
ANNEXES TO VOLUME I

ANNEX 1 – PROJECT CONSULTANT TEAM

Name	Title	Company
Ian Driscall	COP-Chief of Party	Emerging Markets Group
Hussam Abu-Harthieh	Business Process Analyst	Emerging Markets Group
Ramez Mallouk	Senior IT Consultant	Emerging Markets Group
Sanabel El-Rayes	IT Consultant	Deloitte & Touche (M.E.) Jordan
Mohammad Musleh	IT Consultant	RazorView

ANNEX 2 – ITMP STEERING COMMITTEE

Steering Committee	
Eng. Khaldon Khashman	NGWA
Ra'ed Hijazi	NGWA
Mahmoud Shloul	PMU
Naser Bataineh	JVA
Isam Bataineh	WAJ
Eng. Mohammad Bani Mustafa "Coordinator"	MWI
Eng. Youssef Hassan	MWI
Eng. Suzan Taha	MWI
Nidal Saliba	PMU

ANNEX 3 – ITMP WORKING GROUPS

IT Organizational Structure	
Eng. Khaldon Khashman*	NGWA
Mahmoud Shloul	PMU
Naser Bataineh	JVA
Eng. Mohammad Bani Mustafa	MWI
Isam Bataineh	WAJ
Ra'ed Hijazi	NGWA
Majid Outaishat	WAJ
Customer Information System "CIS"	
Isam Bataineh*	WAJ
Fayez Habarneh	NGWA
Yasser Jariri	WAJ
Ahmad Abu-Saoud	AWC
Mohammad Al-Khateeb	JVA
Ahmad Al-Sadouni	LEMA
Eng. Tamer Al-Assad	WAJ
Asset and Plant Management & Maintenance	
Eng. Ahmad Abu-Sheikah*	NGWA
Jiryas Ghandoor	LEMA
Nidal Saliba	PMU
Esmat Halaseh	WAJ
Wa'el Abu-Taha	WAJ
Esam Rahal	JVA
Jamal Al-Khatib	JVA
Supply Chain	
Eng. Mahmoud Hakouz*	JVA
Eng. Eman Fakhouri	WAJ
Khalil Jammai	WAJ
Husein Abu Nijim	NGWA
Eng. Feda Muanes	JVA

* Group Leader

Executive Information System" EIS	
Eng. Youssef Hassan*	JVA
Ibtisam Al- Saleh	MWI
Eng. Suzan Taha*	MWI
Eng. Wessam Yared	WAJ
Back Office	
Naser Bataineh*	JVA
Ghalia Khaznakatbi	JVA
Ayda Jbour	JVA
Nadia Al-Ja'fari	WAJ
Moeen Barqawe	WAJ
Mahmoud Zou'bi	NGWA
Mohammad Muhaisen	LEMA
Collaboration and Web Presence	
Mohammad Bani Mustafa*	MWI
Inas Mohammad Zuraiqat	MWI
Aysha Abu Allan	WAJ
Firas Khallad	LEMA
Abdulqader Jaradat	NGWA
Hashem El-Naser	MWI
Infrastructure, e-Readiness & e-Government	
Mahmoud Shloul*	PMU
Ahmad Abu-Alkishk	LEMA
Eng. Suzan Hamdan	JVA
Reema Hamori	MWI
Eng. Qais Khashman	WAJ
Eng. Bassim Al-Khatib	NGWA

ANNEX 4 – SCOPE OF WORK

Scope of Work Information Technology (IT) Master Plan

Background

The potential for performance improvement in the Jordanian water sector through use of information –technology (IT) has been recognized for some time. Improving the flow of management information to decision –makers within MWI, WAJ and JVA allows performance improvement on many levels – for example, more timely and accurate billing, identification of principle sources of unaccounted for water, or overstock of supplies. At the same time, improved access to performance information for MWI facilities leads to better policy-making and supports the introduction of effective regulation.

Integrated Management Information Systems (MIS) are usually built around a data warehouse. This may accept outputs from of a wide range of IT applications (e.g., financial, revenue management, materials management, work management, HR and SCADA to populate the data warehouse. If a particular application does not easily interface to the data warehouse, “middleware” is available to build that interface. Suitable reporting, data interrogation, and even data mining tools allow an almost infinite variety of financial, operational, management, regulatory and other reports to be reproduced easily from the data warehouse. Such reports can be web-enabled with appropriate security.

Over the past several years, a number of projects have implemented new information systems and technologies in Jordan’s water sector. Examples include the Water Information System, the GIS database, and most recently ORACLE financials and Customer Relationship Management. These are funded by a variety of donors and have tended to be “point” solutions justified on the basis of their own benefit/cost business cases. The geographic and organizational scope of these systems varies and integration of them is limited. While this situation is not uncommon, the synergies of an integrated suite of IT applications that combine financial and operational data to provide management implementation costs are not as developed as they need to be.

Recently a number of developments in communications technology have increased the ways that data can be accessed and transmitted. They have also opened the possibility of using outsourced application Service Provider (ASP) approaches. Indeed, proposals have been made to introduce several additional ORACLE applications through a Unified Application Service Provider to serve all entities in the sector and to establish e-government capabilities.

Until now there has not been a systematic attempt to take a holistic view of the Jordan water and wastewater sector’s IT needs and to develop an IT Master Plan. Such a Master Plan is important in any enterprise or sector-wide IT initiative. It takes account of legacy and ongoing systems implementations but focuses on maximizing the functional benefits of all IT components at minimum cost. In effect it is a “least cost” investment plan for sector IT.

In short, an IT Master Plan is an essential prerequisite to further orderly and effective development of IT in Jordan’s water sector. IT commitments already made have long-term consequences. It is important that any new technology and systems choices build effectively on these post commitments. New IT choices should only be made after a careful analysis of the success (in return on IT investment terms) of previous systems projects. Careful analysis of the needs, options, integration and technology opportunities and challenges and long term costs and benefits of the options for new IT applications will ensure maximum return on future IT investments in the sector.

Several software applications currently exist in the MWI, WAJ and JVA. The following tables summarize these applications.

MWI

Application Name	Description	Type	Tools	Status
Attendees System	Administration	Internal	Oracle	Not Used

		Development		
Water Information System (WIS)	Water Management	Internal Development	Oracle	Production
Expenditure System	Financial System	External development	Oracle	Production

WAJ

Application Name	Description	Vendor	Tools	Database	Version
COBOL Billing System	Financial-Billing	Internal/WAJ	COBOL	COBOL file System	COBOSS0 COBOSS1 COBOSS2
X7 Billing System	Financial-Billing		Info	Oracle	
Inventory System	Inventory	Internal/WAJ	COBOL	Cobol file System	
COBOL Personnel System	Personnel	Internal/WAJ	COBOL	COBOL file System	
COBOL Payroll System	Financial Payroll	Internal/WAJ	COBOL	COBOL file System	
Expropriation System	Expropriation	Internal/WAJ	COBOL	COBOL file System	
Tenders System	Tenders	Internal/WAJ	COBOL	COBOL file System	
ACCPAC Financial System	Financial	Ready Made Package	Oracle	Pervasive .SQL Database	
NGWA Oracle Personnel System	Personnel	Internal/OMS	Oracle	Oracle Database	
NGWA Sewerage System	Sewerage	Internal/OMS	Oracle	Oracle Database	
Job Costing System	Maintenance System	Externally Developed by the RSS	Oracle	Oracle Database	

SCADA System is still under development in Karak governorate and is expected to be in operation in 2004-2005. GIS system is in production in most governorates and is maintained separately within each governorate.

JVA

Application Name	Description	Type	Tools	Status
HRMS & Payroll	Administration	Internal Development	Oracle	Not Used
Water Management Information System (WMIS)	Water Management	Internal Development	Oracle	Production
Financial Accounting System	Financial System	Oracle e-business Suite	Oracle	Production

Application Name	Description	Type	Tools	Status
Geographical Information System (GIS)		Packaged Application (ARC View)		Production

Objectives

This activity will critically review the IT systems already implemented or currently being implemented in Jordan’s water and wastewater sector. Based on an analysis of stakeholder reporting needs relative to the capabilities existing systems, the activity will prepare an IT Master Plan. The objective of the IT Master Plan is to ensure that optimal choices are made concerning the platform, application, configuration, and supporting technologies and resources to build commercially- oriented IT capability for Jordan’s water and wastewater sector.

At a minimum, an IT Master Plan:

- Evaluates the reporting needs of sector stakeholders to establish clear goals for further IT implementation;
- Sets appropriate standards for hardware, software, network and other communications infrastructure to provide “plug and play” functionality to ensure expandability in terms either of increased scope of existing applications, or implementation of new applications;
- Analyzes and justifies the least cost networking and communications strategies providing maximum connectivity to sector stakeholders;
- Analyzes strategic options for IT development in the sector (e.g., in- house systems development vs. integrated “best of breed” vs. enterprise resource planning (ERP) applications; or rapid vs. phased implementation) and justifies the optimum strategies; or outsourcings. Analyzes in-house IT functions;
- Prioritizes new IT applications in benefit/cost terms and sets clear implementation targets to monitor and track implementation success;
- Recommends software, hardware and human resource needs to support the plan’s implementation.
- Recommends the preferred applications; and,
- Ensures the long term sustainability of sector–wide IT by planning for organizational development and capacity building of IT functions and resources in the sector.

The IT Master Plan will clearly identify the priority IT applications and the integration within the sector. Experience of other developing country utilities suggests the maximum benefit/costs will likely come from improvements in:

MIS- especially in data warehousing and reporting tools (to the extent these are not already supported in the current Oracle implementation);

- Metering technologies;
- Cost recovery;
- Billing, collection and customer relationship management systems;
- Regulatory and high level performance information management systems to support better regulation and performance reporting;
- Human resource information systems (HRIS) to improve labor deployment and productivity and manage skills upgrading;
- Network operations and asset management applications to minimize unaccounted for water; and,
- Materials management applications to minimize inventory costs

These areas would be critically evaluated for potential “quick win” opportunities as well as for IT-

enabled re-engineering following systems selection.

Tasks

Task 1: Assessment of The Current Systems and The Identification of Gaps

- Inventory, map, review, assess and document to the degree necessary the existing/available IT systems in the water and wastewater sector that are possessed by MWI, WAJ and JVA, including LEMA, AWC and each governorate's Water Authority.
- Evaluate the extent of integration between these existing IT applications.
- Obtain a comprehensive understanding of the justifiable reporting needs.
- Determine the optimum current and future uses of IT human resources, hardware and systems in fulfilling perceived operational, financial, and other business objectives of MWI, WAJ, JVA and other pertinent water establishments.
- Identify the major "gaps" between current and planned IT functionality, and reporting and performance improvement needs to be addressed by new systems.
- Identify the major performance improvement opportunities across the water and wastewater sector (production, conveyance, supply, groundwater monitoring, quality control and laboratories, etc).
- Prioritize system applications and technology needs.
- Prioritize new systems using a high-level benefit/cost/risk business case basis, and identify potential for small-scale pilot implementations to demonstrate "quick wins".

Task 2: Development of an IT Strategy to Support System Integration

- **Added after Mod. (2)** Establish a series of Working Groups, each with membership of 4-6 persons drawn from the Counterpart Committee and wider sector management as appropriate, to work with the Consultant to develop out the prioritized Master Plan components from Task 1 in more detail;
- Facilitated by the Consultant, each Working Group would complete the data collection and analysis steps identified in Tasks 2 and 3 below to justify each component in terms of benefits, costs and risks, evaluate options to deliver each Master Plan component, recommend specific options, and develop high level budgets and implementation plans;
- Understand the number of entities and sub-entities (e.g., Regional or Divisional Offices, Zones, Billing Centers etc.) to be covered;
- Develop the conceptual design for the required communications and networking infrastructure-evaluating the cost of different communications options;
- Establish appropriate hardware, software, communications and networking platform standards;
- Specify system security, backup and disaster recovery standards;
- Develop and evaluate on a benefit/cost/risk basis the strategic options for implementing the additional systems required (including the ASP model) and for integrating existing systems, and,
- Review the IT organizations and skills levels across MWI, WAJ and JVA. Evaluate the IT "change readiness" of the entities and sub-entities where additional systems will be implemented and develop appropriate capacity-building plans.

Task 3: Selection of IT Applications

- Carry out market surveys of available IT offerings that could help fill the identified gaps;
- Detail business cases for each target application;
- Develop high-level functional specifications for each application;
- Develop budgets for each application;

-
- Identify the future costs and personnel required to support the selected applications and platform;

Task 4: Prepare IT Master Plan Implementation Budget and Work Plan

- Develop an implementation budget for the Master Plan.
- Develop an implementation work plan, including tasks, timetable and personnel requirements

Remarks:

USAID/Jordan would not restrict the design contractor from being the implementing contractor.

Time Schedule

After adding the Working Group activity, it is anticipated that the in-country effort will be completed within a nine months period starting from the signing of the Task Order. All work under the Task Order shall be completed within eleven months from the award date (see attached new project schedule).

Deliverables/ Report/ Outputs

Progress Reporting

Develop work plan with benchmarks and targets for the IT assessment activities, and establish reporting systems to document progress in relation to the benchmarks and targets.

Prepare and maintain project records, conduct implementation workshops to report progress and resolve problem areas.

Submittals:

It is required that close and clear communications be maintained between the contractor, USAID/Jordan and MWI, WAJ, JVA throughout the project. The Contractors shall submit sufficient status reports to MWI, WAJ, JVA and USAID/ Jordan to keep them fully informed of the project.

The Contractor shall submit monthly progress reports to USAID/Jordan. The reports shall, at a minimum, include the following:

A brief discussion of current activities for each major element of the project. This shall include status of each task and activity, progress, status of coordinating work with MWI, WAJ, JVA, cash flow status, recommendations issued, and other activities pertinent to the problems.

Presentation of major problem areas, current or foreseen, and recommendations for resolving these problems

Anticipated activities for the coming month.

A status report on the contractor staff, including arrival and departure dates of U.S. personnel, employment and termination dates of Jordanian personnel, a summary of man days to date and projected for each major task.

Presentation of actual progress to date versus scheduled progress in graphic form, and where appropriate, discuss reasons for slippage from schedule and actions being taken toward recovery.

Such supporting information as required to provide a concise and comprehensive report.

Monthly status reports shall be due on the tenth working day of the following month. Five copies of each report shall be delivered to the USAID/Jordan COTR.

An implementation schedule for the Contractor's activities shall be required.

Demobilization Plan

One month prior to the estimated completion date of the Task Order, the Contractor shall submit a draft demobilization plan to the USAID COTR and Contracting officer for review and approval. The demobilization plan shall have a realistic time frame with a detailed schedule breakdown by task or deliverables, demonstrating compliance with the Task Order terms and requirements. The Plan shall

have three components:

Equipment: The plan for transfer of custody should be directly tied to the work required under the Task Order. Note that no equipment procurement is anticipated under this Task Order.

Staff: Demobilization of staff must be tied to the Task Order work plan

Programmatic: This aspect of the demobilization plan tracks the deliverables to be provided under the Task Order, indicating when the deliverables will be completed or at what stage of completion they will be when staff departs post. This component must track closely with the work plan.

At the conclusion of Task Order activities, a final report shall be produced requiring USAID review and approval that includes a review and discussion of the planning, implementation and outcomes of the Task Order activities.

Submitted to USAID for approval thirty days after the completion of the IT Plan, the Final Report shall include the IT Plan and summarize all Task Order activities and assess the progress made in fulfilling the Task Order purpose and include the following information:

Expatriate personnel (by name and job title); arrival and departure dates; man weeks of service in the performance of the work.

Jordanian personnel (by name and job title) with inclusive dates of work on the project.

Actual submission and approval dates; comments

Problem areas in Task Order administration and suggestions for improvements

All sources of data, information interviews, etc., and a bibliography of reference works used in carrying out the project.

A draft report shall be submitted to USAID for review and comment prior to submittal of the final report.

Ten copies of the Contractor's final report shall be submitted to USAID.

For USAID/Washington, the Contractor should submit the following:

For EGAT/EG: one hard copy of the final report and close out report by mail to:

Mark H. Karns, CFA

Sr. Privatization Advisor

Agency for International Development

Bureau for Economic Growth, Agriculture and Trade

EGAT/EG Suite 2.11.115

1300 Pennsylvania Ave. NW

Washington, DC 20523 – 2110

Direct (202) 712 5516

Fax (202) 216 3025

Email mkarns@usaid.gov

Web <http://inside.usaid.gov/eg>

And

Yoon Joo Lee, Ph D, Economist & CTO

USAID

EGAT/EG, Room RRB-2.11-72

Washington, DC 20523

Tel:202-712-4281; Fax: 202-216-3010

EM: ylee@usaid.gov

For CDIE: one hard copy of the final report and one electronic copy on diskette to:

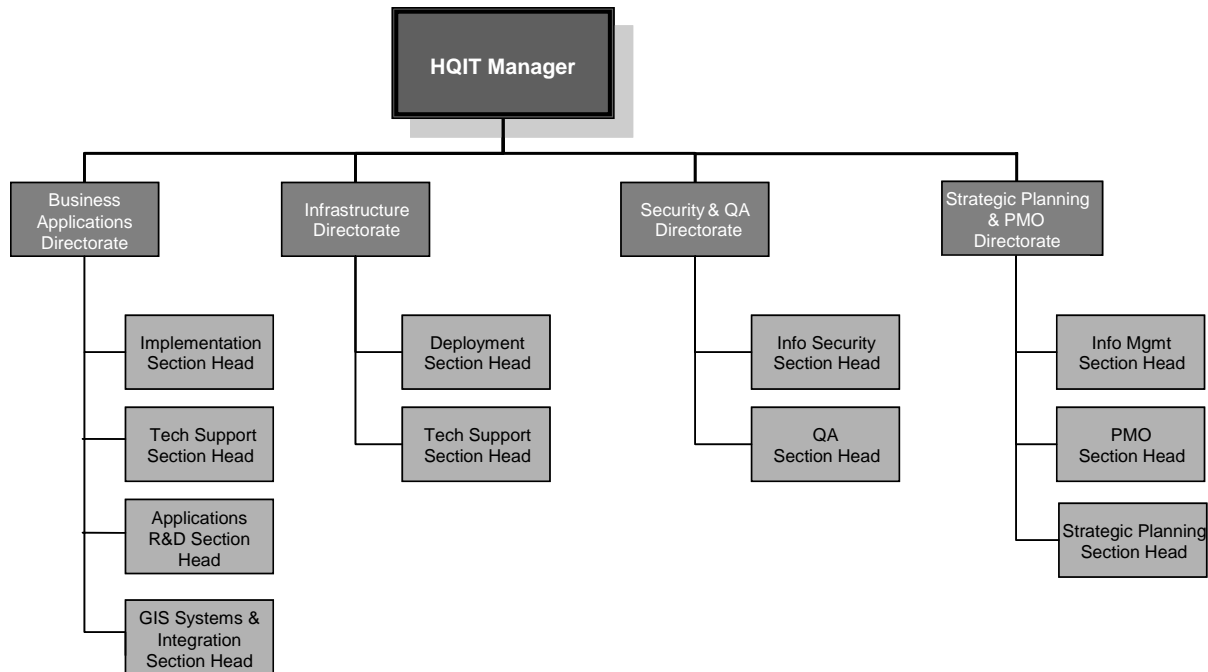
U.S Agency for International Development
PPC/CDIE/DI, Attention: Acquisitions
1300 Pennsylvania Avenue, N.W.
Ronald Regan Building M.01-010
Washington, D.C 20523

Monitoring & Evaluation

In cooperation and coordination with the MWI Project Manager and the USAID/Jordan Team Leader will perform monitoring of contractor's performance. Evaluation of the contractor's performance at the completion of each of the four phases will be documented in the Task Order file.

ANNEX 5 – PROPOSED HQIT ORGANIZATION DESIGN

The proposed design of the new HQIT organization is shown below:



The HQIT is led by a Center/Unit Manager acting as the “Chief Information Officer (CIO)” of the water sector. This individual is responsible for monitoring and assuring the continuous development of IT in the sector according to the ITMP which will be updated every 3 – 5 years. The Center/Unit Manager will work jointly with sector leadership to provide them with consolidated reports and information aggregated by the Executive Information System.

Directorates and their roles

The HQIT will consist of four Directorates with the roles and responsibilities described below. Note that a full Administration, Finance and HR Directorate would need to be added when the HQIT is corporatized:

Business Application Directorate

- Communicate specific business needs and detailed requirements to the PMO Section for project initiation and procurement.
- Provide technical implementation services and ongoing configuration support for backbone systems
- Develop and maintain in-house built applications as required to formal international best practice standards
- Maintain up to date documentation and change records for all backbone and Headquarters Organizations applications
- Ensure that applications are available on a 24x7 basis
- Provide training services for backbone systems and other developed applications
- Monitor research and development trends for utility based business applications
- Liaise with other Directorates and Operating Utilities on applications-related issues
- Implement the recommendations of the Security and Quality Assurance for applications

-
- Update the sector-wide intranet and web portal from an applications perspective

Infrastructure Directorate

- Upgrade and support the HQ LAN and WAN as per the ITMP
- Co-plan and design in cooperation with Operating Utilities WAN upgrades and extensions, again guided by the ITMP
- Implement the recommendations of the Security and Quality Assurance for infrastructure
- Efficiently and effectively procure properly justified HQ hardware, operating system and infrastructure needs
- Ensure that the Headquarters Organizations IT environment is fully available on a 24x7 basis
- Liaise with other Directorates and Operating Utilities on infrastructure-related issues
- Cooperate with Operating Utilities to design business continuity and fail-over strategies
- Maintain the sector-wide intranet and web portal from an infrastructure perspective
- Provide technical support for end-users

Security and OA

- Review and recommend best practice standards and procedures for other HQIT Directorates such as ITIL and SDLCs
- Review, adapt and implement best practices in information security (example: ISO 17799)
- Identify, manage and mitigate all IT risks within HQ Directorates
- Conduct internal audits for security compliance and provide recommendations to all Directorates
- Cooperate with Operating Utilities to encourage their adoption of, and compliance with, risk management, risk mitigation and information security policies – developed again to best practice standards
- Provide quality assurance for all IT HQ related projects, applications, processes and deliverables

Strategic Planning and Program Management Office (PMO)

- Develop Project Management Practice policies, procedures and forms
- Act as the Program Management Office planning, managing and monitoring the implementation of all large IT projects
- Manage and monitor progress against 6-monthly updated HQIT work plans
- Manage annual zero-based budget development by all Sections
- Be responsible for ensuring that PMO standards are adopted on all projects and properly communicated to operating entities
- Cooperate with Operating Utilities to ensure endorsement of PMO
- Consolidate sector-wide information and be responsible for providing CIO and EIS with decision-making data and related information.
- Prepare tender documents and be responsible for procurement and negotiation of services, products and other IT commodities.
- Perform technology watch services and provide sector-wide with analyst reports on latest technologies and standards.

Composition of Sections within each Directorate

The suggested staffing composition of each section under the four Directorates is as follows:

Business Application Directorate

Solutions/Applications Implementation Section – this Section hosts functional consultants and system analysts who possess broad experience of business needs and their systems support solutions.

These individuals will work with business users to develop detailed business requirements and software specifications. They will also provide on-the-job functional training and post-implementation functional support.

Solutions/Applications Technical Support Section – this Section provides Help Desk and technical support services for all solutions/applications implemented by MWI, JVA and WAJ. It hosts purely application technical personnel such as database administrators, application technical administrators, and technical solution architects. and other. It does not provide any infrastructure related administration.

Applications Research and Development Section – primarily hosting a development team who are either responsible for developing internal applications, system interfaces, or customizing best of breed application, this Section acts as a second level support to the Technical Support Section above. It has no interaction with end users. The Section is also responsible for monitoring technology developments in the applications/software domain for the water and utilities sector, and for providing feedback to the HQIT Center/Unit Manager to be communicated across other Operating Utilities.

Geographical Information Systems Section – based on the request of the ITMP Steering Committee, this Section has been created to host technical support staff for GIS. It acts as a custodian of GIS not as an owner (this resides with the specialist end-user community). It has the following specific mandates – providing technical support to business users and owners of GIS data, managing and organizing technology agreements with the Department of Lands and Survey, the Royal Jordanian Geographical Center (RJGC) etc., and developing and ensuring compliance sector-wide with GIS meta data and applications interfacing standards suitable for the Jordan Water Sector. Finally it will also act as the unified repository for sector-wide GIS data.

Infrastructure Directorate

Deployment Section – this Section is responsible for developing hardware and infrastructure specifications and for working collaboratively with the Applications/Solutions Section for infrastructure provisioning. The team is responsible for rolling out infrastructure environments, ensuring that all operational aspects are monitored and that 24x7 service is guaranteed.

Technical Support Section – this Section provides Help Desk and technical support to end users on all issues related to hardware, operating systems, email and related collaboration and office applications and infrastructure. The Section does not provide other applications/solutions support except that it works jointly and collaboratively with the relevant Applications/Solutions Technical Support Section.

Security and OA

Information Security Section – this Section handles all aspects of security monitoring, reporting, resolving and escalation of threats, vulnerability, intrusion...etc. They monitor the audit files and logs of applications and infrastructure components and report violations in a prompt manner. The Section also works with the various business units in authorizing users and granting access privileges.

Quality Assurance Section – this Section ensures compliance of all IT operations with a comprehensive QA process. It is an integral element in assuring data integrity. The role of the QA Section is to test applications, ensure that all IT policies and procedures are followed. It will also assure the quality of systems implementations, monitor acceptance tests, and assure realization of targeted business benefits.

Strategic Planning and PMO

Information Management Section - consolidating and presenting information to decision-makers is the primarily responsibility of this Section. It also assumes the role of monitoring developments in IT worldwide, organizing and watching important related events, and coordinating with other Sections and Operating Utilities.

Program Management Office Section – this Section sets project management and implementation standards, participates in project meetings and is empowered to make sure that all projects are on

track. It escalates risks and issues as quickly as possible to the HQIT Center/Unit Manager for further action as necessary.

Strategic Planning Section – this Section is responsible for drafting contracts, operational policies and procedures, preparing RFPs and monitoring contracts and budgets. The Section is also the custodian of the sector-wide ITMP and ensures its periodic update. Additionally it manages and monitors the 6-monthly workplans of each section and oversees the annual budget preparation process ensuring its consistency with the ITMP.

ANNEX 6 – AM-MM-SUPPLY CHAIN BUSINESS CASE

Key numerical assumptions are bolded
All calculations in JD, unless otherwise stated

BENEFITS CALCULATION IN JD

AM-MM - Annually Recurring Reduction of NRW m3 Supplied	WAJ	JVA	Sector
Current NRW (tech + admin)	46.5%	22.0%	
Assume absolute % reduction achieved =	1.5%	1.5%	
Target NRW (tech + admin)	45.0%	20.5%	
Tech+Admin/Total Factor	50.0%		
Additional m3 billed (NRW saved)	<u>2,062,500</u>	<u>3,615,000</u>	
Average water tariff, retail / JD/m3	0.340	0.015	
Average wastewater tariff, retail / JD/m3	0.155	n/a	
O&M cost of wastewater treatment / JD/m3	0.130	n/a	
Average wastewater contribution margin	0.025	n/a	
% wastewater/water billing	36.0%	n/a	
Net value / m3 NRW saved	<u>0.349</u>	<u>0.015</u>	

1.5% / 46.5% is equivalent to a 3.2% relative reduction

Notes:

1. Benefits and costs are not escalated - in price or volume
2. Benefits continue beyond yr 10 but are ignored as their PV is small

USD million
Total additional revenue from NRW saved/ JD/yr **719,813** 54,225 774,038 **1.11**

AM-MM - Annually Recurring Savings in Energy	WAJ	JVA	Sector
Total energy expenses / JD	51,000,000	1,000,000	
Pumping ratio	70%	20%	
Pumping costs /JD	35,700,000	200,000	
Assume relative saving of	1%	1%	
Savings in energy costs / JD/yr	<u>357,000</u>	<u>2,000</u>	<u>359,000</u>

0.51

1.62

Supply Chain - One-Time Inventory Reduction

Assume in JD (and spread over 3 years below) **5,000,000** **7.14**

Supply Chain - Annually Recurring Reduction in Inventory Losses

Average inventory carried / JD 15,000,000
Assume annual losses of **10%**
Assume reduction of annual losses to **3%**
Savings from loss reductions / JD/yr **1,050,000** **1.50**

DISCOUNTED CASH-FLOW CALCULATION IN USD

USD/JD = 0.70

Year	0	1	2	3	4	5	6	7	8	9	10	Total
Implementation Costs												
- Supply Chain (0.7M USD / 3 yrs)	(0.60)	(0.05)	(0.05)									(0.70)
- AM-MM (4.67M USD / 3 yrs)	(2.34)	(2.10)	(0.24)									(4.67)
Ongoing Support Costs (after 3 years)				(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.40)
Annual Total Cost of Ownership	<u>(2.94)</u>	<u>(2.15)</u>	<u>(0.29)</u>	<u>(0.29)</u>	<u>(0.29)</u>	<u>(0.29)</u>	<u>(0.29)</u>	<u>(0.29)</u>	<u>(0.29)</u>	<u>(0.29)</u>	<u>(0.29)</u>	<u>(7.69)</u>
Benefits												
Annually Recurring Reduction of NRW			1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	9.95
Annually Recurring Energy Savings			0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	4.62
"One-time" Inventory reduction			2.38	2.38	2.38							7.14
Annually Recurring Reduction in Inventory Losses			1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	13.50
			<u>5.50</u>	<u>5.50</u>	<u>5.50</u>	<u>3.12</u>	<u>3.12</u>	<u>3.12</u>	<u>3.12</u>	<u>3.12</u>	<u>3.12</u>	<u>35.21</u>

NPV AT START OF IMPLEMENTATION

	AM-MM-SC	AM-MM	SC
Assume Discount Rate =	10%		
PV of Costs	(5.82)	(5.00)	(0.82)
PV of Benefits	19.74	7.70	12.03
Net Present Value of Systems Implementation	<u>13.92</u>	<u>2.71</u>	<u>11.21</u>

ANNEX 7 – CIS-BILLING BUSINESS CASE

Key assumptions are bolded
All calculations in JD, unless otherwise stated

BENEFITS CALCULATION IN JD

CIS - Annually Recurring Reduction in Non Revenue Water

	WAJ
m3 Supplied	275,000,000
Current NRW (tech + admin)	46.5%
Assume absolute % reduction achieved =	1.5%
Target NRW (tech + admin)	45.0%
Tech+Admin/Total Factor	50.0%
Additional m3 billed (NRW saved)	2,062,500

Average water tariff, retail / JD/m3	0.340
Average wastewater tariff, retail / JD/m3	0.155
% wastewater/water billing	36.0%
Net value / m3 NRW saved	0.396

Total additional revenue from NRW saved/ JD/yr	816,338	USD million	1.17
---	----------------	-------------	-------------

CIS - "One-Time" Cash Inflow from Shift to Monthly Billing

	WAJ		
Average Meter to Cash Cycle	120	days	
By Shifting to Monthly Billing, Reduce to	75	days	
Total Annual Revenue from Water and Wastewater Billing (exc. Taxes) / M JD	72		
One-time Cash Inflow / M JD	8.88		12.68
Assume only largest customers shift to monthly billing (1.7% of total customers y	4.44	50%	6.34

CIS- One-Time Recovery of Bad Debts

Outstanding Bad Debts / M JD	13,500,000		
Assume one-time relative reduction	10%		
One-time Cash Inflow / M JD	1,350,000		1.93

DISCOUNTED CASHFLOW CALCULATION IN USD

	USD/JD =	Year	1	2	3	4	5	6	7	8	9	10	Total
Implementation Costs													
CIS X7 rollout (\$775K + 30% contingency over 2 yrs)	(0.50)		(0.50)										(1.01)
Ongoing Support Costs (5 installs @ \$25K/yr)	(0.13)		(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(1.38)
Annual Total Cost of Ownership	(0.63)		(0.63)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(2.38)
Benefits													
Annually Recurring Reduction of NRW				1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	10.50
"One-time" Inflow from Shift to Monthly Billing (assumed spread over 2 yrs)				3.17	3.17								6.34
One-time recovery of Bad Debts				1.93									1.93
			-	-	6.27	4.34	1.17	1.17	1.17	1.17	1.17	1.17	18.76

NPV AT START OF IMPLEMENTATION

Assume Discount Rate =	10%
PV of Costs	(1.69)
PV of Benefits	11.55
Net Present Value of Systems Implementation	9.86

Notes:

1. Benefits and costs are not escalated - in price or volume
2. Benefits are assumed not to begin for 2 years
3. Benefits continue beyond year 10 according to system life - these are ignored but would anyway have only a small PV