PN-ACU-023

EGYPT
WATER AND WASTEWATER SECTOR
(SELECTED UTILITIES)
DEBT RESTRUCTURING STUDY

USER'S GUIDE FOR THE AWGA, AGOSD AND BEHEIRA FINANCIAL PLANNING MODELS

Funded by:

United States Agency for International Development

Prepared by:

FORWARD

Development Alternatives, Inc.
Environmental Quality International (EQI)

February 2002

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USER'S GUIDE FOR THE AWGA, AGOSD AND BEHEIRA FINANCIAL PLANNING MODELS

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1.0 BACKGROUND

The Government of Egypt (GoE) and its water and wastewater utilities are facing many diverse financial issues in the provision of utility service that warranted an assessment of its current and prospective cost of service, achievable efficiencies and tariffs, and an affordable level of capital debt.

In response to this need, the USAID commissioned the FORWARD Program in March 2000 to develop "what-if" financial planning models for the Alexandria Water General Authority (AWGA), the Alexandria General Organization for Sanitary Drainage (AGOSD) and the Beheira Water and Sanitary Drainage Company (Beheira). The "what-if" models, developed on an Excel electronic spreadsheet, will allow for the testing a wide variety of future utility performance and resulting implications for debt restructuring.

(AWGA), AGOSD, and Beheira were targeted as case studies for possible debt restructuring given the extent of available data and capability strengthening programs in progress. In March 2001, an early version of the model was reviewed with USAID and Alexandria contractor staff. In April 2001, a draft version of the model was provided to USAID for review, and the final version was presented to the Steering Committee and USAID in November 2001. The final financial model as discussed in this manual, therefore, has incorporated any and all comments provided to FORWARD by the GoE and USAID.

This report serves as a user guide for the model, describing its capabilities, limitations, overall structure, inputs, logic and flow of data, key calculations, modification techniques, and maintenance. It should be mentioned that every single aspect of the model will not be detailed in this users guide, as most of the logic, formulae, and links are straightforward. Key formulae will also be described in an intuitive fashion as the real model formulae simply reference cell locations and values.

2.0 MODEL DESIGN

2.1 MODEL GOALS, CAPABILITIES, AND LIMITATIONS

The primary goal in developing the "what-if" financial planning model was to give the GoE the ability to forecast the financial outcome of potential utility reform, efficiency, and tariff programs over a five-year period and to then ascertain the extent of debt that could be afforded in meeting targeted financial goals of the government. The model described, herein, meets this goal and should provide the GoE, USAID, and its contractors with a flexible and powerful tool for near- and long-term utility financial planning.

It should be emphasized, however, that the model is a not detailed systems operations model, nor a detailed accounting program suitable for monthly cash flow management, nor a utility tariff design model. Its focus is on an annual basis and at a level of detail suitable for forecasting major expenses and revenues. The model is generally suitable for forecasting the annual revenue requirements of the utility that could then provide the target revenue for a subsequent, more detailed study of appropriate tariff structure design needed to produce those revenues.

2.2 MODELING SOFTWARE AND SYSTEM REQUIREMENTS

The model was developed using the Microsoft Excel 7.0 electronic 3-D spreadsheet software. This modern software allowed each model to be developed in easy-to-understand logical planning and financial modules assigned to individual worksheets (pages) of a workbook. Because of similarity in the cost-accounting structure, this 3-D layering of similarly-designed pages facilitated model creation and editing, as well as allowing for the addition or deletion of new cost centers as the need arises over time. In addition, most importantly, the use of the electronic spreadsheet tool greatly facilitates the conduct of *"what-if" analyses,* so critical in evaluating future courses of action.

Minimum hardware system requirements recommended for the model's operation is a PC with at least 133 MHz Pentium processor with 64 MB RAM. Also recommended is access to a color printer to allow for the printing of informative "colorized" tables and graphs from the model. Software that allows for file compression and de-compression (zipping and un-zipping) of large files is recommended for easier file transfer to other computers.

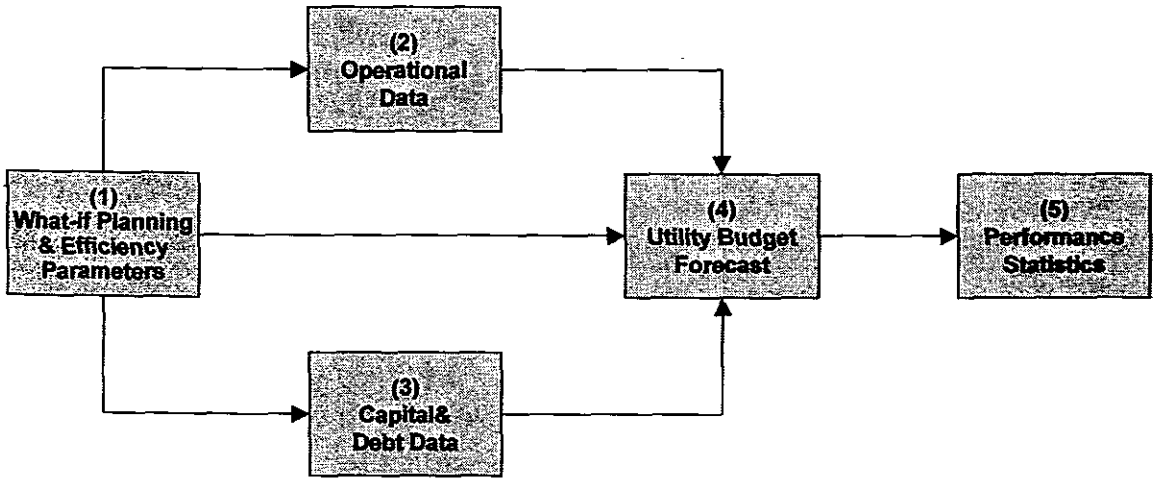
2.3 MODEL OVERVIEW

The Alexandria water and wastewater financial planning and debt assessment model comprises one Excel workbook and is subdivided into two separate worksheets, one for AWGA and one for AGOSD. Data links exist between two individual worksheets within the model. To the extent possible, care was taken in the model design to develop standard cost accounts and model parameters for each utility and to structure the spreadsheet tables,

where possible, in similar order and format. This was done to allow for easier understanding and editing of the models' structure.

Given the uncertainties and "widening error" of making assumptions over a protracted period of time, the model was designed for a five-year forecasting period from the year 2001 to 2005, although the forecasting time frame can be extended with a minor amount of effort.

Figure 1
Conceptual Model Flow Chart



The conceptual structure of the model is shown in Figure 1. The first table in each utility's worksheet contains an array of "what-if" planning and efficiency parameters that, when changed, have an effect upon the growth or service use, its staffing and other O&M expenses, cost and revenue efficiencies, average price of its service, and how capital expenses are included in the model and to what extent. By changing these "what-if" parameters, various scenarios of future utility financial performance can be simulated.

Some information from the first "what-if" parameter table is then provided to the second table of general utility information for use in forecasting the number of utility connections, service production and billing quantities, and staffing levels. This forecasted physical information on the utility is then used, in conjunction with other information, to forecast various financial items in the following budget table, such as utility staffing, chemical, and electrical expenses, and tariff revenues.
Some information from the first "what-if" parameter table is also provided to the third table on capital financing that reflects the utility's current debt level and forecasts the future debt is to be reflected in the utility's budget forecast in the next table.

The fourth table, the utility budget forecast, is the culmination or product of the settings and values of the various what-if parameters, physical, and capital funding data of the prior three

tables. This is the financial forecast for the utility, given the assumptions of a particular modeling scenario.

The fifth table on each worksheet accesses data from the prior four tables and computes various measures that can be used to gauge utility financial and operating performance results.

In the workbook or spreadsheet, various cells are also "**color-coded**" on each worksheet to specify the type of inputs. The style convention for these cells is as follows:

No color – these are not inputs, but instead formula or calculated values internal to the model. These cells are write protected to avoid making errors, and the Operator should not attempt to modify these cells unless underlying a change to the methodology is needed.

Grey color – User-inputted historic or budgeted values.

Yellow color – User-inputted planning or policy parameter.

Blue color – User-inputted efficiency parameter.

Describing each formula in the model in this Users Guide would not only reduce the Manual's user-friendliness but also quickly date the manual. If the model is continued to be used over time, it will have to be dynamic in its design and structure, needing to be edited to keep current with changed conditions, the availability of new data, or improvements in forecasting methods. Therefore the conceptual structure of the model and its inputs and use are the focus of the Manual.

The Model Operator should customize his toolbar in Excel to include the auditing features (buttons) found in the "Tools" portion of the toolbar customization menu (found by right-clicking on the toolbar at the top of the spreadsheet). These auditing buttons will allow the Operator to better understand the inputs to and effects of the formulae used in the model by clicking on a cell (or formula) of interest, then press the appropriate auditing button in the toolbar and having arrows appear that identify all other cells proving input to the highlighted cell (precedent conditions) or other cells that use the content of the highlighted cell (antecedent conditions). Another button click will remove the tracing arrows.

2.4 INTENDED USE OF THE MODEL FOR DEBT RESTRUCTURING ANALYSES

The model is designed to forecast the financial performance of the utility on a cash basis, real funds coming in to the utility to cover real cash expenses being paid in a timely manner, and a primary financial goal is to achieve some targeted level of net income as defined below:

Revenue, Other Income or Available Funds
- Operating Expenses
- Capital-related Expenses
= Net Income

The income or revenue stream is primarily affected by system growth and types of service use (planning factors), changes in per connection use (efficiency factor), tariff levels (financial factor), unaccounted-for water (efficiency factor) and billing collection rates (efficiency factor). Operating costs are primarily affected by inflation (planning factor), growth of the system and resulting operating needs (planning factor), and productivity in providing service (efficiency factor). Capital-related expenses primarily result from growth of the system and resultant service capacity needs (planning factors), cost of acquiring capital and funding/financing arrangements (financial factors).

To address the debt restructuring issue, one can either work "forwards or backwards" towards various answers in the model:

- ✓ making various assumptions about various levels of future tariffs, efficiencies, and funding of capital needs thus producing a resultant (good or bad) utility financial performance,

  - or alternatively -

- ✓ defining a targeted level of financial performance and then making assumptions about various levels of future tariffs, efficiencies, and adjusting the amount of affordable debt expenses to move towards or to the financial performance target.

  [note: one can also solve "backwards" for the other variables as well, such as making assumptions of targeted financial performance, efficiencies, and a capital debt amount, then determining how much overall tariff increase is required to reach the target level of financial performance]

The second technique is the primary analytical method employed in the FORWARD study, determining how much debt is affordable given a certain targeted level of future financial performance. The model is structured to assess the sharing of debt payments or up-front restructuring to alleviate the debt burden on the utility. Various measures of impact on the utility, MoF (GoE), and the public can be then calculated from the model forecasts and comparison between forecasting scenarios.
A more detailed rationale on the motives and effects of such actions may be found in the detailed FORWARD report.

The worksheet, tables, and key links for each utility are described in greater detail in next section of this guide along with an example of how to set the parameter values, run, and interpret a scenario. A printout of an example scenario from the model is used for tabular reference in this regard. The last section of this guide provides more background on model use, data maintenance, editing, and printing.

3.0 DETAILED MODEL DESCRIPTION

3.1 ALEXANDRIA GENERAL WATER AUTHORITY

3.1.1 AWGA Table 1 – "What-If" Planning, Financial, and Efficiency Parameters

Planning. This table can be considered the basic "driver" of the model. Located herein are the large majority of variables (or "what-ifs") that the Model Operator can specify or change to define a future scenario of actions and effects.

As seen in AWGA Table 1 under the "Planning – Change Rate" header at the top of the table, a rate of change can be specified for general inflation that will, in turn, determine the growth for many miscellaneous expenses of the utility. The next rate of change factor specifies inflationary pressures or general trends of increase in overall salaries, aside from any discrete salary changes for productivity or merit purposes. A third factor specifies the rate of inflation on the unit cost of electricity, which because of fuel prices and other issues, may differ from the general rate of inflation. Finally, the last factor under "change rate" parameters at the top of the table is a specific rate of inflation on capital facilities construction cost, which again may differ from other inflationary pressures. Next, rates of change can be identified for population growth (or decline), household size, or the growth in the number of utility connections for smaller or larger users.

Each of these planning factors "drive" or specifies a change in the physical growth of the system, the population served or not served, and various utility expenses.

Financial. Various parameters can be found in the middle portion of the table that have a relatively direct effect on some financial aspect of the utility. The first financial parameter is a change in the average price of water sold. The primary purpose of this study is to assess the potential for utility debt restructuring, and issues related to *detailed* tariff design are left to a subsequent effort. However, this financial planning model was structured to allow for a more discrete set of tariffs for each customer class to be input once that information is developed. For now, a primary concern is how much the overall average price of water might increase over the planning period. Once the model is set to portray a desired forecasting scenario, the change in the average price of water that meets the financial targets will identify a projected revenue requirement that can be the target for a later study of detailed tariff structure design. For now, the Model Operator need only set a rate of change for the first block of residential to affect the overall average price of water for all classes and blocks.

The next set of financial parameters indicates assumptions about the relative share of responsibility for paying existing or future debt service between the utility and MoF. In other words under this "what-if" option, existing debt would not be refinanced, the current debt payment schedule would remain the same, and new debt would continue to be issued much as before, but an agreement would be made between the utility and MoF on the relative

share of existing or future debt payments that each would make towards this debt. For a particular forecasting scenario, once the other planning, efficiency, and tariff assumptions are defined, this payment share parameter can be reduced (or increased) to lessen (or increase) the capital burden on the utility and thus move the utility towards or to a targeted level of overall (net revenue) financial performance.

[Note: the Operator should also take care to check the values for the Utility and MoF Balance shares in Table 3. If the MoF balance share in that table is set greater than zero, this acts to refinance the outstanding balance of the utility's loan and assign a portion of that to the Ministry of Finance. It is not likely that one would want to model both the current debt payment-sharing option (activated in Table 1) and the debt refinancing option (activated in Table 3) at the same time.]

The next financial parameter in the middle of AWGA Table 1 allows the Model Operator to "turn on or off" the inclusion of a rate of return for any scenarios of privatization. The following three financial variables expand upon the privatization scenario allowing the Operator to specify a percentage equity buy-in of existing or future capital for the private entity and an anticipated rate of return on equity capital. If a privatization scenario is designed, the Operator should also review the efficiency parameters below to reflect appropriate gains that could likely realized under private management.

Efficiencies. At the bottom of AWGA Table 1 are various definitions of efficiency parameters allowing the Operator to model improvements in both the revenue stream and increases in operating productivity (lessened expenses). The first efficiency parameter allows for projected improvements in the collections rate for current (this year's) billings to customers, thus enhancing revenue actually received. The second factor projects improvements in the collections of arrears for bills overdue by at least one year that are still being sought for payment. Both of these factors reflect percentage changes applied to the current rate of collections (example: current collections = 58% and an Operator-specified 5.2% annual improvement value will increase next year's current collections rate to 61%).

The next set of efficiency parameters allows the Operator to specify changes in per connection water use reflecting, for example, the effect of a significant tariff increase or a water conservation program reducing customer use. Alternatively, if a new area is served with potable water for the first time or if water rationing or limitations on use are eased, the utility might project an increase in per connection use. As an indication of the integrated links within the model, changes in this per connection use factor (or changing the growth rate of the customer base) will affect the overall water demand forecast, treated water production volumes, and electricity and chemicals costs incurred to produce the water.

The model also allows the Operator to define anticipated changes in the amount of unaccounted-for water. Reform programs to reduce leaks and commercial unaccounted-for (theft, bad metering, etc.) could result in a reduction in un-accounted water which would be

entered by the Operator as a negative percent change in one or more of the future years. Reducing the unaccounted-for water is then, in turn, reflected in the model with a lower future water production volume needed to meet demand and related reductions in facility capacity needs, and electrical and chemical expenses.

The next set of efficiency parameters allow for changes in the cost of the work force, either through affecting staffing levels or by changing average salaries for different skill levels of the employees. This allows the Model Operator to make discrete decisions on increasing or decreasing staffing and salaries of managerial and skilled workers versus that of less skilled trades and laborers. A reform program, for instance, might chose to increase skilled professional staff, reduced unskilled staff, but increase salaries for remaining employees to improve productivity and lessen turnover.

The last two efficiency parameters allow for: (a) changes in use rates of electricity and chemicals which may brought about by either by degradation or improvements in capital facilities or operations, and (b) changes in maintenance spending, which if increased and productively applied, can reduce longer-term operating costs and capital needs.

3.1.2 AWGA Table 2 – Utility Operational Data

This table calculates projects general descriptive information or characteristics of the utility, such as total population, population served, population per household served, number of connections, number of utility employees by skill level, and unit costs of electricity and chemicals. Much of this data is forecasted based on the most recent year's value and Operator-specified changes identified from Table 1.

This projected information is then used to project other intermediate model data and ultimate revenues, expenses, and performance measures. For instance, the number of connections and use per connection are used to forecast the volume of water billed. The volume of water billed is then adjusted upwards to a water production forecast after including allowances for unaccounted-for water. The water volume billed is passed to the next Utility Budget table for billed revenue calculations, and the water volume produced is passed to another portion of the next table for calculation of electricity and chemicals expenses.

Similar to the tariff input portions in Table 1, the structure of Table 2 for the number of water connections and water volume by usage group billed allows for a higher level of data detail to be input at a later date when the information is available.

3.1.3 AWGA Table 3 – Utility Capital and Debt Data

The top portion of Table 3 identifies the existing outstanding debt and debt payment schedule assigned to the utility, even if the MoF is currently covering such payments. As previously mentioned, the input cells for *AWGA and MoF Balance shares* allows for the

Model Operator to simulate a refinancing of the utility's outstanding loan balance and to assign a percentage of the current outstanding balance to separate new loans for the utility and MoF.

The middle and bottom portion of Table 3 allows for input of the utility's anticipated capital improvements program and calculates new debt service associated with these improvements. Currently, the model "bundles" two years worth of capital spending into one debt issue every two years in the forecast period.

The "Total Obligations less Surplus" statistic at the bottom of the table indicates how much net financial burden is still outstanding that the utility or government has yet to realize.

3.1.4 AWGA Table 4 – Utility Budget

Table 4 indicates the utility budget forecast and is the monetary culmination of many of the model's calculations. Here, the utility's historical and projected available funds, operating and capital expenses, and net revenue are shown.

The top portion of the table indicates the beginning balance available to utility. This assumes that the utility in the future will operate more like a business. If it realizes a net revenue surplus, that surplus will be retained and available in the following year for spending, investment, or to be retained as operating reserves. If the net income for the year is negative then any positive carryover balance would be drawn down to cover that year's shortfall. If the carryover balance is insufficient to cover the annual deficit, an interest charge is calculated to cover the expense associated with the short-term financing of the deficit.

A modified accrual approach is used to structure the income and expenses portion of the budget table. The underlying basis for this modified approach is to forecast real funds available to the utility to pay the full annual expenses of the utility on a timely basis, conditions that would be faced by a business and viable utilities. Adjustments to available funds reflect a picture of cash available to the utility, while the expenses shown were taken from accrued expenses from the utility's financial statements. Accrued expenses were chosen as they generally represent the full bills received by the utility for which timely payment in full is expected. Using a cash basis for expenses might reflect significant bills not being paid in full in a timely manner.

Salaries and chemicals costs are forecast based on unit prices and the quantities of service produced. These expenses, and other operating expenses such as salaries, are affected by the efficiency assumptions contained in Table 1. The data and assumptions from Table 3 produce the capital expenses shown in Table 4.

The annual balance (current year funds minus current year expenses) and cumulative annual balance are shown at the bottom of Table 4. Accounts receivable are listed as a footnote to the table for the purpose of calculating collections of accounts in arrears.

3.1.5 AWGA Table 5 – Performance Statistics

The information contained in this table are interpretative statistics of the historical and project information in the other tables and indicate some measures of the financial and operation performance of the utility. In the top portion of the table are four measures of cost recovery starting with simple recovery of operations and maintenance expenses, progressing to partial and full recovery of assigned capital expenses, and if applicable to recovery of full O&M and capital expenses plus a rate of return to a private investor.

Below the cost recovery statistics are the average price of selling water, the cost of producing water, and degree of collections that reflect the tariff, operating efficiency, and capital assumptions of the current model scenario.

The statistics at the bottom of Table 5 provide information on the operational performance of the utility including service coverage being provided, use per connection, unaccounted-for water, levels of staffing and salaries, and degree of significant expenses items facing the utility.

[note: below Table 5 is a summary balance sheet and various graphs illustrating the model results]

3.2 ALEXANDRIA GENERAL ORGANIZATION FOR SANITARY DRAINAGE

Because the models for the AWGA and AGOSD are constructed similarly, but there are also links between the models as well as differences between the two utilities. Therefore, much of the explanatory text of the model features and methods already made concerning the AWGA model will not be repeated again. The information below highlights where AGOSD's parameters or financial forecasts are linked to AWGA, where different inputs or methods were used to reflect wastewater service (instead of water), or where other differences exist between the utilities.

3.2.1 AGOSD Table 1 – "What-If" Planning, Financial, and Efficiency Parameters

Two of the links between the AWGA and AGOSD models are reflected in Table 1. AGOSD service revenues are realized from a percentage-based surcharge made to AWGA water bills. So, the Model Operator should be aware that if AWGA tariffs are increased, this increases the basis to which the percentage wastewater surcharge is applied and AGOSD revenues also increase without any specific actions by AGOSD. In the middle of Table 1, a change in the percentage amount of the wastewater surcharge can be separately made so that it possible for the User to change either the wastewater surcharge basis (through a AWGA tariff increase), the surcharge rate itself, or both the basis and the surcharge rate.

The second link between the AWGA and AGOSD models is the billing collection rates. Since AWGA performs the billing and collections for AGOSD, AWGA's performance on collections is also AGOSD's performance as well.

The remainder of variables in AGOSD Table 1 are similar to those variables described for AWGA Table 1.

3.2.2 AGOSD Table 2 – Utility Data

Most of the variables in AGOSD Table 2 are similar to those variables described for AWGA Table 2 with the exception of the presentation of AWGA billed revenue as a basis for calculating the AGOSD surcharge revenue, and the calculation of wastewater inflow volume to the treatment plants that is used as the basis for forecasting AGOSD power and chemicals expenses.

3.2.3 AGOSD Table 3 – Capital Financing Data

Similar to AWGA Table 3.

3.2.4 AGOSD Table 4 – Utility Budget

Similar to AWGA Table 4.

3.2.5 AGOSD Table 5 – Performance Statistics

Similar to AWGA Table 5.

3.3 BEHERIA WATER AND SANITARY DRAINAGE COMPANY

Again, much of the explanatory text of the model features and methods already made concerning the AWGA model will not be repeated again. The information below highlights where Beheira's inputs or modeling methods differed from AWGA.

3.3.1 Beheira Table 1 – "What-If" Planning, Financial, and Efficiency Parameters

Many of the various model assumptions for Beheira came from a recent USAID report prepared by the Legal, Institutional, and Regulatory Reform (LIRR) project and concurred by the utility's management. Various planning, financial, and efficiency parameters were either set equal to the assumptions explicitly stated in that report, or assumptions were determined to replicate the growth or financial forecasts shown in that report. The remainder of variables in Beheira Table 1 are similar to those presented in AWGA Table 1 with the exception that Beheira has a block-rate tariff structure that was reflected in its model structure.

3.3.2 Beheira Table 2 – Utility Data

Similar to AWGA Table 2 with the exception that Beheira has a block-rate tariff structure that was reflected in its model structure. To replicate the projected water sale revenue in the LIRR report, it was assumed that the price of water in the relevant use block applies to all water consumed, not just the water quantity within that block.

3.3.3 Beheira Table 3 – Capital Financing Data

Similar to AWGA Table 3. Projected capital investment for Beheira included amounts for major plant additions, renewal and replacement, and capital expansion costs noted in the prior LIRR report. This additional capital investment was assumed to be debt financed annually.

3.3.4 Beheira Table 4 – Utility Budget

Similar to AWGA Table 4.

3.3.5 Beheira Table 5 – Performance Statistics

Similar to AWGA Table 5.

4.0 MODEL USE AND MAINTENANCE

4.1 USE OF THE MODEL

4.1.1 Limitations of the Model

One obvious practical limitation of the model is its size or how big and complicated it can get. In trying to answer all possible questions, the model can easily get too big and cumbersome. It is not a cash flow or operations model that advises on daily or monthly cash balances, daily operations or water quality blending. It is not an engineering design model that will identify project plans, specifications, and costs. Nor is it a life-cycle investment model that can more specifically weigh the monetized benefits and costs of a project investment.

However, the financial planning model can provide aggregate annual information that may be useful in further evaluation of these issues. The model can provide a forecast of major expense categories by cost center and annual cash flow of the utility. It can provide information on the quantities and timing of supply needed, and it can provide with- and without-project cash flow of the utility that may be useful for a longer-term project investment analysis.

4.1.2 Development of Standard Planning Scenarios

It will likely be useful to the Model Operator and utility managers to have a "benchmark" planning scenario from which to evaluate the merit of other alternative actions. Typically, one of two such scenarios are defined for these benchmarking purposes: (1) the "no action" future, and (2) the "most likely" future.

4.1.2.1 No Action Future

The "No Action" future scenario usually involves a set of planning and policy assumptions whereby outside or external things in the world continue to occur (such as population growth, inflation, etc.), but there is no significant action by the internal organization (no new projects, no rate increases, etc.).

Obviously, the purpose of this scenario is to indicate the real or implied cost of inaction (such as water shortages, financial deficits, etc.), and to help motivate decision-makers into timely and appropriate actions.

4.1.2.2 Most Likely Future

The "Most Likely" future scenario encompasses a set of planning and policy assumptions by the Model Operator and policy-makers on what they most expect to happen in the future. This usually embodies continuance of recent trends, the implementation of planned projects, rate changes to meet revenue targets, and other actions anticipated occurring with a reasonable degree of likelihood.

4.1.2.3 Variations on Most Likely Future

From these two benchmark scenarios described above, the Model Operator and policy-maker can then examine alternative actions to those anticipated. Other scenarios such as:

"What happens if the utility grows faster or slower?
"What happens if the rate increase lowers water sales?"

"What happens if we fund a significant capital program?
and many, many more potential planning or policy scenarios.

The models' predicted outcome under these planning and policy variations can then be compared to the no action and most likely scenarios to see how changes in the underlying assumptions might affect the viability of no action or anticipated actions.

4.2 MODEL MODIFICATIONS

4.2.1 Annual Updating and Modifications

In the late Spring or early Summer prior to the beginning of each new fiscal year, several annual updating changes will be required to keep the models current:

(a) Using the "Save As" command, save the model under a new file name using a naming convention such as Model-2001-BM, where 2001 and BM represents the current fiscal year of the updated model and the BenchMark (or most likely) forecast, respectively. Later years or other planning scenarios would amend the two naming suffixes accordingly.
(b) It is important to keep the historical data as current and accurate as possible as this will be the source of useful trend or "most recent actual year" information on which to develop budget amounts, base future calculations, and guide future planning assumptions. The complete fiscal year just passed will now be a "historical" year, instead of a "budgeted" year. Once audited actuals are developed for the last complete fiscal year, the Operator should go to that year and replace the budget and planning data with the actual figures.
(c) The Operator should then examine the current budget year to see if the previously-budgeted amounts are on-tract or warrant revision.
(d) The Operator should then, referring to the past few years expenses and anticipated spending in the next year, input the prospective budget expenditures and budget-year planning data into the pending fiscal year.
(e) Appropriate cells of the historical and budgeted columns of input data should be colored gray to signify its historical character, and
(f) To maintain the length of the future-planning horizon, a new future year should be created at the end of the planning period. First group all of the worksheets *after* the Read Me worksheet. Then, *select the column* of the last forecast year (say year 2002), copy the column, and insert the copied column just to the right of the last fiscal year (as the basis for the year 2003). *Prior to copying the column,* the Operator should <Page Down> through the SumInputs worksheet to make sure that the copying of the new column of formulas does not over-write any needed information.
(g) Once the new column is inserted and while the worksheets are still grouped, the Operator should change the date of the last year in the top-most table header.
(h) Then, ungroup the worksheets, and go through the individual worksheets one at a time to:
(i) Change the date in the rightmost columns for table headers below the top table; and
(j) On the WD worksheet, check and possibly reset the calculation formulas in the new first forecast year for some of the water planning data. The first forecast year for some of this water planning data (such as use per connection) may be keyed to *average* the past few years historical data to even out weather fluctuations. The Operator should reset the =Average function in the formula to encompass the new span of historical years whose average would represent normal weather conditions.

4.2.2 Planning, Policy & Project Changes and Sequence of Modifications

The model is not "fully automatic." It requires the intervention of the Model Operator or policy-maker to make new decisions, given changes in the underlying conditions. In general when confronted with a change in the underlying model parameters, the User should first ask himself would this change affect water demands, water supplies, system costs, and/or system revenues. Think through the likely effects first, as this will likely be the best guide on what portions of the model may need checking.

After this is done, a good standard procedure for "recalibrating" the model after an underlying parameter is changed is:

(1). Check the factor most affected by the parameter and ask yourself, "did it change in the expected fashion." For instance, if the cost of electricity increases 5%, did the predicted electricity costs for the subsequent year also increase in roughly the same amount; if not, check for formula errors or unexpected changes in other parameters affecting this variable.

(2). Then go to the water demand and capacity tables. Changes in factors affecting either water demand or supply may cause a new water deficit or surplus situation. A change in either one of these conditions will require the User to make new decisions about demand rationing or supply allocation to rebalance demands that can be met with available supplies, or to decide from which source supplies are obtained (if supply sources are separately modeled).

(3). Then ask yourself, "would the parameter change affect the cost at one of the cost centers identified in the model. If so, has the costs of that activity changed in rough accordance with expectations,

(4). Finally, ask yourself, "would the parameter change necessitate a change in the utility rates to maintain revenue recovery at the desired target goal." If so, a change in rates may be required to finish the recalibration of the model.

4.2.3 Caution on Changes

A good understanding of electronic spreadsheets is one of the most important skills to be a successful Model Operator. Some of these skills cannot be effectively taught, but unfortunately may be only understood and learned after the error has occurred. For this reason, it is always prudent to have recent backup copies of the model (see next section). FORWARD has attempted to structure the model to be easy to edit for the skilled user and therefore has not "write-protected" large portions of the model. Because of this, several cautions are warranted:

Ask yourself:

"Are the worksheets unintentionally grouped such that I am about to make changes to 10 sheets at once, instead of just the one sheet I want to revise?"

"Have I thought through the effect of deleting or adding a row (Is there any other information to the right (off the view of the screen) if I delete a row, or will I be changing the standard table structure on one sheet instead of all similar underlying sheets if I add a row)?"

"Have I thought through the effect of deleting or adding a column?" (Not many good reasons to do this, if at all, except for adding a new year to the end of the forecast period)

"Does the formula I am about to copy contain a relative or absolute cell reference that is desired in the copied formula, or alternatively, does it need such a fixed reference?"

"Before I save the file, do I want to do a 'save as' under an alternative file name to protect my original file?"

4.3 BACKUP

4.3.1 Annual Updates

As mentioned above, the Model requires update at least annually, and accordingly, a backup should be prepared for the new version of the model and labeled properly as per procedure. Backup should be done for all scenarios prepared by the Model Operator.

4.3.2 More Frequent Updates

In case of any changes during the year, the Operator should prepare new backup copy for all changes, and for new scenarios requested by management. Keep all backup copies properly documented so the Model Operator can retrieve the appropriate scenario and readily understand the parameter settings that define that scenario.

4.4 PRINTING

The various worksheet pages can be printed either individually or grouped for printing all worksheets and related tables at once. The pages can be grouped to alter the Page Setup setting for margins, fit-to-page and other layout options. Remember to ungroup the worksheets when done.

Printouts of the all worksheets of the model should be prepared annually for all scenarios, and as needed. All printed copies should be dated and labeled clearly to avoid any confusion, such as using an earlier model version or the wrong scenario for certain decisions. A revision date (that must be manually set) and scenario label is provided for in the upper left hand corner of the first table of every worksheet. The worksheets can be grouped for easy editing of these labels to reflect a new date or scenario.

APPENDIX A-1

SAMPLE TABLES FROM THE AWGA, AGOSD, AND BEHEIRA FINANCIAL PLANNING MODELS

Table 1
"What-If" Model Parameters
Alexandria Water General Authority

Parameter	2000	2001	2002	2003	2004	2005
Planning						
Change Rate						
General Inflation	5.0%	10.0%	9.0%	8.0%	7.0%	6.0%
Salaries	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Electricity	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Financed Capital Program						
Population Growth Rate	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Change in Household Size						
Water Connections Growth Rate						
Residential						
0-1 m^3	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
1-5 m^3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
over 5 m^3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Commerical	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Touristic	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Industrial	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Financial						
Change in Avg. Water Price (piasters/m^3)						
Residential						
0-1 m^3			0.0%	0.0%	0.0%	
1-5 m^3			0.0%	0.0%	0.0%	0.0%
over 5 m^3			0.0%	0.0%	0.0%	0.0%
Commerical			0.0%	0.0%	0.0%	0.0%
Touristic			0.0%	0.0%	0.0%	0.0%
Industrial			0.0%	0.0%	0.0%	0.0%
Total	3.1%	-3.0%	0.0%	0.0%	0.0%	0.0%
Debt Payment Share of Utility						
Existing	100%	100%	100%	100%	100%	100%
Future	100%	100%	100%	100%	100%	100%
Government = 0 Private = 1	n.a.	n.a.		-	-	-
Equity Ownership:						
Percent Equity Ownership of Existing Capital			0%	0%	0%	0%
Percent Equity Ownership of New Capital			100%	100%	100%	100%
Rate of Return on Equity Capital (%)	0%	0%	10%	10%	10%	10%
Efficiencies						
Change in Current Billing Collections Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Arrears Collection Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Per Connection Water Use Rate						
Residential						
0-1 m^3		0%	1%	1%	1%	1%
1-5 m^3		0%	0%	0%	0%	0%
over 5 m^3		0%	0%	0%	0%	0%
Commerical		0%	0%	0%	0%	0%
Touristic		0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%
Total	0%	0%	1%	1%	1%	1%
Change in Unaccounted-for Water	0.0%	0.0%	0.0%			
Change in Number of Employees - Managerial & Skilled			0.0%	0.0%	0.0%	0.0%
Change in Number of Employees - Trades and Unskilled			0.0%	0.0%	0.0%	0.0%
Change in Avg Salaries - Mgr & Skilled Employees			0.0%	0.0%	0.0%	0.0%
Change in Avg Salaries - Trades & Unskilled Employees			0.0%	0.0%	0.0%	0.0%
Change in Power & Chemicals Use Rate		0.0%	0.0%	0.0%	0.0%	0.0%
Change in Parts, Materials & Maintenance		0.0%	0.0%	0.0%	0.0%	0.0%

Table 2
Utility Operational Data
Alexandria Water General Authority

Revised: 12-Jun

Item	2000	2001	2002	2003	2004	2005
General Utility						
Total Population (mill. persons)	3.571	3.631	3.693	3.756	3.820	3.885
Population per Household	4.3	4.3	4.3	4.3	4.3	4.3
Number of Utility Employees						
Managerial & Professional	420	420	420	420	420	420
Trades and Unskilled Labor	3,780	3,780	3,780	3,780	3,780	3,780
Total Number of Employees	4,200	4,200	4,200	4,200	4,200	4,200
Unit Electricity Costs (L.E./m^3)	0.0578	0.0607	0.0638	0.0670	0.0703	0.0738
Unit Chemicals Costs (L.E./m^3)	0.0143	0.0157	0.0171	0.0185	0.0198	0.0210
Water						
Population Served by Water Lines (mill. persons)	3.638	3.700	3.763	3.827	3.892	3.958
Number of Water Connections						
Residential						
0-1 m^3	849,000	863,433	878,111	893,039	908,221	923,660
1-5 m^3	-	-	-	-	-	-
over 5 m^3	-	-	-	-	-	-
Commerical	-	-	-	-	-	-
Touristic	-	-	-	-	-	-
Industrial	-	-	-	-	-	-
Total Water Connections	849,000	863,433	878,111	893,039	908,221	923,660
Water Billed (mcm)	14,192	14,433	14,678	14,928	15,182	15,440
Residential						
0-1 m^3	446.1	453.6	466.0	478.6	491.6	505.0
1-5 m^3	-	-	-	-	-	-
over 5 m^3	-	-	-	-	-	-
Commerical	-	-	-	-	-	-
Touristic	-	-	-	-	-	-
Industrial	-	-	-	-	-	-
Total Water Billed (mcm)	446.1	453.6	466.0	478.6	491.6	505.0
Water Produced (mcm)	700.5	712.4	731.8	751.7	772.1	793.1

Table 3
Utility Capital and Debt Data
Alexandria Water General Authority

Item	2000	2001	2002	2003	2004	2005
Existing Capital						
Existing Principal Payment	9.754	10.907	7.343	8.243	9.253	10.386
Existing Interest Payment	45.215	44.062	34.22	33.318	32.308	31.175
Existing Debt Payment	54.969	54.969	41.561	41.561	41.561	41.561
Cumulative Paid Principal	19.720	30.627	7.343	15.586	24.839	35.225
Remaining Balance	359.691	348.783	271.985	263.742	254.489	244.103
Initial Balance	369.445	369.445	279.328	279.328	279.328	279.328
AWGA Balance Share =		83%	336.540			
MoF Refinanced Cost						
Existing Principal Payment			1.504	1.688	1.895	2.127
Existing Interest Payment			7.008	6.824	6.617	6.385
Existing Debt Payment			8.512	8.512	8.512	8.512
Cumulative Paid Principal			1.504	3.192	5.087	7.215
Remaining Balance			55.708	54.019	52.124	49.997
Initial Balance			57.212	57.212	57.212	57.212
MoF Balance Share =		17%				
New Capital						
New Capital Requirements (mill. L.E.)	80.0	107.4	117.0	241.4	280.1	300.5
Depreciation Estimate	3.200	7.494	12.175	21.832	33.038	45.057
Loan Issue Sizing	80.000	107.355	117.020	241.430	280.137	300.491
Private Equity Ownership	-	-	26.084	43.627	78.585	117.824
Loan 1*						
New Principal Payment	4.925	5.529	6.206	6.966	7.820	8.778
New Interest Payment	22.951	22.348	21.670	20.910	20.057	19.099
New Debt Payment**	27.876	27.876	27.876	27.876	27.876	27.876
Cumulative Paid Principal	4.925	10.454	16.660	23.626	31.446	40.224
Remaining Balance	182.430	176.901	170.695	163.729	155.909	147.131
Initial Balance	187.355	187.355	187.355	187.355	187.355	187.355
Loan 2*						
New Principal Payment			9.423	10.578	11.873	13.328
New Interest Payment			43.910	42.756	41.460	40.006
New Debt Payment**			53.333	53.333	53.333	53.333
Cumulative Paid Principal			9.423	20.001	31.874	45.202
Remaining Balance			349.027	338.449	326.576	313.248
Initial Balance		358.450	358.450	358.450	358.450	358.450
Loan 3*						
New Principal Payment					15.264	17.134
New Interest Payment					71.127	69.257
New Debt Payment**					86.391	86.391
Cumulative Paid Principal					15.264	32.398
Remaining Balance					565.364	548.230
Initial Balance				580.628	580.628	580.628
Loan 4*						
New Principal Payment						-
New Interest Payment						-
New Debt Payment**						
Cumulative Paid Principal						-
Remaining Balance						-
Initial Balance						
Loan Summary						
Total Principal Payments		16.436	22.973	25.787	44.210	49.626
Total Interest Payments		66.410	99.798	96.984	164.952	159.536
Total Debt Payments		82.846	122.771	122.771	209.162	209.162
Total Cumulative Paid Principal		41.081	33.427	59.214	103.423	153.049
Total Remaining Balance of Capital Debt Loans		(525.684)	(791.706)	(765.919)	(1,302.338)	(1,252.712)
Cumulative Ending Balance		1.579	(45.422)	(107.581)	(270.799)	(457.744)
Total Obligations Less Surplus		(524.105)	(837.128)	(873.501)	(1,573.136)	(1,710.456)

*Assumes debt financing is in increments occuring every two years.
**Assumes government capital financing terms of:

Table 4
Utility Budget
Alexandria Water General Authority

Account	2000	2001	2002	2003	2004	2005
AVAILABLE FUNDS (mill. L.E.)						
Beginning Balance			1.579	(45.422)	(107.581)	(270.799)
Service Revenues						
Billed Revenue	193.932	191.334	196.532	201.872	207.357	212.991
Previous Years Billed Revenue	2.277	2.506	2.575	2.645	2.716	2.790
Less Adjustment for Uncollected Accounts	82.408	81.413	83.625	85.897	88.231	90.628
Collected Billings	113.801	112.427	115.482	118.620	121.843	125.153
Collected Arrears	87.290	87.477	84.645	81.128	80.536	83.302
Connection Revenue	17.938	5.571	5.666	5.762	5.860	5.960
Interest Earnings	8.920	0.000	0.000	0.097	0.000	0.000
Other Revenues	2.748	3.023	3.295	3.558	3.808	4.036
TOTAL AVAILABLE FUNDS	230.697	208.498	210.667	209.165	212.046	218.451
Salaries	48.048	40.748	42.786	44.925	47.171	49.530
Commodities						
Electricity	41.964	43.265	46.663	50.327	54.279	58.542
Chemicals	8.228	11.012	12.207	13.542	14.884	16.205
Spare Parts, Tools and Materials	7.860	8.646	9.424	10.178	10.891	11.544
Other	0.335	0.369	0.402	0.434	0.464	0.492
Total Commodities	58.387	63.292	68.696	74.481	80.518	86.783
Services						
Maintenance	5.231	5.754	6.272	6.774	7.248	7.683
Other	4.187	4.606	5.020	5.422	5.801	6.149
Total Services	9.418	10.360	11.292	12.196	13.049	13.832
Purchases for Resale (new connections)	0.000	0.000	0.000	0.000	0.000	0.000
Transferable Expenses						
Taxes	1.846	2.031	2.213	2.390	2.558	2.711
Interest on Debt	45.489	66.410	99.798	102.548	178.131	192.709
Principal on Debt	14.680	16.436	22.973	25.787	44.210	49.626
Rent	0.005	0.006	0.006	0.006	0.007	0.007
Others	0.706	0.777	0.846	0.914	0.978	1.037
Total Transferable Expenses	62.726	85.658	125.837	131.646	225.884	246.090
Specialized Current Exchanges						
Other	6.237	6.861	7.478	8.076	8.642	9.160
Total Specialized Current Exchanges	6.237	6.861	7.478	8.076	8.642	9.160
TOTAL EXPENDITURES	184.816	206.919	256.089	271.325	375.264	405.396
RETURN ON EQUITY (ROE)	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL EXPENDITURES + ROE	184.816	206.919	256.089	271.325	375.264	405.396
ANNUAL BALANCE	45.881	1.579	(47.001)	(62.159)	(163.217)	(186.945)
CUMULATIVE ENDING BALANCE		1.579	(45.422)	(107.581)	(270.799)	(457.744)
Accounts Receivable	150.823	145.940	139.876	138.856	143.624	151.319

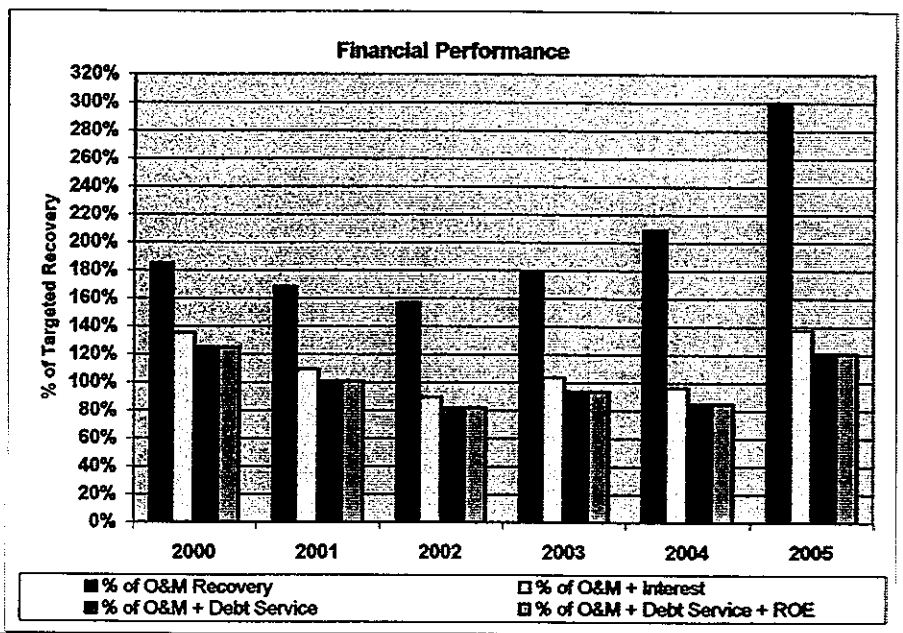
Table 5
Performance Statistics
Alexandria Water General Authority

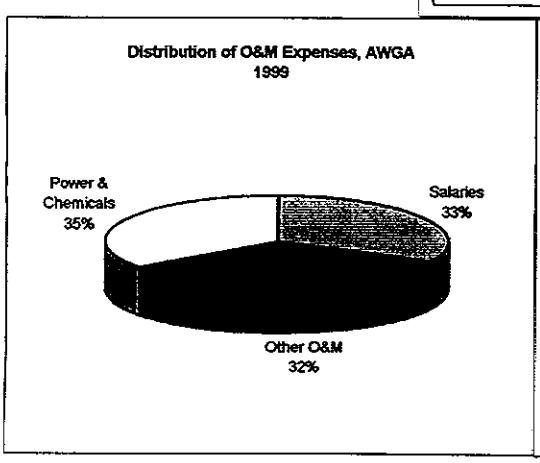
Measure	2000	2001	2002	2003	2004	2005
Financial						
Revenue Recovery						
% of O&M Recovery	185.1%	168.0%	156.8%	178.0%	209.0%	300.0%
% of O&M + Interest	135.6%	109.5%	89.7%	103.7%	96.5%	137.5%
% of O&M + Debt Service	124.8%	100.8%	81.6%	93.8%	85.2%	120.7%
% of O&M + Debt Service + ROE	124.8%	100.8%	81.6%	93.8%	85.2%	120.7%
Avg Price of Water Service (piasters/ m^3)						
Residential						
0-1 m^3	42	42	42	42	42	42
1-5 m^3	-	-	-	-	-	-
over 5 m^3	-	-	-	-	-	-
Commerical	-	-	-	-	-	-
Touristic	-	-	-	-	-	-
Industrial	-	-	-	-	-	-
Total	43	42	42	42	42	42
Change in Avg. Water Price	0%	0%	0%	0%	0%	0%
Avg Cost of Water Service (piasters/ m^3)	26	29	35	36	49	51
Billing Collections Rate	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%
Arrears Collection Rate	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%
Operational						
Percent of Population Served	102%	102%	102%	102%	102%	102%
Water Use per Connection (m^3/day)						
Residential						
0-1 m^3	1.44	1.44	1.45	1.47	1.48	1.50
1-5 m^3	-	-	-	-	-	-
over 5 m^3	-	-	-	-	-	-
Commerical	-	-	-	-	-	-
Touristic	-	-	-	-	-	-
Industrial	-	-	-	-	-	-
Total	1.44	1.44	1.45	1.47	1.48	1.50
Un-accounted-for Water	36%	36%	36%	36%	36%	36%
No. of Mgr & Professional Employees/1,000 Connections	0.5	0.5	0.5	0.5	0.5	0.5
No. of Trades & Unskilled Empl./1,000 Connections	4.5	4.4	4.3	4.2	4.2	4.1
No. of Total Employees per 1,000 Connections	4.9	4.9	4.8	4.7	4.6	4.5
Avg Salary - Managerial & Professional Employee (L.E.)	21,525	22,601	23,731	24,918	26,164	27,472
Avg Salary - Trades and Unskilled Employee (L.E.)	7,875	8,269	8,682	9,116	9,572	10,051
Avg Salary - all employees	11,440	9,702	10,187	10,696	11,231	11,793
Salaries as % of O&M	39%	33%	32%	31%	31%	30%
Electricity as % of O&M	34%	35%	35%	35%	35%	36%

1- (Total available funds) / (Total payable expenses less principal & interest).
2- (Total available funds) / (Total payable expenses less principal) .
3- (Total available funds) / (Total payable expenses).
4- (Total available funds) / (Total payable expenses plus return on equity).

Summary Balance Sheet
Alexandria Water General Authority

Account	2000	2001	2002	2003	2004	2005
Annual Income	230.697	208.498	209.088	209.165	212.046	218.451
Annual Expenses	184.816	206.919	256.089	271.325	375.264	405.396
Net Annual Income	45.881	1.579	(47.001)	(62.159)	(163.217)	(186.945)





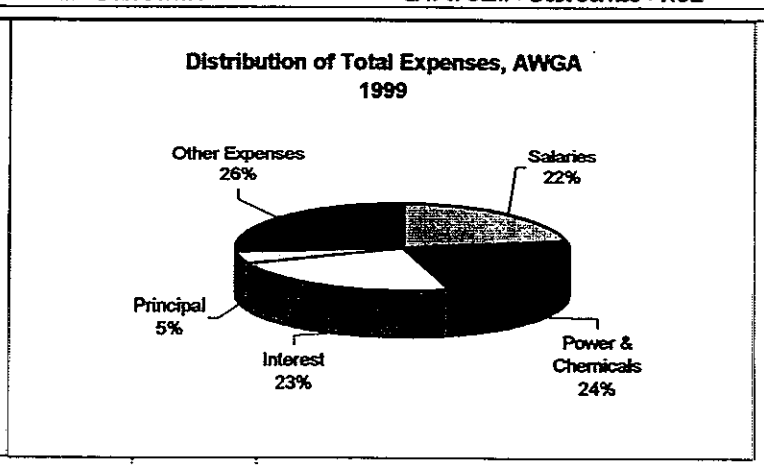


Table 1
"What-If" Model Parameters
Alexandria General Organization for Sanitary Drainage

Parameter	2000	2001	2002	2003	2004	2005
Planning						
Change Rate						
General Inflation	5.0%	10.0%	9.0%	8.0%	7.0%	6.0%
Salaries	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Electricity	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Financed Capital Program		10.0%	10.0%	10.0%	10.0%	10.0%
Population Growth Rate	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%
Change in Household Size	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Connections Growth Rate	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Financial						
Change in WW Surcharge (above AWGA price changes)			0.0%	0.0%		
Debt Payment Share of Utility						
Existing	100%	100%	100%	100%	100%	100%
Future	100%	100%	100%	100%	100%	100%
Government = 0 Private = 1	n.a.	n.a.	-	-	-	-
Equity Ownership:						
Percent Equity Ownership of Existing Capital			0%	0%	0%	0%
Percent Equity Ownership of New Capital			100%	100%	100%	100%
Rate of Return on Equity Capital (%)			10%	10%	10%	10%
Efficiencies						
Change in Current Billing Collections Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Arrears Collection Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Number of Employees - Managerial & Skilled			0.0%	0.0%		
Change in Number of Employees - Trades and Unskilled			0.0%	0.0%	0.0%	0.0%
Change in Avg Salaries - Mgr & Skilled Employees			0.0%	0.0%	0.0%	0.0%
Change in Avg Salaries - Trades & Unskilled Employees			0.0%	0.0%	0.0%	0.0%
Change in Power & Chemicals Use Rate			0.0%	0.0%	0.0%	0.0%
Change in Parts, Materials & Maintenance		0.0%	0.0%	0.0%	0.0%	0.0%

Table 2
Utility Operational Data
Alexandria General Organization for Sanitary Drainage

Revised: 12-Jun

Item	2000	2001	2002	2003	2004	2005
General Utility						
Total Population (mill. persons)	3.571	3.631	3.693	3.756	3.820	3.885
Population per Household	4.3	4.3	4.3	4.3	4.3	4.3
Number of Utility Employees						
Managerial & Professional	1,122	1,122	1,122	1,122	1,122	1,122
Trades and Unskilled Labor	4,488	4,488	4,488	4,488	4,488	4,488
Total Number of Employees	5,610	5,610	5,610	5,610	5,610	5,610
Unit Electricity Costs (L.E./m^3)	0.0123	0.0130	0.0136	0.0143	0.0150	0.0158
Unit Chemicals Costs (L.E./m^3)	-	-	-	-	-	-
Wastewater						
Number of Wastewater Connections	679,177	682,369	685,576	688,799	692,036	695,289
AWGA Billed Revenue (mill. L.E.)	193.9	191.3	196.5	201.9	207.4	213.0
Wastewater Inflow to WWTP (mcm)	620.0	620.0	620.0	785.0	950.0	950.0

Table 3
Utility Capital and Debt Data
Alexandria General Organization for Sanitary Drainage

Item	2000	2001	2002	2003	2004	2005
Existing Capital						
Existing Principal Payment	12.374	12.374	9.642	9.642	9.642	9.642
Existing Interest Payment	48.287	48.287	37.625	37.625	37.625	37.625
Existing Debt Payment	60.661	60.661	47.267	47.267	47.267	47.267
Cumulative Paid Principal	23.636	36.011	9.642	19.284	28.925	38.567
Remaining Balance	419.534	407.160	326.898	317.256	307.614	297.973
Initial Balance	431.908	431.908	336.540	336.540	336.540	336.540
AGOSD Balance Share =		100%	336.540			
MoF Refinanced Cost						
Existing Principal Payment			-	-	-	-
Existing Interest Payment			-	-	-	-
Existing Debt Payment			-	-	-	-
Cumulative Paid Principal			-	-	-	-
Remaining Balance			-	-	-	-
Initial Balance			-	-	-	-
MoF Balance Share =						
New Capital						
New Capital Requirements (mill. L.E.)	52.0	57.2	62.9	69.2	76.1	83.7
Loan Issue Sizing	52.000	57.200	62.920	69.212	76.133	83.747
Private Equity Ownership	-	-	14.260	22.768	36.808	52.418
Loan 1*						
New Principal Payment	3.129	3.478	3.867	4.300	4.780	5.315
New Interest Payment	12.209	11.859	11.470	11.038	10.557	10.022
New Debt Payment**	15.337	15.337	15.337	15.337	15.337	15.337
Cumulative Paid Principal	3.129	6.607	10.474	14.774	19.554	24.869
Remaining Balance	106.071	102.593	98.726	94.426	89.646	84.331
Initial Balance	109.200	109.200	109.200	109.200	109.200	109.200
Loan 2*						
New Principal Payment			3.786	4.209	4.679	5.202
New Interest Payment			14.772	14.349	13.879	13.355
New Debt Payment**			18.558	18.558	18.558	18.558
Cumulative Paid Principal			3.786	7.994	12.674	17.876
Remaining Balance			128.346	124.138	119.458	114.256
Initial Balance		132.132	132.132	132.132	132.132	132.132
Loan 3*						
New Principal Payment					4.581	5.093
New Interest Payment					17.875	17.362
New Debt Payment**					22.455	22.455
Cumulative Paid Principal					4.581	9.673
Remaining Balance					155.299	150.207
Initial Balance				159.880	159.880	159.880
Loan 4*						
New Principal Payment						-
New Interest Payment						-
New Debt Payment**						
Cumulative Paid Principal						-
Remaining Balance						-
Initial Balance						
Loan Summary						
Total Principal Payments		15.9	17.3	18.2	23.7	25.3
Total Interest Payments		60.1	63.9	63.0	79.9	78.4
Total Debt Payments		76.0	81.2	81.2	103.6	103.6
Total Cumulative Paid Principal		42.6	23.9	42.1	65.7	91.0
Total Remaining Balance of Capital Debt Loans		(509.8)	(554.0)	(535.8)	(672.0)	(646.8)
Cumulative Ending Balance		(93.4)	(204.9)	(333.9)	(504.7)	(696.8)
Total Obligations Less Surplus		(603.2)	(758.9)	(869.7)	(1,176.7)	(1,343.5)

*Assumes debt financing is in two increments occuring in years 2003 and 2005.

Table 4
Utility Budget
Alexandria General Organization for Sanitary Drainage

Account	2000	2001	2002	2003	2004	2005
AVAILABLE FUNDS (mill. L.E.)						
Beginning Balance			(93.40)	(204.89)	(333.89)	(504.70)
Service Revenues						
Billed Revenue	31.565	29.657	30.463	31.290	32.140	33.014
Previous Years Billed Revenue	0.353	0.389	0.399	0.410	0.421	0.432
Less Adjustment for Uncollected Accounts	13.405	12.619	12.962	13.314	13.676	14.047
Collected Billings	18.512	17.426	17.900	18.386	18.886	19.399
Collected Arrears	13.530	13.559	13.120	12.575	12.483	12.912
Connection Revenue	0.335	0.335	0.337	0.338	0.340	0.342
Interest Earnings	0.000	0.000	0.000	0.000	0.000	0.000
Other Revenues	9.797	10.777	11.747	12.686	13.574	14.389
TOTAL AVAILABLE FUNDS	**42.174**	**42.097**	**43.103**	**43.986**	**45.283**	**47.041**
EXPENDITURES (mill. L.E.)						
Salaries	38.007	38.533	40.459	42.482	44.606	46.837
Commodities						
Electricity	7.656	8.038	8.440	11.221	14.258	14.971
Chemicals	0.000	0.000	0.000	0.000	0.000	0.000
Spare Parts, Tools and Materials	4.600	5.060	5.515	5.957	6.374	6.756
Other	2.512	2.763	3.012	3.253	3.481	3.689
Total Commodities	14.768	15.862	16.968	20.430	24.112	25.417
Services						
Maintenance	0.603	0.967	1.054	1.138	1.218	1.291
Other	0.603	1.442	1.571	1.697	1.816	1.925
Total Services	1.205	2.408	2.625	2.835	3.034	3.216
Purchases for Resale (new connections)	0.000	0.000	0.000	0.000	0.000	0.000
Transferable Expenses						
Taxes	0.155	0.171	0.186	0.201	0.215	0.228
Interest on Debt	35.061	60.146	74.309	85.918	117.264	134.791
Principal on Debt	15.503	15.852	17.295	18.150	23.682	25.252
Rent	0.003	0.003	0.004	0.004	0.004	0.004
Others	0.000	0.000	0.000	0.000	0.000	0.000
Total Transferable Expenses	50.722	76.172	91.793	104.273	141.165	160.274
Specialized Current Exchanges						
Other	2.291	2.520	2.747	2.967	3.174	3.365
Total Specialized Current Exchanges	2.291	2.520	2.747	2.967	3.174	3.365
TOTAL EXPENDITURES	**106.992**	**135.495**	**154.592**	**172.987**	**216.092**	**239.108**
RETURN ON EQUITY (ROE)	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
TOTAL EXPENDITURES + ROE	**106.992**	**135.495**	**154.592**	**172.987**	**216.092**	**239.108**
ANNUAL BALANCE	**(64.818)**	**(93.398)**	**(111.489)**	**(129.002)**	**(170.809)**	**(192.067)**
ENDING BALANCE (wo/Depreciation)		**(93.398)**	**(204.887)**	**(333.889)**	**(504.698)**	**(696.765)**

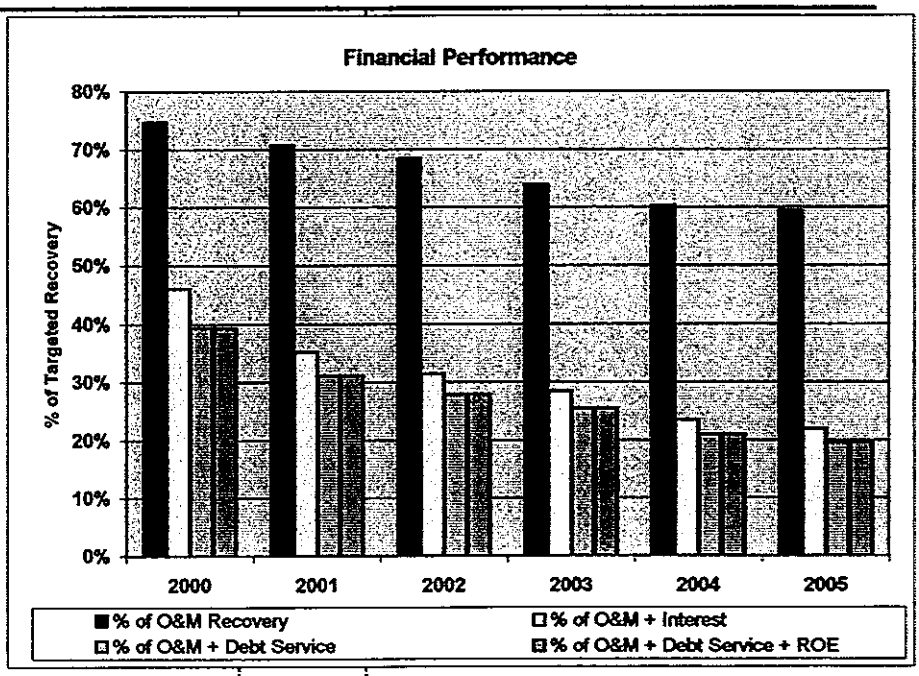
Table 5
Performance Statistics
Alexandria General Organization for Sanitary Drainage

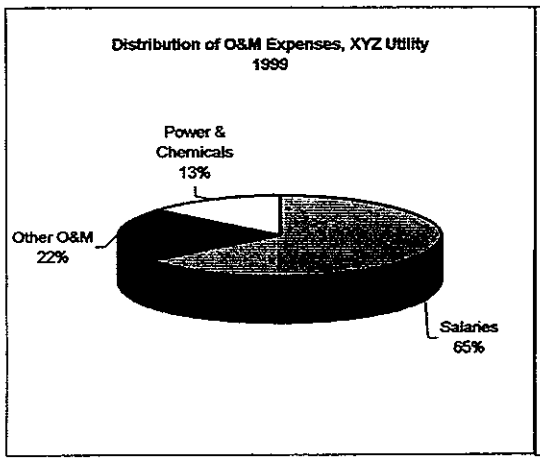
Measure	2000	2001	2002	2003	2004	2005
Financial						
Revenue Recovery						
% of O&M Recovery	74.7%	70.8%	68.4%	63.8%	60.3%	59.5%
% of O&M + Interest	46.1%	35.2%	31.4%	28.4%	23.5%	22.0%
% of O&M + Debt Service	39.4%	31.1%	27.9%	25.4%	21.0%	19.7%
% of O&M + Debt Service + ROE	39.4%	31.1%	27.9%	25.4%	21.0%	19.7%
Avg Cost of Wastewater Service (piasters/ m^3)	17.3	21.9	24.9	22.0	22.7	25.2
Billing Collections Rate	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%
Arrears Collection Rate	58.0%	58.0%	58.0%	58.0%	58.0%	58.0%
Operational						
No. of Mgr & Professional Employees/1,000 Connections	1.7	1.6	1.6	1.6	1.6	1.6
No. of Trades & Unskilled Empl./1,000 Connections	6.6	6.6	6.5	6.5	6.5	6.5
No. of Total Employees per 1,000 Connections	8.3	8.2	8.2	8.1	8.1	8.1
Avg Salary/Managerial & Professional Employee (L.E.)	11,708	12,293	12,908	13,553	14,231	14,942
Avg Salary/Trades and Unskilled Employee (L.E.)	5,250	5,513	5,788	6,078	6,381	6,700
Avg Salary - all employees	6,775	6,869	7,212	7,573	7,951	8,349
Salaries as % of O&M	67%	65%	64%	62%	59%	59%
Electricity as % of O&M	14%	14%	13%	16%	19%	19%

1- (Total available funds) / (Total payable expenses less principal & interest).
2- (Total available funds) / (Total payable expenses less principal) .
4- (Total available funds) / (Total payable expenses).
5- (Total available funds) / (Total payable expenses plus return on equity).

Summary Balance Sheet
Alexandria General Organization for Sanitary Drainage

Account	2000	2001	2002	2003	2004	2005
Annual Income	42.174	42.097	43.103	43.986	45.283	47.041
Annual Expenses	106.992	135.495	154.592	172.987	216.092	239.108
Net Annual Income	(64.818)	(93.398)	(111.489)	(129.002)	(170.809)	(192.067)





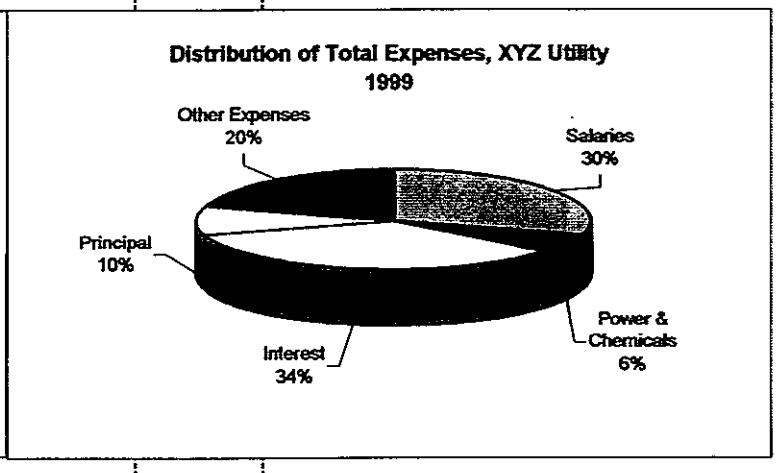


Table 1
"What-If" Model Parameters
Beheira Water Company

Parameter	2000	2001	2002	2003	2004	2005
Planning						
Change Rate						
General Inflation	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Salaries	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Electricity	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Financed Capital Program	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Population Growth Rate	1.9%	2.1%	2.1%	2.1%	2.1%	2.1%
Change in Household Size		0.0%	0.0%	0.0%	0.0%	0.0%
Water Connections Growth Rate by Customer Class						
Residential	0.5%	6.0%	6.0%	6.0%	6.0%	6.0%
Commerical	0.3%	6.0%	6.0%	6.0%	6.0%	6.0%
Public sector	0.6%	6.0%	6.0%	6.0%	6.0%	6.0%
Governmental	0.5%	6.0%	6.0%	6.0%	6.0%	6.0%
Religious	-0.5%	3.0%	3.0%	3.0%	3.0%	3.0%
Standpipes	-0.1%	-12.5%	-12.5%	-12.5%	-12.5%	-12.5%
Total	0.5%	5.9%	5.9%	5.9%	5.9%	5.9%
Financial						
Change in Avg. Water Price (piasters/m^3)						
Domestic						
1st Block			0.0%	0.0%	0.0%	0.0%
2nd Block			0.0%	0.0%	0.0%	0.0%
3rd Block			0.0%	0.0%	0.0%	0.0%
Service			0.0%	0.0%	0.0%	0.0%
Economic			0.0%	0.0%	0.0%	0.0%
Total	0.0%	-0.7%	6.9%	0.0%	0.0%	0.0%
Debt Payment Share of Utility						
Existing	100%	100%	100%	100%	100%	100%
Future	100%	100%	100%	100%	100%	100%
Government = 0 Private = 1	n.a.	n.a.		-	-	-
Equity Ownership:						
Percent Equity Ownership of Existing Capital			0%	0%	0%	0%
Percent Equity Ownership of New Capital			0%	0%	0%	0%
Rate of Return on Equity Capital (%)	0%	0%	10%	10%	10%	10%
Efficiencies						
Change in Current Billing Collections Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Arrears Collection Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Per Connection Water Use Rate						
Domestic						
1st Block			-1.2%	2.9%	2.2%	3.0%
2nd Block			-1.2%	2.9%	2.2%	3.0%
3rd Block			-1.2%	2.9%	2.2%	3.0%
Service			-0.8%	3.4%	2.6%	3.5%
Economic			-1.3%	2.8%	2.1%	3.0%
Total		-1%	-1%	3%	2%	3%
Change in Unaccounted-for Water	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Number of Employees - Managerial & Skilled	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Number of Employees - Trades and Unskilled	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Avg Salaries - Mgr & Skilled Employees	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Avg Salaries - Trades & Unskilled Employees	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Power & Chemicals Use Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Change in Parts, Materials & Maintenance	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 2
Utility Operational Data
Beheira Water Company

Revised: 12-Jun

Item	2000	2001	2002	2003	2004	2005
General Utility						
Total Population (mill. persons)	4.300	4.390	4.482	4.577	4.673	4.771
Population per Household	4.3	4.3	4.3	4.3	4.3	4.3
Number of Utility Employees						
Managerial & Professional	220	220	220	220	220	220
Trades and Unskilled Labor	1,980	1,980	1,980	1,980	1,980	1,980
Total Number of Employees	2,200	2,200	2,200	2,200	2,200	2,200
Unit Electricity Costs (L.E./m^3)	0.0566	0.0599	0.0635	0.0673	0.0713	0.0756
Unit Chemicals Costs (L.E./m^3)	0.0251	0.0266	0.0282	0.0299	0.0317	0.0336
Water						
Population Served by Water Lines (mill. persons)	1.333	1.413	1.498	1.588	1.683	1.784
Number of Water Connections by Customer Class						
Residential	310,000	328,600	348,316	369,215	391,368	414,850
Commerical	14,000	14,840	15,730	16,674	17,675	18,735
Public sector	910	965	1,023	1,085	1,151	1,220
Governmental	5,100	5,406	5,730	6,074	6,439	6,825
Religious	1,580	1,627	1,675	1,725	1,777	1,829
Standpipes	2,412	2,111	1,848	1,617	1,415	1,239
Total Water Connections	334,002	353,549	374,323	396,391	419,824	444,698
Number of Water Connections by Tariff Class						
Domestic						
1st Block	140,585	148,820	157,574	166,874	176,752	187,240
2nd Block	112,468	119,056	126,059	133,500	141,402	149,792
3rd Block	59,358	62,835	66,531	70,458	74,629	79,057
Service	7,590	7,998	8,429	8,885	9,366	9,875
Economic	14,000	14,840	15,730	16,674	17,675	18,735
Total Water Connections	334,002	353,549	374,323	396,391	419,824	444,698
Water Billed by Customer Class (mcm)						
Residential	70.5	73.5				
Commerical	3.0	3.1				
Public sector	1.0	1.1				
Governmental	9.2	9.6				
Religious	9.2	9.6				
Standpipes	23.9	24.9				
Total Water Billed (mcm)	116.7	121.8	127.4	138.8	150.2	163.9
Water Billed by Tariff Class (mcm)						
Domestic						
1st Block	32.100	33.101	34.620	37.726	40.819	44.556
2nd Block	26.010	26.497	27.714	30.199	32.675	35.666
3rd Block	13.200	13.943	14.584	15.892	17.195	18.768
Service	41.412	44.054	46.077	50.209	54.326	59.298
Economic	4.006	4.202	4.395	4.789	5.182	5.656
Total Water Billed (mcm)	116.728	121.798	127.389	138.815	150.197	163.943
Water Produced (mcm)	174.4	174.4	182.4	198.8	215.1	234.7

Table 3
Utility Capital and Debt Data
Beheira Water Company

Item	2000	2001	2002	2003	2004	2005
Existing Capital						
Existing Principal Payment		13.716	13.716	15.397	17.283	19.400
Existing Interest Payment		63.914	63.914	62.234	60.348	58.231
Existing Debt Payment	-	77.631	77.631	77.631	77.631	77.631
Cumulative Paid Principal	-	13.716	27.433	42.829	60.112	79.512
Remaining Balance	521.750	521.750	508.034	492.637	475.354	455.955
Initial Balance		521.750	521.750	521.750	521.750	521.750
Behiera Balance Share =		100%				
MoF Refinanced Cost						
Existing Principal Payment			-	-	-	-
Existing Interest Payment			-	-	-	-
Existing Debt Payment			-	-	-	-
Remaining Balance			-	-	-	-
Initial Balance			-	-	-	-
MoF Balance Share =						
New Capital						
New Capital Requirements (mill. L.E.)		-	128.3	70.1	64.9	89.8
Depreciation Estimate	-	-	5.131	7.935	10.532	14.122
Loan Issue Sizing	-	-	128.265	70.098	64.931	89.764
Private Equity Ownership	-	-	-	-	-	-
New Principal Payment	-	-	3.372	3.785	4.249	4.769
New Interest Payment	-	-	15.712	15.299	14.836	14.315
New Debt Payment**			19.084	19.084	19.084	19.084
Cumulative Paid Principal			3.372	7.157	11.406	16.175
Remaining Balance			124.893	121.108	116.860	112.090
Initial Balance		128.265	128.265	128.265	128.265	128.265
Loan 2*						
New Principal Payment				1.843	2.069	2.322
New Interest Payment				8.587	8.361	8.108
New Debt Payment**				10.430	10.430	10.430
Cumulative Paid Principal				1.843	3.911	6.233
Remaining Balance				68.255	66.187	63.865
Initial Balance			70.098	70.098	70.098	70.098
Loan 3*						
New Principal Payment					1.707	1.916
New Interest Payment					7.954	7.745
New Debt Payment**					9.661	9.661
Cumulative Paid Principal					1.707	3.623
Remaining Balance					63.224	61.308
Initial Balance				64.931	64.931	64.931
Loan 4*						
New Principal Payment						2.360
New Interest Payment						10.996
New Debt Payment**						13.356
Cumulative Paid Principal						2.360
Remaining Balance						87.404
Initial Balance					89.764	89.764
Loan Summary						
Total Principal Payments		13.716	17.088	21.024	25.307	30.767
Total Interest Payments		63.914	79.627	86.121	91.499	99.395
Total Debt Payments		77.631	96.715	107.145	116.806	130.162
Total Cumulative Paid Principal		13.716	30.805	51.829	77.136	107.903
Total Remaining Balance of Capital Debt Loans		(521.750)	(632.927)	(682.000)	(721.624)	(780.621)
Cumulative Ending Balance		(11.647)	(114.198)	(240.524)	(393.542)	(580.380)
Total Obligations Less Surplus		(533.397)	(747.124)	(922.525)	(1,115.166)	(1,361.001)

*Assumes debt financing is in increments occuring every two years.

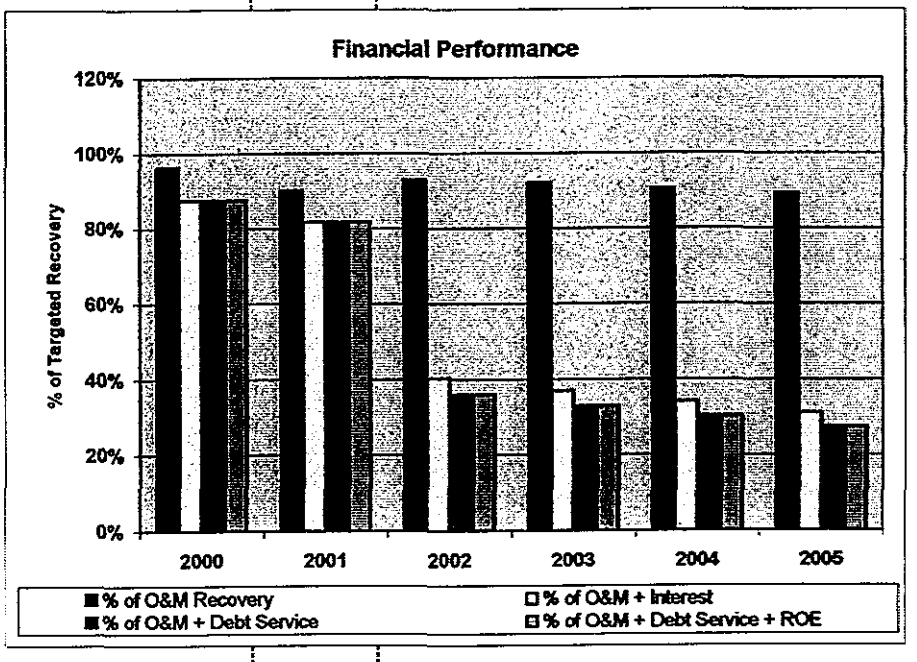
Table 4
Utility Budget
Beheira Water Company

Account	2000	2001	2002	2003	2004	2005
AVAILABLE FUNDS (mill. L.E.)						
Beginning Balance			(11.647)	(114.198)	(240.524)	(393.542)
Service Revenues						
Billed Revenue	38.956	40.372	45.135	49.183	53.216	58.086
Services and Connection Revenue	10.508	10.680	11.426	12.137	12.888	13.681
Purchases for resale (water)	1.797	1.855	1.855	1.855	1.855	1.855
Other	0.449	0.516	0.483	0.483	0.483	0.483
Less Adjustment for Uncollected Accounts	25.627	24.772	27.311	29.518	31.736	34.362
Collected Billings	26.083	28.651	31.587	34.139	36.705	39.742
Collected Arrears	18.445	10.473	14.175	15.891	17.468	19.103
Purchases for Resale (materials)	7.744	9.271	7.625	7.625	7.625	7.625
Previous Years Billed Revenue	0.278	0.131	0.223	0.223	0.223	0.223
Interest Earnings	0.835	0.993	0.993	0.993	0.993	0.993
Other Revenues	3.445	2.653	2.868	2.868	2.868	2.868
TOTAL AVAILABLE FUNDS	**56.830**	**52.173**	**57.472**	**61.740**	**65.882**	**70.554**
EXPENDITURES (mill. L.E.)						
Salaries	25.007	27.223	27.774	29.441	31.207	33.080
Commodities						
Electricity	9.870	10.443	11.578	13.373	15.338	17.746
Chemicals	3.374	3.603	4.917	5.451	6.296	7.221
Spare Parts, Tools and Materials	3.780	3.593	3.809	4.037	4.279	4.536
Other	1.404	1.277	1.354	1.435	1.521	1.612
Total Commodities	18.428	18.916	21.656	24.296	27.434	31.115
Services						
Maintenance	0.815	0.920	0.975	1.034	1.096	1.161
Other	1.065	1.245	1.320	1.399	1.483	1.572
Total Services	1.880	2.165	2.295	2.433	2.579	2.733
Purchases for Resale (new connections)	6.599	7.699	8.161	8.651	9.170	9.720
Transferable Expenses						
Taxes	0.537	0.604	0.640	0.679	0.719	0.763
Interest (debt and short-term borrowing)	5.937	5.937	81.054	100.110	120.963	147.604
Principal	0.000	0.000	17.088	21.024	25.307	30.767
Rent	0.000	0.000	0.000	0.000	0.000	0.000
Others	0.000	0.000	0.000	0.000	0.000	0.000
Total Transferable Expenses	6.474	6.541	98.782	121.813	146.990	179.133
Specialized Current Exchanges						
Other	6.484	1.276	1.353	1.434	1.520	1.611
Total Specialized Current Exchanges	6.484	1.276	1.353	1.434	1.520	1.611
TOTAL EXPENDITURES	**64.872**	**63.820**	**160.022**	**188.067**	**218.899**	**257.393**
RETURN ON EQUITY (ROE)	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
TOTAL EXPENDITURES + ROE	**64.872**	**63.820**	**160.022**	**188.067**	**218.899**	**257.393**
ANNUAL BALANCE	**(8.042)**	**(11.647)**	**(102.550)**	**(126.327)**	**(153.017)**	**(186.838)**
CUMULATIVE ENDING BALANCE		**(11.647)**	**(114.198)**	**(240.524)**	**(393.542)**	**(580.380)**
Accounts Receivable	110.947	118.129	132.428	145.563	159.190	173.459

Table 5
Performance Statistics
Beheira Water Company

Measure	2000	2001	2002	2003	2004	2005
Financial						
Revenue Recovery						
% of O&M Recovery	96.4%	90.1%	92.9%	92.2%	90.7%	89.3%
% of O&M + Interest	87.6%	81.7%	40.2%	37.0%	34.0%	31.1%
% of O&M + Debt Service	87.6%	81.7%	35.9%	32.8%	30.1%	27.4%
% of O&M + Debt Service + ROE	87.6%	81.7%	35.9%	32.8%	30.1%	27.4%
Avg Price of Water Service (piasters/ m^3)						
Domestic						
0-1 m^3	23	23	23	23	23	23
1-5 m^3	29	29	29	29	29	29
over 5 m^3	35	35	35	35	35	35
Service	45	45	45	45	45	45
Economic	75	75	75	75	75	75
Average Price	33	33	35	35	35	35
Change in Avg. Water Price	0%	-1%	7%	0%	0%	0%
Avg Cost of Water Service (piasters/ m^3)	37	37	88	95	102	110
Billing Collections Rate	50.4%	53.6%	53.6%	53.6%	53.6%	53.6%
Arrears Collection Rate			12.0%	12.0%	12.0%	12.0%
Operational						
Percent of Population Served	31%	32%	33%	35%	36%	37%
Water Use per Connection by Tariff Class (m^3/day)						
Domestic						
1st Block	0.63	0.61	0.60	0.62	0.63	0.65
2nd Block	0.63	0.61	0.60	0.62	0.63	0.65
3rd Block	0.61	0.61	0.60	0.62	0.63	0.65
Service	14.95	15.09	14.98	15.48	15.89	16.45
Economic	0.78	0.78	0.77	0.79	0.80	0.83
Total	0.96	0.94	0.93	0.96	0.98	1.01
Un-accounted-for Water	33%	30%	30%	30%	30%	30%
No. of Mgr & Professional Employees/1,000 Connections	0.7	0.6	0.6	0.6	0.5	0.5
No. of Trades & Unskilled Empl./1,000 Connections	5.9	5.6	5.3	5.0	4.7	4.5
No. of Total Employees per 1,000 Connections	6.6	6.2	5.9	5.6	5.2	4.9
Avg Salary - Managerial & Professional Employee (L.E.)	26,500	28,090	29,775	31,562	33,456	35,463
Avg Salary - Trades and Unskilled Employee (L.E.)	9,540	10,112	10,719	11,362	12,044	12,767
Avg Salary - all employees	11,367	12,374	12,625	13,382	14,185	15,036
Salaries as % of O&M	42%	47%	45%	44%	43%	42%
Electricity as % of O&M	17%	18%	19%	20%	21%	22%

1- (Total available funds) / (Total payable expenses less principal & interest).
2- (Total available funds) / (Total payable expenses less principal) .
3- (Total available funds) / (Total payable expenses).
4- (Total available funds) / (Total payable expenses plus return on equity).

Summary Balance Sheet
Beheira Water Company

Account	2000	2001	2002	2003	2004	2005
Annual Income	56.552	52.042	57.249	61.517	65.659	70.331
Annual Expenses	64.872	63.820	160.022	188.067	218.899	257.393
Net Annual Income	(8.320)	(11.778)	(102.773)	(126.550)	(153.240)	(187.061)