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Report No: PAD2405

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF

US$210 MILLION

TO THE

REPUBLIC OF IRAQ

FOR A

BAGHDAD WATER SUPPLY AND SEWERAGE IMPROVEMENT PROJECT

January 9, 2018

Water Global Practice
Middle East And North Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective December 31, 2017)

Currency Unit =	Iraqi Dinar
US$1 =	IQD1,190

FISCAL YEAR

January 1 - December 31

Regional Vice President:	Hafez Ghanem
Country Director:	Saroj Kumar Jha
Senior Global Practice Director:	Guang Zhe Chen
Practice Manager:	Carmen Nonay
Task Team Leader(s):	Abdulhamid Azad, Nafie Mohammed Mofid

ABBREVIATIONS AND ACRONYMS

BSA	Baghdad Sewerage Authority
BWA	Baghdad Water Authority
CPF	Country Partnership Framework
DMA	District Metered Area
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESO	Environmental and Safeguards Officers
FM	Financial Management
GDP	Gross Domestic Product
GoI	Government of Iraq
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
IBNET	International Benchmarking Network
IDP	Internally Displaced People
IQD	Iraqi Dinar
IFC	International Finance Cooperation
IFR	Interim Financial Report
MCM	Million Cubic Meters
MFD	Maximizing Finance for Development
M&E	Monitoring and Evaluation
MIGA	Multilateral Investment Guarantee Agency
MoCHMPW	Ministry of Construction, Housing, Municipalities and Public Works
MoB	Mayoralty of Baghdad
MoU	Memorandum of Understanding
NDP	National Development Plan
NPF	New Procurement Framework
NRW	Non-Revenue Water
OP	Operations Policies
PDO	Project Development Objective
PIC	Project Implementation Consultant
PMAC	Prime Minister's Office Advisory Commission
PMU	Project Management Unit
PPSD	Project Procurement Strategy for Development
PPP	Public-Private Partnership
SCADA	Supervisory Control and Data Acquisition
SCD	Systematic Country Diagnostic
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

BASIC INFORMATION

Is this a regionally tagged project?	Country(ies)	Financing Instrument
No		Investment Project Financing

[ ] Situations of Urgent Need of Assistance or Capacity Constraints

[ ] Financial Intermediaries

[ ] Series of Projects

Approval Date	Closing Date	Environmental Assessment Category
31-Jan-2018	30-May-2023	B - Partial Assessment

Bank/IFC Collaboration
No

Proposed Development Objective(s)

The Project Development Objective (PDO) is to improve the quality of drinking water supply and wastewater services in Baghdad.

Components

Component Name	Cost (US$, millions)
Institutional strengthening for integrated urban water management and utility management, and creating an enabling environment for private sector engagement	11.47
Investment in drinking water supply and wastewater infrastructure	188.00
Project management, studies and M&E	10.00

Organizations

Borrower :	REPUBLIC OF IRAQ
Implementing Agency :	Mayoralty of Baghdad

PROJECT FINANCING DATA (US$, Millions)

[ ] Counterpart Funding	[✓] IBRD	[ ] IDA Credit	[ ] IDA Grant	[ ] Trust Funds	[ ] Parallel Financing

Total Project Cost:	Total Financing:	Financing Gap:
210.00	210.00	0.00
	Of Which Bank Financing (IBRD/IDA): 210.00	

Financing (in US$, millions)

Financing Source	Amount
IBRD-87960	210.00
Total	**210.00**

Expected Disbursements (in US$, millions)

Fiscal Year	2018	2019	2020	2021	2022	2023
Annual	4.50	17.72	30.90	52.60	75.15	29.13
Cumulative	4.50	22.22	53.12	105.72	180.87	210.00

INSTITUTIONAL DATA

Practice Area (Lead)

Water

Contributing Practice Areas

Governance

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

Yes

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

Yes

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

Yes

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	High
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Moderate
6. Fiduciary	High
7. Environment and Social	Substantial
8. Stakeholders	Moderate
9. Other	High
10. Overall	High

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Natural Habitats OP/BP 4.04		✓
Forests OP/BP 4.36		✓
Pest Management OP 4.09		✓
Physical Cultural Resources OP/BP 4.11		✓
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37		✓
Projects on International Waterways OP/BP 7.50	✓	
Projects in Disputed Areas OP/BP 7.60		✓

Legal Covenants

Sections and Description

Schedule 2, Section I, B.6.a: the Borrower shall no later than ninety (90) days after the Effective Date, establish and thereafter maintain throughout the period of implementation of the Project, a grievance redress mechanism, satisfactory to the Bank, for management of complaints related to the project.

Conditions

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Abdulhamid Azad	Team Leader(ADM Responsible)		GWA05
Nafie Mohammed Mofid	Team Leader		GWA05
Nazaneen Ismail Ali	Procurement Specialist(ADM Responsible)		GGOPM
Leena Mohammed Khider Al Abbasy	Procurement Specialist		GGOPM
Jad Raji Mazahreh	Financial Management Specialist		GGOMN
Alexander A. McPhail	Team Member		GWA05
Andrianirina Michel Eric Ranjeva	Team Member		WFALN
Avjeet Singh	Team Member		GWASO
Chaogang Wang	Social Safeguards Specialist		GSU05
Charalambos Bambos Charalambous	Team Member		GWA05
Christine Makori	Counsel		LEGAM
Concepcion Aisa Otin	Team Member		FABBK
Delphine Divan	Peer Reviewer		CASPM
Elena Gagieva-Petrova	Team Member		GWA05
Ibrahim Ismail Mohammed Basalamah	Social Safeguards Specialist		GSU05
Joel Evan Kolker	Peer Reviewer		GWAGP
Macha Petronella Kemperman	Team Member		GTKM1
Maitreyi B Das	Peer Reviewer		GWADR
Nina Chee	Safeguards Advisor		OPSES
Raghad Adday Hussein	Team Member		MNCIQ
Sean Christopher Nelson	Team Member		GWASO
Sharon D. C. Faulkner	Team Member		GWA05

Tracy Hart	Environmental Safeguards Specialist		GEN01
Vivek Srivastava	Peer Reviewer		
William D. Kingdom	Team Member		GWADR

Extended Team

Name	Title	Organization	Location

IRAQ
BAGHDAD WATER SUPPLY AND SEWERAGE IMPROVEMENT PROJECT

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I. STRATEGIC CONTEXT

A. Country Context

1. In 2013, the population of the Republic of Iraq was estimated at around 33 million, of which 66 percent lived in urban areas. Currently the country has an estimated 3.3 million internally displaced people (IDPs). About 27 percent of the total urban population in Iraq resides in Baghdad, the largest city in the country with an estimated population of six million, not including an estimated 289,000 of IDPs. A 2012 household survey indicated that Iraq's national poverty stood at 19 percent and that 20 percent of the population lived on less than US$2 a day, and 70 percent on less than US$4 a day. The poverty rate in 2012 in Baghdad was at 12 percent; this figure is likely to have risen significantly due to the recent conflict. Unemployment is high and labor force participation remains low, especially for women and youth.

2. The current government, in place since September 2014, has detailed a reform plan to build a more transparent state that delivers better services to the public. The main priority for Iraq is the incremental and long-term rebuilding of state institutions that have been weakened over the last thirty years. Despite the complex political situation, the authorities are committed to implementing the National Development Program for 2014-2018 that focuses on reaching security and stability by restoring the rule of law and upgrading the standard of living. This includes delivering water and electricity services, improving the health and education sector performance, and reforming the social protection system. On July 10, 2017, the Government of Iraq (GoI) declared the liberation of the second largest city, Mosul, which had been occupied by ISIS for the past three years. The humanitarian crisis in Iraq is almost unprecedented. The pace of displacement over the past three years has been enormous. The second strategic priority of the government program is to deliver public services and upgrade standards of living.

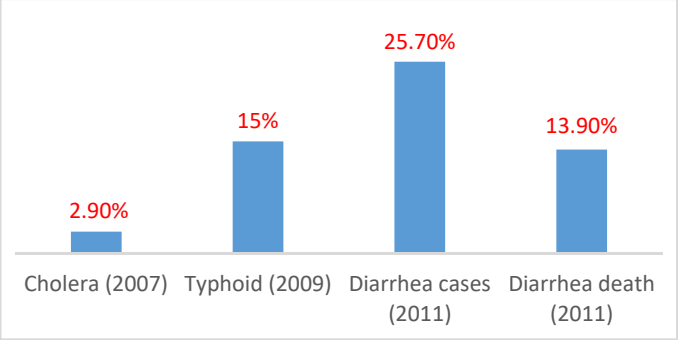
3. The country's ongoing security problems and the large role of the state in the economy impede investment and inhibit private economic activity. Security threats and a fall in oil prices, the main revenue source for the GoI, have compounded economic decline and worsened the fiscal situation. The economy grew at 0.1 percent in 2014 and 2.9 percent in 2015, from a 4.2 percent growth in 2013. While oil production was increased over time despite low oil prices, non-oil-GDP contracted by 5.1 percent in 2014 and 13.9 percent in 2015. High dependence on the oil sector has led to structural weaknesses in the overall economy. State-owned enterprises (SOEs) and the public sector more broadly provide almost all formal jobs. Decades of state-driven economic policy have discouraged private sector growth. Limited access to finance, an underdeveloped financial sector dominated by a few state-owned banks, and weak financial regulations further compound the challenges. A vibrant private sector, however, is a necessary condition for stability and poverty reduction. Furthermore, moving from stabilization to long-term development will require diversification, with strong non-oil-based economic activities also contributing to GDP.

4. The GoI recognizes the urgent need for private sector development throughout the entire economy. One way to increase the involvement of the private sector is through Public-Private-Partnership (PPP) in infrastructure development given the key role adequate infrastructure can play in improving the business environment, economic growth and stability. However, the government efforts have yet to translate into a tangible PPP program given the focus on improving political stability and addressing the security environment, as well as the lack of understanding of PPP procurement and contractual

requirements at the ministerial level. Iraq has not succeeded in implementing its infrastructure plans in the last few years. Moreover, many infrastructure projects are reported to have been stopped at various construction stages due to budget constraints owing to the prolonged decline in the oil price and the deteriorating security situation.

5. Inadequate infrastructure has affected access to and quality of public service delivery. Water and electricity shortages are binding constraints on the population's quality of life and private sector development. Safe drinking water and basic sanitation are of crucial importance to the preservation of human health, especially among children. Baghdad is one of the governorates most impacted by outbreaks of waterborne diseases (see Figure 1). Contaminated water supplies and improper disposal of sewage force families to spend a significant fraction of their income on medical treatment and to purchase bottled water. This has implications for gender inequality in addition to the adverse effects on children's health, by increasing the burden of care on mothers, who are the primary caregivers of children.

Figure 1 – Incidence of waterborne diseases in Baghdad



Source: Integrated Drought Risk Management – National Framework for Iraq, March 2014, UNESCO

6. Amidst the immediate concern over political stability, security, and structural reform of the economy, climate change looms as a major impediment to long-term growth and development. Climate change will affect rainfall patterns and temperatures in Iraq, increasing the country's vulnerability to drought and environmental challenges. Population growth trends and increasing urbanization will lead to a rise in water consumption and increased pressure on urban water systems across the nation, but particularly in Baghdad. Climate-induced flooding of the Tigris into Baghdad also remains a concern.

B. Sectoral and Institutional Context

Drinking Water Supply and Sanitation Sector Overview

7. The GoI has recognized that its social contract with citizens is dependent on the improved provision of basic services. The recent constitutional reforms which give increased authority and responsibility to governorates for provision of services are intended to improve the targeting of development projects and expenditure by bringing the government closer to citizens, promoting greater involvement of the community in setting priorities, and strengthening direct accountability for public service provision to customers. Despite these benefits, the planned decentralized service delivery has exposed challenges to the water and sanitation sector[1]. Structurally weak local capacity, relatively limited progress on the devolution of financial and administrative authority, and regional divisions are serious obstacles to moving forward on the vision articulated in the Iraqi constitution.

[1] Public Expenditure Review for the Water Sector in Iraq, WB report number 96309-IQ, November 2015

8. The incentives for the governorates to address sector issues in a comprehensive manner are not aligned with governorates' new responsibilities which include urban water supply and sanitation services. At present, central government resource allocations for ministerial expenditures are based largely on past staffing levels, and the transfer of oil and gas revenues to governorates through tied grants are based either on an equal per capita distribution or the volume of oil and gas produced in the governorate. There is no comparative assessment of the relative needs of the governorates and the flow of funds to them, irrespective of their performance or compliance with national requirements and targets. Fulfilling the vision of decentralized service delivery will require significant effort to address political, administrative, technical, and capacity constraints.

9. There is currently no private sector financing on PPPs (build-operate transfer or concessions) in the water sector. Private participation in water infrastructure investments is impeded by the long-term character of the sector's activities (most water infrastructure is built for a service period of more than 20 years) and limited capacity to structure bankable projects**.** PPPs in water infrastructure depend on long-term government commitment, regulatory enforceability and government contributions. Substantial government support through public financing of capital investments and operating subsidies or capacity payments (under a long-term off-take agreement) is required over the course of any PPP contract. Moreover, fundamental improvements in performance and institutional strengthening are needed to meet minimum levels of commercial performance. In the short term the GoI needs to work within the existing structures to reduce losses of treated water; to improve revenue flows, to introduce collection rates that allow for cost-recovery and an appropriate return on investment; and to improve management and financial information systems. These actions need to take place to create an enabling environment for private sector participation. The Bank's 2016 "Doing Business" report ranked Iraq as very low in "ease of doing business", with a regulatory environment that is still not favorable to the private sector.

10. The municipal water and sanitation sector is managed by two ministries, namely the Ministry of Water Resources (bulk water supply), and the Ministry of Construction, Housing, Municipalities and Public Works (MoCHMPW). There is scope for improving coordination across central government ministries. Although the MoCHMPW oversees the planning and development of many of the municipal water and sanitation projects, final approval of such projects lies with the Ministry of Planning, while the Ministry of Finance approves the associated budget. Greater coordination between national and provincial planning processes, especially regarding the annual budget formulation is necessary to improve service delivery. Governorates need to be included in the decision-making process which is part of the current decentralization processes. Technical assistance is required to harmonize budget procedures, and to align procurement, disbursement, and project monitoring procedures. The transition from a central to a decentralized structure remains a work in progress with the new governorate structure still under preparation by the governorates. It will be reviewed by the Provincial Council and then submitted to the Council of Ministers and the Council of Representatives.

11. The Mayoralty of Baghdad (MoB) status is separate from any Ministry, and it is empowered to prepare and implement plans for municipal and water projects. Law number 16 of 1995 provides for the organization of the MoB, which manages the Baghdad Water Authority (BWA) and the Baghdad Sewage Authority (BSA). The first article of the law states that the MoB shall provide the municipal services in Baghdad. Three Deputy Mayors support the Mayor in her duties. Article 8 states that the water supply system for Baghdad city shall be managed and operated by the BWA.

Baghdad Water and Sewerage Services

12. The city of Baghdad and its suburbs cover 950 km^2 and are administered by the MoB. Baghdad is divided into 14 municipalities. The water and wastewater services are administered centrally by the BWA and the BSA, which are responsible for all infrastructure assets. As far as water supply and sewerage are concerned, the municipalities' role is limited to installing house connections and to maintaining neighborhood networks (pipes under 200 mm diameter). The planning and implementation of investment projects in the municipalities is the responsibility of the MoB.

13. The Tigris is the only source of drinking water in Baghdad. The average flow is 21.2 billion cubic meters. The BWA operates 11 water treatment plants which produce an estimated 3.5 million cubic meters (MCM) per day (6 percent of the average annual flow of the Tigris) with a planned increase to 6 MCM by 2030. There are 13 reservoirs providing a total storage capacity of about 1,058,000 cubic meters. About 53 percent of storage capacity is located on the Rasafa (east) side of the city, while 47 percent of storage capacity is located on the Karkh (west) side. The number of service reservoirs is inadequate and the present storage capacity is insufficient. The water supply system on the Rasafa side is facing severe shortages.

14. The current use of groundwater is limited. The depth of the aquifer which is "*unconfined" and of "recent deposits"*, generally ranges between 15 and 18 meters. The groundwater quality is saline with a *high total dissolved solids* concentration of above 1,500 mg/l. Fresh and slightly brackish groundwater occurs along the Tigris River. There have been no studies and assessments of the groundwater potential or strategies for treatment of brackish groundwater. The lack of alternative water resources to the Tigris emphasizes the need to study groundwater, introduce water savings, water consumption reduction, and water losses reduction.

15. Flow meters at the point of discharge into the network are not available, or are malfunctioning. Only 23 percent of the existing service connections are metered with functional water meters. Therefore, it is difficult to assess water losses precisely. Some studies have estimated unaccounted water/water losses in the range of 50 percent.

16. The sewer system consists of a network which covers about 92 percent of the city area. Baghdad has two main wastewater treatment plants, one in Rasafa called "Rustomiya", and another one in Karkh. The efficiency with which these wastewater treatment plants (WWTP) and the (old) pumping stations are operated has dropped significantly, by an estimated 30 to 50 percent. The WWTPs, therefore, are not operating effectively and are under-utilized. The bulk of the city's sewage is discharged untreated and constitutes a major source of pollution to surface water and groundwater and a risk to public health.

17. The capital area is unable to maintain access to water supply and sewerage services due to rapid population growth including the inflow of internally displaced people (about 289,000, most of whom are staying in rented housing and with host families). About 18 percent of the population deals with daily service interruptions, and in the hot summer months, service interruptions are even more frequent. Leakage from sewer pipes contaminates potable water networks and groundwater aquifers, which aggravates health and environmental problems.

18. Existing water tariffs are low and do not cover the cost of water and wastewater treatment. Residential water tariffs stand at IQD10 (Iraqi dinar) per cubic meter (US$0.0086) for the first 30 cubic meters of water per month. The tariff structure is an increasing block rate tariff with four blocks of each 30 cubic meters per month. Industrial and government water tariffs are at about IQD100 per cubic meter. The tariff for sewerage services is the same as for water services. These rates are low, compared to the average operation and maintenance costs of the water services which were estimated at IQD155 per cubic meter in 2013 (US$0.13). Despite the low tariffs, a large part of the population does not pay their water bill, which may be linked to dissatisfaction with the quality of the services but is also linked to policies that do not allow the BWA and BSA to charge certain groups of residential consumers, and the high transaction costs of paying very small water bills in the absence of a well-functioning banking system in the country.

19. **Climate change**. According to the Think Hazard[2] profile for Iraq, the Baghdad area is at a high level of exposure to future river floods and at a medium level of exposure to water scarcity. In addition, the country is at risk of higher temperature and heat. Some recent examples of possible climate events that have affected the country have been: (a) changes in the severity and frequency of drought and flood events such as in 2013 and 2015; (b) increases in temperature with heat wave temperatures above 50 C that resulted in a government shutdown in 2015; (c) decreases in water availability due to lower than normal precipitation. Untreated wastewater in Baghdad has been leaking out of sewers and overflowing into the streets and into the Tigris (which is Baghdad's only local source of fresh drinking water), which represents a public health risk in case of climate change-induced flooding of the Tigris.

20. The BWA and BSA need to take a long-term approach to climate change, which requires supply-side measures as well as demand management. Adapting to these changes requires planning infrastructure to meet future demand in addition to protecting against potential scarcity or abundance of water. This requires investing in new raw water sources (such as groundwater) to diversify the resource base, expanding treatment facilities to accommodate larger flows, or using desalination, recycling or multi-purpose storage facilities. There is a need to take an integrated approach to planning that relies on flexible designs and the use of climate action plans to mitigate risk.

21. **Gender aspects**. The water sector in Baghdad has several gender gaps of which this project considers three: in jobs, in voice and in agency. The water and sewerage utilities in Baghdad have historically had a solid representation of women with currently a share of female staff at the BSA of 37 percent, and in BWA of 26 percent. However, women's representation at managerial positions in these utilities is limited, with 25 percent at the BWA, and none at the BSA. Based on staff consultations, this was deemed to be caused by the lack of adequate opportunities for women for professional growth and development, like targeted capacity building, training and professional exposure, that would enable them to rise in the organizations. During project implementation current Human Resources practices and policies with regard to women will be analyzed. As customers, despite being educated and having a relatively high level of awareness about the environment, women in Baghdad often lack the information and opportunities to resolve problems in water and sewerage services within their homes and communities. This is due to the fact that avenues for grievance redress and citizen engagement are few and those that exist are dominated by men.

[2] http://www.thinkhazard.org/en/report/118-iraq and http://www.thinkhazard.org/en/report/1572-iraq-baghdad

C. Higher Level Objectives to which the Project Contributes

22. The proposed project is consistent with the Bank's strategic goals of ending extreme poverty and boosting shared prosperity in a sustainable manner as it supports three interlinked objectives: shared prosperity through support for economic growth, increased sustainability by protecting the natural resources base on which these goals are built, and ending extreme poverty through support for improved access to water and sanitation services which are key to improving livelihoods and health. The project support for water and sanitation services in the city of Baghdad, which houses about 27 percent of the country's urban population, will contribute to the country's effort to meet the United Nations Sustainable Development Goal number 6 on ensuring availability and sustainable management of water and sanitation for all.

23. The project is aligned with the FY13-FY16 Country Partnership Strategy (CPS), the priorities identified in the 2017 Systematic Country Diagnostic for Iraq[3], and has been informed by the findings of the Performance and Learning Review[4]. The project will contribute to institutional strengthening by increasing efficiency, accountability and transparency in service delivery (drinking water and sanitation) at the Mayoralty of Baghdad. The project is also aligned with the MENA Regional Strategy[5] pillars on renewal of the social contract and building resilience to internally displaced people/refugee shocks. The project will focus on the renewal of the social contract through inclusive and accountable service delivery and strengthening public institutions; recovery and reconstruction and a stronger private sector and building resilience to deal with the internally displaced people by addressing the effects of water scarcity.

24. The recently completed National Water and Land Strategy (2015-2035) indicates that for the next 20 years the GoI must invest US$22 billion in drinking water supply and US$57 billion in wastewater treatment. For Baghdad the required investments for the next 20 years have been estimated at US$2.3 billion for drinking water supply and US$10 billion for wastewater treatment and swerage systems. In the context of limited availability of public funding, attracting commercial finance will be critical for implementing this ambitious strategy. In close coordination with the International Finance Coporation (IFC), this project will therefore focus on creating a more favorable business environment, and on supporting the preparation of feasibility studies and transactions to enable private sector participation in the water sector. During implementation the project will engage with the Ministry of Planning and the Prime Minister's Office Advisory Commission (PMAC). Successful creation of an environment encouraging private investment in public services in Baghdad will also be relevant in other areas of Iraq in the future. A key incentive would be an adjusted tariff structure that enables water and wastewater providers to recover the costs of the services and provide users with higher quality services.

25. The proposed project is of high public interest. The water and sanitation sectors impact economic indicators and growth as well as the social sectors, including health, education and employment. Water supply and sanitation have immediate and major impacts on the quality of life of citizens. Sewerage improvement also benefits society as a whole. Moreover, in times when the drivers of fragility and conflict are still in place, restoring the social contract between citizens and the state is crucial for Iraq's future. The delivery of basic water and sanitation services – even if financed through scarce public resources - will

[3] Report No. 112333, dated February 3, 2017.
[4] Report No. 94767, dated May 1, 2015.
[5] World Bank (2015) MENA Strategy: Economic and Social Inclusion for Peace and Stability in the Middle East and North Africa: A New Strategy for the World Bank Group.

contribute to building trust amongst Iraq's citizens and the representatives of the state and support social cohesion when it is most needed. Private sector participation was considered for the proposed project through the application of the "maximizing finance for development" (MFD) Decision Framework. The planned rehabilitation activities and construction of the reservoir are not considered as likely private sector financeable activities under the MFD approach. The Bank and IFC consider project activities focused on utility governance and tariffs critical enabling activities in anticipation of future private sector involvement. The short term agenda is to improve services and the institutions themselves in order to create a foundation for private sector engagement. A first step will be the preparation of the feasibility studies.

26. The IFC signed in August 2017 a Memorandum of Understanding (MoU) with the Ministry of Planning which aims to assist the GoI in creating a pipeline of PPP projects. It is expected that IFCs involvement in the development of the pipeline will help identify pilot PPP projects that are high priority for the GoI, economically viable, manageable in size, and suitable for implementation within a reasonable timeframe, in order to maximize chances of early success, while also building capacity with the GoI to undertake PPPs. The IFC proposes to support the GoI under the umbrella of the MoU that will entail providing technical assistance for identification of infrastructure projects suitable for PPPs and selection of possible pilot PPP projects to be implemented by the relevant line ministries or local authorities, such as the Mayoralty of Baghdad for the water and waste-water sectors.

27. The project will support decentralized development and will also contribute to the creation of an environment for greater private sector investments (in line with the MENA strategy of renewing the social contract in the area of the quality services). For the latter contribution, the "MFD" approach to infrastructure financing would be adopted, identifying at each level from MoB to municipalities those infrastructure items or services which could potentially be financed privately or through PPPs.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

28. The Project Development Objective (PDO) is to improve the quality of drinking water supply and wastewater services in Baghdad.

B. Project Beneficiaries

29. Direct beneficiaries of the project include approximately 5 million residents[6] of Baghdad (over 80 percent of the total Baghdad population of 6 million) who will have increased access to reliable potable water supply, and improved sanitation. Half of the direct beneficiaries are women. Indirect benefits will also accrue to the population of five governorates (7.5 million people) south of Baghdad who depend on the Tigris for their drinking water, because of the decrease of untreated wastewater being discharged in the Tigris in the project area. The project will have several institutional and technical benefits. It will

[6] Direct beneficiaries of improved water supply are one million residents of Shaab and Rasheed districts/municipalities. Direct beneficiaries of improved sanitation are four million residents of Karkh, Rasafa, Karrada, Dora, Sadr and Adhamiyah districts/municipalities.

benefit MoB/BSA and BWA through improvement in utility management aspects and also create an enabling environment for private sector participation. There will also be a number of indirect benefits related to improvement in the quality of life, health, and sanitation. The incidence of water-borne diseases will be reduced. The project will also create employment during construction and operation and maintenance stages of implementation.

C. PDO-Level Results Indicators

30. The project will monitor the following key indicators to measure the achievements of the PDO:

- People benefiting from access to improved drinking water supply.
- People benefiting from access to improved sanitation.
- Hours of water supply at a minimum pressure (10m) in Shaab and Rasheed municipalities.

III. PROJECT DESCRIPTION

A. Project Components

31. **Component 1: Institutional strengthening for integrated urban water management and utility management, and creating an enabling environment for private sector engagement (US$11.475 million).** This component will support the MoB in operational and strategic decision making with regard to Baghdad's water security and water conservation. The focus will be on improving the institutional knowledge and preparedness with regard to all aspects of water security and urban water management, including resilience (climate change adaptation measures), sustainability of water use, the potential use of groundwater, the use of non-conventional water (reuse of wastewater) and storm water management.

32. This component will support the BWA and BSA in strengthening their revenue administration and financial management through two main activities: i) strengthening BWA and BSA's revenue administration through preparation of a revenue administration manual, business process re-engineering and training of staff, and ii) digitization of consumer records and computerization of billing and collection practices. At the same time, this component will support BWA and BSA in strengthening their financial management by improving their accounting and financial reporting, improving cost accounting of service delivery, and computerizing the asset register and adoption of modern asset management practices.

33. Under this component, innovative private financing models will be explored and capacity building for structuring bankable projects and managing contracts will be conducted. Capacity in the areas of innovative financing, PPP procurement and contract management will be strengthened through a series of training courses and South-South Knowledge Exchanges in the form of study tours. Training courses will include private sector participation in service delivery; performance based contracts; financing options and risk-sharing instruments. Other aspects of institutional strengthening such as variability in budget allocations by the GoI to the MoB and the coordination issues across central ministries and between the central ministries and the MoB, will be studied and addressed during implementation.

34. **Component 2: Investment in drinking water supply and wastewater infrastructure (US$188 million)** will cover:

35. *Construction of the "R2[7]" reservoir (US$71 million).* The main works will comprise: a twin-compartment concrete ground-level reservoir with a total capacity of 135,000 cubic meters; inlet and outlet works, reservoir overflow systems; pumps, piping system; and chlorination station. The reservoir will ensure improved quality and reliability of the water supply services in the area served by it, which is in the Shaab municipality and has a population of more than 550,000. The construction of the reservoir will help the city to manage its water supply better in case of climate-induced droughts.

36. *Rehabilitation of pumping stations including main sewerage network (US$68 million).* This will include rehabilitation of 29 sewerage pumping stations by replacing old pumps and associated electro-mechanical works. This will also include rehabilitation of the main trunk sewer system and manholes. The untreated wastewater is currently flowing out of sewers into the streets and into the Tigris. The project will make sure this untreated wastewater reaches the underutilized WWTP, thus reducing the public health effects of untreated wastewater exposure in the event of Tigris flooding induced by climate change.

37. *Non-Revenue Water (NRW) reduction (US$39 million).* This will include establishment of a NRW unit at the BWA, the creation of district metering areas and a NRW management system and the reduction of physical losses by replacing about 130 km of water supply distribution network in Rasheed and Shaab municipalities. The distribution networks to be rehabilitated include trunk, primary and secondary pipes ranging from 100mm to 700mm in diameter which are old and are exhibiting frequent breaks with high leakage resulting in intermittent supplies of poor quality water. A Supervisory Control and Data Acquisition (SCADA) system will be established. This will provide BWA with the means to monitor and control the water supply system and to improve operational performance. Reducing non-revenue water will have energy efficiency gains. Reduced leakages will also improve the city's ability to handle any future climate-related water shortages.

38. *Engineering, construction supervision, and quality control (US$10 million).* A multi-disciplinary engineering and management consulting firm will assist the Project Management Unit (PMU) with the overall implementation of the project. Consultants support to the PMU will include support to engineering, construction supervision, quality control, procurement, non-revenue water, environment and assistance with the monitoring of the physical and financial progress.

39. **Component 3: Project management, studies and monitoring and evaluation (US$10 million).** This component will support the operation of the PMU in the MoB. The PMU was established and comprises staff from the BWA, BSA and MoB. The PMU will coordinate the overall planning, coordination, implementation and supervision of project activities including central procurement and management of funds.

40. Component 3 will provide funding for preparation of four feasibility studies for the water treatment plant and the three sewerage systems including Khansaa wastewater treatment plant for private sector financing. The component will also provide funding for: citizen engagement including the establishment and operation of a grievance redress mechanism, communication and water conservation awareness; environmental and social management plan; M&E, including carrying out an International Benchmarking Network (IBNET) performance assessment for BWA and BSA, periodic monitoring during implementation, beneficiary satisfaction surveys; mid-term review in collaboration with the IFC and the Multilateral Guarantee Agency (MIGA) and completion report. Finally, this component will finance

[7] In Rasafa

capacity building activities targeted to female technical and managerial staff in the BSA and BWA to enhance their professional skills and enable them to rise in the organizations.

B. Project Cost and Financing

41. The project costs will be financed by an IBRD loan in the amount of US$210 million (Table 1). The implementation period is five years.

Table 1: Project Cost and Financing

Project Component	Estimated Cost (US$ million)	IBRD financing (US$ million)	% financing
Component 1: Institutional strengthening for integrated urban water management and utility management and creating an enabling environment for private sector engagement.	11.475	11.475	100
Component 2: Investment in drinking water supply and wastewater infrastructure.	188	188	100
Component 3: Project management, studies and monitoring and evaluation.	10	10	100
Sub-total	**209.475**	**209.475**	**100**
Front-end fee	**0.525**		
Total	**210**		

B. Lessons Learned and Reflected in the Project Design

42. The performance and learning review of the FY13-FY17 Country Partnership Strategy indicates that restoring the social contract between citizens and the state is critical for Iraq's future. Even during conflict, it is important to continue to support investments such as water supply and sanitation, irrigation services, health and education, which have immediate and major impacts on the quality of life of citizens. In addition to delivering basic services, this contributes to building engagement and confidence among citizens and the representatives of the state and to nurturing social cohesion. A focus on incremental and sustainable decentralization to enhance accountability and transparency and building inclusive coalitions for reform among government, citizens, and civil society actors will be helpful for renewing state-citizen relationships in Iraq.

43. The project design incorporates regional and international lessons on capacity building to monitor project outcomes and risk mitigation measures. Regional experience shows that there is a need to take first steps to achieve greater utility performance sustainability by combining investments focused on attaining minimum levels of reliability and efficiency, while improving sector financial performance. Given the fragile political and security situation in Iraq, improvements in the provision of water and wastewater services will be modest, and will have to be built incrementally. The project addresses such improvements through institutional reforms, capacity building, and raising operational and financial efficiencies.

44. In order to sustainably reduce and maintain non-revenue water at low levels it is imperative to first address the fundamental issues of managing and monitoring NRW, which include water auditing and benchmarking. The main strategies for reducing and controlling physical and commercial water losses are embedded in the project design through the application of District Metered Areas (DMAs), bulk and customer metering as well as continuous monitoring through telemetry and a SCADA system. These strategies are applied in other countries in the region such as Jordan, Bahrain and Lebanon with encouraging results. Overall water utility performance will be measured by the International Benchmarking Network (IBNET) for water and sanitation utilities based on the IWA benchmarking system.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

45. MoB will be the Executing Agency mandated with the responsibility of providing and managing water and wastewater services in Baghdad. MoB owns the water and wastewater infrastructure assets that are managed by the Baghdad Water Authority (BWA) and the Baghdad Sewage Authority (BSA). The PMU has been established and will be responsible for the day to day management of project implementation including procurement, contract management, financial management, disbursement, safeguards, and M&E.

46. A multi-disciplinary management and engineering consulting firm will assist the PMU with the overall implementation of the project particulary in engineering support, construction supervision and quality control. Management support to the PMU will include technical assistance to integrated urban water management, private sector participation, institutional strengthening, procurement, safeguards, and M&E. The project will also support the prepration of a feasibilty study for the Khansaa WWTP for private sector financing in close coordination with the IFC advisory services.

47. The project will be implemented over a five-year period. Implementation readiness is well-advanced. A general procurement notice has been published on MoB and United Nations Development Business (UNDB) websites. Detailed designs are ready including contract specifications and bidding documents of the largest contract for the R2 reservoir. In addition to the detailed designs, bill of quantities and contract specification for most of the sewerage investments have been finalized.

B. Results Monitoring and Evaluation

48. Project perfomance will be monitored based on the indicators and methodologies detailed in the results framework (Section VII). Responsibility for M&E will rest with the PMU complemented by close Bank implementation support. Results monitoring will be conducted on a continuous basis.

49. The project will establish a baseline by conducting a beneficiary survey, to measure who benefits, and to what extent, from the infrastructure and services and how it affects people's lives in both social and economic terms. The PMU will also collect and compile data to provide the basis for a comprehensive mid-term review which would, inter alia, examine possibilities for inclusion of private financing in the

second half of the project or in follow-up projects. The unit will also undertake an end term review and final Implementation Completion and Results report. In addition, data and information on project activities will be collected and collated quarterly. The PMU will be required to submit comprehensive progress reports on implementation aspects quarterly that will include reporting on procurement, financial management, physical implementation and environmental and social aspects.

50. The IBNET performance assessment will be applied for the comprehensive performance monitoring of the Baghdad BWA on an annual basis starting from 2018 and tested by the mid-term review.

51. The M&E system would produce data that would help to identify lessons to be applied to follow up projects. Project financing includes an allocation for technical support to the PMU and BSA/BWA as needed to carry out their M&E duties and responsibilities. Some components of the M&E system will be participatory, engaging citizens, thus contributing towards the empowerment of communities, building trust amongst implementation stakeholders and strengthening cohesion by the results and achievements of the project.

C. Sustainability

52. Project sustinability will be supported by: (i) a strong commitment of the GOI to improve the quality of public services, most notably water and electricity; (ii) a strong track record that the MoB has in implementing similar works; and (iii) simple design of the reform efforts financed by the project. Project design focuses on practical ways to improve the financial, operational and technical performance of the BWA and BSA, and more generally MoB, and on measures that will improve revenue management and increase operational efficiency of water and wastewater operations, thereby reducing the dependency on government subsidies for the operation and maintenance of water and wastewater service.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

53. Overall risk rating of the project is high. The major risks that have been identified that may affect project implementation and corresponding mitigation measures are:

54. *Political and governance risks will likely continue to be high.* This relates not only to the complex social fabric and political landscape in Iraq, including highly entrenched vested interests in public and private sectors, but also to the impact of regional geopolitics on internal dynamics and performance. Two major events may impact the current situation: (i) the referendum in Kurdistan that took place on September 25, 2017 but the effects of which are yet to be fully determined and could be impacted by the activities of external actors and precipitate internal civil unrest[8]; and (ii) the upcoming April 2018 national elections which could result in changes (or outright rejection) of the current reform and development

[8] There are two issues of relevance: an outcome that results in a vote for full independence and the status of disputed areas. The extent of destabilization will depend largely on the speed at which independence is sought and the guarantees that are given to the GoI and to neighboring Turkey and Iran. The issue of disputed territories, which should, according to Article 140 of the constitution, have been settled by the end of 2007, was not and it covers a little under 50% of Kurdistan Region's land and impacts on as many as 2.7 million people.

agenda. Of immediate concern is the incognito return of ISIS combatants, auxiliaries and their families, which could result in reprisals and/or unrest and undermining of physical security.

55. The World Bank Group (WBG) will continue to rely on its comparative advantages, including technical knowledge and expertise, lessons learned that are relevant for Iraq and the Bank's role as a trusted convener and interlocutor with the public sector, private sector and citizens. The Bank task team will strengthen its focus on citizen engagement and expand it to include a broader range of stakeholders who are likely to be involved in the critical development and policy choices that lie ahead. It will also improve the availability of timely and comprehensive information that is useful to the public to understand and contribute to the GoI's efforts towards improving basic service delivery, and provide support for putting into place avenues for strengthening effective community participation.

56. *Macroeconomic risk is substantial.* Iraq's undiversified economy remains under pressure because of the sharp drop in oil revenues since the mid-2014 and it is constrained by the security situation. These risks could undermine the momentum of economic growth and affect the implementation of the WBG program. Public finances are likely to be strained due to high levels of expenditure on security and stabilization efforts, as well as ongoing and planned activities geared towards poverty reduction and socio-economic development that may not yield immediate results. This will require further strengthening of social safety nets to protect vulnerable groups during this transition period, including women, IDPs and youth.

57. *Sector Strategies and Policies risk is substantial.* The sector carries its own set of risks related to limited management capacity and sector policies pertaining to the financial sustainability in service delivery resulting in low levels of cost recovery, the associated fiscal burden and subsequent lack of maintenance of existing infrastructure, that can adversely affect the quality in service provision. Component 1 of the project aims to strengthen sector institutions in sustainable management of water supply and sanitation services.

58. *Fiduciary risks are high due to the weak transparency and accountability arrangements.* As part of the project preparation, a financial management assessment has been conducted that evaluates FM risks, and makes recommendations on mitigation measures. The MoB has identified the procurement packages and developed the project's procurement strategy for development as per Bank's new procurement framework. The PMU will conduct annual updates of the procurement plan in agreement with the Bank annually orwill do so more frequently to reflect project implementation needs and improvements in institutional capacity. An engineering firm will be hired to provide project implementation support. A solid implementation support plan to enhance the quality of project implementation is also in place to mitigate these risks.

59. *Environmental risks are substantial* due to exposure to extreme temperatures/heat waves, urban flooding and the high potential impact of these hazards on the available water quantity. The capacity of the MoB to cope with climate change impacts still needs to be developed. Data availability is limited due to weak forecast and monitoring systems, which limits the capacity to make reliable forecasts on extreme weather events and therefore affects the quality of decision-making at the central, MoB and municipal levels. The project includes a component on integrated urban water management including resilience (climate change adaptation measures) and sustainability of water use. Project investments will also contribute to climate change adaptation and mitigation by efficient use and savings of water resources,

improvements to the wastewater collection system to avoid the spread of uncollected wastewater during climate change-induced flooding, as well as by reducing Greenhouse Gas (GHG) emissions. The social risk associated with the project is moderate. The project will improve the much needed water and sanitation services.

60. *Security risks are high* due the overall security situation in Baghdad. Despite a recent improvement in the security situation, this residual risk is high. Given the project's dependence on imports for construction contracts, there may be costly bids for civil works and consulting services contracts. The project cost includes a security cost premium of 3% of the base cost in addition to all the physical and price contingencies.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

61. The Base Case financial and economic analysis results for the project are shown in Table 2 below.

Table 2: Base-Case Financial and Economic Analysis Results

	Financial		Economic	
Scenario	FIRR (%)	NPV (IQD M)	EIRR (%)	NPV (IQD M)
Base-Case	14	33,054	15	43,202

62. The financial and economic analyses use a "with" and "without" project- methodology, over a conservative 15-year analysis period. Recognizing the integrated nature of the project, the analysis includes 50% of the cost of Components 1 and 3, and 100% of the cost of Component 2.

63. The largest financial benefits accrue from: 1) reductions in NRW; 2) a 5% across-the-board tariff increase for water and wastewater every three years; 3) energy savings from more efficient network pumps and a decrease in household pumping; 4) reduction in flood restoration costs achieved by restoration of sewage pumping stations; and 5) reduced bottled water sales resulting from better network pressure. The economic benefits result from estimated reductions in carbon emissions. A full description of the analyses, a sensitivity and switching analysis, and recommendations for key variables to be monitored during supervision, are included in Annex 5.

B. Technical

64. The project will set Iraq's water supply and sanitation sector on a path for increased private sector participation. It is expected that, once the investment climate improves, water supply and sanitation services will become an attractive investment opportunity for private investors. In the short term the MoB will need to work within its existing structures to reduce losses, improve revenue flows, improve management and financial information systems, modernize water laws and regulations, and meet minimum levels of commercial performance. While improvements are being made in the system, private sector participation may already start in the medium term with low-risk, low-value engagement (such as outsourcing services; performance-based O&M; and non-revenue water), eventually evolving into mobilizing private financing for water infrastructure in the long run.

65. This project intends to improve the performance of BWA and BSA through better planning and increased service sustainability. It aims to support their performance by strengthening utility governance, extracting utility productivity gains, and gradually reforming the tariff system. Investments in energy efficient infrastructure will lower utility energy consumption and its environmental footprint. Non-revenue water is the cornerstone in delivering efficient and effective water services. High levels of NRW hinder efforts to achieve the desired levels of service and sustainability of operations. A comprehensive system of bulk water and customer metering will provide the necessary data and information required for the detailed evaluation of losses in each DMA. This will ensure an adequate quantity of water to all consumers at all times at a minimum pressure of 10m.

66. The R2 reservoir detailed engineering design is considered sound and meets accepted international standards. The proposed implementation period of five years is considered adequate, considering that the detailed designs and contract documents of the R2 reservoir (estimated cost is US$71 million) are already completed, prior to starting project implementation.

67. The net emissions of the project are -5,182,103 tCO2-eq over the life of the project, while the gross emissions are 2,122,378 tCO2-eq. On average, the project generates net emissions of -177,672 tCO2-eq annually. The wastewater treatment activities are the biggest contributors to the net emissions reductions at -4,086,057 tCO2-eq, which are mostly attributable to avoiding methane emissions from stagnant sewers. Energy efficiency gains from improvements to the water supply contributed another -1,096,462 tCO2-eq. The reservoir had net emissions of 416 tCO2-eq, though it should be noted that this reservoir helps to facilitate improvements to the water supply that yield net emissions reductions.

68. During implementation, engineering consultants will assist the PMU in the engineering, procurement, and construction supervision quality control, and environmental and social safeguard aspects. This will ensure that the quality of engineering design, supervision and physical construction is maintained.

C. Financial Management

69. The World Bank undertook an assessment of the financial management (FM) systems within the BWA and BSA. The assessment concluded that, with the implementation of agreed-upon actions, the proposed FM arrangements will satisfy the minimum requirements under Bank Policy and Bank Directive for Investment Project Financing. Annex 2 provides additional information on the FM assessment and the recommended mitigation measures.

70. The overall responsibility for the project lies with the MoB. A PMU was established and will be responsible for FM and disbursement. The PMU will include an FM team consisting of two Financial Officers and one Internal Auditor seconded from the MoB. The MoB has prior experience with World Bank FM and disbursement procedures gained during the implementation of the Emergency Baghdad Water Supply and Sanitation project that closed in June 2013.

71. To ensure that funds are readily available for project implementation, a U.S. Dollar Designated Account (DAs) will be opened at a bank acceptable to the World Bank, and will be managed by the PMU. Quarterly Interim Unaudited Financial Reports (IFRs) and annual project financial statements will be

prepared and submitted by the PMU to the Bank in a format and content acceptable to the Bank. The IFRs will be submitted by the PMU to the World Bank within 45 days after the end of the concerned period. An independent external auditor acceptable to the Bank will be engaged to carry out the annual project audit, and issue an independent opinion on the project's financial statements. The audit reports will be sent to the Bank no later than six months following the end of the project's fiscal year. The PMU will be responsible for preparing the Terms of Reference for the auditors and submitting them to the Bank for clearance. Besides the financial audit, the project will finance the technical audit of construction work performed under the signed civil construction contracts.

D. Procurement

72. Procurement will be carried out in accordance with the "World Bank Procurement Regulations for Borrowers under Investment Project Financing" dated July 1, 2016. As per the requirements of the World Bank's New Procurement Framework (NPF), the first draft of the Project Procurement Strategy for Development (PPSD) has been finalized with support of the Bank. The PMU will be responsible for procurement, and will be supported by an international consulting firm to ensure proper quality of design, procurement, construction management and supervision. The Borrower and the Project Implementating Entity shall ensure that the Project is carried out in accordance with the provisions of the "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants", dated October 15, 2006 and revised in January 2011 and as of July 1, 2016 ("Anti-Corruption Guidelines").

73. Main procurment risks are inherent to the following: (i) weak capacity of the PMU in procurement and management of large contracts; (ii) high risk and weak control environment; (iii) Iraq's ability to manage public resources is undermined by poor security, outdated practices, and a poor ranking in Transparency International's Corruption Perception Index, the lowest of all countries in the region; (iv) a limited local market with only a few regional/international bidders with the required experience may result in lower competition and higher bid prices, and (v) possible delays in implementation due to the security conditions in Iraq, lack of experience in procurement planning, and contract management as well as delay in implementation from the bidder's side and time/cost over-runs. Based on the overall assessment of the implementing agency and the information available on the procurement environment in Iraq, the overall procurement risk is judged to be high.

E. Social (including Safeguards)

74. Social Benefits: The project will have positive socio-economic benefits since it will improve the operation of urban water and wastewater infrastructure. The rehabilitation of the sewerage pumping stations will enable BSA to reduce sewer overflows in the city and hence reduce the incidence of water and soil pollution, while increasing the volume of wastewater treatment in the city. The social risk associated with the project is relatively moderate.

75. *Land Acquisition and Resettlement:* Involuntary resettlement and livelihood restoration are expected to be issues of moderate complexity. The land for the construction of R2 complex is owned by MoB. At present, a part of the R2 land is being temporarily used by the adjacent college caravans and the students' cars for parking. Assurances have been obtained by the BWA that the caravans will be removed and cars will be evacuated before implementation starts because the college will have completed its

expansion. The OP 4.12 is triggered out of precaution. The resttelement policy framewok has been prepared and dislcosed (English and Arabic): (i) at the external WB website on August 30-31, 2017, and (ii) in the country at publicly accessible locations and on the MoB website. The sewerage pumping stations will include rehabilitation of existing pumping stations only, and will not need any new land acquisition or resettlement.

76. *Citizen Engagement*: Public consultations were carried out as part of the environmetal and social impact assesment and environmental and social management plan preparation process between November 2015 and January 2017 near the project sites. Participants included representatives from municipality services and councils and a number of local community members in addition to BWA and BSA project teams. The purpose of the consultation sessions was to present the overall project design, explain its broader benefits at the city level, outline some of the anticipated adverse environmental and social impacts expected to result from project activities, and to enable the stakeholders to understand the project and its activities, as well as to ensure that their concerns and issues are considered during all phases of the project, including at the planning phase.

77. *Poverty and Social Impact Assessment*: in addition to the project's financial benefits, it will have a positive social impact on households. The impact of more reliable services will be felt by consumers in a reduction in coping costs to deal with intermittent water supply (especially in summer) and low drinking water quality. The reduction in coping costs will reduce the financial burden on consumers since they will no longer face the extra burden of coping with water supply cuts. As BWA and BSA will be able to benefit from fewer emergency maintenance expenses, this will free up operational subsidy resources for more rehabilitation investments in the sector.

78. *Grievance Redress Mechanism*. The current GRM at both BWA and BSA is handled through the information department and is managed by one individual. The current system will be enhanced and the staff be trained in registering, tracking, monitoring and documenting. The enhanced GRM will provide a system for reporting and addressing project-affected people's concerns with regard to environmental and social impacts of the project activities, with particular attention to the accessibility of the GRM services to females.

F. Environment (including Safeguards)

79. The project will contribute to improving the environment primarily through rehabilitation of sewerage pumping stations. The project does not include new water resources development and will not support expansion or rehabilitation of existing underutilized wastewater treatment facilities. Thus, the project is classified as environmental category "B", due to potential adverse environmental and social impacts which are site-specific and reversible; thus easily remediable by applying appropriate mitigation measures. These potentially adverse environmental impacts may include the following: air quality and noise; construction debris, including old piping and sewerage infrastructure requiring proper disposal; employee health and safety issues; as well as vehicular and pedestrian traffic disruptions. Contract documents for rehabilitation of pumping stations and the construction of R2 reservoir will include agreed provisions for mitigation of short-term impacts such as noise, traffic disruption and health and safety.

80. In order to identify risks, impacts, and mitigation measures, two Environmental and Social Impact Assessment (ESIAs), each of which includes an Environmental and Social Management Plan (ESMP), were

prepared for (a) R2 reservoir construction; and (b) Dora, Habibiya and Ghazalia sewerage pumping stations (rehabilitation). An ESMP has been prepared for the 22 smaller-capacity sewerage pumping stations to be rehabilitated in Rasafa.

81. Construction will be supervised by Environmental and Social Officers (ESOs), one each for BWA and BSA, who will be seconded to the PMU. The proposed ESOs were also responsible for safeguards supervision during the Emergency Baghdad Water Supply and Sanitation Project and have a good level of safeguards capacity. The ESOs will be supported by an Environmental Safeguards Specialist and a Social Safeguards Specialist employed as part of the Project Implementation Consultant (PIC) team, who will provide independent quality control in all areas of safeguards compliance. Environmental mitigation will be led by the contractors; mitigation measures to be included in the construction contracts are estimated at US$5.5 million, or approximately 4% of the total contract costs. The construction teams are expected to include on-site safety engineers. An amount of US$1 million is allocated to Component 3, to assess and strengthen the capacity of the BWA and BSA water quality laboratories, provide relevant safeguards training throughout the implmentation of the project, and upgrade the BWA, BSA, and municipalities' grievance redress mechanisms. See Annex 2 for more details.

82. Public consultations were advertised and held by BWA and BSA between November 2015 and January 2017. These consultations were a combination of open public consultations and one-on-one interviews with directly impacted neighbors to the sites. The environmental safeguards instruments (ESIAs/ESMPs) were dislcosed: (i) on the external WB website on August 30-31, 2017, and (ii) in the country at publicly accessible locations and on the MoB website. Each of these three safeguards documents, written in English, include Arabic- and English- language Executive Summaries.

G. Other Safeguard Policies

83. **Projects on International Waterways OP/BP 7.50:** The project area is located on the Tigris which is an international waterway. However, the project involves rehabilitation of existing pumping stations, construction of potable water reservoir, and non-revenue water including replacement of old drinking water distribution network. The project does not involve works and activities that would exceed the original capacity of the pumping stations and will not increase water off-take from the Tigris. Therefore, the project falls within the exception to the notification requirements of OP 7.50, set forth in paragraph 7(a) of OP 7.50. The exception memorandum was approved on February 22, 2016, in accoordance with Bank policy.

H. World Bank Grievance Redress

84. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit

http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework
COUNTRY : Iraq
Baghdad Water Supply and Sewerage Improvement Project

Project Development Objectives

The Project Development Objective (PDO) is to improve the quality of drinking water supply and wastewater services in Baghdad.

Project Development Objective Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: People benefiting from access to improved drinking water supply		Number (Thousand)	0.00	1000.00	Annually	Progress reports	PMU/BWA/BSA
Description:							
Name: People benefiting from access to improved sanitation		Number (Thousand)	0.00	4000.00	6 months	Progress reports	PMU/BWA/BSA
Description:							

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Hours of water supply at a minimum pressure (10m) in Shaab and Rasheed municipalities		Hours	8.00	24.00	Annually	Progress reports	PMU/BWA
Description:							

Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Water security plan including groundwater management plan for the city of Baghdad prepared and approved		Yes/No	N	Y	Annually	Progress reports	PMU/BWA
Description:							

Name: Business plans for BSA and BWA developed under implementation and operationalized		Yes/No	N	Y	Annualy	Progress reports	PMU/BWA/BSA
Description:							

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Capacity of the reservoir constructed		Cubic Meter(m3)	0.00	135000.00	Annually	Progress reports	PMU/BWA
Description:							
Name: Volume of wastewater collected and safely disposed (MCM/year)		Cubic meters/year	65.00	162.00	Annually	Progress report	PMU/BSA
Description:							
Name: Collection ratio		Percentage	40.00	70.00	Annualy	Progress reports	PMU/BWA/BSA
Description:							
Name: Framework for private sector participation developed		Yes/No	N	Y	Annually	Progress reports	PMU/BWA/BSA
Description:							
Name: Non-revenue baseline assessed and strategy developed		Yes/No	N	Y	Annually	Progress reports	PMU/BWA

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Description:							
Name: Length of distribution network replaced		Kilometers	0.00	130.00	Annually	Progress reports	PMU/BWA
Description:							
Name: Number of female technical and managerial staff who have attended training		Number	0.00	50.00	Annually	progress reports	PMU/BWA/BSA
Description: Target was established based on the outreach made by the BSA and BWA to females on their willingness to undertake training and professional development opportunities.							
Name: Share of female staff in managerial positions		Percentage	15.00	50.00	Annually	Progress reports	PMU/BWA/BSA
Description: The total number of females in managerial positions at project design stage was 3, and is expected to increase by 7 with a total of 10 females in managerial positions (head of units) out of total 20. The target was set in consultation with the utility management and their staffing projections with consideration of capacity building activities to be undertaken under the project.							
Name: Grievance Redress Mechanism established and operational		Yes/No	N	Y	Annually	Progress reports	PMU/BWA/BSA

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Description:							
Name: Users satisfied by quality of water and wastewater services		Percentage	0.00	70.00	Annually	Progress reports	PMU/BWA/BSA
Female users satisfied by quality of water and wastewater services		Percentage	0.00	70.00	Annually	Progress Reports	PMU/BWA/BSA
Description:							

Target Values

Project Development Objective Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
People benefiting from access to improved drinking water supply	0.00	0.00	0.00	0.00	0.00	1000.00	1000.00
People benefiting from access to improved sanitation	0.00	0.00	0.00	100.00	300.00	4000.00	4000.00
Hours of water supply at a minimum pressure (10m) in Shaab and Rasheed municipalities	8.00	8.00	8.00	8.00	24.00	24.00	24.00

Intermediate Results Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Water security plan including groundwater management plan for the city of Baghdad prepared and approved	N	N	Y	Y	Y	Y	Y
Business plans for BSA and BWA developed under implementation and operationalized	N	N	Y	Y	Y	Y	Y
Capacity of the reservoir constructed	0.00	0.00	0.00	0.00	135000.00	135000.00	135000.00
Volume of wastewater collected and safely disposed (MCM/year)	65.00	0.00	0.00	32.40	64.80	64.80	162.00

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Collection ratio	40.00	40.00	40.00	50.00	60.00	70.00	70.00
Framework for private sector participation developed	N	Y	Y	Y	Y	Y	Y
Non-revenue baseline assessed and strategy developed	N	N	Y	Y	Y	Y	Y
Length of distribution network replaced	0.00	0.00	0.00	26.00	52.00	52.00	130.00
Number of female technical and managerial staff who have attended training	0.00	5.00	20.00	35.00	50.00	50.00	50.00
Share of female staff in managerial positions	15.00	15.00	15.00	25.00	40.00	50.00	50.00
Grievance Redress Mechanism established and operational	N	Y	Y	Y	Y	Y	Y
Users satisfied by quality of water and wastewater services	0.00	0.00	0.00	40.00	60.00	70.00	70.00
Female users satisfied by quality of water and wastewater services	0.00	0.00	0.00	40.00	60.00	70.00	70.00

ANNEX 1: DETAILED PROJECT DESCRIPTION

COUNTRY : Iraq
Baghdad Water Supply and Sewerage Improvement Project

1. **Component 1: Institutional strengthening for integrated urban water management and utility management and creating an enabling environment for private sector engagement (US$11.475 million).** This component will support the MoB in operational and strategic decision making with regard to Baghdad's water security and water conservation, and will be climate-informed. The focus will be on improving the institutional knowledge and preparedness with regard to all aspects of water security and integrated urban water management, including resilience (climate change adaptation measures), sustainability of water use, potential use of groundwater, and the use of non-conventional water (re-use of wastewater). Studies and master plans will be developed covering groundwater assessment, groundwater management, stormwater management and water harvesting.

2. A comprehensive long-term strategic plan is required for stormwater management. A master plan will be prepared as part of this component. The problem of flood and stormwater drainage in Baghdad is complex and chronic, and a special study will be developed to promote safe re-use of treated effluent and corresponding infrastructure. The aim is to increase and improve re-use in irrigation (agricultural production), in public re-use systems (landscaping, parks, and gardens) or in other sectors such as industrial production, large institutions, such as commercial and educational centers (non-potable purposes), or possibly in cooling systems. Such measures could provide additional alternative water sources, that are especially important given the limited water resources available in Baghdad. Over the course of project implementation, treated sewerage effluent re-use will be increased, systematically for all new developments.

3. *Strengthening revenue administration through preparation of a revenue administration manual, business process re-engineering and training of staff.* This sub-component will support BWA and BSA in improving their billing and collection processes. This will include identifying potential weaknesses and recommend the necessary corrective measures that would have an immediate impact on the revenue streams of BWA and BSA. The project will support BWA and BSA in implementing key short and mid-terms reforms in their billing and collection procedures and re-engineering processes that will be documented in manuals, and training staff on the new processes and procedures. The assessment will focus on:

- The effectiveness of the current billing and collection practices, including the practices related to customer databases, levels of metered and unmetered service provision, billing structure and cycles, practices, and delivery, staff capacity, efficiency in billing and collection, and facilities for customers' payments;
- Weaknesses and areas for improvement, as well as case studies of potential billing practices which are succeeding in certain areas;
- Set out a rigorous billing protocol, complete with information to be collected and tracked;
- Developing KPIs (service quality, financial performance, monitoring of contracts, personnel resources and productivity performance, health and safety);
- Developing internal capacity for existing data cleansing process; and

- Training of BWA teams.

4. *Digitization of Consumer Records; Computerization of billing and collection, and new accounting system.* Billing and account collection performance is very poor, available statistics from the MoB suggest that the proportion of bills issued that are settled (the collection ratio) is in the order of 50%. The project will support the introduction of a modern billing, account collection and customer information system that will meet international standards. This system will be in line with commercial management systems that houses billing, account collection and Customer Information System (CIS). In addition, the billing, account and CIS elements need to be addressed in the short term given the poor procedures and collections rates. Key aspects will be the development of a robust customer database and registry incorporating billing details, credit history, risk profile and metering details that would also improve customer service.

5. *Strengthening Utility Financial Management.* To increase the efficiency of public expenditure, and ensure that access to services is improved, the water sector needs to (a) improve sector planning and (b) improve implementation of procurement, disbursement, auditing, and monitoring arrangements to ensure a more efficient use of resources.

6. *Improved Accounting and Financial Reporting.* Better accounting leads to better reporting, which provides the information necessary for better decision-making, which in turn should lead to better use of public resources. BWA and BSA and their stakeholders need to improve their understanding of the full, long-term economic impact of their decisions on financial performance, financial position and cash flows. The project will support BWA and BSA in enhancing the quality of their accounting and financial reporting practices by installing a new accounting system.

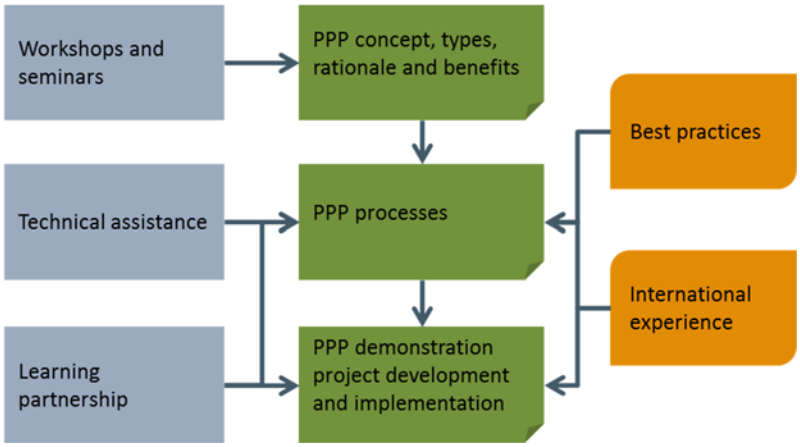
7. *Computerizing the asset register and adoption of modern asset management practices.* The project will support BWA and BSA in recording all asset attributes in an asset management database, providing clear information on which to base key business decisions on activities such as asset rehabilitation, replacement, reinforcement, maintenance and repair. Infrastructure asset management is the combination of management, financial, economic, engineering, and other practices applied to enhance the integrity of physical assets with the objective of providing the required level of service in the most cost-effective manner there by reducing equipment down time. It includes the management of the whole life cycle (design, procurement, construction, commissioning, operating, maintaining, repairing, modifying, replacing and decommissioning/disposal) of physical and infrastructure assets.

8. Under this sub-component innovative private financing models will be explored and capacity building for structuring bankable projects and managing contracts will be conducted. The PMU will engage with the Ministry of Planning and the PMAC in the build-up of an enabling environment for private sector participation. Capacity in the areas of innovative financing, PPP procurement and contract management will be strengthened through a series of training courses. These trainings courses will include blended-financing options, risk-sharing instruments, vendor finance and results-based contracting.

9. Creating an enabling environment for private sector engagement (see Table 4). The potential for using private financing ahead of utility credit worthiness will also be examined in collaboration with the IFC. Capacity building on innovative financing models will partly be undertaken through South-

South Knowledge Exchanges in the form of study tours. Important lessons can be found in Jordan where donor and public funding closed the viability gap for the expansion of the As-Samra Wastewater Treatment Plant, as well as in Bahrain and Egypt. Study tours serve as an excellent vehicle for exposing Iraq's water sector decision-makers to blended financing as alternatives to public funding. These trainings will be complemented with studies for sewerage improvement - including market analysis for a performance-based operation and maintenance contract for sewerage pumping stations. This could possibly lead to a Build, Operate and Transfer (BOT) contract for the wastewater treatment works. Component 1 will also support a capacity building program for private sector participation (Figure 1).

Figure 1: Capacity building program for private sector participation



10. Decentralization will be tested through a sub-utility performance assessment for separate hydraulic zones to assess community satisfaction with the service, the quality of the water and financial management of the Authority.

11. **Component 2: Investment in drinking water supply and wastewater infrastructure (US$188 million).**

12. *Construction of the "R2" reservoir (US$71 million).* The "R2" reservoir, to be built on the Rasafa (east) side of Baghdad, with a capacity of 135,000 m^3 will provide more stability to the supply system by minimizing high water pressure and securing enough water for the end users. Building the R2 complex will help eliminate direct pumping into the distribution network which currently generates high pressure variations. It will ensure improved quality and reliability of water supply services in the area served by the reservoir complex (more than 550,000 people in the Shaab municipality).

13. The R2 reservoir will build resilience into the water supply system. Not only will having 14 hours of water supply constantly within the city limits ensure that the water supply system will be able to weather further supply shocks, but the reservoir also plays a key role in the adaptation measures for NRW reduction under sub-component 2.3. The R2 reservoir will help to ensure an increased water pressure in the system compared to the current situation. As a result, less water will be lost due to leakages as water moves through the system. In addition, while the R2 reservoir by itself is slightly emissive (net emissions of 416 tCO2-eq over 50 years), the reservoir's improvements to the system's water pressure also contribute to the sizeable net emissions reductions due to energy efficiency gains

attributable to NRW reductions under sub-component 2.3 (net emissions of 198,713 tCO2-eq over 10 years).

14. The size of the reservoir is 140 m x 163.2 m x 7.55 m depth with an effective water depth of 6 m. The total plan area is 22,848 m^2. The works will comprise the following main items: twin compartment concrete ground-level reservoir, inlet and outlet works, reservoir overflow systems; pumping stations including pumps, piping system; standby generator station; chlorination station; guard house; fuel tank; store warehouse; access road and landscaping; and security towers.

15. A chlorination station will be provided for the supplies from the reservoirs to ensure that there is satisfactory residual chlorine at the furthest points in the distribution system at all times. Chlorine dosing will be proportional to flow. The equipment to be supplied will be dose up to 2 mg/l under peak flow conditions. The chlorinating station layout will comprise a drum store large enough for the storage of 1 ton drums for a 30 days supply of chlorine at an average dose of 1 mg/l at peak rates of pumping, a chlorinator room and a booster pump room.

Figure 2 – Layout of R2 reservoir

16. *Rehabilitation of pumping stations including main sewerage network (US$68 million).* This will include rehabilitation of 29 sewerage pumping stations by replacing old pumps and associated electro-mechanical works. This will also include rehabilitation of the main trunk sewer system and associated manholes.

17. (a) Rehabilitation of the Dora main sewerage pumping station (US$12 million). The Dora pumping station in Karkh was constructed in the 1980s. It consists of 13 vertical sewerage pumps with a design capacity of about 13.5 m^3/sec (head 22 meters; 13 vertical pumps and 2 submersible). The current capacity is 9 m^3/s. The pumping station serves a population of 2.5 million and transfers the sewage collected to the Karkh sewage treatment plant (capacity of 405,000 m^3/day).

18. (b) Rehabilitation of Habibiya main sewerage pumping station (US$12 million). Constructed in 1984 in Rasafa (east) with a design capacity of 11 m^3/sec (10 vertical pumps and 2 submersible; head 14 meters). Current capacity 7 m^3/s. The pumping station serves a population of around 2.6 million and transfers the sewage and stormwater to the Rustomiya wastewater treatment plant (capacity 550,000 m^3/day).

19. (c) Rehabilitation of sewage and stormwater pumping stations in Rasafa (US$28 million). There are 22 sewage and stormwater pumping stations that need full rehabilitation. The pumping stations are of different capacities (from 100 to 20,000 l/sec) and transfers the sewage to the Rustomiya wastewater treatment plant (capacity 550,000 m^3/day). Currently the capacities are 50%.

20. (d) Rehabilitation Ghazalya main sewerage system (US$16 million). This will include rehabilitation of the main trunk and five pumping stations. The works for the main trunk sewer will include pipe jacking through micro-tunneling for a length of 725 m and rehabilitation of 7 deep manholes (external diameter of 2.2m and a depth of 9m). Use of micro-tunneling is considered for the trunk's rehabilitation to minimize damages and inconvenience during construction works, especially for built-up or sensitive areas, where the network needs extension or is lacking. Experiences around the world have demonstrated this technique to be cost-effective as well as least disruptive. The work will include supply and installation of electrical and mechanical equipment including motors, pumps with their accessories, and works for their operation. The work will also include provision and installation of generators ventilation columns, all electrical wirings, and transformers. The project will serve approximately 630,000 inhabitants in Ghazalya and Shula.

21. On average, most of the 29 pumping stations are working at about 50% of their designed capacity with frequent corrective maintenance. Pumps/motors will be replaced with new ones in order to reduce the annual maintenance budget required to keep repairing such equipment, and to reduce the effect of pollution in the Tigris and Diyala due to the discharge of large amounts of untreated sewage. The following criteria have been adopted during the preparation of detailed designs and bill of quantities.

Table 1: Replacement Criteria for Pumping Stations

Equipment	Criteria for replacement
Influent gate	if it cannot stop water or water is leaked
Screen (primary)	if installation ≥20 years or it frequently breaks down
Screen (secondary	if installation ≥20 years or it frequently breaks down
Suction valves	if installation ≥20 years or it frequently breaks down
Sewerage pumps	if installation ≥20 years or it frequently breaks down
Shaft bearing	This is a part of the pump and the necessity of replacement should be the same at that of pump

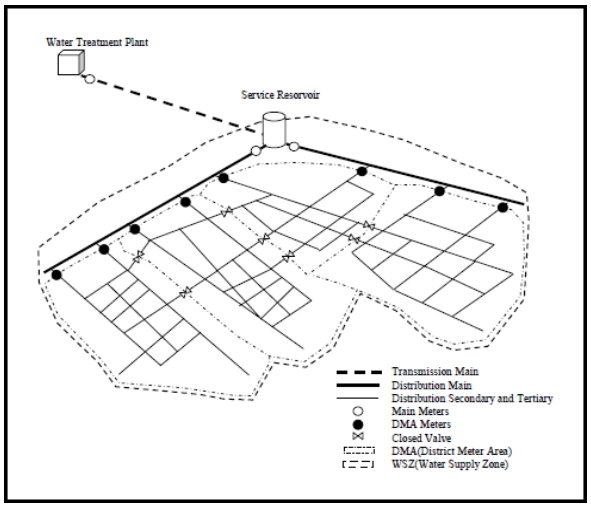
Motors	This is a part of the pump and the necessity of replacement should be the same at that of pump
Check valves	if installation ≥20 years or it frequently breaks down
Submersible pumps	if installation ≥20 years or it frequently breaks down
Discharge valves	if installation ≥20 years or it frequently breaks down
Overhead travelling crane	If it frequently breaks down

22. **Non-revenue water reduction (US$39 million).** This will ensure that BWA improves its operational efficiency through the introduction of measures to manage demand and reduce losses. Water loss reduction activities will be carried out in Shaab and Rasheed muncipalites of Baghdad to improve services for approximately 1 million people and save enough water to serve larger population. The scope of the project will include creation of DMAs, preparation of an accurate customer database, installation/replacement of customer meters, reduction of losses, and establishment of a non-revenue water management system. Implementation of a SCADA system will provide BWA with the means to efficiently and effectively monitor and control the water supply system and to improve operational performance. The SCADA system will provide BWA with accurate online measurements of water transfer, storage and supply to the network and will allow optimization of the operational and maintenance costs, management, and fair distribution of water.

23. The project's NRW reduction activities are instrumental in building increased resilience into Baghdad's water supply system. Carrying out these activities will ensure that the city of Baghdad will have a reliable water supply while both reducing the amount of water produced with less energy consumption and also maintaining an improved level of service.

24. DMAs: Water is abstracted from the Tigris and is directly pumped into Water Treatment Plants (WTPs) from where the treated water is delivered to Water Supply Zones (WSZs). There are 14 WSZs in Rasafa (east) and 11 WSZs in Karkh (west). The average daily water consumption per capita is estimated at 240 liters per capita per day and the average daily water consumption per household was estimated at 5.2 m^3/d including losses. The net (without losses) daily water consumption per household was assumed to be 2.8 m^3/d. Although BWA produces treated water to meet the present water demand, BWA customers are dissatisfied because of the seasonal fluctuations in water availablity, restricted water supply and actual losses of more than 50%.

Figure 3 – District Metered Area



25. Generally non-revenue water management in an open system, such as the one in Baghdad, is undertaken in a passive manner where non-revenue water reduction activities are initiated only when the loss becomes visible or is reported. A more effective approach is to move

towards Active NRW Management where dedicated teams are established and sent out to look for water losses, such as leaks, reservoir overflows, and illegal connections.

26. Active NRW Management is only possible using zones, where the system as a whole is divided into a series of smaller sub-systems for which NRW can be calculated individually. These smaller sub-systems, referred to as DMAs, should be hydraulically isolated so that the water utility will be able to calculate the volume of water lost within the DMA. When a supply system is divided into smaller, more manageable areas, the water utility can better target NRW reduction activities, isolate water quality problems, and better manage overall system pressure to allow for 24x7 water supply throughout the network.

27. The project will provide for the division of two WSZs in Baghdad, namely: Shaab (R2) and Rasheed (K7), to be divided into DMAs. The design of the DMAs will be based on a set of criteria that must be verified and proved using a hydraulic network model. These criteria include:

- Size of DMA (e.g. number of connections—generally between 1,000 and 2,500).
- Number of valves that must be closed to isolate the DMA or number of physical pipe disconnections.
- Number of flow meters to measure inflows and outflows (the fewer meters required, the lower the establishment costs).
- Ground-level variations and thus pressures within the DMA (the flatter the area the more stable the pressures and the easier to establish pressure controls).
- Easily visible topographic features that can serve as boundaries for the DMA, such as rivers, drainage channels, railroads, and highways.

28. New NRW Unit. The BWA will create an NRW Unit within its current structure to handle all matters relating to all NRW activities. A reorganization will be required, and conducted as quickly as possible to ensure the least possible disruption to staff. Staff currently involved in NRW activities may be assigned to the new NRW Unit, while the newly created vacant positions will be filled by BWA staff, as appropriate. Specialized and dedicated on-going training of the staff, focusing on accountability and target-setting will be carried out. It is envisaged that the NRW Unit will initially handle water audit activities, DMA management and active leakage control. The NRW Unit will be independent of any other unit and/or department in BWA and the head of the NRW unit will report directly to the Technical Deputy and/or Director General of BWA. The NRW unit staff will carry out duties related exclusively to NRW management and control and will not be involved in any other activities within BWA.

29. Liaison between BWA and the Municipalities: Although the responsibilities between BWA and the Municipalities are already defined in terms of network activities, with the municipalities handling the installation of house connections and maintenance of the network below 200mm in diameter, it is imperative to define protocols of communication relating to the operation of the network particularly regarding leak repairs on pipes under 200mm diameter and the installation and repair of service connections.

30. Activities such as active leakage control, DMA management, customer meter management, etc. should be under the direct control of BWA. The pipe repairs and house connection installation should be carried out by the municipalities according to procedures and standards, for both materials and workmanship that will be defined by BWA.

31. The project will support and strengthen the link between BWA and the Municipalities in identifying any gaps and weaknesses in the current system and make recommendation for any improvements and enhancements. The works will broadly include the following tasks:

- Technical study of the network, review and update the Geographical Information System and set-up of hydraulic models for proposed DMAs in the Shaab and Rasheed.
- Design, engineering and implementation of the DMAs in the above areas.
- Installation / replacement of customer meters using high accuracy meters in the Shaab and Rasheed.
- Telemetry implementation and installation of a SCADA management system.
- Targeted replacement of dilapidated pipelines and leaky service connections.
- Extensive training of the NRW Unit staff both at home and abroad in NRW techniques and methodologies and in the use of technologies and equipment relating to leakage reduction as well as provision of external advisory support services as required.

Table 2: Cost Estimation for Non Revenue Water

Non Revenue Water Items	Total (US$ million)
NRW management and reduction	4
DMA establishment	2
Customer meters	3
Leak repair	1
Service connection replacement	4
Distribution network replacement (130 km)	19
SCADA system	3
Contingencies	3
Total	**39**

32. *Engineering, construction supervision, and quality control.* The Project Implementation Consultants, to be recruited by the PMU, will be in charge of reviewing all the finalized detailed designs; review and finalization of bidding documents and preparation of bid evaluation reports; construction supervision including certification of the contractor's payments; capacity building and formulation of non-revenue water strategy and action plan; review and finalization of a number of Terms of References for the studies. The PICs will also provide support to the PMU specific to environmental and social safeguards supervision and quality control.

33. **Component 3: Project management, studies and M&E (US$10 million). This component will finance:**

i) Support of the PMU through financing key staff positions in the PMU management and administration
ii) The IBNET performance assessment will be implemented from 2018, followed by an annual report.
iii) Support will be provided for user's satisfaction survey including the use of dedicated hotline and SMS based surveys; citizen's engagement and communication; disclosure; and establishment of the Grievance Redress Mechanism. In addition to raising awareness at schools on water conservation.

34. The project will integrate climate change considerations across all studies to be carried out under component 3 to ensure that the water supply system and urban water management is resilient to climate shocks.

35. A program of technical assistance is included under the project and include provisions to (i) strengthen the PMU to support implementation of the project and dissemination of experience to other governorates; (ii) provide consultants to assist in the establishment of proper financial management and accounting system for annual financial audits; (iii) assess and strengthen the BWA and BSA water quality laboratories as needed, in terms of equipment, chemicals, and technical expertise (US$300,000); (iv) strengthen current BWA and BSA protocol for water quality monitoring and reporting, including baseline setting for identified critical monitoring points (US$350,000); (v) prepare and implement a series of trainings for BWA, BSA, and Municipalities on environmental and social safeguards topics (US$250,000); and (vi) carryout related studies including willingness of consumers to pay (US$400,000) for water and wastewater services.

36. The PMU will be managing all the activities related to this project with close involvement of BSA and BWA. The PMU will also be responsible for disseminating experience gained under the project to other governorates.

37. Selected high priority studies and preparation of feasibility studies for water supply and sewerage improvement will be undertaken for private sector partcipation and in alignment with the priorities set forth in the Master Plan and Land and Water Strategy.

38. **Detailed Project Cost.** The estimated construction costs for the civil works and pumping stations are based on actual tendered cost of similar works which have been completed. The construction costs exclude the cost of engineering, supervision and quality control, physical and price contingencies. The electro-mechanical prices were based on international suppliers' prices. For both civil works and electro-mechanical items contingencies were added to include the contractor's overhead and profit in addition to project conditions regarding environment and security and any related risks that may appear during construction.

Table 3: Project Costs

Project Components	Cost including contingencies US$ million	%
Component 1: Institutional strengthening for integrated urban water management, utility management and creating an enabling environment for private sector engagement	**11.475**	**5.5**
Component 2: Investment in drinking water supply and wastewater infrastructure	**188**	**89.5**
Component 3: Project management, studies and monitoring and evaluation	10	5
Front - end fee	**0.525**	**0.25**
Total	**210**	**100**

Component 1	Cost including contingencies US$ million
Preparation of water security and water conservation plan	0.5
Formulation of Baghdad city groundwater strategy, assessment and monitoring	1
Formulation of wastewater reuse and storm water reuse	1
Financial management, billing and accounting systems	
i. Strengthening Utility Revenue Management	2.4
ii. BWA and BSA Planning Framework	0.4
iii. Strengthening Utility Financial Management	1.2
Development of regulatory framework for private sector participation	2
Willingness- to-pay study	0.5
Support to decentralization and strengthening municipalities	2.475
Total	**11.475**

Component 2	Cost including contingencies US$ million
Construction of the "R2" reservoir	71
Rehabilitation of sewerage pumping stations and sewerage network	
Dora sewerage pumping station	12
Habibiya sewerage pumping station	12
22 sewerage pumping stations in Rasafa	28
Rehabilitation Ghazalya sewerage system and pumping stations	16
Non-revenue water reduction and renewal of five networks	39
Engineering, construction supervision, and quality control	10
Total	**188**

Component 3	Cost including contingencies US$ million
Citizens engagement; communication and water conservation awareness	1
Environmental and Social Management and M&E	2
Feasibility studies	**7**
Khansaa wastewater treatment for private sector participation	
Kanat Al Shurta sewer system	
East sewerage Trunk line	
Dora water treatment plant	
Total	**10**

Table 4: Maximizing Finance for Development in the Baghdad Water and Sanitation Sector

Commercial Financing Readiness Assessment		Proposed Project Actions
• **Funding** o Revenues from user fees are not sufficient to recover cost, while no major increases in user charges are foreseen within the scope and lifetime of the project. o Iraq's public funds to cover funding shortfall are not perceived as sufficiently stable and predictable to be considered a credible and potentially bankable source of revenue for private investors.	→	• **Improve Commercial Performance** o Restore Water Supply and Waste Water Services. o Improve billing and collection procedures. o Reduce Non-Revenue Water. o Efficient and cost-effective technology selection. o Improve Financial Management system. o Improve asset management system.
• **Regulatory System** o Policy, legal, and regulatory environment are currently complex and non-transparent, hence unfavorable for private sector participation in the water sector.	→	• **Create enabling environment** o Preparation of feasibility study and transaction for the Khansaa wastewater treatment plant (IFC advisory team will work with Bank team). o Preparation of performance-based contracts for the operation of sewerage pumping stations and non-revenue water for two municipalities. o In consultation with IFC, develop regulatory framework for private sector participation in the water sector. o Introduce transparent and favorable policies, laws and procedures.
• **Capacity** o Institutional capacity inadequate to support private sector participation within the scope of the project.	→	• **Strengthen BWA's and BSA's capacity for private sector engagement** o Training courses on PPP contract management, procurement, blended finance, risk-sharing instruments, vendor finance, results-based finance. o South-South Knowledge Exchanges/Study Tours to Jordan, Egypt, Bahrain and Spain on innovative financing options.

• **Financing and security** o Limited availability of commercial finance domestically. o The overall security situation in Baghdad makes commercial financing highly risky. Deterioration in the security situation exacerbates risk, especially given the dependence of construction industry on imports. Recently there has been an improvement in the security situation. However, due to the security situation there may be costly bids for civil works and consulting services contracts.	→	• **Introduce innovative financing options** o In collaboration with IFC and MIGA, explore innovative financing mechanisms, including for currency risk mitigation and blended finance instruments: • Wastewater treatment plant (Build-Operate-Transfer Contract). • Performance-based contract for non-revenue water and O&M. • Outsourcing services. • Delegated management.

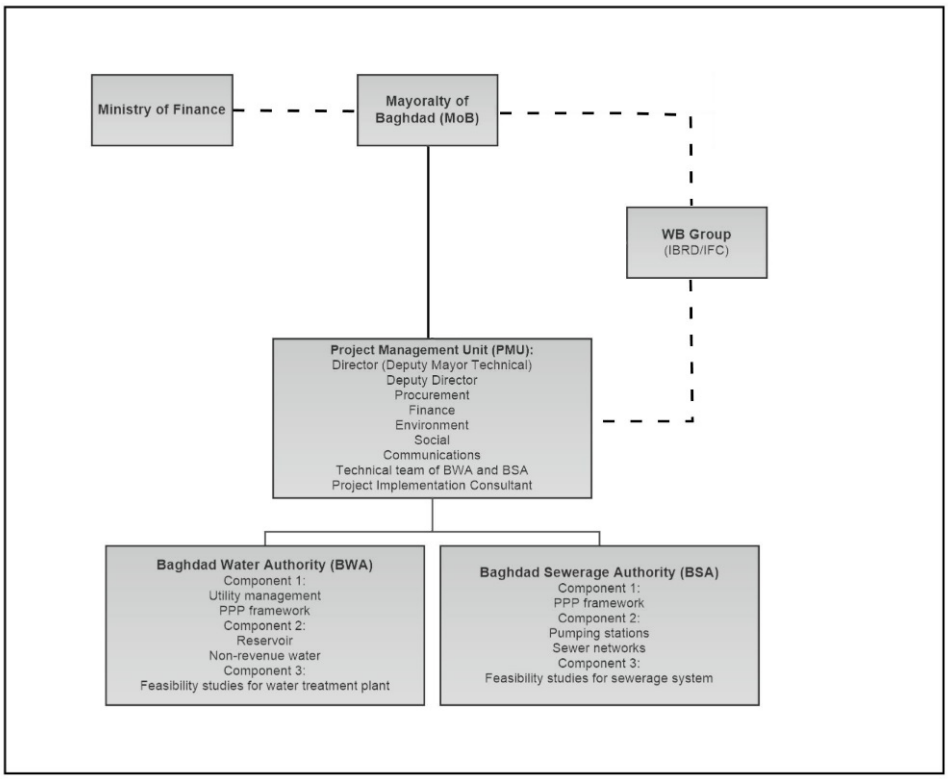
ANNEX 2: IMPLEMENTATION ARRANGEMENTS

COUNTRY : Iraq
Baghdad Water Supply and Sewerage Improvement Project

Project Institutional and Implementation Arrangements

1. The overall responsibility for the project lies with the MoB. The Project Management Unit (PMU) consisting of staff from the BWA and the BSA has been established and was responsible for project preparation. The PMU will be responsible for procurement, contract management, FM, disbursement, safeguards, and monitoring and evaluation. The MoB/BWA/BSA has a long track record in the formulation and execution of water and sewerage programs in Baghdad. The MoB has good knowledge of World Bank procedures and GoI requirements.

Figure 1 – Project organigram



2. The PMU is headed by a project director and will be responsible for the day-to-day and overall project management, monitoring and reporting, including the implementation of the ESMP. The PMU has a core management Team and a Technical Team from BSA and BWA. The PMU consists of: (i) a director (ii) a procurement specialist; (iii) a financial management specialist; (iv) an environmental and social specialist; and (v) an engineer. The technical team at the PMU will consist: (i) an electro-mechanical engineer; (ii) two civil/water engineers; (iii) one structural engineer. There will also be an administrative assistant in the PMU. A multi-disciplinary management and engineering consulting firm

will provide technicall assistance to the PMU with the overall implementation of the project. It will provide engineering support as well as construction supervision and quality control. Management support to PMU will include support to integrated urban water management, private sector participation, institutional strengthening, procurement, safeguards, and monitoring and evaluation.

Financial Management

3. **Financial Management.** The PMU will oversee project implementation with full day-to-day responsibilities. The PMU will include a financial team consisting of two Financial Officers and one internal auditors seconded from the MoB. The Financial Management team will be managing the day-to-day financial management and disbursement tasks. MoB has a prior experience with World Bank financial management and disbursement guidelines, acquired during the implementation of the earlier project.

4. **Financial Management Risk.** The assessment of the financial management systems within MoB was conducted for the project. Based on the results of the assessment, the overall financial management risk is “high”. With mitigation measures in place, the project will have acceptable project financial arrangements and the residual financial management risk rating will be “substantial”. The unmitigated financial management risk is assessed as “high” mainly due to:

i) Limited capacity at MoB to meet the financial management requirements.
ii) Overall weaknesses and shortcomings in the control environment.
iii) Limited accounting and reporting systems in providing timely and comprehensive information.
iv) Delays in making payments due to the shortfalls in the Iraqi banking sector.

The following measures are identified to mitigate financial management related risks:

i) Centralized financial management function within the PMU’s authority with FM team consisting of two Financial Officers, and one internal auditor.
ii) MoB accounting system will be used to capture the project’s financial transactions while interim financial reports will be generated using Excel spread sheets.
iii) One US dollar Designated Account (DA) will be opened.
iv) A project implementation consultant firm will be hired to monitor the physical progress of each construction contract.
v) The financial management manual will be updated documenting the procedures, internal controls, financial reporting and auditing, responsibilities’ duties, and flow of information.
vi) Hiring an independent external auditor to perform annual financial audit.

5. **Budgeting and Flow of Funds.** The PMU will maintain a detailed disbursement plan per quarter. The disburment plan will be developed based on the initial procurement plan, or based on the schedule of outputs as defined in the implementation schedule and estimated payments cycles, and revised when need. It will be used as a monitoring tool to analyze budget variances and manage cash and will feed into the quarterly interim financial reports. To ensure that funds are readily available for project implementation, one Designated Account (DA) will be opened. The PMU will be responsible for managing the DA, preparing the reconciliations, and submitting monthly replenishment applications with appropriate supporting documentation.

6. **Accounting and Financial Reporting.** All government agencies in Iraq follow the unified accounting bylaw issued in 2011 by the Iraq Federal Supreme Audit Institute. This Bylaw is an update of the original bylaw that was issued in 1989. The project will follow the cash basis of accounting and key accounting policies and procedures will be documented in the financial procedure manual which will be finalized before negotiations. MoB use very basic accounting software to capture their daily financial transactions. This locally developed software is not capable of generating the project's quarterly interim unaudited financial reports in accordance with the World Bank financial management guidance and record commitments. The available accounting system will be used to capture the projects financial transactions and Excel spread-sheets will be used to generate the interim financial reports.

7. The PMU will be responsible for preparing the following:

a. **Quarterly Interim un-audited Financial Reports** and submitting them to the Bank within 45 days from the quarter then ended. These reports will consist of: i) Statement of Cash Receipts and Payments by each category; (ii) detailed use of funds schedule by component/disbursement categories; comparison with budgets; and short-term forecasts of expenditure; (iii) reconciliation statement for the balance of the Designated Account, (iv) a list of contracts showing the physical vs financial progress; (v) a list of assets (goods and equipment); and (vi) a narrative summary of implementation highlights for the quarter.

b. **Annual Project Financial Statements (PFSs)** will be audited by an independent external auditor. The audit report will be submitted to the Bank not later than six months after the end of each fiscal year. The PFS includes: (i) cash receipts and payments by category and accounting policies and explanatory notes, including a footnote disclosure on schedules; (ii) detailed use of funds schedule by project component/disbursement categories; comparison with budgets; and short-term forecasts of expenditure; (iii) reconciliation statement for the balance of the Designated Account; (iv) a list of contracts; (v) a list of assets of goods and equipment; and (v) a narrative summary of implementation highlights for the quarter.

c. **Internal controls:** The project will be implemented through centralizing management and disbursement functions within the PMU with specific controls and procedures documented in the financial management manual. The financial management manual will document the project's implementation of internal control functions and processes and will describe the responsibilities of the PMU staff which are summarized in terms of authorization and execution processes. The expenditure cycle will specify the following steps: (i) technical approvals for civil works and deliverables by consultants; (ii) administrative approval by the PMU director; (iii) issuance of payments will be made upon receipt of supportive documentation and written requests signed by authorized officials; and (iv) verification by the Financial Officer of the accuracy and compliance of the payment requests with the loan agreement.

d. The bulk of the project's expenditures will finance civil work contracts and goods/equipment with some consultancy service contracts and incremental operating costs. Civil work contracts will be financed mainly through direct payments.

Independent private consulting firms, financed from the loan, will be contracted to perform construction supervision on the ground. All claims will be verified (technically) by the consultancy firm before being processed further for payment by the PMU. On a monthly basis, the Financial Officer will reconcile the project account bank statement with the account book balance. Reconciliations should be prepared by the Financial Officers and checked by an independent auditor. All reconciling items (if any) will be listed, explained and followed up. Copies of the reconciliation reports together with the account bank statement will be kept in the project files and will be attached to the interim financial reports.

8. **Financial and Technical Audit.** The project's financial statements will be audited annually by an independent auditor acceptable to the Bank, in accordance with internationally accepted auditing standards and Terms of Reference (ToR) cleared by the Bank. The PMU will be responsible for preparing the ToR for the auditor and will submit them to the Bank for clearance. The audit report will be sent to the Bank no later than six months following the end of the project's fiscal year. The report shall include an opinion on the financial statement. The auditor will provide an opinion on the effectiveness of the project's internal control system. Finally, a management letter identifying any deficiencies in the control system the auditor finds pertinent shall accompany the audit report including recommendations for their improvement.

Disbursements

9. **Designated Account (DA)**. To ensure that funds are readily available for project implementation, **a DA** will be opened for the project and denominated in US dollars. Authorized signatories, names and corresponding specimens of signatures will be submitted to the Bank prior to the receipt of the first Withdrawal Application. The ceiling of the Designated Account will be US$ 5 million.

10. The proceeds of the loan will be disbursed in accordance with the World Bank's disbursements guidelines that will be outlined in the Disbursement and Financial Information Letter and in accordance with the World Bank Disbursement Guidelines for Projects. Transaction-based disbursement will be used under this project. Accordingly, requests for payments from the loan will be initiated using Withdrawal Applications (WAs) either for direct payments, reimbursements and replenishments to the DAs. WAs will include appropriate supporting documentation, including detailed Statement of Expenditures (SOEs) for reimbursements and replenishments to the DA. To facilitate payments, all contracts using Request for Bids (International Market Approach) shall be paid through Direct Payments or Special Commitments, irrespective of the requested amount. The category of eligible expenditures that may be financed out of the proceeds of the loan and the percentage of expenditures to be financed as eligible expenditures will be spelled out in the Loan Agreement.

11. **E- Disbursement**. The World Bank has introduced e-disbursement for all projects in Iraq. Under e-disbursement, all transactions will be conducted and associated supporting documents scanned and transmitted online through the World Bank's Client connection system. The use of e-disbursement will streamline online payment processing to (i) avoid common mistakes in filling out WAs; (ii) reduce the time and the cost of sending WAs to the Bank; and (iii) expedite the Bank processing of disbursement requests.

12. **Statements of Expenditures (SOEs)**. All reimbursement and Designated Account replenishment applications for withdrawal of proceeds from the loan account will be documented using Statement of Expenditures (SOE) as per format attached to the Disbursement and Financial Information Letter (DFIL). The documentation supporting expenditures will be retained at the PMU and will be readily accessible for review by the external auditors and periodical Bank supervision missions.

13. The Bank will issue a DFIL, which will specify the additional instructions for withdrawal of the proceeds of the loan.

Procurement

14. **Key procurement under the project.** The total cost of the project is US$210 million of which about US$107.8 million is for civil works, US$68.37 million for supply and installation, and US$20 million for consulting services (procurement plan: Tables 1 to 3).

15. **Civil Works, Supply and Installation**. Civil works will include: construction of the "R2" reservoir and replacement of distribution network. Supply and installation will include mainly pumps and electromechanical equipment for sewerage and storm water pumping stations for Dora, Habibiya, Ghazalya, and 22 stations in Rasafa.

Table 1: Procurement Plan – Civil works, Supply and Installation

Ref. No.	Contract (Description)	Estimated Cost (US$) Million	Procurement Method	Review by Bank (Prior/Post)	Expected Contract Award Date (dd/mm/yyyy)
BWA.W.01	Construction of the "R2" reservoir	71	RFB	Prior	15/4/2018
BSA.S&I.01	Rehabilitation of the Dora sewerage pumping station	12	RFB	Prior	15/4/2018
BSA.S&I.02	Rehabilitation of Habibiya sewerage pumping station	12	RFB	Prior	15/4/2018
BSA.S&I.03	Rehabilitation of sewage and storm water pumping stations in Rasafa -1	9.7	RFB	Prior	15/5/2018
BSA.S&I.04	Rehabilitation of sewage and storm water pumping stations in Rasafa - 2	8.8	RFB	Prior	15/5/2018
BSA.S&I.05	Rehabilitation of sewage and storm water pumping stations in	9.87	RFB	Prior	15/6/2018

	Rasafa - 3				
BSA.S&I.06	Rehabilitation Ghazalya main sewerage system	16	RFB	Prior	15/8/2018
BWA.W.02	Non-revenue water reduction	20	RFB	Prior	1/12/2018
BWA.W.03	Renewal of water supply networks - M 821	5.5	RFB	Prior	1/5/2019
BWA.W.04	Renewal of water supply networks - M 321	2.9	RFB	Post	1/5/2019
BWA.W.05	Renewal of water supply networks - M 636	3.3	RFB	Post	1/5/2019
BWA.W.06	Renewal of water supply networks - M 516	3.1	RFB	Post	1/5/2019
BWA.W.07	Renewal of water supply networks - M 634	2	RFB	Post	1/5/2019

16. **Selection of Consultants.** There are consultancy services under Component 1 and 3 for improving the institutional knowledge and preparedness about all aspects of water security and urban water management, private sector participation and preparation of feasibility studies and for other technical assistance activities to improve the capacity of BWA, BSA and MoB staff in implementing the project.

Table 2: Procurement Plan – Consulting Services

Ref. No.	Contract (Description)	Estimated Cost (US$) Million	Procurement Method	Review by Bank (Prior/Post)	Expected Contract Award Date (dd/mm/yyyy)
PMT.CS.01	Project implementation consultant	10	QCBS	Prior	1/5/2018
PMT.CS.02	Preparation of feasibility studies	9	QCBS	Prior	1/2/2019
PMT.CS.03	Environmental management	0.5	Ind.	Post	1/8/2018
PMT.CS.04	Development of SRS for digitization of consumer records, computerization of billing and	0.5	QCBS	Prior	15/3/2019

	collection, and accounting				
PMT.CS.05	External auditor	0.2	LCS	Post	1/9/2018

17. **Procurement of Goods and Non-Consulting Services.** The project will finance IT application and equipment for digitization of consumer records, computerization of billing and collection, and accounting. It is envisaged that the PMU team will procure office equipment and furniture for its staff. Contracts will be of small value and use request-for-quotation procedures.

Table 3: Procurement Plan – Goods

Ref. No.	Contract (Description)	Estimated Cost (US$) Million	Procurement Method	Review by Bank (Prior/Post)	Expected Contract Award Date (dd/mm/yyyy)
PMT.GO.02	Digitization of consumer records, computerization of billing and collection, and accounting	5	RFB - 2 stage	Prior	1/3/2019
PMT.GO.03	PMU Office equipment	0.075	RFQ	Post	15/4/2018
PMT.GO.04	PMU Office furniture	0.075	RFQ	Post	15/4/2018

18. **Client Capability and PMU Assessment.** Project implementation will be the responsibility of the MoB. The PMU will be responsible for procurement, contract management, financial management, disbursement, safeguards, and monitoring and evaluation. The World Bank's New Procurement Framework is new to MoB. Several PMU staff have been trained on the different features of NPF. The field level officers managing the contracts need contract management training.

19. To strengthen the procurement and contract management capacity a project implementation consultant will be hired to ensure proper quality of the design, procurement and construction management and supervision.

20. **Contract management.** PMU staff will require capacity enhancement to manage procurement of the supply and installation contracts for rehabilitation of pumping station as well contracts for non-revenue water reduction. The PMU field level engineers have some contract management experience of civil works contracts and supply and installation.

21. **Complaints management and dispute resolution systems.** Regulation 1 for 2014 "Executing Public Contracting" in Iraq establishes the right of the bidder to raise a complaint to a centralized committee at each procuring entity. However, bidders do not have adequate access to independent administrative review and appeal processes. Although civil courts have jurisdiction over civil and commercial matters, access to them is perceived as inadequate by participating bidders, and the administrative review and court systems are not operating adequately under current circumstances. The complaint procedure in Iraq does not fully meet the criteria of independence from the officials that are involved in the actions. In the absence of a formal independent complaint mechanism, the procedures for administration and handling of procurement-related complaints stated in the Bank's procurement regulations will be followed.

22. Advance procurement is key to ensure good disbursement indicators. Draft request for proposals and Terms of Reference were prepared and the general procurement notice was published. To ensure project readiness, the detailed designs for the four main contracts were completed and preparation of bidding documents was undertaken during the preparation stage.

23. **Domestic preference.** The key procurement activities under the project will be tendered by approaching the international market for supply of goods or supply and installation, as the local market has limited firms with experience in manufacturing or carrying out similar contracts. Therefore, the question of domestic preference does not arise. For works contract's Iraq's per capita income is US$ 4,944 in 2015 (per World Bank's list of per capita nominal GDP for countries and dependencies 2015); hence Iraq is not eligible for domestic preference.

24. **Market Analysis.** Due to the security and instability of the country, the possibility of attracting big international contractors could be limited. However, communicating/consulting with potential bidders would be important to receive some competitive bids from the region. Furthermore, the few international/regional firms who are familiar with MoB or World Bank systems could take advantage and submit exceptionally high bids. To encourage as many bidders as possible and to avoid these risks, an awareness program needs to be carried out for interested bidders from within and outside Baghdad. It is important to bring in local contractors and use the local workforce joint ventures with local firms or subcontracting to local firms are some of the options that could contribute to faster mobilization of materials and labor and easier access to the project sites.

25. **Procurement Thresholds and Prior Review Thresholds.** The Procurement Plan shall set forth those contracts, which shall be subject to the World Bank's Prior Review for high risk environment. All other contracts shall be subject to Post Review by the World Bank.

Table 4: Prior Review Thresholds

Type of procurement	Prior Review High risk (US$ million)
Civil Works	5
Goods, information technology and non-consulting services	1.5
Consultants - firms	0.5
Consultants - individuals	0.2

Environmental and Social (including safeguards)

26. The PMU has appointed one Environmental and Social Officer (ESO) each from BWA and BSA. The ESOs will have the responsibility to represent BWA and BSA, respectively, throughout project implementation. The Implementation Consultants are expected to identify environmental and social safeguards training needed, the ESOs are expected to identify who might benefit from such training. Training could include topics such as risk assessment and risk-based management, structured specific conditions contracting for environmental and social compliance as well as ISO-certification-based training on environmental management systems, environmental indicators and performance, and occupational health and safety.

27. Special training for monitoring levels of pollutants (air, noise, vibration, land/soil, water, wastewater) would entail providing special training courses on operating, servicing, and calibrating testing apparatus (portable/handheld, and stationery) in the field. Training should also include sampling and sample storage techniques against internationally endorsed testing and sampling procedures (examples include WHO and USGS methods, as well as Standard Methods for the Examination of Water and Wastewater).

28. Upon operating the newly rehabilitated/upgraded pumping stations, new professional challenges may arise. New challenges may include running and operating new equipment and facilities, performing maintenance and troubleshooting per manufacturers' instructions, referring to manuals for replacing parts and troubleshooting, and many others. The project was planned in such a way to accommodate training and capacity-building for such challenges.

29. **Social Benefits.** The project will have broad social benefits since it will improve the operation of urban water and wastewater infrastructure, and hence the quality of water and wastewater services in specific parts of the capital city. After the project, the services provided will be of higher quality for the residents of Baghdad in terms of few supply interruptions in the area served by the R2 complex and improvements in drinking water quality in Shaab and Rasheed and some modest increase in access to piped water. This will enable BWA to provide services to future residents of these two Municipalities. The rehabilitation of several sewerage pumping stations will enable BSA to reduce sewer overflows in the city and hence reduce the incidence of water and soil pollution, while increasing the volume of wastewater treatment in the city. The social risks associated with the project are moderate. The main risk might be related to the current land use of the R2 reservoir site by the adjacent college and the parking area used by the college staff and students.

30. **Land Acquisition and Resettlement.** Involuntary resettlement and livelihood restoration are expected to be issues of moderate complexity. The land for the construction of R2 complex is owned by the MoB and transferred to the BWA, but is currently occupied by an adjacent college which is using some structures (caravans) inside the project area. In addition, part of the land is being used by the college staff and students as a parking lot. Accordingly, OP 4.12 is triggered as a precautionary measure. The resttelement policy framewok has been prepared and dislcosed (English and Arabic): (i) at the external WB website on August 30-31, 2017, and (ii) in the country at publicly accessible locations and on the MoB website. The sewerage pumping stations will include rehabilitation of existing facilities, and will not need any new land acquisition or resettlement.

31. **Citizen Engagement.** Public consultations were carried out as part of the ESIA/ESMP preparation process between November 2015 and January 2017 near the project sites. Participants included representatives from municipality services and councils and a number of local community members in addition to BWA and BSA project teams. The purpose of the consultations sessions was to present the overall project design, explain its broader benefits at the national level; and begin to outline some of the anticipated adverse environmental and social impacts expected to result from project activities, all to enable the stakeholders to understand the project and its activities, as well as to ensure that their concerns and issues are considered during all phases of the project, including at the planning phase.

32. **Poverty and Social Impact Assessment.** The project will have a positive impact on households. The impact of more reliable services will especially be felt by consumers in a reduction in coping costs to deal with intermittent supplies (especially in summer) and low drinking water quality. The reduction in coping costs will reduce the financial burden on consumers. As BWA and BSA will be able to benefit from less emergency maintenance expenses, this will free up operational subsidy resources to be used for rehabilitation investments in BWA and BSA.

33. **Grievance Redress Mechanisms**. Effective and responsive grievance redress mechanisms (GRMs) will be established satisfactory to the Bank within 90 days after the effective date, for the duration of the project. These GRMs serve as a channel through which citizens can hold service providers accountable and will give voice to citizens' concerns and queries. They will help address complaints early on and as such help manage risks in project preparation and implementation before they escalate. The grievance procedures will be designed to provide transparent grievance tracking, monitoring, and reporting to the community. Service standards for acknowledgement, response, and resolution will be established and published. To ensure that the interface is credible and easily accessible for all groups within the society, the GRMs will provide multiple channels for soliciting complaints, including a dedicated SMS hotline for submitting feedback and a simple online complaint form. Staff training for BSA and BWA will be rolled out to help with the successful implementation of the GRMs. Grievance indicators will be adopted in the project's results framework to monitor performance.

Monitoring and Evaluation

34. The project will be monitored and evaluated based on the indicators and targets set out in the results framework provided in section 7. The Bank will carry out regular supervision missions during

which project progress, outputs and work plan updates will be reviewed. Moreover, the PMU of MoB in coordination with BWA and BSA will be responsible for monitoring the progress of project implementation and achievement of the performance indicators and accordingly report to the Bank. The PMU will be required to submit comprehensive progress reports on implementation aspects quarterly that will include reporting on procurement, financial management, physical implementation and environmental and social aspects.

35. *Capacity for Safeguards Implementation*. Day-to-day management of project implementation, including safeguards implementation, will be the responsibility of the PMU. The PMU will be responsible for overall project coordination, including safeguards implementation, monitoring and reporting. The PMU members, as well as the broader BWA and BSA engineering staff, have responded well to the social and environmental safeguards workshops held during project preparation; additionally, the teams have been learning through the safeguards document preparation and public consultations.

36. The PMU will include one full-time Environmental and Social Safeguards Officer (ESO). The ESO in close liaison with the PIC will supervise, monitor, and report on the work of the private contractors' and to ensure contractors compliance with ESMP mitigations tables attached to the bidding documents. The ESO will benefit from support and guidance from the Bank environmental and social team members.

37. **Training and Capacity Strengthening**. Project preparation has included an introduction to World Bank Operational Policies, relevant safeguards documents to be used ESIA, ESMP, RPF, and generic ESMP, as well as public consultation and disclosure. Further training will include detailed explanations of the impacts and mitigation measures for each of the safeguards documents; as well as an introduction to safeguards supervision, monitoring, and reporting. During project implementation, the ESO of the Project Implementation Consultant will design and hold workshops on relevant topics, including, but not limited to: operational health and safety; good-practice mitigation measures; institutional responsibilities for measuring, monitoring, and reporting to ensure compliance; and construction-phase on-site supervision practices, including documentation of monitoring and reporting.

38. **Stakeholder Consultations.** Project-affected citizens and other relevant stakeholders will continue to be engaged throughout the project cycle to provide the MoB, BWA and BSA with real-time performance checks and to increase transparency and public understanding of the project objective and challenges. Specific consultations about the project's environmental and social aspects will also be organized with local non-governmental organizations (NGOs).

39. **Beneficiary Satisfaction Surveys.** The client will gather customer feedback through beneficiary satisfaction surveys. A baseline, mid-term and end-line survey will be completed to assess BSA and BWA's service quality through user satisfaction ratings. The survey will gather information about to what extent the targeted population benefit from the infrastructure and services as well as how it affects people's lives in social and economic terms. Consumers who are currently dealing with poor service delivery as reflected in deficient drinking water quality, interrupted supplies, and sewer blockages will be included in the surveys. This will inform remedial action during project implementation (if needed) and facilitate measurement of the project's development outcomes

through user satisfaction indicator in the results framework. To take advantage of Information and Communication Technologies (ICT) to support scalable, sustainable, inclusive, and cost-effective participatory processes, the surveys will be conducted through hybrid ICT interventions. They will include automated SMS-based surveys and audio call surveys where citizens respond to pre-recorded survey questions using touch tones, complemented by off-line mobile/tablet surveys to be conducted in person.

40. **Strategic Communication.** Outreach activities will be undertaken to inform the population in the project area about the project, its objectives, ambition and its limits. Effective communication will help proactively manage beneficiaries and communities' expectations. Important project related information will be posted on websites and at the appropriate local levels. Messages will also be targeted to generate and sustain stakeholder interest. Sensitizing beneficiaries to the project benefits combined with responsive grievance mechanisms, aims to lay a foundation of trust and acceptance for the needed reform of the tariffs system, which is critically important for the financial sustainability of the BSA and BWA.

41. **Resources for Citizen Engagement (CE).** CE awareness-raising and training modules will be provided to the BWA and BSA and other key stakeholders. Officials will receive training in the mechanisms for engaging with citizens, obtain insights in the benefits it can provide and learn how to mitigate potential risks related to grievances. Knowledge exchange with other governments that have successfully implemented CE initiatives may also be included in the capacity building program. The project's earmarked funding for communication and CE efforts will also be used for procuring the complaint management system and training staff to respond to citizens' grievances.

42. **Water conservation awareness raising.** A campaign for water conversation will be launched at schools and through annual school's water festivals. Informing young people about water savings. The campaign will aim to raise children's awareness of the importance of water saving. A dedicated communication and dissemination plan will be developed for fine-tuning the main messages and identifying effective communication channels based upon the audience's preferences and other characteristics impacting receptiveness. Progress will be measured through tracking the number of schools having received information about the importance of water conservation.

ANNEX 3: IMPLEMENTATION SUPPORT PLAN

COUNTRY : Iraq
Baghdad Water Supply and Sewerage Improvement Project

Strategy and Approach for Implementation Support

1. The implementation support plan provides the framework for the Bank's operational approach to supporting BWA and BSA's implementation of the BWSIP project and monitoring implementation progress. The implementation support plan was developed taking into consideration: (i) the high risks identified for the project; (ii) the limited experience of BWA and BSA staff with respect to private sector participation; (iii) the importance of large civil works contracts in overall implementation and achievement of project development objectives; (iv) the importance of environmental and social safeguards; and (v) the role of BWA and BSA's financial sustainability in the long-term sustainability of project investments and the reliability of water supply and wastewater. The implementation support plan reflects these key considerations. There will also be a joint mission with IFC and MIGA during the early stages of project implementation.

2. Three core activities include: (i) close and ongoing communications with implementing agencies, with respect to procurement and contract implementation issues; (ii) receipt and review of quarterly project management reports prepared by the project implementing agencies; and (iii) at least three implementation support missions to Iraq annually, involving both headquarters and country office staff and technical consultants. This three-pronged approach will provide comprehensive support and oversight for project implementation and enable quick and responsive interactions between project officials and World Bank staff.

Implementation Support Plan and Resource Requirements

3. Tables 1 and 2 outline the implementation support plan and resources required for the project.

Table 1: Implementation Support

Time	Focus	Skills needed	Resource Estimate
2018	Project launch Confirm reporting and M&E formats Confirm financial reporting Confirm safeguard monitoring and reporting TA procurement; Private sector participation	Team Leader Engineer Procurement Financial Management Spec. Financial Analyst/Economist Environmental Specialist Social Specialist Utility Institutional Specialist PPP specialist/IFC/MIGA	US$120,000

		Governance Team Assistant	
2019	Contract management Safeguards Ongoing procurement Civil works and engineering issues, if any M&E BWA and BSA financial results Project financial management	Team Leader Engineer Procurement Financial Management Spec. Financial Analyst Environmental Specialist Social Specialist Utility Specialist Team Assistant	US$ 120,000 per year
2020-2023	Contract management Safeguards M&E BWA and BSA financial results Project financial management ICR preparation	Team Leader Engineer Procurement Financial Management Spec. Financial Analyst Environmental Specialist Social Specialist Economist	US$120,000 per year
Mid-term review	Contract management Safeguards Private sector Project sustainability BWA and BSA financial results M&E	Team Leader Engineer Procurement Financial Management Spec. Financial Analyst Economist Environmental Specialist Social Specialist Private sector specialist Monitoring and Evaluation	
Implementation Completion Reporting	Project results and evaluation Financial and economic analyses	Team Leader Engineer Financial Analyst Economist	US$50,000

Table 2: Skills Requirements

Skills requirement	Staff Weeks per Year	Trips per Year	Comments
Team Leaders	14	2	CO/regional based

Lawyer	2	As required	HQ based
Engineer	12	2	CO/regional based
Environmental Specialist	6	2	HQ based
Social Specialist	6	2	CO based
Procurement Specialist	8	2	CO based
Financial Management Specialist	8	2	CO based
Private Sector Specialist	6	2	Regional/HQ based
Economist	2	1	HQ based
Financial Analyst	6	2	CO based
Monitoring & evaluation	12	2	CO based
Team Assistant	4	-	CO based

ANNEX 4: FINANCIAL AND ECONOMIC ANALYSIS

1. **Rationale for Public Sector Investment.** In Iraq, water and wastewater services are traditionally supplied through public sector companies. The benefits of water supply and wastewater services do not only accrue to individuals, but also to society in terms of improvements in public health, and environmental protection water and soil resources, natural ecosystems and biodiversity. However, the benefits of such investments are usually not sufficient to induce private sector investments. This is especially true for Iraq, where the water and wastewater sector has suffered from decades of underinvestment and poor maintenance in combination with low tariffs which has resulted in utilities which depend heavily on the government for funding their daily operations. In addition, the security situation in the country jeopardizes the investments of the private sector. Hence, public financing is still needed to ensure that investments in the sector can be made.

2. **Methodology.** The methodology used is cost-benefit and "with and without project". The period of analysis is 15 years. The financial analysis uses historical data from financial statements of the water and sewer companies for the past three years (2013 to 2015). Costs and benefits are expressed in constant 2013 prices[9]. The financial cash flows have been translated into economic cash flows by adding the expected reductions in CO2 emission (document available in the project file).

3. Project costs included in the analysis include 50% of Component 1, 50% of Component 3 and 100% of Component 2. The implementation schedule of each is based on the annual "Expected Disbursements" shown in the PAD Data Sheet. Portions of Components 1 and 3 are included in the analysis because certain activities under these components are considered essential to achieve the expected project benefits.

4. A truncated portion of the "with project" model worksheet is shown in Table 4.

5. **Benefits.** For the Base Case analysis, the major benefit streams from the project are:

i. A 5% annual reduction in non-revenue water during project implementation. Thus, non-revenue water decreases from 60% in 2015 to 30% in 2024 and for the remainder of the analysis period;
ii. A 40% decrease in electricity pumping costs because of the rehabilitation of the sewage pumping stations, and other pump replacements, starting during project implementation and reaching the maximum reduction in the last year of implementation, and then holding steady for the reminder of the analysis period;
iii. An increase in collection rates, starting at 40% in 2015 and steadily improving to 88% by the end of the analysis period in 2031;
iv. A decrease in flood repair costs, assuming a flood every other year that causes US$400 million in damage, and for which the project reduces this cost by 80%;
v. A 10 cent per day decrease in household pumping costs, for 50,000 households, because of the improvements in network pressure resulting from the R2 reservoir. It is assumed that pumping time is reduced from two hours to one hour per day, starting at the last year of project implementation and then continuing until the end of the analysis period.
vi. A five percent across the board tariff increase every three years; and

[9] The exchange rate used was USD 1 is equivalent to IQD 1,160.

vii. A 2-liter per day reduction in bottled water sales, for 250,000 people, because of the increased pipe pressure and reliability of potable water delivery because of the project.

6. Additional likely financial and economic benefits streams, such as reduced chlorine use (financial), projected public health improvements (economic), and projected reductions on household sanitation expenditures (economic), were not modelled but would increase the internal rates of return over the Base Case results.

7. **Results.** Table 1 show the Base Case analysis results. The results are well above the normal hurdle rate of 10% used in water supply and sanitation project analyses.

Table 1: Results of the Cost Benefit Analysis

	Financial		Economic	
Scenario	FIRR (%)	NPV (IQD M)	EIRR (%)	NPV (IQD M)
Base Case	14	33,054	15	43,202

8. **Sensitivity and Switching Analysis.** For the sensitivity analyses, major risks identified in Section V are modelled, as shown in Table 2.

Table 2: Results of Sensitivity Analyses

Scenario	Description	PAD Risk	FIRR (%)
0	Base Case	n/a	13.90
1	Tariff Increase Every 4th Year	Political & Governance	12.39
2	Implementation Delayed 2 Years	Institutional & Fiduciary	13.71
3	Cost Overrun by 15%	Technical Design & Institutional	11.08
4	50% Less Bottled Water Savings	Technical Design	10.92

9. As shown there, the analysis is stable for scenarios 0 through 2. Bigger variances are seen for scenarios 3 and 4. A cost overrun of 15 % on the component amounts in the model (US$194 million) would amount to US$29 million, which is a large amount and, given the project management measures funded under Component 3 and described in Annex 2, considered unlikely.

10. The most significant variable for the analysis is the assumption regarding bottled water purchases. As described in Section III, construction of the R2 reservoir will improve water reliability and availability for more than 550,000 people in the Shaab municipality. The Base Case analysis assumes a 2 liter/day reduction in bottled water by over half of this population (i.e., 250,000 people), and the sensitivity analysis tests the hypothesis that the project results in only a 1 liter decrease per day—with a 3% drop in the FIRR.

11. To further understand the effects these two variables have on the Base Case, a switching value analysis was done. The results are shown in Table 3.

Table 3: Results of Switching Analyses

Scenario	Description	Value resulting in NPV=0
3	Cost Overrun	22.56%
4	Bottled Water Savings/person/day	0.35 Bottles

12. As shown above to reach a NPV of zero at a 10% discount rate, there would have to be:

- A cost overrun of 23 percent; or
- Only a third of a bottle per day reduction in bottled water sales.

13. **Implications for Supervision.** Based on the sensitivity and switching analyses, the implications and recommendations for project supervision include:

- Timely completion of the R2 reservoir, and that the technical performance is achieved regarding the increased network pressure and reliability;
- Minimum tariff increases take place on a regular basis; and
- There are no large cost overruns.

Table 4: "With Project" Base Case Model

	FY	2015	2016	2017	2018	2019	2020	2021	2022	2023	2031
	Year No.			1	2	3	4	5	6	7	15
Benefits											
Incease in Water Customers/year			2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Decrease in Operating Costs/year - Water			0.00%	0%	0%	0.00%	10.00%	25.00%	30.00%	40.80%	40.80%
Decrease in Operating Costs/year - Sewer			0.00%	0%	0%	0.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Decrease in NRW/year			0.00%	0%	0%	5.00%	5.00%	5.00%	5.00%	5.00%	
Increase in Collectrion rates/year			0.00%	0%	0%	5.00%	5.00%	5.00%	5.00%	5.00%	1.00%
Decrease in Flood Repair Costs			0.00%	0%	0%	0%	60%	70%	80%	80%	80%
Increase in Tariffs			0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	0.00%	5.00%	0.00%
Water Produced & Delivered											
Network Input	MCM/day	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Network Input	M3/year	1,277,500,000	1,277,500,000	1,277,500,000	1,277,500,000	1,277,500,000	1,277,500,000	1,277,500,000	1,277,500,000	1,277,500,000	1,277,500,000
NRW	%	0.60	0.60	0.60	0.60	0.55	0.50	0.45	0.40	0.35	0.30
Delivered	M3/year	511,000,000	511,000,000	511,000,000	511,000,000	574,875,000	638,750,000	702,625,000	766,500,000	830,375,000	894,250,000
Water Consumed											
Domestic	m3/year	440,482,000	440,482,000	440,482,000	440,482,000	495,542,250	550,602,500	605,662,750	660,723,000	715,783,250	770,843,500
Commercial	m3/year	4,088,000	4,088,000	4,088,000	4,088,000	4,599,000	5,110,000	5,621,000	6,132,000	6,643,000	7,154,000
Government	m3/year	66,430,000	66,430,000	66,430,000	66,430,000	74,733,750	83,037,500	91,341,250	99,645,000	107,948,750	116,252,500
Wastewater Produced											
Domestic	m3/year	347,980,780	347,980,780	347,980,780	347,980,780	391,478,378	434,975,975	478,473,573	521,971,170	565,468,768	608,966,365
Commercial	m3/year	4,088,000	4,088,000	4,088,000	4,088,000	4,599,000	5,110,000	5,621,000	6,132,000	6,643,000	7,154,000
Government	m3/year	66,430,000	66,430,000	66,430,000	66,430,000	74,733,750	83,037,500	91,341,250	99,645,000	107,948,750	116,252,500
Water Tariffs											
Domestic	IQD/m3	12	12	12	12	12	13	13	13	13	15
Commercial	IQD/m3	100	100	100	100	100	105	105	105	110	122
Government	IQD/m3	100	100	100	100	100	105	105	105	110	122
Wastewater Tariffs											
Domestic	IQD/m3	14	14	14	14	14	15	15	15	15	17
Commercial	IQD/m3	100	100	100	100	100	105	105	105	110	122
Government	IQD/m3	100	100	100	100	100	105	105	105	110	122
Collection Rates											
Water	%	40.00%	40.00%	40.00%	40.00%	45.00%	50.00%	55.00%	60.00%	65.00%	89.00%
Wastewater	%	40.00%	40.00%	40.00%	40.00%	45.00%	50.00%	55.00%	60.00%	65.00%	89.00%

Table 4: "With Project" Base Case Model (Cont.)

Income - Water	IQD M										
Water Sales		4,935	4,935	4,935	4,935	6,246	8,097	9,797	11,659	14,367	23,357
Service Revenues		62	62	62	62	62	62	62	62	62	62
Manufacturing		36,173	36,173	36,173	36,173	36,173	36,173	36,173	36,173	36,173	36,173
Other		(41)	(41)	(41)	(41)	(41)	(41)	(41)	(41)	(41)	(41)
Sub-total		41,129	41,129	41,129	41,129	42,440	44,291	45,991	47,853	50,561	59,551
Expenses - Water	IQD M										
Salaries - Water		26,464	26,464	26,464	26,464	26,464	26,464	26,464	26,464	26,464	26,464
Cost of Materials		70,511	70,511	70,511	70,511	70,511	70,511	70,511	70,511	70,511	70,511
Cost of Service (mostly energy)		3,038	3,038	3,038	3,038	3,038	2,734	2,051	1,435	607	607
Extinction		11,763	11,763	11,763	11,763	11,763	11,763	11,763	11,763	11,763	11,763
Manufacturing Cost		7	7	7	7	7	7	7	7	7	7
Other		11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816
Sub-total		123,599	123,599	123,599	123,599	123,599	123,599	123,599	123,599	123,599	123,599
Income - Sewer	IQD M										
Sewer Sales		4,769	4,769	4,769	4,769	6,036	7,825	9,468	11,268	13,885	22,573
Actually Passed On	%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Sewer Sales - Actual		4,769	4,769	4,769	4,769	6,036	7,825	9,468	11,268	13,885	22,573
Service Revenues		-	-	-	-	-	-	-	-	-	-
Manufacturing		12,169	12,169	12,169	12,169	12,169	12,169	12,169	12,169	12,169	12,169
Other Revenues		1,913	1,913	1,913	1,913	1,913	1,913	1,913	1,913	1,913	1,913
Sub-total		18,851	18,851	18,851	18,851	20,118	21,907	23,550	25,350	27,967	36,655
Expenses - Sewer	IQD M										
Salaries - Water		7,837	7,837	7,837	7,837	7,837	7,837	7,837	7,837	7,837	7,837
Cost of Materials		5,956	5,956	5,956	5,956	5,956	5,956	5,956	5,956	5,956	5,956
Cost of Service (mostly energy)		4,024	4,024	4,024	4,024	4,024	3,944	3,865	3,787	3,712	3,158
Extinction		1,363	1,363	1,363	1,363	1,363	1,363	1,363	1,363	1,363	1,363
Manufacturing Cost		2	2	2	2	2	2	2	2	2	2
Other		655	655	655	655	655	655	655	655	655	655
Sub-total		19,837	19,837	19,837	19,837	19,837	19,837	19,837	19,837	19,837	19,837
Net - Water	IQD M	(82,470)	(82,470)	(82,470)	(82,470)	(81,159)	(79,308)	(77,608)	(75,746)	(73,038)	(64,048)
Net - Sewer		(986)	(986)	(986)	(986)	281	2,070	3,713	5,513	8,130	16,818
Total		(83,456)	(83,456)	(83,456)	(83,456)	(80,878)	(77,239)	(73,895)	(70,233)	(64,908)	(47,230)
	Exchange Rate										
Project (IQRM)	1166										
Component 1					1166	1166	1166	1166	2332		
Component 2					29150	40810	44308	52470	40810		
Component 3					2332	2332	2332	2332	2332		
Sub-Total					32648	44308	47806	55968	45474		
Flood costs	IQD M	4,664		4,664		4,664		4,664		4,664	4664
Savings in Flood Costs	IQD M	0	0	0	0	0	0	3264.8	0	3731.2	3731.2
Decrease in Bottled Wat	IQD M	-	-	-	-	-	-	-	-	17,024	17
Decrease in HH Pumping	IQD M								2128	2128	2128
Net - With Project		(83,456)	(83,456)	(83,456)	(116,104)	(125,186)	(125,045)	(126,598)	(113,579)	(42,025)	(41,354)
Net W/O - With		-	243	485	(31,920)	(40,760)	(40,801)	(42,100)	(28,826)	42,576	42,370

ANNEX 5: PROJECT MAP