149,842	2,214,822	2,281,766	2,350,733
Loan Date/ Grace Period		0	0	0	0	0	0	0
EOY Balance		32,421,700	36,381,828	39,752,331	37,602,488	35,387,667	33,105,901	30,755,168
Total Existing Loans & Debt Service								
Initial/ BOY Balance		454,248,127	440,979,110	396,337,978	336,698,155	274,672,027	217,652,941	165,928,655
New Borrowing		0	40,000,000	40,000,000	40,000,000	0	0	0
Interest		46,986,947	49,690,346	60,750,224	35,834,233	28,809,971	22,780,936	17,528,886
Loan Period/ Annual Installment		18,990,494	50,098,406	59,639,824	62,026,127	57,019,086	51,724,286	39,984,251
Loan Date/ Grace Period		0	0	0	0	0	0	0
EOY Balance		435,257,634	390,880,704	336,698,155	274,672,027	217,652,941	165,928,655	125,944,404
Total Debt Service for Existing Debt		**65,977,441**	**99,788,752**	**120,390,048**	**97,860,360**	**85,829,058**	**74,505,222**	**57,513,137**

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Loan Type/ Elements		2001	2002	2003	2004	2005	2006	2007
Summary of New Loans								
Local Loans: MOF								
Initial/ BOY Balance		0	0	0	0	0	0	0
New Borrowing		0	0	0	0	0	0	0
Interest		0	0	0	0	0	0	0
Loan Period/ Annual Installment		0	0	0	0	0	0	0
Loan Date/ Grace Period								
EOY Balance		0	0	0	0	0	0	0
Local Loans: NIB (Summary)								
Initial/ BOY Balance		0	23,666,667	74,833,333	252,819,444	519,965,278	767,826,389	865,847,222
New Borrowing		23,666,667	51,166,667	180,944,444	276,500,000	279,833,333	164,555,556	37,333,333
Interest		1,538,333	4,864,167	16,625,556	34,405,764	51,986,910	60,604,826	58,706,736
Loan Period/ Annual Installment		0	0	2,958,333	9,354,167	31,972,222	66,534,722	98,222,222
Loan Date/ Grace Period								
EOY Balance		23,666,667	74,833,333	252,819,444	519,965,278	767,826,389	865,847,222	804,958,333
Foreign Loans (Summary)								
Initial/ BOY Balance		0	0	0	39,722,222	150,690,058	260,061,404	329,311,404
New Borrowing		0	0	39,722,222	111,500,000	111,500,000	71,777,778	0
Interest		0	0	259,661	1,001,111	1,727,727	2,150,577	2,081,064
Loan Period/ Annual Installment		0	0	0	532,164	2,128,655	2,527,778	4,520,833
Loan Date/ Grace Period		0	0	0	0	0	0	0
EOY Balance		0	0	39,722,222	150,690,058	260,061,404	329,311,404	324,790,570
Total New Loans & Debt Service								
Initial/ BOY Balance	1,355,500,000	0	23,666,667	74,833,333	292,541,667	670,655,336	1,027,887,792	1,195,158,626
New Borrowing		23,666,667	51,166,667	220,666,667	388,000,000	391,333,333	236,333,333	37,333,333
Interest		1,538,333	4,864,167	16,885,417	35,406,875	53,714,636	62,755,404	60,787,800
Loan Period/ Annual Installment		0	0	2,958,333	9,886,330	34,100,877	69,062,500	102,743,056
Loan Date/ Grace Period		0	0	0	0	0	0	0
EOY Balance		23,666,667	74,833,333	292,541,667	670,655,336	1,027,887,792	1,195,158,626	1,129,748,904
Loan Type/ Elements		**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Total Existing & New Loans Debt Service								
Initial/ BOY Balance		454,248,127	464,645,777	471,171,312	629,239,821	945,327,364	1,245,540,733	1,361,087,281
New Borrowing		23,666,667	91,166,667	260,666,667	428,000,000	391,333,333	236,333,333	37,333,333
Interest		48,525,280	54,554,513	77,635,641	71,241,108	82,524,608	85,536,340	78,316,686
Loan Period/ Annual Installment		18,990,494	50,098,406	62,598,157	71,912,458	91,119,964	120,786,786	142,727,307
Loan Date/ Grace Period		0	0	0	0	0	0	0
EOY Balance		458,924,300	465,714,037	629,239,821	945,327,364	1,245,540,733	1,361,087,281	1,255,693,308
Total Debt Service (Principal + Interest)		**67,515,774**	**104,652,919**	**140,233,798**	**143,153,566**	**173,644,571**	**206,323,126**	**221,043,992**

Table 3.3.2: Debt Service on National Investment Bank Loans

Loan Description/ Elements	Loan Information	Construction Start / Construction End / Annual Percent	2001	2002	2003	2004	2005	2006	2007
Existing Loans: NIB									
Initial/ BOY Balance	297,327,032		297,327,032	297,327,032	265,074,032	224,710,625	181,286,167	146,253,317	117,990,430
New Borrowing			0	40,000,000	40,000,000	40,000,000	0	0	0
Interest	13%		38,057,000	40,714,000	52,836,638	29,212,381	23,567,202	19,012,931	15,338,756
Loan Period/ Annual Installment				32,253,000	40,365,407	43,424,458	35,092,850	28,262,887	22,801,194
Loan Date/ Grace Period									
EOY Balance			297,327,032	265,074,032	224,710,625	181,286,167	146,253,317	117,990,430	95,189,237
New Loans: NIB									
1. ETP & WTP: Phase II									
B.O.Y. Balance			0	23,666,667	47,333,333	68,041,667	62,125,000	53,250,000	44,375,000
New Borrowing	71,000,000	28-May-00	23,666,667	23,666,667	23,666,667	0	0	0	
Interest Rate/ Annual Amount	13%	30-Jun-03	1,538,333	3,076,667	4,615,000	4,422,708	4,038,125	3,461,250	2,884,375
Loan Period/ Annual Installment	10 years		0	0	2,958,333	5,916,667	8,875,000	8,875,000	11,833,333
Constr. Start/ Grace Period	2001/2 Years	36							
E.O.Y. Balance			23,666,667	47,333,333	68,041,667	62,125,000	53,250,000	44,375,000	32,541,667
2. Increase Ardh El Heelsh TP									
B.O.Y. Balance				0	11,666,667	23,333,333	33,541,667	30,625,000	26,250,000
Loan Drawdown	35,000,000	19-May-01		11,666,667	11,666,667	11,666,667	0	0	0
Interest Rate/ Annual Amount	13%	28-Jan-04		758,333	1,516,667	2,275,000	2,180,208	1,990,625	1,706,250
Loan Period/ Annual Installment	10 years			0	0	1,458,333	2,916,667	4,375,000	4,375,000
Constr. Start/ Grace Period	2002/3 Years	36							
E.O.Y. Balance				11,666,667	23,333,333	33,541,667	30,625,000	26,250,000	21,875,000
3. Increase Ardh El Helsh TP									
B.O.Y. Balance					0	8,333,333	33,333,333	48,958,333	44,791,667
Loan Drawdown	50,000,000	1-Mar-03			8,333,333	25,000,000	16,666,667	0	0
Interest Rate/ Annual Amount	13%	1-Mar-05			541,667	2,166,667	3,250,000	3,182,292	2,911,458
Loan Period/ Annual Installment	10 years				0	0	1,041,667	4,166,667	5,208,333
Constr. Start/ Grace Period	2003/2 Years	24							
E.O.Y. Balance					8,333,333	33,333,333	48,958,333	44,791,667	39,583,333
4. Construct PS & Networks in Mex- Dekhella									
B.O.Y. Balance				0	10,000,000	40,000,000	68,750,000	93,750,000	105,000,000
Loan Drawdown	120,000,000	11-Mar-02		10,000,000	30,000,000	30,000,000	30,000,000	20,000,000	0
Interest Rate/ Annual Amount	13%	11-Mar-06		650,000	2,600,000	4,550,000	6,418,750	7,393,750	6,825,000
Loan Period/ Annual Installment	10 years			0	0	1,250,000	5,000,000	8,750,000	8,750,000
Constr. Start/ Grace Period	2002/4 Years	48							
E.O.Y. Balance				10,000,000	40,000,000	68,750,000	93,750,000	105,000,000	96,250,000

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5. Contruct a TP, PSs, & Network at King Maryout									
B.O.Y. Balance							0	23,333,333	46,666,667
Loan Drawdown	70,000,000	1-Jul-04					23,333,333	23,333,333	23,333,333
Interest Rate/ Annual Amount	13%	30-Jun-07					1,516,667	3,033,333	4,550,000
Loan Period/ Annual Installment	10 years						0	0	2,916,667
Constr. Start/ Grace Period	2005/ 2 years	36							
E.O.Y. Balance							23,333,333	46,666,667	67,083,333
6. Execution & Provide Service tp Khorshid Zawalda & Surroundings									
B.O.Y. Balance				0	5,833,333	23,333,333	40,104,167	54,687,500	61,250,000
Loan Drawdown	70,000,000	11-Mar-02		5,833,333	17,500,000	17,500,000	17,500,000	11,666,667	0
Interest Rate/ Annual Amount	13%	11-Mar-06		379,167	1,516,667	2,654,167	3,744,271	4,313,021	3,981,250
Loan Period/ Annual Installment	10 years			0	0	729,167	2,916,667	5,104,167	5,833,333
Constr. Start/ Grace Period	2002/ 2 years	48							
E.O.Y. Balance				5,833,333	23,333,333	40,104,167	54,687,500	61,250,000	55,416,667
7. Execution of WW Project for El-Siouf & Surtroundings									
B.O.Y. Balance					0	30,000,000	60,000,000	86,250,000	78,750,000
Loan Drawdown	90,000,000	1-Jul-02			30,000,000	30,000,000	30,000,000		0
Interest Rate/ Annual Amount	13%	30-Jun-05			1,950,000	3,900,000	5,850,000	5,606,250	5,118,750
Loan Period/ Annual Installment	10 years				0	0	3,750,000	7,500,000	11,250,000
Constr. Start/ Grace Period	2002/ 2 years	36							
E.O.Y. Balance					30,000,000	60,000,000	86,250,000	78,750,000	67,500,000
8. Execution of TP & WW Network for Six Villages									
B.O.Y. Balance					0	10,000,000	30,000,000	48,750,000	55,000,000
Loan Drawdown	60,000,000	1-Jan-03			10,000,000	20,000,000	20,000,000	10,000,000	0
Interest Rate/ Annual Amount	13%	1-Jan-06			650,000	1,950,000	3,250,000	3,818,750	3,575,000
Loan Period/ Annual Installment	10 years				0	0	1,250,000	3,750,000	6,250,000
Constr. Start/ Grace Period	2003/ 2 years	36							
E.O.Y. Balance					10,000,000	30,000,000	48,750,000	55,000,000	48,750,000
9. Construction of TPs & PSs for Agami Area									
B.O.Y. Balance					0	42,777,778	171,111,111	294,097,222	358,263,889
Loan Drawdown	385,000,000	1-Mar-03			42,777,778	128,333,333	128,333,333	85,555,556	0
Interest Rate/ Annual Amount	13%	1-Mar-06			2,780,556	11,122,222	19,463,889	24,677,431	23,287,153
Loan Period/ Annual Installment	10 years				0	0	5,347,222	21,388,889	37,430,556
Constr. Start/ Grace Period	2003/ 2 years	36							
E.O.Y. Balance					42,777,778	171,111,111	294,097,222	358,263,889	320,833,333
10. Construction of TPs & PSs in Amerya									
B.O.Y. Balance					0	7,000,000	21,000,000	34,125,000	45,500,000
Loan Drawdown	70,000,000	1-Jan-03			7,000,000	14,000,000	14,000,000	14,000,000	14,000,000
Interest Rate/ Annual Amount	13%	31-Jan-08			455,000	1,365,000	2,275,000	3,128,125	3,867,500
Loan Period/ Annual Installment	10 years				0	0	875,000	2,625,000	4,375,000
Constr. Start/ Grace Period	2003/ 2 years	60							
E.O.Y. Balance					7,000,000	21,000,000	34,125,000	45,500,000	55,125,000
Total New NIB Loans									
B.O.Y. Balance	1,021,000,000		0	23,666,667	74,833,333	252,819,444	519,965,278	767,826,389	865,847,222
Loan Drawdown			23,666,667	51,166,667	180,944,444	276,500,000	279,833,333	164,555,556	37,333,333
Interest Rate/ Annual Amount			1,538,333	4,864,167	16,625,556	34,405,764	51,986,910	60,604,826	58,706,736
Loan Period/ Annual Installment			0	0	2,958,333	9,354,167	31,972,222	66,534,722	98,222,222
Constr. Start/ Grace Period									
E.O.Y. Balance			23,666,667	74,833,333	252,819,444	519,965,278	767,826,389	865,847,222	804,958,333
Total NIB Loans - Existing & New									
B.O.Y. Balance			297,327,032	320,993,699	339,907,365	477,530,069	701,251,445	914,079,706	983,837,652
Loan Drawdown			23,666,667	91,166,667	220,944,444	316,500,000	279,833,333	164,555,556	37,333,333
Interest Rate/ Annual Amount			39,595,333	45,578,167	69,464,194	63,618,145	75,554,111	79,617,758	74,045,492
Loan Period/ Annual Installment			0	32,253,000	43,321,740	52,778,625	67,005,072	94,797,609	121,023,416
Constr. Start/ Grace Period			0	0	0	0	0	0	0
E.O.Y. Balance			320,993,699	339,907,365	477,530,069	701,251,445	914,079,706	983,837,652	900,147,570

Table 3.3.3: Debt Service on Foreign Loans

Loan Description/ Elements	Loan Information	Construct Start / Construct End / Construct Months	2001	2002	2003	2004	2005	2006	2007
Existing Foreign Loans									
US Dollar Loan In US$			In US$						
B.O.Y. Balance			$9,963,211	$9,535,794	$9,095,457	$8,641,811	$8,174,454	$7,692,971	$7,196,935
Initial/ BOY Balance	9,963,211		$0	$0	$0	$0	$0	$0	$0
Interest	3.0%		$298,896	$286,074	$272,864	$259,254	$245,234	$230,789	$215,908
Loan Period/ Annual Installment	30 years		$427,417	$440,337	$453,646	$467,357	$481,483	$496,036	$511,029
Loan Date/ Grace Period	1981/ 10 years								
E.O.Y. Balance			$9,535,794	$9,095,457	$8,641,811	$8,174,454	$7,692,971	$7,196,935	$6,685,906
US Dollar Loan In LE	21.0940	Exchange Rate (LE/$)	3.4	4.0	4.6	4.6	4.6	4.6	4.6
B.O.Y. Balance			33,874,917	36,143,176	41,839,102	39,752,331	37,602,488	35,387,667	33,105,901
Initial/ BOY Balance			0	0	0	0	0	0	0
Interest	3%		1,016,248	1,144,295	1,255,173	1,192,570	1,128,075	1,061,630	993,177
Loan Period/ Annual Installment	30 years		1,453,218	1,761,348	2,086,772	2,149,842	2,214,822	2,281,766	2,350,733
Loan Date/ Grace Period	1981/ 10 years		0	0	0	0	0	0	0
E.O.Y. Balance			32,421,700	36,381,828	39,752,331	37,602,488	35,387,667	33,105,901	30,755,168
New Foreign Loans									
French Loan A In FRF									
B.O.Y. Balance					0 F	16,666,667 F	66,666,667 F	116,666,667 F	150,000,000 F
Initial/ BOY Balance	150,000,000 F	1-Mar-03			16,666,667 F	50,000,000 F	50,000,000 F	33,333,333 F	0 F
Interest	0.1%	1-Mar-06			8,333 F	33,333 F	58,333 F	75,000 F	75,000 F
Loan Period/ Annual Installment	20 years				0 F	0 F	0 F	0 F	1,041,667 F
Loan Date/ Grace Period	2005/ 3 years	36.0							
E.O.Y. Balance					16,666,667 F	66,666,667 F	116,666,667 F	150,000,000 F	148,958,333 F

French Loan B in FRF									
B.O.Y. Balance					0 F	7,222,222 F	28,128,655 F	46,754,386 F	57,587,719 F
Initial/ BOY Balance	65,000,000 F	1-Mar-03			7,222,222 F	21,666,667 F	21,666,667 F	14,444,444 F	0 F
Interest	6.6%	1-Mar-06			198,611 F	794,444 F	1,369,371 F	1,682,968 F	1,583,662 F
Loan Period/ Annual Installment	10 years				0 F	760,234 F	3,040,936 F	3,611,111 F	5,416,667 F
Loan Date/ Grace Period	2003/ 6 months	36.0							
E.O.Y. Balance					7,222,222 F	28,128,655 F	46,754,386 F	57,587,719 F	52,171,053 F
Total French Loans in FRF									
B.O.Y. Balance					0 F	23,888,889 F	94,795,322 F	163,421,053 F	207,587,719 F
Initial/ BOY Balance	215,000,000				23,888,889 F	71,666,667 F	71,666,667 F	47,777,778 F	0 F
Interest	3.0%				206,944 F	827,778 F	1,427,705 F	1,757,968 F	1,658,662 F
Loan Period/ Annual Installment	10 years				0 F	760,234 F	3,040,936 F	3,611,111 F	6,458,333 F
Loan Date/ Grace Period	2003/ 6 months				0 F	0 F	0 F	0 F	0 F
E.O.Y. Balance					23,888,889 F	94,795,322 F	163,421,053 F	207,587,719 F	201,129,386 F
Total French Loans in LE	0.70								
B.O.Y. Balance					0	16,722,222	66,356,725	114,394,737	145,311,404
Initial/ BOY Balance	150,500,000				16,722,222	50,166,667	50,166,667	33,444,444	0
Interest					144,861	579,444	999,393	1,230,577	1,161,064
Loan Period/ Annual Installment					0	532,164	2,128,655	2,527,778	4,520,833
Loan Date/ Grace Period					0	0	0	0	0
E.O.Y. Balance					16,722,222	66,356,725	114,394,737	145,311,404	140,790,570
EIB Loan in Euro									
B.O.Y. Balance					€ 0	€ 3,333,333	€ 13,333,333	€ 23,333,333	€ 30,000,000
Initial/ BOY Balance	30,000,000	1-Mar-03			€ 3,333,333	€ 10,000,000	€ 10,000,000	€ 6,666,667	€ 0
Interest	1.0%	1-Mar-06			€ 16,667	€ 66,667	€ 116,667	€ 150,000	€ 150,000
Loan Period/ Annual Installment	16 years				€ 0	€ 0	€ 0	€ 0	€ 0
Loan Date/ Grace Period	2003/ 5.5 years	36.0							
E.O.Y. Balance					€ 3,333,333	€ 13,333,333	€ 23,333,333	€ 30,000,000	€ 30,000,000
EIB Loan in LE	4.60								
B.O.Y. Balance	138,000,000				0	15,333,333	61,333,333	107,333,333	138,000,000
Initial/ BOY Balance					15,333,333	46,000,000	46,000,000	30,666,667	0
Interest					76,667	306,667	536,667	690,000	690,000
Loan Period/ Annual Installment					0	0	0	0	0
Loan Date/ Grace Period					0	0	0	0	0
E.O.Y. Balance					15,333,333	61,333,333	107,333,333	138,000,000	138,000,000
Spanish Loan in US$									
B.O.Y. Balance					$0	$1,666,667	$5,000,000	$8,333,333	$10,000,000
Initial/ BOY Balance	10,000,000	1-Jan-03			$1,666,667	$3,333,333	$3,333,333	$1,666,667	$0
Interest	1.0%	1-Jan-06			$8,333	$25,000	$41,667	$50,000	$50,000
Loan Period/ Annual Installment	30 years				$0	$0	$0	$0	$0
Loan Date/ Grace Period	2003/ 10 years	36.0							
E.O.Y. Balance					$1,666,667	$5,000,000	$8,333,333	$10,000,000	$10,000,000
Spanish Loan in LE	4.60								
B.O.Y. Balance	46,000,000				0	7,666,667	23,000,000	38,333,333	46,000,000
Initial/ BOY Balance					7,666,667	15,333,333	15,333,333	7,666,667	0
Interest					38,333	115,000	191,667	230,000	230,000
Loan Period/ Annual Installment					0	0	0	0	0
Loan Date/ Grace Period					0	0	0	0	0
E.O.Y. Balance					7,666,667	23,000,000	38,333,333	46,000,000	46,000,000
Total New Foreign Loans (in LE)									
B.O.Y. Balance	334,500,000		0	0	0	39,722,222	150,690,058	260,061,404	329,311,404
Initial/ BOY Balance			0	0	39,722,222	111,500,000	111,500,000	71,777,778	0
Interest			0	0	259,861	1,001,111	1,727,727	2,150,577	2,081,064
Loan Period/ Annual Installment			0	0	0	532,164	2,128,655	2,527,778	4,520,833
Loan Date/ Grace Period			0	0	0	0	0	0	0
E.O.Y. Balance			0	0	39,722,222	150,690,058	260,061,404	329,311,404	324,790,570
Total Foreign Loans (in LE)									
B.O.Y. Balance			33,874,917	38,143,176	41,839,102	79,474,553	188,292,547	295,449,070	362,417,305
Initial/ BOY Balance			0	0	39,722,222	111,500,000	111,500,000	71,777,778	0
Interest			1,016,248	1,144,295	1,515,034	2,193,681	2,855,801	3,212,207	3,074,241
Loan Period/ Annual Installment			1,453,218	1,761,348	2,086,772	2,682,006	4,343,477	4,809,543	6,871,567
Loan Date/ Grace Period			0	0	0	0	0	0	0
E.O.Y. Balance			32,421,700	36,381,828	79,474,553	188,292,547	295,449,070	362,417,305	355,545,738
Total Debt Service on Foreign Loans			**2,469,465**	**2,905,643**	**3,601,806**	**4,875,687**	**7,199,278**	**8,021,751**	**9,945,807**

Table 4: REVENUES AND COLLECTIONS ANALYSIS

Table 4.1: Current Sewer Service Tariffs (LE/m³)

Year	Historical Data 1999	2000	2001	Estimated Data 2002	Projections 2003	2004	2005	2006	2007	Totals	Average Year (2003-2007)
Sewer Service Tariff Rates (LE/m3)											
Domestic - Minimum Use	0.000	0.000	0.000	0.000	0.081	0.081	0.081	0.081	0.081		0.081
Domestic - up to 30 m3/month	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.081		0.081
Domestic - over 30 m3 month	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105		0.105
Service (50% Discount)	0.147	0.147	0.147	0.147	0.147	0.147	0.147	0.147	0.147		0.147
Service (75% Discount)	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168		0.168
Service (No Discount)	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168		0.168
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	0.210	0.210	0.210	0.210	0.210	0.210	0.210	0.210	0.210		0.210
Small Industry (factories & workshops, garages, mills, bakeries)	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300		0.300
Large Factories	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320		0.320
Investment (private hospitals, investment companies, free zones)	0.357	0.357	0.357	0.357	0.357	0.357	0.357	0.357	0.357		0.357
Tourism (five-star hotels and restaurants)	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510	0.510		0.510
Government - Local government	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168		0.168
Government - Agencies and Companies	0.240	0.240	0.240	0.240	0.240	0.240	0.240	0.240	0.240		0.240
AAA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000

Table 4.2.1: Sewer Service Tariff Revenues

Year	Historical Data 1999	2000	2001	Estimated Data 2002	Projections 2003	2004	2005	2006	2007	Totals	Average Year (2003-2007)
Domestic - Minimum Use	0	0	0	0	1,865,638	1,926,379	2,009,789	2,165,774	2,362,104	10,329,685	2,065,937
Domestic - up to 30 m3/month	12,819,093	12,945,781	13,448,945	13,852,413	14,351,061	14,818,301	15,459,914	16,659,804	18,170,034	79,459,114	15,891,823
Domestic - over 30 m3 month	3,954,355	4,025,808	4,424,615	4,557,353	4,694,074	4,834,898	4,979,943	5,129,341	5,283,221	24,921,474	4,984,295
Service (50% Discount)	228,687	245,448	272,525	280,701	289,122	297,795	306,729	315,931	325,409	1,534,986	306,997
Service (75% Discount)	329,990	222,087	149,045	153,516	158,122	162,865	167,751	172,784	177,967	839,489	167,898
Service (No Discount)	10,814	8,528	8,648	8,908	9,175	9,450	9,734	10,026	10,327	48,711	9,742
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	3,124,719	3,324,169	3,523,574	3,629,281	3,738,160	3,850,305	3,965,814	4,084,788	4,207,332	19,846,399	3,969,280
Small Industry (factories & workshops, garages, mills, bakeries)	550,419	606,523	638,581	657,739	677,471	697,795	718,729	740,291	762,499	3,596,784	719,357
Large Factories	4,556,056	4,251,830	4,037,004	4,158,114	4,282,857	4,411,343	4,543,683	4,679,994	4,820,394		4,547,654
Investment (private hospitals, investment companies, free zones)	992,400	1,553,120	1,389,132	1,430,806	1,473,730	1,517,942	1,563,481	1,610,385	1,658,697	7,824,235	1,564,847
Tourism (five-star hotels and restaurants)	76,801	60,880	177,370	182,691	188,172	193,817	199,631	205,620	211,789	999,029	199,806
Government - Local government	107,804	125,123	123,926	127,643	131,473	135,417	139,479	143,664	147,974	698,007	139,601
Government - Agencies and Companies	4,948,436	4,927,569	4,948,046	5,096,488	5,249,382	5,406,864	5,569,070	5,736,142	5,908,226	27,869,684	5,573,937
AAA	0	0	0	0	0	0	0	0	0	0	0
Total Billed Sewer Service Tariff Revenue	**31,699,575**	**32,296,882**	**33,141,411**	**34,135,653**	**37,108,436**	**38,263,170**	**39,633,747**	**41,654,543**	**44,045,972**	**200,705,869**	**40,141,174**

Table 4.2.2: Summary Sewer Service Tariff Revenues under Aggregated Classification

Year	Historical Data 1999	2000	2001	Estimated Data 2002	Projections 2003	2004	2005	2006	2007	Total (2003 - 2007)	Average Year (2003-2007)
Domestic	16,773,449	16,971,590	17,873,559	18,409,766	20,910,773	21,579,578	22,449,646	23,954,919	25,816,359	114,710,272	22,942,054
Calculated Annual Increase %		1.2%	5.3%	3.0%	13.6%	3.2%	4.0%	6.7%	7.8%		7.1%
Service	5,625,731	5,528,771	5,502,190	5,667,256	5,837,273	6,012,392	6,192,783	6,378,546	6,569,903	30,990,877	6,198,175
Calculated Annual Increase %		-1.7%	-0.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Commercial	9,300,396	9,796,521	9,765,661	10,058,631	10,360,390	10,671,202	10,991,338	11,321,078	11,660,711	55,004,719	11,000,944
Calculated Annual Increase %		5.3%	-0.3%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%		3.0%
Total Water Consumption of Sewered Users	31,699,575	32,296,882	33,141,411	34,135,653	37,108,436	38,263,170	39,633,747	41,654,543	44,045,972	200,705,869	40,141,174
Calculated Annual Increase %		1.9%	2.6%	3.0%	8.7%	3.1%	3.6%	5.1%	5.7%		5.2%
Percent of Total Consumption:											
Domestic	52.9%	52.5%	53.9%	53.9%	56.4%	56.4%	56.6%	57.5%	58.6%		57.1%
Service	17.7%	17.1%	16.6%	16.6%	15.7%	15.7%	15.6%	15.3%	14.9%		15.5%
Commercial	29.3%	30.3%	29.5%	29.5%	27.9%	27.9%	27.7%	27.2%	26.5%		27.4%

Table 4: REVENUES AND COLLECTIONS ANALYSIS

Total Water Consumption of Sewered Users	31,699,575	32,296,882	33,141,411		34,135,653	Total Water Consumption of Sewered Users	37,108,436	38,263,170	39,633,747	41,654,543	44,045,972	200,705,869	40,141,174
Calculated Annual Increase %		1.9%	2.6%		3.0%	Calculated Annual Increase %	8.7%	3.1%	3.6%	5.1%	5.7%		5.2%
Percent of Total Consumption:						**Percent of Total Consumption:**							
Domestic	52.9%	52.5%	53.9%		53.9%	Domestic	56.4%	56.4%	56.6%	57.5%	58.6%		57.1%
Service	17.7%	17.1%	16.6%		16.6%	Service	15.7%	15.7%	15.6%	15.3%	14.9%		15.5%
Commercial	29.3%	30.3%	29.5%		29.5%	Commercial	27.9%	27.9%	27.7%	27.2%	26.5%		27.4%

Table 4.3: Fixed-Charge Sewer Service Revenues

Government - Agencies and Companies	Historical Data			Estimated Data	Government - Agencies and Companies	Projections					Total	Average Year (2003-2007)
	1999	2000	2001	2002		2003	2004	2005	2006	2007		
Not Applicable for AGOSD	0	0	0	0	Not Applicable for AGOSD	0	0	0	0	0	0	0
Not Applicable for AGOSD	0	0	0	0	Not Applicable for AGOSD	0	0	0	0	0	0	0
Total Fixed-Charge Revenues	0	0	0	0	**Total Fixed-Charge Revenues**	0	0	0	0	0	0	0

Table 4.4: Sewer Service Non-Tariff Revenues (LE)

Year	Historical Data			Estimated Data	Year	Projections					Total	Average Year (2003-2007)
	1999	2000	2001	2002		2003	2004	2005	2006	2007		
Inspection	93,426	83,711	90,929	89,355	Inspection	90,000	91,000	92,000	93,000	94,000	460,000	92,000
Sample Analysis	62,120	57,500	111,621	77,080	Sample Analysis	79,007	80,983	83,007	85,082	87,209	415,289	83,058
Supervision & Lease of Equipment	440,638	192,880	99,799	244,439	Supervision & Lease of Equipment	250,550	256,814	263,234	269,815	276,560	1,316,973	263,395
Septic Hauling	767,235	859,563	973,087	1,095,896	Septic Hauling	1,497,300	2,245,950	3,835,125	3,835,125	3,835,125	15,248,625	3,049,725
Connections	126,931	31,931	313,697	157,520	Connections	163,049	168,295	175,250	187,627	203,029	897,250	179,450
Administrative Charges	28,573	37,304	103,809	56,562	Administrative Charges	58,547	60,431	62,929	67,373	72,903	322,184	64,437
Other Services & Contributions	5,478,124	8,463,862	12,112,239	17,333,262	Other Services & Contributions	17,333,262	19,066,588	20,973,246	23,070,571	25,377,628	105,821,295	21,164,259
Total Non-Tariff Revenues	6,997,047	9,726,751	13,805,181	19,054,113	**Total Non-Tariff Revenues**	19,471,715	21,970,060	25,484,791	27,608,593	29,946,455	124,481,615	24,896,323

Table 4.5: Total Revenue

Year	Historical Data			Estimated Data	Year	Projections					Total	Average
	1999	2000	2001	2002		2003	2004	2005	2006	2007		
Total Billed Sewer Service Tariff Revenue	31,699,575	32,296,882	33,141,411	34,135,653	Total Billed Sewer Service Tariff Revenue	37,108,436	38,263,170	39,633,747	41,654,543	44,045,972	200,705,869	40,141,174
Total Fixed-Charge Revenue	0	0	0	0	Total Fixed-Charge Revenue	0	0	0	0	0	0	0
Total Non-Tariff Revenues	6,997,047	9,726,751	13,805,181	19,054,113	Total Non-Tariff Revenues	19,471,715	21,970,060	25,484,791	27,608,593	29,946,455	124,481,615	24,896,323
Total Revenue	38,696,622	42,023,633	46,946,592	53,189,766	Total Revenue	56,580,151	60,233,230	65,118,538	69,263,137	73,992,427	325,187,484	65,037,497
ercentage Contributions to Total Revenue:					**Percentage Contributions to Total Revenue:**							
Total Billed Sewer Service Tariff Revenue	81.9%	76.9%	70.6%	64.2%	Total Billed Sewer Service Tariff Revenue	65.6%	63.5%	60.9%	60.1%	59.5%		61.9%
Total Fixed-Charge Revenue	0.0%	0.0%	0.0%	0.0%	Total Fixed-Charge Revenue	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
Total Non-Tariff Revenues	18.1%	23.1%	29.4%	35.8%	Total Non-Tariff Revenues	34.4%	36.5%	39.1%	39.9%	40.5%		38.1%
Total Revenue	100.0%	100.0%	100.0%	100.0%	Total Revenue	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%

Table 4.6: Collection Efficiency

Year	Historical Data			Estimated Data	Year	Projections					Total	Average
	1999	2000	2001	2002		2003	2004	2005	2006	2007		
Total Billings:												
Sewer Service Tariff Revenue	31,699,575	32,296,882	33,141,411	34,135,653								
Fixed-Charge Revenue	0	0	0	0								
Total Billings	31,699,575	32,296,882	33,141,411	34,135,653								
Total Collections	27,839,037	29,873,282	36,394,631	28,419,065								
AWGA Collection Efficiency (%)	88%	92%	110%	83%	AWGA Collection Efficiency (%)	91%	92%	93%	94%	95%		93.0%
Sewer Service Revenue Collection	27,839,037	29,873,282	36,394,631	28,419,065								

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Table 5.1: TARIFF ANALYSIS

Table 5.1.1: Calculation of Revenue Requirement and Average Tariff Increase without Debt Service

Year	Historical Data			Estimated Data	Projections					Total	Average (2003-07)
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Total Sewer Service Demand (m3)	276,332,470	279,991,151	290,834,762	299,559,805	309,712,759	319,519,422	331,671,245	352,160,102	378,908,865	1,690,172,194	338,034,439
O&M Costs (LE)	51,581,373	55,095,769	58,883,407	63,169,848	67,344,025	79,368,748	84,464,573	90,532,820	97,271,997	418,960,164	83,792,033
O&M Costs / m3 Demand	0.19	0.20	0.20	0.21	0.22	0.25	0.25	0.26	0.26		0.25
Renewal & Replacement Capital Costs (LE)	7,117,624	13,938,886	8,395,718	9,317,409	18,400,000	19,000,000	19,200,000	19,150,000	19,250,000	95,000,000	19,000,000
Total Costs (LE)	58,698,997	69,034,655	67,279,125	72,987,257	85,744,025	98,368,748	103,664,573	109,682,820	116,521,997	513,960,164	102,792,033
Non-Tariff Revenue Deduction	6,997,047	9,726,751	13,805,181	19,054,113	19,471,715	21,970,060	25,484,791	27,608,593	29,946,455	124,481,615	24,896,323
Fixed-Charge Revenue Deduction	0	0	0	0	0	0	0	0	0	0	0
Cash Requirement from Tariffs	51,701,950	59,307,904	53,473,944	53,933,144	66,272,310	76,386,688	78,169,782	82,074,227	86,575,542	389,478,549	77,895,710
Cash Requirement / m3 Demand	0.19	0.21	0.18	0.18	0.21	0.24	0.24	0.23	0.23		0.23
Average Tariff Increase Factor	163%	184%	161%	156%	179%	200%	197%	197%	197%		194%
Tariff Revenue at Current Tariffs	31,699,575	32,296,882	33,141,411	34,135,653	37,108,436	38,263,170	39,633,747	41,654,543	44,045,972	200,705,869	40,141,174
Average Tariff Revenue at Current Tariffs (LE/m3	0.11	0.12	0.11	0.11	0.12	0.12	0.12	0.12	0.12		0.12
Collection Efficiency Rate	88%	92%	110%	83%	91%	92%	93%	94%	95%		93%
Sewer Tariff Revenue Collection	27,639,037	29,873,282	36,394,831	28,419,065	60,307,802	70,275,753	72,697,897	77,149,773	82,246,765	362,677,991	72,535,598
Cost of AWGA Billing Services (5% of Collections	1,391,952	1,493,664	1,819,732	1,495,740	3,015,390	3,513,788	3,634,895	3,857,489	4,112,338	18,133,900	3,626,780
Net Sewer Tariff Revenue Collection	26,447,085	28,379,618	34,574,899	26,923,325	57,292,412	66,761,965	69,063,002	73,292,284	78,134,427	344,544,091	68,908,818
Average Collection/m3 of Demand	0.10	0.11	0.13	0.09	0.19	0.22	0.22	0.22	0.22		0.21
Net Income at Current Tariffs	-23,862,913	-29,434,622	-17,079,313	-25,514,079	-5,984,508	-6,110,935	-5,471,885	-4,924,454	-4,328,777	-26,800,658	-5,360,112
Revenue Requirement for Break-Even	60,263,595	65,613,179	60,513,780	64,781,972	72,826,715	83,029,009	84,053,529	87,313,007	91,132,150	418,354,409	83,670,882
Average Tariff Required for Positive Cash (LE)	0.22	0.23	0.17	0.22	0.24	0.26	0.25	0.25	0.24		0.25
Average Tariff Increase Factor for Positive Cash	190%	203%	152%	190%	196%	217%	212%	210%	207%		208%

Table 5.1.2: Calculation of Revenue Requirement and Average Tariff Increase with Debt Service *(for illustrative purposes only)*

Year	Historical Data			Estimated Data	Projections					Total	Average (2003-07)
	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Total Sewer Service Demand (m3)	276,332,470	279,991,151	290,834,762	299,559,805	309,712,759	319,519,422	331,871,245	352,160,102	376,908,665	1,690,172,194	338,034,439
O&M Costs (LE)	51,581,373	55,095,769	58,883,407	63,169,848	67,344,025	79,356,748	84,454,573	90,532,820	97,271,997	418,960,164	83,792,033
O&M Costs / m3 Demand	0.19	0.20	0.20	0.21	0.22	0.25	0.25	0.26	0.26	0.25	0.25
Renewal & Replacement Capital Costs (LE)	7,117,624	13,938,886	8,395,718	9,817,409	18,400,000	19,000,000	19,200,000	19,150,000	19,250,000	95,000,000	19,000,000
Debt Service Costs	53,188,955	65,345,624	67,515,774	104,652,919	140,233,798	143,153,566	173,644,571	206,323,126	221,043,992	884,399,053	176,879,811
Total Costs (LE)	111,887,952	134,380,179	134,794,899	177,640,176	225,977,823	241,510,314	277,299,144	316,005,946	337,565,989	1,398,359,217	279,671,843
Non-Tariff Revenue Deduction	6,997,047	9,726,751	13,805,181	19,054,113	19,471,715	21,970,060	25,484,791	27,608,593	29,946,455	124,481,615	24,896,323
Fixed-Charge Revenue Deduction	0	0	0	0	0	0	0	0	0	0	0
Cash Requirement from Tariffs	104,890,905	124,653,428	120,989,718	158,586,063	206,506,108	219,540,254	251,814,353	288,397,353	307,619,535	1,273,877,602	254,775,520
Cash Requirement / m3 Demand	0.38	0.45	0.42	0.53	0.67	0.69	0.76	0.82	0.82	0.75	0.75
Average Tariff Increase Factor	331%	386%	365%	465%	556%	574%	635%	692%	698%	635%	631%
Tariff Revenue at Current Tariffs	31,699,575	32,296,882	33,141,411	34,135,653	37,108,436	38,263,170	39,633,747	41,654,543	44,045,972	200,705,869	40,141,174
Average Tariff Revenue at Current Tariffs (LE/m3	0.11	0.12	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Collection Efficiency Rate	88%	92%	110%	83%	91%	92%	93%	94%	95%	93%	93%
Sewer Tariff Revenue Collection	27,839,037	29,873,282	36,394,631	28,419,065	187,920,558	201,977,033	234,187,348	271,093,511	292,238,558	1,187,417,009	237,483,402
Cost of AWGA Billing Services (5% of Collections	1,391,952	1,493,664	1,819,732	1,420,953	9,396,028	10,098,852	11,709,367	13,554,676	14,611,928	59,370,850	11,874,170
Net Sewer Tariff Revenue Collection	26,447,085	28,379,618	34,574,899	26,998,112	178,524,530	191,878,182	222,477,981	257,538,836	277,626,630	1,128,046,159	225,609,232
Average Collection/m3 of Demand	0.10	0.11	0.13	0.09	0.61	0.63	0.71	0.77	0.78	0.70	0.70
Net Income at Current Tariffs	-77,051,868	-94,780,146	-84,595,087	-130,166,998	-18,585,550	-17,563,220	-17,627,005	-17,303,841	-15,380,977	-86,460,593	-17,292,119
Revenue Requirement for Break-Even	120,828,451	136,260,142	111,994,497	191,907,121	236,325,817	248,729,562	282,477,489	320,360,370	338,421,964	1,426,315,202	285,263,040
Average Tariff Required for Positive Cash (LE)	0.44	0.49	0.39	0.64	0.76	0.78	0.85	0.91	0.90	0.84	0.84
Average Tariff Increase Factor for Positive Cash	381%	422%	338%	562%	637%	650%	713%	769%	768%	711%	707%

Table 6: Average Class Tariff Planning Worksheet

Table 6.1: Historical Tariffs

Year	Historical Data			Estimated Data
	1999	2000	2001	2002
Annual Tariff Increase for Minimum Usage Class				
Domestic - Minimum Use	0.000	0.000	0.000	0.000
Annual Tariff Increase for All Other Classes				
Domestic - up to 30 m3/month	0.081	0.081	0.081	0.081
Domestic - Over 30 m3/month	0.105	0.105	0.105	0.105
Service (50% Discount)	0.147	0.147	0.147	0.147
Service (75% Discount)	0.168	0.168	0.168	0.168
Service (No Discount)	0.168	0.168	0.168	0.168
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	0.210	0.210	0.210	0.210
Small Industry (factories & workshops, garages, mills, bakeries)	0.300	0.300	0.300	0.300
Large Factories	0.320	0.320	0.320	0.320
Investment (private hospitals, investment companies, free zones)	0.357	0.357	0.357	0.357
Tourism (five-star hotels and restaurants)	0.510	0.510	0.510	0.510
Government - Local government	0.168	0.168	0.168	0.168
Government - Agencies and Companies	0.240	0.240	0.240	0.240
AAA	0.000	0.000	0.000	0.000
Average Tariff	**0.11**	**0.12**	**0.11**	**0.11**

Table 6.1: Proposed Average Tariffs (Cost-Recovery without Debt Service)

Year	Projections						Average Year
	2003	2004	2005	2006	2007		
Annual Tariff Increase for Minimum Usage Class							
Domestic - Minimum Use	0.081	0.081	0.081	0.081	0.081		0.081
Annual Tariff Increase for All Other Classes							
	80%	0%	33%	0%	0%		
Domestic - up to 30 m3/month	0.145	0.145	0.193	0.193	0.193		0.174
Domestic - Over 30 m3/month	0.189	0.189	0.251	0.251	0.251		0.226
Service (50% Discount)	0.265	0.265	0.352	0.352	0.352		0.317
Service (75% Discount)	0.302	0.302	0.402	0.402	0.402		0.362
Service (No Discount)	0.302	0.302	0.402	0.402	0.402		0.362
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	0.378	0.378	0.503	0.503	0.503		0.453
Small Industry (factories & workshops, garages, mills, bakeries)	0.540	0.540	0.718	0.718	0.718		0.647
Large Factories	0.576	0.576	0.766	0.766	0.766		0.690
Investment (private hospitals, investment companies, free zones)	0.643	0.643	0.855	0.855	0.855		0.770
Tourism (five-star hotels and restaurants)	0.918	0.918	1.221	1.221	1.221		1.100
Government - Local government	0.302	0.302	0.402	0.402	0.402		0.362
Government - Agencies and Companies	0.432	0.432	0.575	0.575	0.575		0.518
AAA	0.000	0.000	0.000	0.000	0.000		0.000
Average Tariff	**0.21**	**0.21**	**0.28**	**0.27**	**0.27**		0.249

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Table 6.2: Historical Tariff Revenue

Year	Historical Data			Estimated Data
	1999	2000	2001	2002
Domestic - Minimum Use	0	0	0	0
Domestic - up to 30 m3/month	12,819,093	12,946,781	13,448,945	13,852,413
Domestic - Over 30 m3/month	3,954,355	4,025,808	4,424,615	4,557,353
Service (50% Discount)	228,667	245,446	272,525	280,701
Service (75% Discount)	329,990	222,087	149,045	153,516
Service (No Discount)	10,814	8,526	8,648	8,908
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	3,124,719	3,324,169	3,523,574	3,629,281
Small Industry (factories & workshops, garages, mills, bakeries)	550,419	606,523	636,581	657,739
Large Factories	4,556,056	4,251,830	4,037,004	4,158,114
Investment (private hospitals, investment companies, free zones)	992,400	1,553,120	1,389,132	1,430,806
Tourism (five-star hotels and restaurants)	76,801	60,880	177,370	182,691
Government - Local government	107,804	125,123	123,926	127,643
Government - Agencies and Companies	4,948,436	4,927,589	4,948,046	5,096,488
AAA	0	0	0	0
Total Tariff Revenue	31,699,575	32,296,882	33,141,411	34,135,653
Surplus/Deficit (Without Debt Service)	(28,564,020)	(33,316,298)	(17,372,370)	(30,646,319)
Surplus (Deficit) as Percentage of Costs	-47%	-51%	-34%	-47%

Table 6.2: Projected Tariff Revenue

Year	Projections					Total	Average Year
	2003	2004	2005	2006	2007		
Domestic - Minimum Use	1,865,638	1,926,379	2,009,789	2,165,774	2,362,104	10,329,685	2,065,937
Domestic - up to 30 m3/month	25,831,910	26,672,942	37,011,034	39,883,570	43,499,061	172,898,517	34,579,703
Domestic - Over 30 m3/month	8,449,332	8,702,812	11,921,983	12,279,642	12,648,031	54,001,801	10,800,360
Service (50% Discount)	520,419	536,032	734,310	756,339	779,029	3,326,128	665,226
Service (75% Discount)	284,619	293,157	401,596	413,644	426,053	1,819,070	363,814
Service (No Discount)	16,515	17,010	23,303	24,002	24,722	105,551	21,110
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	6,728,688	6,930,546	9,494,158	9,778,983	10,072,353	43,004,731	8,600,946
Small Industry (factories & workshops, garages, mills, bakeries)	1,219,447	1,256,031	1,720,637	1,772,256	1,825,423	7,793,794	1,558,759
Large Factories	7,709,143	7,940,418	10,877,578	11,203,905	11,540,023	49,271,067	9,854,213
Investment (private hospitals, investment companies, free zones)	2,652,715	2,732,296	3,742,973	3,855,262	3,970,920	16,954,165	3,390,833
Tourism (five-star hotels and restaurants)	338,709	348,870	477,918	492,255	507,023	2,164,775	432,955
Government - Local government	236,651	243,751	333,914	343,931	354,249	1,512,496	302,499
Government - Agencies and Companies	9,448,886	9,732,355	13,332,353	13,732,324	14,144,293	60,390,214	12,078,043
AAA	0	0	0	0	0	0	0
Total Tariff Revenue	65,302,675	67,332,602	92,081,545	96,701,887	102,153,284	84,714,399	84,714,399
Surplus/Deficit (Without Debt Service)	(7,524,039)	(15,696,407)	8,028,016	9,388,880	11,021,135	5,217,585	1,043,517
Surplus (Deficit) as Percentage of Costs	-10%	-19%	10%	11%	12%		1%

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AGOSD Rates Summary (2003-2007)							
Class/Block	2002 (Current)	2003	2004	2005	2006	2007	Average (2003-2007)
	LE/m3						
Domestic - Minimum Use	0.00	0.08	0.08	0.08	0.08	0.08	0.13
Domestic - up to 30 m3/month	0.08	0.14	0.14	0.19	0.19	0.19	0.20
Domestic - Over 30 m3/month	0.11	0.19	0.19	0.25	0.25	0.25	0.27
Service (50% Discount)	0.15	0.26	0.26	0.35	0.35	0.35	0.34
Service (75% Discount)	0.17	0.30	0.30	0.40	0.40	0.40	0.36
Service (No Discount)	0.17	0.30	0.30	0.40	0.40	0.40	0.41
Small Commercial: (Cafes, filling stations, 2 & 3 star hotels, private schools, HIO hospitals & construction)	0.21	0.38	0.38	0.50	0.50	0.50	0.55
Small Industry (factories & workshops, garages, mills, bakeries)	0.30	0.54	0.54	0.72	0.72	0.72	0.67
Large Factories	0.32	0.58	0.58	0.77	0.77	0.77	0.73
Investment (private hospitals, investment companies, free zones)	0.36	0.64	0.64	0.85	0.85	0.85	0.93
Tourism (five-star hotels and restaurants)	0.51	0.92	0.92	1.22	1.22	1.22	0.73
Government - Local government	0.17	0.30	0.30	0.40	0.40	0.40	0.44
Government - Agencies and Companies	0.24	0.43	0.43	0.57	0.57	0.57	0.52

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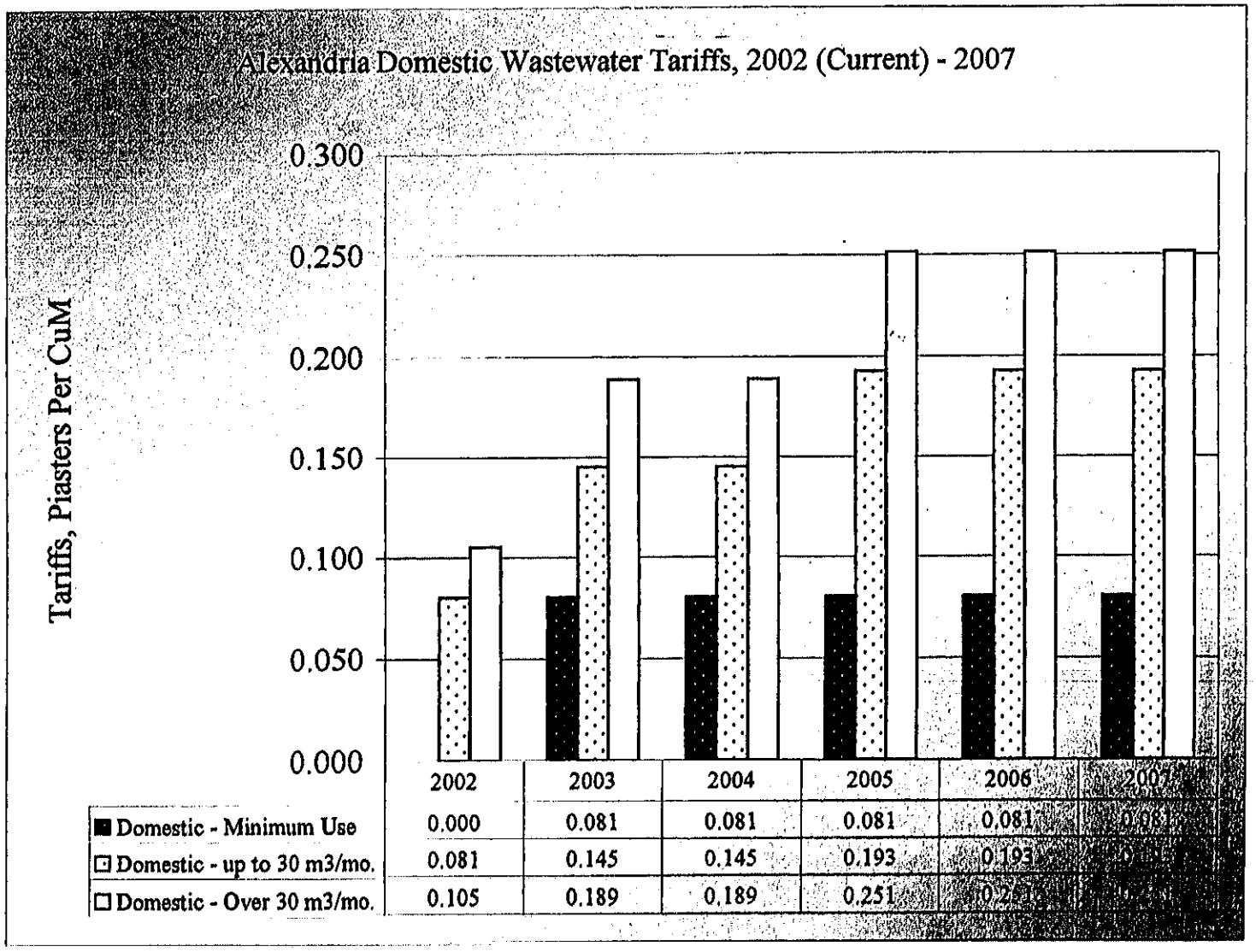

	2002	2003	2004	2005	2006	2007
Domestic - Minimum Use	0.000	0.081	0.081	0.081	0.081	0.081
Domestic - up to 30 m3/mo.	0.081	0.145	0.145	0.193	0.193	[illegible]
Domestic - Over 30 m3/mo.	0.105	0.189	0.189	0.251	[illegible]	[illegible]

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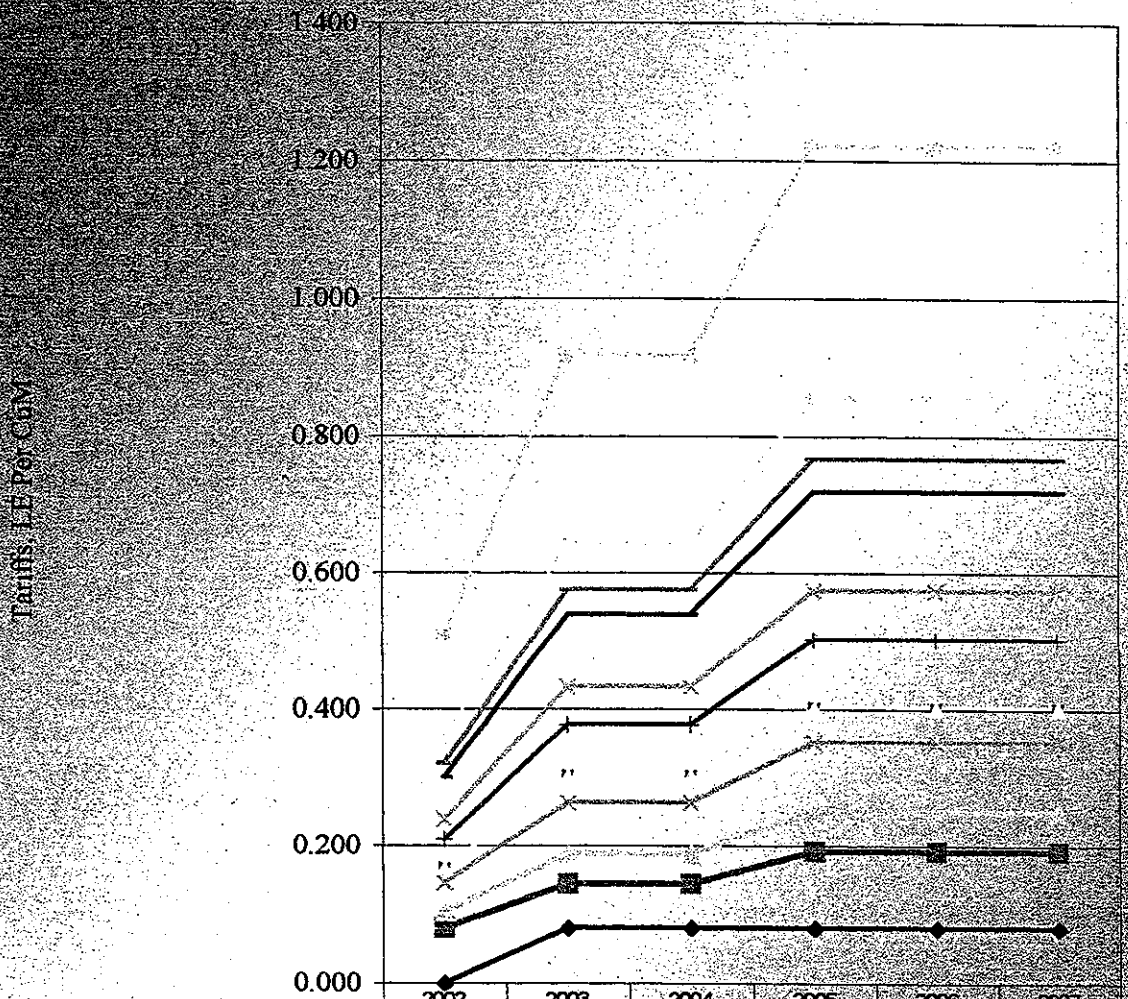
Alexandria Wastewater Tariffs, 2002 (Current) - 2007



	2002	2003	2004	2005	2006	2007
Domestic - Minimum Use	0.000	0.081	0.081	0.081	0.081	0.081
Domestic - up to 30 m3/month	0.081	0.145	0.145	0.193	0.193	0.193
Domestic - Over 30 m3/month	0.105	0.189	0.189	0.251	0.251	0.251
Service (50% Discount)	0.147	0.265	0.265	0.352	0.352	0.352
Service (75% Discount)	0.168	0.302	0.302	0.402	0.402	0.402
Service (No Discount)	0.168	0.302	0.302	0.402	0.402	0.402
Small Commercial	0.210	0.378	0.378	0.503	0.503	0.503
Small Industry	0.300	0.540	0.540	0.718	0.718	0.718
Large Factories	0.320	0.576	0.576	0.766	0.766	0.766
Investment	0.357	0.643	0.643	0.855	0.855	0.855
Tourism	0.510	0.918	0.918	1.221	1.221	1.221
Government - Local	0.168	0.302	0.302	0.402	0.402	0.402
Government - Agencies	0.240	0.432	0.432	0.575	0.575	0.575

The Arabic Republic of Egypt
Ministry of Housing, Utilities and Urban Communities

Legal, Institutional, and Regulatory Reform of the Water/Wastewater Sector in Egypt (LIRR II)

A USAID-funded Project

CONCEPT PAPER: CDPSP AND EWRA COORDINATION

July 2002

CHEMONICS

THE INSTITUTE FOR PUBLIC-PRIVATE PARTNERSHIPS

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ACRONYMS

CDPSP	Central Department for Private Sector Projects
GOE	Government of Egypt
EWRA	Egyptian Water/Wastewater Sector Regulatory Agency
KPI	Key Performance Indicators
LGU	Local Government Unit
LIRR-I	Legal, Institutional and Regulatory Reform I Project
LIRR-II	Legal, Institutional and Regulatory Reform II Project
MHUUC	Ministry of Housing, Utilities and Urban Communities
PBAC	Pre-qualification, Bids, and Awards Committee
PDF	Project Development Fund
PEA	Public Economic Authority
PIRR	Proposed Implementing Rules and Regulations (CDPSP)
PSP	Private-Sector Participation
W/WW	Water and Wastewater

Concept Paper: Central Department for Private Sector Projects – Egyptian Water/Water Sector Regulatory Agency Coordination

A. Introduction

This concept paper identifies areas requiring coordination between the proposed Egyptian Water/Wastewater Sector Regulatory Agency (EWRA) and the Central Department for Private Sector Projects (CDPSP), and provides recommendations for enhancing the relationship and clarifying the respective roles of the two agencies.

A1. EWRA – The Regulator

The Legal, Institutional and Regulatory Reform I (LIRR-I) Project developed a concept for the EWRA and drafted a proposed Presidential Decree to establish the EWRA and rationalize the water/wastewater (W/WW) sector. The role of the EWRA is to regulate the sector with the objective of achieving the sector goal of improved service, and economic and financial performance. These concept materials are found in Volume I, Preliminary Design of Regulatory Agency, of the LIRR-I Final Report, submitted in November 2000 (Preliminary Design).

Subsequently, the legislative strategy has been revised. Under the revised strategy, the EWRA will be organized under a Presidential Decree (Draft Revised EWRA Presidential Decree) issued pursuant to a new Concession Law and Regulatory Law (Law)[1]. The EWRA organized under the Draft Revised EWRA Presidential Decree to be issued pursuant to the Law will retain the same key provisions as those originally contemplated for the EWRA in the Preliminary Design[2].

To date, the EWRA has not yet been formally established.

A2. CDPSP – The Facilitator

The CDPSP was established in February 2001 by Ministerial Decree 41/2001 (the CDPSP Decree) to attract and promote private-sector participation (PSP) in the sector, as part of a strategy for achieving the sector goal of improved service, economic and financial performance. The founding principles of the CDPSP and its responsibilities are set-out in the CDPSP Decree. The CDPSP's procedures recommended by Legal, Institutional and Regulatory Reform II (LIRR-II) build upon the foundation established in the CDPSP Decree, and are found in the CDPSP supporting materials (CDPSP Supporting Documents) listed in Table 1.

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[1] Draft Law on Grant of Concessions for Water/Wastewater Utilities and on Establishment of an Agency for Water/Wastewater Sector Regulation and Customer Protection.

[2] The draft Presidential Decree organizing the EWRA pursuant to the Law has been prepared but not formally submitted to the MHUUC. This report refers to the revised version of the Presidential Decree as the Draft Revised EWRA Presidential Decree.

Table 1: CDPSP Supporting Documents

• CDPSP Mission and Role, Project Life-Cycle Toolkit, Volume I, Section I (May 2002) • CDPSP Role in the Project Life-Cycle, Toolkit, Volume I, Section II (May 2002) • Proposed Implementing Rules and Regulations, CDPSP (PIRR) (May 2002)

The Ministry of Housing, Utilities, and Urban Communities (MHUUC) has seconded to the CDPSP an Executive Director and several staff members. The CDPSP's Project Life-Cycle Toolkit provides guidelines for, and models of, procurement procedures, tender documents, and contracts, as well as other useful background information for use by sponsoring utilities, any other project-tendering agencies and private-sector bidders on projects.

Further, the *Proposed Implementing Rules and Regulations* (PIRR) outlines proposed CDPSP project development procedures to be followed by sponsoring utilities, any other project-tendering agencies and the private sector for establishing and monitoring PSP projects.

The CDPSP supporting documents have not yet been formally adopted by the MHUUC, but are consistent with the vision of the CDPSP outlined in the CDPSP Decree.

A3. Coordination

This concept paper identifies (a) provisions of the Preliminary Design of the EWRA and the Draft Revised EWRA Presidential Decree relevant to the EWRA's relationship to the CDPSP and (b) provisions of the CDPSP Decree and CDPSP supporting documents that are relevant to the CDPSP's working relationship with the proposed EWRA. The concept paper suggests how to promote coordination between the two agencies.

In broad terms, the EWRA has primacy in the relationship with the CDPSP because the EWRA regulates PSP in the W/WW sector. Accordingly, all CDPSP procedures and projects that the CDPSP helps develop have to meet EWRA criteria, and have to fit in with the sponsoring utilities' compliance with Government of Egypt (GOE) sector objectives and EWRA regulations. With this primacy in mind, the concept paper focuses on encouraging and institutionalizing communication and coordination between the EWRA and the CDPSP.

B. Background – The Roles and Responsibilities of the EWRA and the CDPSP

The stated purposes and goals of the EWRA and the CDPSP are complementary:

- The EWRA regulates the sector (including PSP) in accordance with GOE policy; and
- The CDPSP facilitates PSP development of new PSP projects, as well as management of existing facilities, in compliance with W/WW sector policies and strategies.

B1. Goals of the EWRA and the CDPSP

With respect to the EWRA, the Draft Revised EWRA Presidential Decree states[3]:

> The goal of the Agency [EWRA] is to regulate the water/wastewater sector in such a way as to enable and encourage concerned utilities to achieve a higher level of performance and cost recovery and enhance their capacities for self-finance. In particular the Agency shall seek to:
> 1. ensure the satisfaction of demand for water/wastewater services and the needs for all consumers…at the most reasonable prices;
> 2. promote and regulate private sector participation in investment in the water/wastewater sector; and
> 3. ensure that water/wastewater production entities and service providers in the sector comply with definite quality and performance standards.

The CDPSP Decree establishes the CDPSP as the entity responsible for facilitating the development and management of PSP in the W/WW sector[4]:

> CDPSP will be established with the purpose of attracting and promoting private-sector participation in the establishment and execution of W/WW projects, and management [monitoring] of existing utilities [PSP contracts]. The CDPSP will plan and coordinate inter-governmental relations in order to facilitate private sector participation in W/WW projects, on the national level, in compliance with W/WW sector policies and strategies.

B2. Responsibilities of the EWRA and CDPSP

A comparison of responsibilities of the two agencies demonstrates similar complementarity, and that the development and management of PSP projects should be within the framework of, and consistent with, the policies for the sector. This recognizes that PSP projects are established to supply and service the regulated utilities. Accordingly, any PSP projects supplying and servicing utilities should have a positive impact on – or at least not adversely interfere with - the utilities' compliance with EWRA regulations and efforts to achieve sector objectives.

Specifically, the Draft Revised EWRA Presidential Decree indicates[5]:

> The Agency will be responsible for the regulation of the W/WW sector and the enhancement of the technical, economic and financial performance of all utilities. To this end it shall have the following responsibilities:
> 1. develop criteria for utility technical, economic and financial performance; determine the procedures and periodicities of reports submitted by entities working in the sector and control, and audit procedures of the EWRA;
> 2. provide technical assistance to the utilities in terms of preparation of studies on the basis of which target performance levels are determined;

[3] Article I
[4] Article I
[5] Article II

3. set principles and controls for preparing cost studies, tariff setting and procedures for submitting and evaluating of tariff adjustment applications according to the policies developed by the Inter-ministerial Policy Coordinating Committee and send the same to the economic authorities and companies for preparation and tariff proposals;
4. examine, review and approve tariff adjustment applications submitted by W/WW utilities, and determine the economic cost of service at the level of each utility;
5. review and approve five-year plans prepared by each utility, which shall specify the annual target percentage of cost recovery. These plans should aim for the highest degree of cost recovery compatible with the economic conditions of each utility…;
6. review the wording of standard contracts and agreements which structure the reciprocal relationships between service providers and customers;
7. monitor compliance of utilities with technical, economic and financial performance criteria;
8. review the financial and economic feasibility of new projects to evaluate expected impacts on the cost and price of W/WW service delivery;
9. issue required operating licenses for W/WW facilities; and
10. determine procedural and executive steps necessary for initiating the transformation of Public Economic Authorities (PEAs) and companies working in the sector into private joint-stock companies.

The CDPSP Decree sets-out the CDPSP's responsibilities[6]:

CDPSP shall be responsible for the following tasks:

1. determining the conditions and controls that regulate private sector participation in water and wastewater projects in compliance with W/WW sector policies and strategies;
2. developing and regulating procedures for the preparation of PSP project pre-feasibility studies and assigning priorities to these projects;
3. developing and regulating procedures for the preparation of pre-qualification and tendering documents and contract forms;
4. providing investors with all the data concerning opportunities for private sector participation, including laws and regulations organizing investment in the sector; and
5. providing necessary technical assistance to authorities and companies working in the sector during the stages of planning, tendering and implementation of projects executed with PSP. CDPSP may prepare pre-feasibility studies, researches, outlines and designs as well as manage tendering, awarding and contracting of a specific project… It may seek assistance from other entities based on the nature of the project.

[6] Article II

C. Areas of Interaction between the EWRA and the CDPSP

There are a number of areas in which the missions and responsibilities of the EWRA and the CDPSP should be coordinated. Each of these is identified below, along with the relevant provisions of the Preliminary Design, Draft Revised EWRA Presidential Decree, CDPSP Decree and the CDPSP supporting documents, and proposed solutions to reconcile and harmonize the roles of the EWRA and the CDPSP.

The EWRA is responsible for regulating both public and private providers of water and wastewater services in Egypt. Accordingly, as indicated in the Introduction, the EWRA has primacy in the relationship between it and the CDPSP. To maximize communications and coordination, LIRR-II recommends that an *ad-hoc* PSP Liaison Unit be created within the EWRA. As elaborated upon in this section, the Unit would be responsible for coordinating EWRA review activities of CDPSP overall, as well as specific project, conditions, controls and procedures. This section makes specific recommendations about some of the more important areas for coordination.

C1. PSP Project Review

C1.1 EWRA

The Draft Revised EWRA Presidential Decree makes it clear that the EWRA is not only responsible for post-award monitoring of any PSP project but should also be involved at an early stage of the PSP review process. The Draft Revised EWRA Presidential Decree indicates that the EWRA is charged with reviewing the project plans submitted by both public and private-sector entities to:

- assess their impact on prices;
- ensure that the investment levels do not exceed demand; and
- determine the conditions under which agreed tariffs may be adjusted.

To ensure that both the EWRA and the CDPSP fulfill their roles, there should be a significant amount of interaction between them. The EWRA should be involved in PSP activities to the extent that the EWRA is involved in the conception of any project to ensure that it is appropriately sized, and assess its possible impact on prices to the end users.

We also suggest a 'sign-off' by the EWRA prior to a proposed PSP project being selected for bidding and tendering. Additionally, for those projects that are slated to move ahead, the EWRA should be closely involved (again, with a sign-off authority) in the rate-setting and resetting (during the contract term) mechanism to ensure that rates agreed upon in the original contract are re-evaluated during the contract term.

C1.2 CDPSP

Consistent with the foundation laid-down by the CDPSP Decree, the CDPSP supporting documents describe the CDPSP's lead role in supervising the screening, selection and preparation of PSP projects in Egypt's W/WW sector, including reviewing planned PSP projects

at critical junctures. The CDPSP Supporting Documents solidify the CDPSP's position by anticipating that a major mechanism through which the CDPSP will exercise authority is the CDPSP's role in recommending projects for funding by the Project Development Fund (PDF), but state that PSP projects will require CDPSP involvement even if PDF funding is not sought. The PIRR proposes[7]:

> A significant degree of the CDPSP's authority comes through its funding recommendations to the PDF and its review and recommendation responsibilities regarding the use of PDF funds. However, some utilities or development agencies in the MHUUC may elect to undertake project-development activities without PDF involvement. In those cases, GOE regulations still provide for reviews and approvals recommendations by the CDPSP at the times of contractor selection and contract award. CDPSP involvement at these times is mandatory for such projects to obtain final GOE approval and other needed authorizations, permits, or licenses.

The PIRR further emphasizes[8]:

> The CDPSP has the *lead role in project-screening*, in response to requests from sponsoring utilities, as the first step in overall project-specific compliance-assurance and "quality control," and in decision-making regarding the use of PDF funding. (Emphasis added)

C1.3 Importance of Coordination

Coordination between the EWRA and the CDPSP during PSP project preparation is essential for the creation of a credible, transparent, and stable post-award regulatory environment. Coordination is particularly important in the areas of:

- Provisions for tariff and price setting and adjustment;
- Development of service standards and performance targets;
- Long-term planning and development;
- Reporting requirements; and
- Dispute resolution.

Lack of coordination between the EWRA and CDPSP during project design may result in a transaction structure that fosters a hostile environment between the EWRA and the private operator. Not only will this reduce the effectiveness of individual transactions, but it will deter other private investors from entering the Egyptian market.

C1.4 Recommendations

There are a number of methods for facilitating the coordination between EWRA and CDPSP during the PSP project development process:

[7] Section A1
[8] Section B4

- LIRR-II recommends that an *ad-hoc* PSP Liaison Unit be created within the EWRA. The current pace of PSP in Egypt does not warrant the establishment of a full time PSP Division within EWRA. Rather, an ad-hoc Unit could be assembled when needed to work closely with CDPSP in reviewing proposed PSP projects. The unit's primary responsibilities would include reviewing (for EWRA sign-off):
    - service quality as well as tariff, economic, and financial impact of the proposed PSP project on the sponsoring utility;
    - PSP contract provisions relating to tariff and price setting, and adjustment to ensure their compliance with EWRA rules and procedures;
    - PSP contract provisions relating to service standards and performance targets to ensure that they meet the minimum standards required under Egyptian laws and regulations;
    - PSP contract provisions and tender documents relating to long-term planning and capital investment to ensure that investments keep pace with, but do not exceed projected demand;
    - reporting requirements for private operators to ensure that they will provide the EWRA with the information it requires to effectively carry out its regulatory mandate; and
    - procedures for dispute resolution and consumer complaint resolution to ensure that they comply with EWRA rules and procedures.

- While the PSP Liaison Unit will be an *ad-hoc* unit housed within EWRA, we recommend that it hold regular meetings (quarterly, initially) to which representatives of the CDPSP are invited. Specifically, unit meetings should be attended by representatives of the CDPSP's Financial and Economic Division (responsible for establishing private-sector participation financial and economic policies and standards), Legal Unit (responsible for staying current on GOE laws and regulations and international best practices, and assuring that tenders comply with GOE policies, regulations, and guidelines), and the General Department for Transaction Support's Department for Tendering and Contracting.

- A representative of EWRA should be appointed to serve as a member of any Prequalification, Bids, and Awards Committee (PBAC) convened by the CDPSP. Section 3.1 ("Composition") of the PIRR allows for the inclusion of "One technical officer knowledgeable about aspects or requirements of the project from a concerned regulatory body, when applicable, to be invited by the concerned agency on a project-by-project basis: Member (non-voting)." Rather than leave the appointment of an EWRA representative to the discretion of the "concerned agency," we recommend that EWRA participation in PBAC's be compulsory, and that the EWRA representative be selected from the agency's PSP Liaison Unit.

C2. Establishing Guidelines for the Preparation and Tendering of PSP Projects

C2.1 Critical Role of EWRA

An important role of the EWRA will be servicing the requirements of the CDPSP. The Draft Revised EWRA Presidential Decree envisages that the *EWRA regulates the CDPSP's activities,*

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particularly with respect to reviewing financial and economic feasibility of new projects (an explicit EWRA responsibility), and in that connection, regulates the CDPSP responsibilities of establishing procedures for conducting pre-feasibility studies, and once feasibility has been established, proceeding with regulation of procedures for pre-qualification and tendering for utility concessions, as well as promulgation of draft model contract forms.

This assigns the EWRA a critical oversight role in the development and application of guidelines for project preparation and tendering. The PIRR closely tie the project-procurement process and contract-monitoring to the model procurement documents, guidelines, and contracts presented in the Project Life-Cycle Toolkit. Inasmuch as there is not at this time an operational EWRA, the guidelines and models do not describe a direct role for the EWRA; "regulation by contract" is the implied modus operandi.

C2.2 Recommendations

Many of the model procurement documents, guidelines, and contracts to be used by the CDPSP have already been developed under LIRR-II, and are found in the Project Life-Cycle Toolkit. LIRR-II recommends that upon establishment of the EWRA, that agency be provided an opportunity to review these documents, provide comments, and suggest modifications. At that time, the documents can be finalized by the CDPSP, taking into account EWRA comments and feedback where appropriate.

C3. Granting of Permits, Licenses and Authorizations for PSP Projects

C3.1 EWRA and CDPSP Interaction

EWRA's responsibilities as described in the Draft Revised EWRA Presidential Decree include[9]:

- Approving permits to operate water and wastewater plants;
- Enforcing the terms and conditions of licenses and taking "necessary measures" in the case of violation of licensing conditions, including revocation; and
- Deciding the fees to be charged for licenses and permits.

Section B2 of the PIRR lists among the CDPSP's primary responsibilities "coordinating/ facilitating the process of obtaining project-specific GOE permits, licenses, and authorizations." Interaction between the two agencies will be required.

C3.2 Recommendations

Within the CDPSP, primary responsibility for facilitating and coordinating project approvals, permits, and licensing among the various pertinent GOE departments and ministries rests with the Legal Division. We recommend that all requests or applications for approvals, permits, and licenses on the part of private operators be submitted to the CDPSP, which will then forward those requests and applications on to the relevant GOE department or ministry (or the EWRA) on behalf of the private operator. In this manner, coordination between EWRA and the CDPSP

[9] Article 4

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will be streamlined, with EWRA having a central point of contact for all requests and applications for approvals, permits or licenses.

C4 Post-Award Monitoring and Regulation

C4.1 EWRA and CDPSP Interaction

The Draft Revised EWRA Presidential Decree articulates the goals of the EWRA in Article I, specifically stating that the EWRA shall "Promote and regulate private sector participation in investment in the W/WW sector." This mandate establishes EWRA as the GOE agency with primary responsibility for post-award monitoring and regulation of PSP contracts in the water and wastewater sector.

While the Decree provides EWRA with a mandate for post-award monitoring and regulation, it does not detail EWRA's role in establishing the procedures for monitoring during PSP project development. The PIRR contemplates a clear mandate for the CDPSP to establish Contract Monitoring Plans for private operators. This mandate is elaborated upon in the PIRR[10], which states:

> A final Contract Monitoring Plan shall be negotiated by the concerned Agency/Local Government Unit (LGU) and the concessionaire and cover at least the following major aspects of the project:
>
> - Concessionaire's technical performance;
> - Financial matters;
> - Legal compliance and administrative effectiveness;
> - Any Key Performance Indicators (KPIs) that specifically pertain to the project; and
> - Annual Work Plan.

Given EWRA's role in post-award monitoring and regulation, it is critical that EWRA be involved in reviewing the Contract Monitoring Plan.

C4.2 Recommendations

We recommend that EWRA review of Contract Monitoring Plans be compulsory. The vehicle through which this review can occur is the PSP Liaison Unit of the EWRA.

D. Conclusion

The EWRA and the CDPSP are linked because the EWRA is responsible for regulating the sector, including PSP, and the CDPSP is responsible for facilitating the development and management of PSP in the sector. An *ad-hoc* PSP Liaison Unit should be established within the EWRA to coordinate the EWRA's review of CDPSP activities, both as they relate to overall control of PSP, as well as specific projects. Once the EWRA is established, it is important that the EWRA review procedures and model documents already developed by the CDPSP.

[10] Section 12.2 ("Contract Monitoring Plan")

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