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The World Bank

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Report No: PAD2026

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$ 145.5 MILLION

TO THE

REPUBLIC OF BOTSWANA

FOR AN

BOTSWANA EMERGENCY WATER SECURITY AND EFFICIENCY PROJECT

February 15, 2017

Water Global Practice
Africa Region

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ABBREVIATIONS AND ACRONYMS

BD	Bidding Documents
BOBS	Botswana Bureau of Standards
BOD	Biochemical Oxygen Demand
BTC	Board Tender Committee
BWP	Botswana Pula
COD	Chemical Oxygen Demand
CIWA	Cooperation in International Waters
CLR	Country Learning Report
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
DEA	Department of Environmental Affairs
DA	Designated Account
DPA	Designated Project Account
DSAP	Dam Safety Action Plan
DWA	Department of Water Affairs
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FIRR	Financial Internal Rate of Return
FM	Financial Management
GDP	Gross Domestic Product
GFDRR	Global Fund for Disaster Risk Reduction
GIZ	German Aid Agency
GoB	Government of Botswana
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
ICR	Implementation Completion Report
IDA	International Development Association
IEG	Independent Evaluation Group
IFC	International Finance Corporation
IFRs	Interim Financial Reports
ISP	Implementation Support Plan
IWRM	Integrated Water Resource Management
M&E	Monitoring and Evaluation
MCs	Management Centers
MFED	Ministry of Finance and Economic Development
MLWS	Ministry of Land Management, Water and Sanitation Services
MoA	Ministry of Agriculture
MTC	Management Tender Committee
NCB	National Competitive Bidding
NDP	National Development Plan
NPF	New Procurement Framework
NPV	Net present value

NRW	Non-Revenue Water
NSO	National Strategy Office
O&M	Operation and Maintenance
PDO	Project Development Objective
PE	Procuring Entity
MLWS - PMO	MLWS - Programme Management Office
WUC - PMO	WUC - Project Management Office
POM	Project Operational Manual
PPP	Public Private Partnership
PPSD	Project Procurement Strategy for Development
PU	Procurement Unit
RAP	Resettlement Action Plan
RAS	Reimbursable Advisory Services
RPF	Resettlement Policy Framework
SADC	Southern African Development Community
SAP	Safeguards Action Plan
TA	Technical Assistance
ToR	Terms of Reference
VC	Vulnerable Communities
VCP	Vulnerable Communities Plan
WAVES	Wealth Accounting and Valuation of Ecosystem Services
WSRP	Water Sector Reform Program
WSS	Water Supply and Sanitation
WUC	Water Utilities Corporation
WWTP	Waste Water Treatment Plant

BASIC INFORMATION

Is this a regionally tagged project?	Country(ies)	Lending 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
01-Mar-2017	31-May-2021	A - Full Assessment
Bank/IFC Collaboration		
No		

Proposed Development Objective(s)

To improve availability of water supply in drought vulnerable areas, increase the efficiency of WUC, and strengthen wastewater management in selected systems.

Components

Component Name	Cost (US$, millions)
Component 1: Improve Availability of Water Supply and Efficiency of Services	114.05
Component 2: Improve Wastewater and Sludge Management	21.65
Component 3: Sector Reform and Institutional Strengthening	20.75
Contingency	3.55

Organizations

Borrower : Ministry of Finance and Economic Development

Implementing Agency : Ministry of Land Management, Water and Sanitation
Water Utilities Corporation

Safeguards Deferral

Will the review of safeguards be deferred?

[✔] Yes [ ] No

PROJECT FINANCING DATA (IN USD MILLION)

[✔] Counterpart Funding	[✔] IBRD	[ ] IDA Credit [ ] Crisis Response Window [ ] Regional Projects Window	[ ] IDA Grant [ ] Crisis Response Window [ ] Regional Projects Window	[ ] Trust Funds	[ ] Parallel Financing

Total Project Cost:	Total Financing:	Financing Gap:
160.00	160.00	0.00
	Of Which Bank Financing (IBRD/IDA): 145.50	

Financing (in US$, millions)

Financing Source	Amount
Borrower	14.50
International Bank for Reconstruction and Development	145.50
Total	**160.00**

Expected Disbursements (in US$, millions)

Fiscal Year	2017	2018	2019	2020	2021
Annual	2.00	15.00	30.00	50.00	48.50

Cumulative	2.00	17.00	47.00	97.00	145.50

INSTITUTIONAL DATA

Practice Area (Lead)

Water

Contributing Practice Areas

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

No

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

No

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

No

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

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

9. Other	
10. Overall	Moderate

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. A. 1. (b) - The Borrower shall ensure that the MLWS PMO shall at all times be comprised of qualified and experienced personnel in adequate numbers, and to this end, except as otherwise agreed with the Bank, no later than two (2) months after the Effective Date, the Borrower shall contract additional expertise in areas such as financial management, procurement, monitoring and evaluation, all with qualifications and terms of reference acceptable to the Bank.

Sections and Description

Schedule 2, Section I. A. 2. (b) - The Borrower shall ensure that the WUC PMO shall at all times be comprised of qualified and experienced personnel in adequate numbers, and, to this end, except as otherwise agreed with the Bank, the Borrower shall ensure that no later than two (2) months after the Effective Date, WUC PMO shall contract additional expertise in areas such as financial management, procurement, contract management, environmental and social safeguards, monitoring and evaluation, engineering, and project coordination, all with qualifications and terms of reference acceptable to the Bank.

Sections and Description

Schedule 2, Section I. F. 1. - The Borrower shall implement (and cause WUC to implement) the Project in accordance with the Safeguards Action Plan (SAP) and shall, to that end, if any activity under the Project would require the adoption of a Supplemental Safeguards Instrument: (a) prepare (or cause WUC to prepare) such Supplemental Safeguards Instrument in accordance with the applicable Resettlement Policy Framework (RPF), Vulnerable Communities Plan (VCP) and Dam Safety Action Plan (DSAP); furnish such Supplemental Safeguards Instrument to the Bank for review and approval; (b) thereafter adopt such Supplemental Safeguards Instrument prior to implementation of the activity; and thereafter take such measures as shall be necessary or appropriate to ensure full compliance with the requirements of such Supplemental Safeguards Instrument.

Sections and Description

Schedule 2, Section I. F. 2. -The Borrower shall, (a) no later than two (2) months after the Effective Date: (i) prepare in accordance with terms of reference and process acceptable to the Bank, the RPF in form and substance satisfactory to the Bank; (ii) furnish said RPF to the Bank for its review and approval; and (iii) adopt and disclose the RPF in the Borrower's territory; and (b) thereafter, implement (or cause WUC to implement) the Project in accordance with the RPF.

Sections and Description

Schedule 2, Section I. F. 3. - The Borrower, prior to initiating the carrying out of any civil works for any subproject, shall: (a) (i) prepare (or cause WUC to prepare) in accordance with terms of reference and process acceptable to the Bank, any Resettlement Action Plan (RAP) required for such subproject under the RPF and furnish said RAP to the Bank for its review and approval; (ii) adopt and disclose such RAP in the Borrower's territory; (b) if any activity under the Project would involve Affected Persons, ensure that: (i) no displacement (including restriction of access to legally designated parks and protected areas) shall occur before resettlement measures under the applicable RAP, including, in the case of displacement, full payment to Affected Persons of compensation and of other assistance required for relocation, have been taken; and (ii) provide from its own resources, any financing required for any measures under sub-paragraph (i) above including any costs associated with land acquisition required for the Project; and (c) thereafter implement (or cause WUC to implement) the Project in accordance with such RAP.

Sections and Description

Schedule 2, Section I. F. 4. - The Borrower shall: (a) prior to commencement of bidding for civil works for any subproject: (i) prepare (or cause WUC to prepare) in accordance with terms of reference and process acceptable to the Bank, the Environmental and Social Impact Assessment (ESIA) required for the subproject under the SAP in form and substance satisfactory to the Bank; (ii) furnish said ESIA to the Bank for its review and approval; and (iii) adopt and disclose the ESIA in the Borrower's territory; and (b) thereafter, implement (or cause WUC to implement) the Project in accordance with such ESIA.

Sections and Description

Schedule 2, Section I. F. 5. - The Borrower shall: (a) prior to commencement of bidding for civil works for any subproject: (i) prepare (or cause WUC to prepare) in accordance with terms of reference and process acceptable to the Bank, the Environmental and Social Management Plan (ESMP) required for the subproject under an ESIA, in form and substance satisfactory to the Bank; (ii) furnish said ESMP to the Bank for its review and approval; (iii) adopt and disclose said ESMP in the Borrower's territory; and (iv) incorporate said ESMP in the bidding documents; and (b) thereafter, implement (or cause WUC to implement) the Project in accordance with such ESMP.

Sections and Description

Schedule 2, Section I. F. 6. - The Borrower shall, if a Vulnerable Communities Plan (VCP) shall be required for any Project activity on the basis of the SAP: (i) prepare (or cause WUC to prepare) said VCP in accordance with the requirements of the SAP with terms of reference and processes acceptable to the Bank and in form and substance satisfactory to the Bank; (ii) furnish said VCP to the Bank for its review and approval; (iii) adopt and disclose the VCP in the Borrower's territory; and (iv) ensure that no works under said activity shall commence until all measures required to be taken under such VCP prior to the initiation of said works shall have been taken.

Sections and Description

Schedule 2, Section I. F. 7. - The Borrower shall no later than two (2) months after the Effective Date:(i) prepare (or cause WUC to prepare) in accordance with terms of reference and process acceptable to the Bank, a Dam Safety Action Plan (DSAP) for the Project, in form and substance satisfactory to the Bank; (ii) furnish said DSAP to the Bank for its review and approval; and (iii) adopt and disclose said DSAP in the Borrower's territory; and (b) thereafter, implement (or cause WUC to implement) the Project in accordance with the DSAP.

Sections and Description

Schedule 2, Section I. D. - No later than two (2) months after the Effective Date, the Borrower shall, and shall cause WUC to adopt the Project Operational Manual, in form and substance satisfactory to the Bank, and thereafter,

carry out the project, and cause WUC to carry out its respective Parts of the Project in accordance with the POM, which shall include a financial management manual, monitoring and evaluation manual, procurement manual, and shall contain detailed arrangements and procedures for: (a) institutional coordination and day-to-day execution of the Project; (b) Project budgeting, disbursement and financial management; (c) procurement; (d) monitoring, evaluation, reporting and communication; and (e) such other administrative, financial, technical and organizational arrangements and procedures as shall be required for the Project as the same may be further updated from time to time with the prior written agreement of the Bank.

Conditions

Type	Description
Effectiveness	Article V, 5.01 - The Subsidiary Agreement has been executed on behalf of the Borrower and WUC in accordance with Section I.B of Schedule 2 to this Agreement.

Type	Description
Disbursement	Schedule 2, Section IV, B, 1 (a) - Notwithstanding the provisions of Part A of this Section, no withdrawal shall be made: from the Loan Account until the Bank has received payment in full of the Front-end Fee;

Type	Description
Disbursement	Schedule 2, Section IV, B, 1 (b) -“Notwithstanding the provisions of Part A of this Section, no withdrawal shall be made: for payments made prior to the date of this Agreement, except that withdrawals up to an aggregate amount not to exceed two million USD ($2,000,000) may be made for payments made prior to this date but on or after July 1, 2016, for Eligible Expenditures under Category (1).

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Rosemary Mukami Kariuki	Team Leader(ADM Responsible)	Water Supply and Sanitation	GWA01

Chitambala John Sikazwe	Procurement Specialist(ADM Responsible)	Procurement	GGO01
Tandile Gugu Zizile Msiwa	Financial Management Specialist	Financial Management	GGO25
Anna Cestari	Team Member	Water Resources	GWA03
Carolina Dominguez Torres	Team Member	Economist	GWA07
David Malcolm Lord	Peer Reviewer	Senior Water Supply and Sanitation Specialist	GWA09
George Ferreira Da Silva	Team Member	Disbursement	WFALA
Helen Z. Shahriari	Safeguards Specialist	Social Safeguards	GSU05
Jemima Harlley	Team Member	Program Assistant	AFCS1
Kisa Mfalila	Safeguards Specialist	Environmental Safeguards	GEN01
Loungo Lolo Tibone	Team Member	Operations Analyst	AFMBW
Martin P. Gambrill	Peer Reviewer	Lead Water Supply and Sanitation Specialist	GWAGP
Nathalie S. Munzberg	Safeguards Advisor	Safeguards	OPSPF
Shelley Mcmillan	Peer Reviewer	Senior Water Resources Specialist	GWA01
Sudipto Sarkar	Peer Reviewer	Lead Water Supply and Sanitation Specialist	GWA02
Zoe Kolovou	Counsel	Lawyer	LEGAM

Extended Team

Name	Title	Organization	Location

BOTSWANA
BOTSWANA EMERGENCY WATER SECURITY AND EFFICIENCY PROJECT

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I. STRATEGIC CONTEXT

A. Country Context

1. Botswana, an upper middle-income country, has been one of the world's fastest growing economies. Since independence, economic growth has been sustained, averaging 8.7 percent between 1966 and 2008 –among the highest of any country over this period. Gross National Index per capita has steadily increased-- from power purchasing parity US$4,935 in 1980 to US$14,792 in 2013, driven largely by diamond exports. This heavy reliance on commodities nonetheless renders the country vulnerable to international market fluctuations, as experienced during the global financial crisis in 2009 and, more recently, the collapse of commodity prices in 2015. The country is also water stressed and has suffered from repeated droughts. The 2015-2016 El-Nino related drought has affected Botswana and its regional trade partners quite significantly. Lower export receipts and higher food import costs caused Gross Domestic Product (GDP) growth to turn negative in 2015 (-0.3 percent), and entailed large budgetary shortfalls (a fiscal deficit of 6.3 percent of GDP in 2015). Thus, Botswana has become increasingly resource constrained and is in a weaker position to finance the infrastructure investments required to address increase the supply of water to areas affected by the drought.

2. Over the past few decades, good governance and prudent macroeconomic and natural resource management have led to impressive economic and social gains. Botswana's efforts to redistribute wealth through education, health programs and infrastructure development, have contributed to a substantial decline in poverty levels. Between 2003 and 2010 the share of population below the national poverty line fell from 30.6 to 19.4 percent. Rural poverty fell furthest— by around 21 percentage points, during a period which also experienced significant rural-urban convergence. However, vulnerability remains particularly acute in rural households that depend on subsistence agriculture, particularly when rains fail or are late – food inadequacy affected an estimated 38.8 percent of the population in 2014. According to staff estimates, the drought in 2015 reduced by 2.5 percent the purchasing power of the bottom 40 percent of the population through its impact on beef production and imported maize prices. While the Government has provided drought relief to affected households[1], these recent economic and climatic shocks may have put another third of the population (classified as vulnerable but non-poor in the 2015 Poverty Assessment) at greater risk of falling into poverty.

3. The Government intends to sustain its positive poverty reduction trajectory by diversifying sources of growth. Through the realization of sustainable employment creation, it also aims to achieve more inclusive socio-economic outcomes. Under its eleventh National Development Plan (NDP 11) it will place emphasis on infrastructure development, including water and sanitation which are vital to private sector led commercial and industrial development; as well as livelihoods and human development. This will build on significant achievements to date. For example, three of four Millennium Development Goal targets for both water and sanitation were met: around 95 percent of the population now have access to an improved drinking water supply; and 79 percent of the urban population have access to improved

[1] A supplemental budget of US$44 million was allocated towards drought relief in 2015.

sanitation[2]. However, sustained access to an improved water supply service is not assured as many communities are served by systems that are affected by chronic drought. Given high and rising levels of water stress, and climate variability, achieving the NDP 11 objectives will therefore require greater attention to long term water security. The latter is also essential for Botswana to maintain its positive trend towards meeting Sustainable Development Goal targets in many areas.

4. *Situations of Urgent Need of Assistance*. In July 2015 Botswana declared a drought emergency following a second year of poor or failed rains across most of the country. In 2014 the Standard Precipitation Index (SPI) was minus one (-1) and in 2015 it was minus two (-2) (see Annex 1). The meteorological department rated the 2015 drought *extremely severe*– "the worst in the last 34 years". After another year of inadequate rainfall, a follow up assessment extended the drought emergency for an additional year, and rated the drought *severe*. The Government of Botswana has therefore approached the World Bank for support in improving water supply availability to drought affected communities as well as building Botswana's medium to long term resilience to chronic drought[3]; and a path to long term water security.

5. Since the onset of the 2015 drought, "hotspots" in the central, southern and western parts of the country have been significantly impacted. In addition to dams, rivers and well fields running dry, extremely low levels of rainfall, and or late rains, have led to significant loss of crops (a 70 percent decline in cereal crop) and declining grasslands have affected both livestock (a 20 percent mortality rate in 2015) and wildlife[4]. Nationwide, dam levels fell below 20 percent of design capacity – the Gaborone dam fell to 1.6 percent, the lowest since 2000. Ground water recharge rates (less than 5mm year) have also been affected, and boreholes in several wellfields have run dry or become saline. As a result, water rationing arrangements (three times a week for eight hours during peak periods) are in place for most large settlements in the country. More than 20 settlements are now being served by water bowsers at high cost. In addition, many households have installed storage tanks, pumps and are purchasing water from private water vendors.

6. Droughts in Botswana are chronic— six of the last ten years have been moderately to severely dry. Acute events, such as the current drought, which has stretched for a period of three years, further aggravate the water balance. As noted above, in order to mitigate drought impacts and adapt to climate change, urgent measures are required to strengthen resilience and achieve water security. Ongoing efforts include the study and design of potential inter-basin transfers from sources such as the Lesotho highlands and the Chobe-Zambezi basin. The Government intends to invest an additional US$1.2 billion in the sector over the 2017 to 2023 period for a combination of measures, including an emergency water supply program— of which this Project will comprise US$160 million (about 13 percent of the investments planned over the NDP 11 period)[5]. Key priorities to be supported include investments in water supply availability to alleviate immediate drought impacts and improve resilience; water source

[2] Rural sanitation still lags behind—42 percent of rural households have access to adequate sanitation. Source: Joint Monitoring Program, 2015

[3] The entire Southern Africa region is experiencing a drought and the World Bank is actively engaged in helping SADC with the response. Several IDA countries in SADC will receive supplemental finding from the Crisis Response window,

[4] Food and Agriculture Organization, 2016

[5] Over the last 10 years the Government invested around US$1.5 billion in the sector.

protection and wastewater reuse; and strengthening of water resources management, groundwater monitoring, conservation, demand management and loss reduction measures.

B. Sectoral and Institutional Context

7. Botswana has a semi-arid climate. Rainfall levels are low (at 250 - 450mm), unevenly distributed (with 5 year deficits recorded in some areas), and highly variable from year to year (30 percent below normal in 2015). Most rivers are seasonal, and despite limited availability, groundwater abstraction has increased from less than 150 cubic mega meters ($Mm^{3)}$) in 1990 to 195 Mm^3 in 2013/14. Groundwater now accounts for three quarters of the country's water requirements, particularly in western Botswana, where groundwater is the main resource. In general, water resources are constrained, fragile, and subject to many competing demands: in 2013 agriculture and mining were the main users, accounting for 42 percent and 23 percent respectively, while domestic consumption accounted for 25 percent. As water is central to Botswana's continued economic success and sustained development gains, demand is projected to rise further[6]. However, in the context of chronic drought and climate change, managing rising demand— to reduce pressure on already constrained resources, is a priority.

8. In order to offset growing reliance on its groundwater resources, the government has constructed a number of dams (e.g. Dikgatlhong, Thune and Lotsane) and has developed several water transfer schemes including the 400km-long North-South Carrier – phase 1 (NSC-1), which brings water from the Motloutse River in the North-East to major villages and towns along the eastern corridor of Botswana. This is being expanded from its existing $25Mm^3$/year capacity, and it is proposed that a second phase (NSC-2) will deliver an additional $45Mm^3$ per year. The Government is studying other long term options including a third phase of the NSC (NSC-3) to abstract water from the Chobe-Zambezi; importing water from the Lesotho highlands; and desalinating sea water in Windhoek, Namibia. These surface water systems are gradually being inter-linked with groundwater systems to allow aquifers to recover, and provide for alternate use or back up supply.

9. Improving water security is a top priority, as Botswana is one of four Southern Africa nations that could become "highly water stressed by 2040" under a business as usual scenario[7]. Climate change projections indicate that the country will face: a rise in temperature of up to two degrees Celsius (January 2016 was the hottest month on record; a decline in river flows of up to 13 percent; and a reduction in rainfall of about 3 to 9 percent. A climate risk assessment carried out by the Bank in 2010 (using multiple measures, over multiple temporal scales) concludes that there is a definite bias towards increased droughts, and groundwater recharge (less than 5mm per annum) is likely to decline. High open-water evaporation rates, ranging from 1,900 mm to 2,200 mm per annum (Food and Agricultural

[6] Water demand is forecast to reach 285.8(Mm^3) a year by 2030 (compared to only 193.4Mm^3 in 2000.

[7] Baseline water stress measures competition for surface water calculated as withdrawals over renewable supply. The Water Resources Institute ranking of 147 water stressed countries globally Indicates that water stress levels for Botswana, Namibia, and South Africa are expected to reach between 40-80 percent by 2040. Namibia and Botswana are the two countries in the ranking expected to face the greatest increase in water stress.

Organization, 2009) also contribute to relatively low annual rates of groundwater recharge and surface runoff, thus diminishing opportunities for storage[8]. Measures to protect, conserve and manage surface and ground water sustainably are therefore critical.

10. Climate variability is already a major constraint to the agriculture sector. Crop production is rainfall dependent and only a small portion of land is under irrigation (around 1 800 ha) [9]. As a result, agricultural productivity varies from year to year. In 2015 and 2016, the drought caused a 44 percent drop in cereal production (including a loss of 70 percent for maize)[10]. In addition, livestock losses due to the ongoing drought were estimated at 20 percent per year in 2015 and 2016. Climate variability is also a threat to Botswana's current high level of household access, as the drought has led to extensive water rationing affecting most of the large settlements. As the Government moves to diversify its economy, closer attention to water resource management will be essential, particularly for water intensive sectors.

11. Substantial investments are required to align water security requirements with the growing demands of Botswana's increasingly prosperous population. Greater rainfall variability and declining groundwater availability suggest that additional investment in surface water infrastructure will be a priority, including: additional storage and transmission, interlinking surface and groundwater supplies; and developing water transfer schemes such as those noted in paragraph 10. However, as many settlements are small and scattered and water must be transported over long distances (often at high cost), the task of responding to recurrent droughts is further compounded.

12. Recognizing the importance of water for Botswana's development, in 2009 the Government of Botswana (GoB) initiated a Water Sector Reform Program (WSRP) with the intention of leveling services for all water users in the country through a uniform standard of water and wastewater service. With the support of a technical assistance program funded by the World Bank[11], WSRP aimed to provide: (i) clear separation of responsibilities between the delivery of water and sanitation services, and the management of water resources; and, (ii) piped water supply to all of its citizens by the year 2016. Prior to these reforms the responsibility for service delivery, including sanitation, sewerage, and wastewater, was divided between the Water Utilities Corporation (WUC), District Councils, and the Department of Water Affairs (DWA) in the Ministry of Land Management, Water and Sanitation Services (MLWS)[12].

13. As a result of this fragmentation, the operational and financial performance of water schemes across the country, was uneven. For DWA and District Council schemes, costs often exceeded (up to 1.5 times) revenue from customers, tariffs were low, and collection rates well below billing. Despite receiving Government subsidies equivalent to about 70 percent of customer revenue, due to inadequate

[8] Botswana Climate Variability and Change: Understanding the Risks. World Bank, November 2010.
[9] Second Botswana National Water Master Plan.
[10] Food and Agriculture Organization, 2016 .
[11] World Bank, 'Technical advice for Reform of the Water and Sanitation Sector', Volume 1 & 2, Government of Botswana, 2009.
[12] Prior to 2009, WUC was responsible for urban water services in Gaborone, Jwaneng and Lobatse in the South and Francistown, Selebi Phikwe and Sowa in the North. District Councils and the DWA were responsible for 540 water supply systems serving all other urban and rural areas.

maintenance and inefficient management, over time these systems deteriorated. In contrast, WUCs performance was solid and its financial position, strong. In 2008 WUC's non-revenue-water was about 11 percent of production, 95 percent of the bills were collected, and customers received a high-quality service (24/7).

14. The WSRP re-aligned these roles and responsibilities through a phased approach implemented between 2009 and 2013. WUC assumed responsibility for water supply, reticulation, and wastewater treatment for all 540 DWA and District systems, which are clustered under 16 Management Centers (MCs). DWA's mandate changed to water resource planning, development and management, including large water infrastructure such as dams and transfer schemes. Steps to improve operational and financial efficiency through modern management methods, the introduction of innovative, appropriate technology options, and tariff setting and pricing (to adequately reflect scarcity and opportunity costs) were also initiated, however these have yet to be completed.

15. The consolidation of water supply and wastewater treatment schemes under WUC has contributed to the deterioration of WUC's operational and financial performance. From 2009 to 2015 WUC's customer base grew significantly from 83,000 to 415,000, and production increased to over 102 million cubic meters of water (from 70,000 in 2009). Billing also increased to about Botswana Pula (BWP) 1,000 million in 2015 compared to BWP 300 million in 2009, but overall collection rates declined as more rural customers were added[13]. Years of underinvestment and poor maintenance have resulted in an asset base in dire need of replacing and upgrading. Non-Revenue Water (NRW) has increased from about 11 percent of production (in 2008) to about 40 percent; labor productivity has moderately improved, but there are still 7 staff per thousand connections— largely due to small and scattered settlements. Prolonged periods of water rationing arising from chronic drought have also added to the financial stress of the utility.

16. With respect to wastewater, the majority of systems inherited by WUC in 2013 suffer from operational issues related to under-dimensioning and lack of critical maintenance, particularly those formerly operated by municipal authorities. Treated wastewater amounts to an estimated 20 to 30 Mm^3 per annum and only 10 per cent is currently reused. WUC intends to develop capacity for greater reuse and recycling[14]. This will reduce environmental degradation as increased reuse will require more stringent compliance with Botswana standards— untreated effluent discharged to the environment is a threat to already constrained ground and surface water sources. Greater water reuse will also contribute to demand management by reducing the need for development of new sources.

17. Overall, since the start of the WSRP, WUC has reported increasing operating losses of more than BWP 350 million per year. Currently it is only able to recover about 75 percent of its operating cost, in particular due to increasing energy and chemical costs[15].

[13] WUC Annual Reports - 2014 and 2015.
[14] Government has set an ambitious target of 96 percent reuse of wastewater outflows by 2030 but existing inflow and outflow data is scarce.
[15] Unlike in the 2012/2013 financial year where the Government provided a revenue grant of BWP 200 million, during 2013/2014 financial year no revenue grant was received as it was intended that this

18. In order to improve the performance and capacity of sector institutions, the GoB will support the institutional reform and restructuring of WUC, and advance a number of urgent policy and regulatory reforms initiated under the WSRP. These include implementation of the Integrated Water Resource Management Water Efficiency Strategy (2013–2030) and the Water Policy (approved by Parliament in August 2016), which provides a framework for enhancing access to good quality water, promoting sustainable development of water resources, and ensuring that water is allocated more efficiently across different user sectors. The policy calls for establishment of a Water Resources Council and improved regulatory capacity. The Water Resources Council will be responsible for overseeing and allocating water resources and developing water related policies, while the water supply and sanitation (WSS) Regulator will be responsible for ensuring financial sustainability by guiding and monitoring water tariffs[16].

C. Higher Level Objectives to which the Project Contributes

19. The Project supports the Bank's twin goals of eliminating extreme poverty and boosting shared prosperity by reducing vulnerability of drought affected communities, improving economic opportunity, contributing to sustainable livelihoods, and a better quality of life for Botswana's population. The Country Partnership Framework (CPF) FY16-20 (Report No. 104953), approved by the Board in November 2015, acknowledges that to achieve sustainable development; poverty reduction; and improved inequality, Botswana needs to address key challenges in infrastructure, services and policies, particularly in the water and sanitation sector. The Project is aligned to one of the three key strategic areas of engagement for Bank support under the CPF– Strengthening Human and Physical Assets—, which has a sub-objective of 'improving efficiency and sustainability of water supply and sanitation services'.

20. The Project is also aligned to Botswana's Vision 2036, in particular, the pillar on Sustainable Environment through which Botswana aims to ensure sustainable and optimal use of natural resources, including water resources, to transform the economy and uplift its people. Vision 2036 outlines the need for a shift towards improved efficiency in water supply and demand management; improved water resource management, including instruments for water efficiency and water allocation; and the promotion of artificial recharge of aquifers. NDP 11, which has the overarching objective of: '*Inclusive Growth for the Realization of Sustainable Employment Creation and Poverty Eradication',* is designed to support the first five year of activities (2017-2023) of Vision 2036.

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funding would be sourced through a bond. As this did not happen, much of WUC's planned investment under NDP 10 was deferred and operating losses rose to BWP 350 million.

[16] At present, WUC has proposed a pricing structure, which has to be approved by the MLWS— a block tariff system with rising water tariffs for higher user bands. Self-providers pay for water rights attained from the Water Apportionment Board, but not for raw water abstraction. However, the 2016 Water Policy calls for a raw water extraction fee for all water withdrawals to help fund water management activities and encourage conservation.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

To improve availability of water supply in drought vulnerable areas, increase the efficiency of WUC, and strengthen wastewater management in selected systems.

B. Project Beneficiaries

21. The Project will improve the availability of water supply and the quality of sanitation services in select settlements prioritized because of their location in drought affected areas. It is estimated that around 460,000 people in select settlements will benefit from augmentation or rehabilitation of existing water supply systems; and about 177,000[17] people will benefit from improved wastewater treatment and sludge management systems.

22. In addition to these direct beneficiaries, the Project will also build capacity in MLWS and WUC to improve efficiency and security of water supply through actions to support the on-going reform process, in particular by improving the operational and financial performance of the utility. This includes actions to reduce NRW; manage demand; and, increase wastewater reuse. WUCs capacity for strategic planning, capital development, innovation and public private partnerships (PPPs) will also be strengthened.

23. With respect to improving long term water security and strengthening WRM, the DWA will benefit from support for: ongoing policy, legislative and regulatory reform; improved water quality and quantity measurement and monitoring; and strategy formulation in relation to drought management, climate change and water resource management. DWA's capacity for strategic planning, resource regulation and enforcement will also be strengthened.

C. PDO-Level Results Indicators

24. The following Project Development Objective (PDO) indicators will be used to monitor implementation progress:

a. Direct project beneficiaries (number), of which female (percentage)

b. Additional water made available by the investments under the project (cubic meters)

[17] As the beneficiaries in Letlhakane MC have: (i) increased water supply; and (ii) improved sludge management facilities, the number of total Project beneficiaries is adjusted (to remove double counting) accordingly. An estimated total of 580,000 people will therefore benefit from the water and sanitation investments under project.

c. People benefiting from improved water supply through measures aimed at alleviating drought impact (number)

d. Revenue to operating cost ratio (number)

e. Average annual COD removal efficiency from wastewater at WWTPs (percentage)

III. PROJECT DESCRIPTION

A. Project Components

25. The Project is designed to respond to Botswana's ongoing drought and reduce vulnerability to drought in the medium to long term. The drought declared in July 2015 was the worst in the past 34 years and has been extended for an additional year (July 2016 - July 2017). As droughts in Botswana are chronic, the acute dry spell has further aggravated the water balance. For groundwater in particular, impacts will not be alleviated in the short term as recharge rates are already low, and are projected to decline further with climate change[18]. The proposed sub-projects are located in the western, eastern and southern part of Botswana, which are the driest and/or most populated parts of the country. The Project includes critical investments in water supply to urban and rural areas, that are needed to mitigate drought impacts, and wastewater treatment investments needed to comply with effluent standards and prevent pollution of vital downstream water sources.

26. The proposed investments were selected from a list of "hot spots" identified by GoB as part of its NDP 11 planning process. Several of these priority subprojects were first proposed to the World Bank for financing in 2014, however, the proposed International Bank for Reconstruction and Development (IBRD) Project did not move forward due to financing and capacity limitations and was eventually dropped. These have now been incorporated in the NDP 11 emergency water supply program which this Project will support. In addition to the "hot spots" list, the Project also draws on financial and operational performance data for each of WUC's 16 MCs[19]. This data will be used to support operational efficiency improvements in underperforming MCs as a means of improving demand management, reducing losses, increasing access to services (particularly for vulnerable populations). These actions are vital for the sustainability of services, and conservation of already scarce water resources.

27. The Project is organized under three components, as follows: Component 1: Improve Availability of Water Supply and Efficiency of Services; Component 2: Improve Wastewater and Sludge Management; and Component 3: Sector Reform and Institutional Strengthening.

[18] Botswana Climate Variability and Change: Understanding the Risks. World Bank, November 2010.

[19] The operational snapshots rank MCs based on five key indicators: (1) non-revenue water; (2) water quality compliance; (3) number of reported bursts; (4) staff per 1000 connections; and (5) operating cost coverage ratio (revenues / costs). It was noted that for all regions water supply coverage is high (generally >90 percent) and water services are close to 24 hours per day.

28. **Component 1: Improve Availability of Water Supply and Efficiency of Services** (US$114.05 million including taxes) - will support immediate and medium term investments and measures to mitigate the impact of the drought by improving availability of water in settlements that have experienced extended periods of rationing and/or been forced to rely on water bowsers. Specific investments will include: (i) water source management, optimization and development, including interlinking of existing water sources (surface and ground) and water supply schemes to ensure backup supply and more sustainable production; (ii) expansion of water supply systems to reach underserved or drought affected communities; and (iii) measures to improve operational efficiency, including reducing technical losses along transmission lines. The budget for this component provides for implementation of safeguards actions (ESMPs, RAPs and ESIAs), alongside the design and supervision services for the civil works. It will be implemented by the WUC and is supported by institutional strengthening activities (under Component 3) aimed at improving the long-term sustainability of service provision and managing water demand.

29. The proposed measures are intended for settlements in drought affected areas where boreholes are running dry, becoming saline, or being mined/overdrawn, as a result of the drought. However, as droughts in Botswana are chronic (six of the last ten years were drought years) the investments are also designed to address medium term needs and avoid having to resort to short term solutions (such as bowsers or emergency boreholes) every time a drought occurs. As Botswana relies heavily on groundwater (60 percent) and recharge rates are low (less than 5 mm per year) the proposed investments aim at reducing the stress on water sources by bringing water from more secure sources – e.g. underutilized dams or well fields that have a sustainable yield.

30. **Component 2: Improve Wastewater and Sludge Management** (US$21.65 million including taxes) - This component will support strategic investments in refurbishment/rehabilitation of wastewater treatment facilities, to protect surface and groundwater sources; and enable scaling up wastewater reclamation and reuse in Francistown and Lobatse through design and build contracts. In Letlhakane sludge management facilities will be rehabilitated and expanded to avoid transporting waste to the nearest facility which is 200 km away in Serowe. The Francistown and Lobatse wastewater treatment facilities require urgent attention to prevent environmental contamination caused by discharge of inadequately treated wastewater into nearby water courses. Due to inadequate treatment of wastewater at the Mambo wastewater treatment plant (WWTP) in Francistown, a key water supply dam (Dikgatlhong) located 50 km downstream may be at risk of pollution. The Tati River, into which the Mambo WWTP discharges, is seasonal and the effluent discharged during the dry season can cause local contamination.

31. Given the limited water resources available in Botswana, the proposed measures will protect and conserve existing water supply. A key objective of the investments in Mambo and Lobatse is to bring the effluent to a quality level where it can be re-used. Many users, including mines, local stadia, golf courses and other businesses have expressed their interest in re-using the treated water if WUC can ensure that effluent meets the standards set by law. In addition to improving treatment and operational efficiency (as measured by effluent quality), the Project also includes (under Component 3) activities to enhance WUC's capacity to holistically manage, treat, dispose of, and reuse wastewater and sludge through strategic investments in new or improved technology options. This component will be implemented by WUC.

32. **Component 3: Sector Reform and Institutional Strengthening** (US$20.75 million). The Component will support reforms initiated under WSRP in 2009 by strengthening the institutional, policy, and legal framework as a means to improving long-term water security and increased efficiency of services. As such, policy and strategies need to be directed toward improving allocative efficiency, enhancing technological developments, strengthening service delivery, improving water resources stewardship and strengthening water demand management. In addition, capacity for implementation will be strengthened to ensure a timely and efficient response to the drought. Activities financed under Component 3 will include:

33. *Sub-component 3.1. Sector Reform.* This will support the development or roll out of sector policies, legislation and institutions. In order to conform to new institutional mandates, the sector is in the process of developing or updating several key legal, strategy and policy instruments. Prioritized activities will enable implementation of the development agenda outlined in NDP 11, with a strategic focus on improving water security and developing resilience to droughts and water shocks, through strengthened water resources management and planning capacity, and more effective WRM instruments. This sub-component will be implemented by MLWS.

34. *Sub-component 3.2. Institutional Strengthening and Capacity Building*. This Sub-component will enable MLWS (DWA) and WUC to increase their capacity to implement sector policies and strategies; strengthen their overall operational performance; and, improve their corporate governance and management: (a) Support for MLWS (DWA) will include capacity for water resource planning and monitoring, groundwater development, and regulation; (b) Support for WUC will include institutional restructuring, business strategy development, efficiency improvements (e.g. through demand management, cost recovery, energy reduction, non-revenue water, and innovative ICT use); refinement of water supply, sanitation and waste water supply guidelines; and training and reskilling WUC staff in underperforming MCs. This Sub-component will be implemented by MLWS and WUC.

35. *Sub-component 3.3. Forward Planning – Technical Assistance and Studies*. This Sub-Component includes: (a) technical assistance required to develop a pipeline of strategic national investments aimed at improving long-term water security (e.g. Chobe-Zambezi and Lesotho-Botswana Transfer Schemes); (b) strengthening the pipeline of investments such as the Western Region Master Plans, through feasibility studies; detailed designs; environmental and social assessments, transaction design, expert panels. A sound investment pipeline will allow Government to advance its vast water investment program more rapidly, and assist in closing the large investment gap. This sub-component will be implemented by MLWS and WUC.

36. *Sub-component 3.4. Project Management*. This Sub-component includes support for adequate project implementation capacity in the MLWS Programme Management Office (MLWS - PMO) and WUC Project Management Office (WUC -PMO), including funding for both PMO's capacity (staffing and technical assistance) to support Project implementation. In addition, the Project will finance inputs required to ensure the effectiveness of implementing agencies including (as needed), equipment, running costs, logistical support, and other operating requirements. Responsibilities of the MLWS - PMO and WUC - PMO include project management and coordination, procurement and financial management, project monitoring and evaluation, social and environmental safeguards management and oversight, and strategic project communications and outreach. This Sub-component will be implemented by MLWS and WUC.

B. Project Cost and Financing

37. The Project will be financed through an IBRD loan. The loan will support investments in water supply, wastewater treatment, sludge management and support for sector reform, estimated at US$145.5 million (exclusive of taxes). GoB will finance taxes in the amount of US$14.5 million. The total Project cost is therefore US$160 million.

38. In view of the nature of most subprojects, mainly targeted at drought affected/vulnerable villages, and given the poor operational efficiency of systems in many MCs, Ministry of Finance and Economic Development (MFED) will on-grant loan proceeds to WUC. This decision takes into account WUCs poor financial performance over the past few years following its conversion into a national utility responsible for both rural and urban water supply; and unexpected costs arising from its response to the drought— many communities are spread over long distances and some rural households are not in a position to pay for services. GoB intends to improve the financial performance of WUC, including through institutional strengthening measures supported under Component three of the Project to support the ongoing restructuring.

39. With respect to Components 1, 2 and parts of Component 3, for which WUC will be the implementing agency, MFED will enter into a subsidiary agreement with WUC. Similar arrangements were used under the recently closed IBRD financed energy sector project for which Botswana Power Corporation (BPC) was the implementing agency. The agreement will detail the fiduciary requirements governing the use of loan proceeds on-granted to WUC by MFED. Funds for parts of Component 3 which support DWA, will be managed by the MLWS - PMO, which will coordinate project implementation on behalf of the Government.

40. The Project will leverage funding from various sources, such as the International Finance Corporation (IFC), and the Water Global Practices Multi Donor Trust Fund, to support measures to improve WUC investment planning process, diversify sources of capital funding, and engage the private sector. Global Fund for Disaster Risk Reduction (GFDRR) funding will support the preparation of a drought mitigation and climate change adaptation strategy for the water sector; and provide specific support for improvements to the hydro-meteorological and groundwater monitoring systems. This funding will complement an on-going regional Groundwater Study, supported by the Cooperation in International Waters (CIWA) Trust Fund managed by the Southern African Development Community (SADC) Water Facility, which aims at increasing data and information on Botswana's groundwater resources, among others.

41. The Government will be responsible for counterpart financing to cover value added tax, acquisition of land, and any compensation due to project affected people. Land and compensation costs associated with proposed subprojects will be identified and budgeted on an annual basis once these costs are known. Year 1 investments support subprojects are not expected to require counterpart financing for land and compensation. However, GoB will set aside a contingency budget to cater for any costs that may be identified through ESIAs that are currently being prepared.

42. The Government has requested retroactive financing in the amount of US$2 million to advance the work required to prepare environmental and social safeguards, technical packages and bidding documents.

43. Although specific subproject investments have been identified, the Project will provide flexibility in order to accommodate any new priorities arising from the extension of the drought emergency, and to enable a quick “scale up” through additional IBRD financing or parallel or co-financing from other development partners.

Table 1. Project Costs and Financing

Project Components	Project cost	IBRD Financing	Trust Funds	Counterpart Funding
Total Costs	160.00	145.46	0	14.54
- Component 1	114.05	101.83	0	12.22
- Component 2	21.65	19.33	0	2.32
- Component 3	20.75	20.75	0	0
- Contingency	3.55	3.55	0	0
Total Financing Required	160.00	145.46	0	14.54

C. Lessons Learned and Reflected in the Project Design

44. The Project has taken into account the following lessons learnt from ongoing projects, advisory and analytic services, and Independent Evaluation Group (IEG) findings.

45. **Country level.** The Country Learning Report (CLR) for the FY09-FY13 Country Partnership Strategy (CPS) concludes that results achieved under the CPS were significantly below expectations. Program performance was rated *Moderately Unsatisfactory* as most outcome indicators were overly ambitious and initial delays in implementation meant that most objectives were not achieved at the end of the CPS period[20]. Lessons include:

a. *Candid risk assessments and other* diagnostics on capacity can help to ensure that capacity constraints are understood early on, and risks are mitigated. In complex projects, senior/on the ground presence is required. Establishing a PMO is essential in environments where the intensity of implementation support is high and capacity is limited.

b. *Establish clear, relevant and measurable indicators* to ensure objective assessment of program/project performance. Over-ambitious objectives undermine actual achievements, if there is insufficient baseline data to support achievements reported. Support for baseline data collection is therefore essential and to the extent possible, data monitoring and management systems should be integrated.

46. **At Project level**. Lessons from the recently completed Morupule B Generation and Transmission Project are aligned with those from the CPS review. These include: (i) ensuring that the implementing agencies have adequate capacity for all phases of the project; (ii) taking early procurement action; (iii) giving thorough attention to environmental and social safeguard concerns; (iv) providing a satisfactory policy framework, especially regulations, for timely and adequate tariff setting to ensure financial viability of utility/sector; and (v) ensuring strong ownership of the project and reforms. The project completion report for the most recent Project in the water sector – the Second Water Project

[20] The CLR was further downgraded to *Unsatisfactory* by the IEG due to the slow pace of implementation at the beginning of the CPS. IEG notes that the World Bank failed to identify capacity constraints at initial stages and thus did not mitigate this risk.

(completed in 1978) similarly emphasizes the importance of building on preparatory design work done by the client.

47. These findings are also echoed in an IEG review of project implementation experience across Small States which notes that limited capacity is cited frequently as a factor in poor project performance accounting for low scores on institutional development impact[21]. Botswana is a small state that faces capacity constraints for a variety of reasons, including limited trained manpower in specialized areas in particular. These constraints have intensified as a result of the additional demands on staff, arising from the drought. In line with these lessons from the report, the Project will contract additional expertise to boost capacity as and where required.

48. Finally, the Project also takes into account lessons from recent World Bank supported analytical work within the sector: The Wealth Accounting and Valuation of Ecosystem Services Project (WAVES, 2015) and the Water Sector Technical Assistance program (2008), which identify the need for sustained support in order to institutionalize reforms. The Project will therefore build on and advance policy and institutional reforms initiated by GoB with support of these programs as elaborated in Component 3.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

49. MLWS primary role is to formulate, direct, and coordinate policies and programs for land management, as well as water and sanitation development. In the water and sanitation sector, MLWS is responsible for ensuring the delivery of clean water for drinking purposes and for allocation of water for agricultural, commercial and industrial development through its departments and parastatals. DWA and the WUC are responsible for day to day implementation of the Government's water programme. MLWS coordinates these activities through a MLWS -PMO headed by a Programme Coordinator. Within MLWS, DWA takes the lead on water resources policy and management. In addition, DWA is responsible for monitoring and regulating water resource use; and developing long term strategic water supply schemes. WUC (established by the Water Utilities Corporation Act of 1970) is currently responsible for delivering water to domestic, mining, manufacturing, and commercial customers countrywide; although mining and energy users in remote areas often develop ground water supplies independently. WUC also has operational responsibility for wastewater and water treatment, pumping, storage and distribution to customers, and has partial responsibility for sanitation services.

50. The Project will be implemented by MLWS and WUC. On behalf of the Borrower, MLWS will be responsible for overseeing project implementation. It will do so through its existing MLWS -PMO, which will have overall responsibility for coordination of Project activities, and consolidation of monitoring, reporting for the project. This will include preparation of a consolidated work plan, procurement plan, monitoring reports, financial reports, and other reports required for the Project. MLWS - PMO will be

[21] Making the Most of World Bank Assistance to Small States: A Synthesis of Evaluation Findings, IEG, 2006.

responsible for the implementation of Component 3 institutional and capacity building activities that fall under the mandate of MLWS (DWA). Based on the division of responsibilities for all Component 3 activities agreed between MLWS (DWA) and WUC, the annual work program and procurement plan will identify the specific activities and budgets allocated for WUC and MLWS (DWA) –including training, capacity building, technical assistance and studies. Each entity (MLWS - PMO, and WUC) will be responsible for identifying and preparing inputs to the annual work program (e.g. TOR, budgets). As MLWS - PMO will be responsible for enabling the implementation of MLWS (DWA) activities under Component 3, it will procure additional monitoring and evaluation (M&E), procurement and financial management capacity to support this function. These activities will be complemented by grant funding from other development partners, where available. MLWS will ensure cooperation and integration of these activities.

51. WUC will be responsible for the implementation of all subprojects under Components 1 and 2, which largely involve rehabilitation and augmentation of existing water and wastewater systems currently managed by WUC. In addition, it will be responsible for a subset of the institutional and capacity building activities under Component 3. Responsibility for the day to day management of WUC implemented activities will be delegated to the existing WUC -PMO housed in the Technical Services Department. WUC will strengthen the capacity of WUC - PMO by contracting additional expertise in such areas as financial management, procurement, monitoring and evaluation, social and environmental safeguards and project coordination. WUC - PMO will implement the proposed subprojects and activities through existing structures under the supervision of WUC's management team. Sub-projects and activities supported by the Project will be coordinated by the responsible Project Engineers with support of General Managers of the relevant Management Centers under the leadership of the Director of the Technical Services Department. As these activities form part of the overall NDP 11 work program, in line with current practice, where necessary WUC will also support the MLWS - PMO and MLWS (DWA), in the execution of their obligations under the Project.

B. Results Monitoring and Evaluation

52. To the extent possible, Project results indicators and data collection will be aligned with existing monitoring and reporting systems in the sector. At the national level, Project indicators will be aligned with the monitoring and evaluation framework being developed by the National Strategy Office (NSO) as part of the NDP 11. This effort is being supported by a Bank Reimbursable Advisory Services (RAS) agreement currently being negotiated with the Government. At the utility level, proposed indicators will be drawn from existing WUC data on outputs monitored across all MCs; and supplemented with other sector Indicators. This approach is intended to enable the Government and the World Bank to monitor and aggregate results beyond the project. MLWS is expected to be responsible for reporting results under the NDP and is therefore intending to develop a comprehensive M&E system for the sector under the Project. Project alignment with WUC operational indicators will also help ensure that data collected is used to monitor operational efficiency. The Results Framework for the Project is included in Section VII.

53. Overall responsibility for consolidating M&E data for the project will lie with MLWS - PMO. An M&E expert and computerized management information system will be procured through the project to enable timely monitoring, reporting and communication of results during execution of the project. Key M&E requirements are: qualitative and quantitative information on the execution of selected subprojects or activities; progress in procurement and contractual matters, accounting and financial recording, and any other Project reporting requirements. As monitoring of Project activities will be undertaken by WUC or MLWS (DWA) for activities they are respectively responsible for, arrangements for data gathering at these levels will be coordinated by MLWS - PMO.

C. Sustainability

54. As noted above, the Project is aligned with the Governments national development planning process. NDP 11 outlines priority actions for the coming five years (2017-2023) and allocates resources based on the thematic areas identified in Botswana's Vision 2036. This includes Project subprojects or activities included in NDP 11 as part of the Government's emergency water supply program. Water security is a key priority for NDP 11 and the Government has therefore allocated around US$1.2 billion for strengthening the sector over the 2017-2023 period.

55. The activities proposed for support through this Project will leverage and complement other activities proposed for Government financing. The proposed IBRD loan is therefore supplemental financing to enable the GoB to accelerate the pace of: immediate (critical) physical investments; key policy and institutional reforms; operational efficiency improvements; and the long term water security agenda. It will also help strengthen capacity for climate change adaptation, drought mitigation and integrated water resources management (IWRM).

56. Institutional strengthening measures planned for WUC will ensure that there is sufficient capacity to deliver efficient services; manage demand; sustain existing and planned investments; and plan for long term infrastructure needs. In its role as custodian for water resources, MLWS (DWA) will strengthen capacity to manage and monitor water resources; plan and negotiate long term strategic investments (e.g. inter-basin transfers); and complete or revise policies, strategies and regulations that are critical to the sustainability of the sector.

D. Role of Partners

57. The Project has benefitted from the World Bank's recent engagement with partners in the delivery of advisory service and analytics:

a. *Sector Engagement:* The World Bank has been working with several partners to advance the water security agenda in Botswana. Through the CIWA trust fund (financed by Sweden, United Kingdom, European Union, Denmark, and the Netherlands), it is currently assisting the Government to study several long term water supply options including the Lesotho-Botswana

transfer and the Chobe-Zambezi transfer. Through CIWA the Bank is also collaborating with other partners including SADC (regional Groundwater study); and United States Agency for International Development, for the Okavango Multi-sector Options Study. Further development of the long term water security options identified in studies supported under the Project, could be financed through potential partnerships with other Development Partners (e.g. African Development Bank, Agence France de Developpement, European Investment Bank, Japanese, Chinese or Korean development agencies). Currently development partners supporting the sector include the Governments of China, Japan and Korea.

b. *Country Engagement:* As the project is aligned with both the Botswana NDP 11 and the SADC Region's El Nino Response Action Plan, coordination with partners has been undertaken in both respects22. The World Bank participated actively in the consultative process leading up to the preparation of the NDP 11, which has also engaged a wide range of stakeholders in the development community, Government, and non-governmental organizations (NGOs) (NGOs in identifying national and sectoral priorities. With respect to the ongoing SADC El Nino drought response, the World Bank has worked with SADC and other development partners to assess risks, challenges and actions required to support the alleviation of immediate impacts across the region.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

58. The project risk is rated "moderate".

59. As a result of its stable political and governance environment and sound macroeconomic management, Botswana has maintained steady progress in meeting its economic and social objectives. Effective checks and balances exist, institutions on the whole remain robust, inclusive, and transparent, and stakeholders are involved, widely consulted and well informed of government programs. While these risks are "low", the Government wishes to improve its standing (e.g. as measured by global rankings) in order to tackle emerging economic and fiscal challenges. It is therefore taking steps (with support of a World Bank-funded Public Sector Reform RAS) to "reinvent itself" through a program of core reforms aimed at achieving efficient and effective service-delivery. With respect to "moderate" risks, the GoB has taken a series of steps to roll out critical sector strategies and policies identified in the 2009 water sector reform program (supported through a World Bank technical assistance (TA). The Project therefore includes measures to advance these sector reforms building on actions already taken. NDP 11 identifies measures to ensure that an adequate policy, strategy and regulatory framework is in place; and to restructure, reskill and equip sector institutions to manage services more effectively. These actions underpin the water and wastewater investments planned under the project.

[22] The World Bank is supporting RIASCO to prepare an El Nino Response Action Plan in support of SADC's humanitarian appeal for El Nino

60. As this is the first IBRD investment operation being undertaken by the water sector, a rating of "substantial" is assigned for institutional capacity for implementation and sustainability and environment and social safeguards. While staff of the Ministry (previously Ministry of Minerals, Energy and Water Resources) have managed small grants (e.g. CIWA), WUC has had no recent experience with IBRD financed activities (the last World Bank financed project closed in the 1970s). While the two implementing agencies lack familiarity with World Bank operations, WUC has a track record of preparing and implementing subprojects— as demonstrated by the pipeline of ready subprojects that the World Bank will support. As many of the subprojects have been prepared to some level, this will accelerate the time taken to complete the Project. A procurement review conducted by the World Bank concludes that WUC has similar processes and procedures for engaging consultants and contractors for environmental and social impact assessments, design, supervision, and construction works. As there are competent professionals in both implementing agencies, the Project will mitigate this risk by strengthening capacity through training, knowledge sharing, awareness raising. It will also establish additional capacity in MLWS - PMO and WUC - PMO to ensure that the IBRD requirements for implementation of sub-projects are in place.

61. Finally, other risks to sustainability include: (i) groundwater depletion – this will be mitigated through measures to: protect and manage groundwater sources, including inter-linking surface water sources and wellfields (as an alternate or back up supply), introducing measures for artificial recharge, strengthening demand management, groundwater monitoring and mapping, drought preparedness, climate change adaptation, and supporting a raw water abstraction strategy; and (ii) operational and financial performance – this will be mitigated through support for institutional restructuring measures to allow the corporation to improve staff productivity, boost billing and collection, reduce technical losses, optimize water supply production and wastewater treatment processes; and reduce operating costs. A business strategy, capital investment book and financial recovery plan will also be prepared.

VI. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

62. The results of the economic and financial analysis show that the Project is economically and financially viable with returns at a present value of US$72 and US$3 million, respectively, when a 6 percent rate of return is used. This analysis is presented in detail in Annex 1 and complemented with sensitivity analysis.

63. The cost benefit analysis carried out for Component 1 and 2 was undertaken from an economic and financial perspective. From an economic perspective, it was evaluated by converting financial cash flows into economic cash flows to eliminate distortions caused by taxes, subsidies and other externalities. From a financial perspective, it was evaluated by estimating costs and benefits at market prices, in the same way WUC will be paying or receiving from each input.

64. **Cost-benefit analysis.** The economic/financial feasibility analysis of the Project compares estimated economic/financial benefits of the Project with economic/financial costs. As the project costs

are given, the primary analytical challenge of this analysis is to most accurately estimate the expected benefits that are likely to occur as a result of project implementation. The net benefit is the difference between the incremental benefits and the incremental costs of two scenarios: "without" and "with" the project. The "without" project scenario considers that utility consumers will face continuous deteriorating services. The "with" project scenario considers the project and its associated targets. Annex 1 describes in detail the current situation and the changes expected to be achieved once the investments under Component 1 and 2 are implemented.

65. Discount rate. The analysis was done using two discount rate assumptions: 6 and 10 percent. The 6 percent discount rate assumption corresponds to the recent World Bank guidance regarding discount rates for use in economic analysis[23].

66. Economic analysis. The investments under Component 1 and 2 aim at addressing the immediate drought impact by making available greater volumes of potable water in selected areas in Botswana, which are suffering from low levels of consumption per capita. It will also increase the quality of the effluent in selected wastewater treatment facilities. Benefits expected from the proposed water supply investments include: (i) elimination of water rationing (including savings from coping costs); (ii) additional water sales arising from increasing demand from existing connections (as water demand per connection is expected to increase once water rationing is eliminated); (iii) additional water sales arising from greater availability of water derived from technical losses reductions in a number of investments included under the Project; and (iv) savings in operating costs due to reductions in technical losses in the Masunga and Ghanzi water supply scheme. Investments in wastewater treatment include the upgrading of existing facilities to comply with effluent standards so that it can be reused for agriculture and other purposes and/or reclaimed; and, the expansion of WWTP and ponds to allow for higher volumes of sludge and wastewater to be treated. Hence, the benefits of the wastewater treatment system evaluated in the economic analysis include: (i) increased revenues when higher wastewater treatment occurs; (ii) increased quality of the effluent from wastewater treatment facilities; (iii) avoided cost of sludge transportation from Letlhakane to Serowe; and (iv) increase in WUC's revenues from greater emptying of septic tanks at the Letlhakane wastewater treatment ponds.

67. Besides direct preventable economic losses, there are many other potential benefits that are not factored into the cost-benefit analysis described here. This is either because estimating such benefits is difficult due to the lack of data or it is challenging to quantify the value of those benefits because they might not be financial or economic in nature. For instance, the Project is expected to enable greater volumes of wastewater reuse and reclamation, a benefit that is not estimated in this economic analysis due to lack of data. Similarly, environmental benefits from higher volumes of wastewater treated at prevailing standards; the impact on women and girls; the expected decrease in morbidity and mortality rate; the potential revenue and economic benefits from higher reclamation and/or reuse of wastewater treated are not captured in the economic benefits estimates. Therefore, the

[23] Based on estimated GDP per capita growth rates. The economy in Botswana is expected to rebound with projected GDP growth rates of 3.7 and 4.3 percent respectively in 2016 and 2017, driven mainly by an expected improvement in diamond prices as developed economies stabilize and fiscal stimulus that will propel non-mining activity. World Bank. Discounting Costs and Benefits in Economic Analysis of World Bank Projects. May 9, 2016.

estimated benefits of the project described in this analysis can be considered conservative and it can be reasonably assumed that the actual benefits will be larger than the ones estimated here.

68. The project is economically viable when analyzed as a whole, as well as component by component. Indeed, the cost benefit analysis for all subprojects analyzed generated positive rates of return. The economic internal rate of return (EIRR) is 11.4 percent. A summary of the present value of benefits and cost, and the NPV of the Project, under the two discount rate scenarios, is shown in Table 2.

Table 2. Summary results of the economic analysis

Results	**Component 1 and Component 2**	
	Discount rate 6%	Discount rate 10%
Present value of benefits (US$, millions)	400	240
Present value of costs (US$, millions)	329	231
Net present value (US$, millions)	72	9
Benefit-cost ratio	1.2	1.0

69. Financial analysis. The financial benefits of the Project were measured in financial terms as the increase of revenue for WUC. Revenues were measured as volume of water billed times the average tariff per cubic meter, and then adjusted by the collection revenue rate of 95 percent. No tariff adjustments were assumed for the financial projections. Increased revenue will come from: (i) additional water sales arising from increased demand from existing connections; (ii) additional water sales arising from greater availability of water derived from NRW reductions; (iii) savings in operating costs due to reductions in technical losses in the Masunga North East and Tutume Sub District water supply scheme; (iv) increase in revenues when additional wastewater treatment occurs; (v) avoided cost of sludge transportation for Letlhakane WWTP; and, (vi) increased revenue from sludge emptying at Letlhakane WWTP. In addition, as the WUC will receive the funding from the Project as a grant, the investment costs have not been factored into the costs. The financial internal rate of return (FIRR) of investments under Component 1 and Component 2 is 18.5 percent. Table 3 summarizes annual values of the project financial benefits and their present values, using a 6 and 10 percent discount rate.

Table 3. Summary results of the financial analysis

Results	**Component 1 and Component 2**	
	Discount rate 6%	Discount rate 10%
Present value of benefits (US$, millions)	224	136
Present value of costs (US$, millions)	262	159
Net present value (US$, millions)	3	2
Benefit-cost ratio	0.86	0.85

70. **Sensitivity Analysis**. A sensitivity analysis was carried out to measure the impact on the economic and financial results when changes in the production and treatment costs and NRW reduction forecasts occur, assuming a 6 percent discount rate. Given the benefits accounted for in this economic analysis, changes in certain parameters does not compromise the economic viability of the project. The Project remains economically and financially viable under a 30 percent increase in production and

treatment costs. Similarly, a 30 percent deviation (in both directions) from the NRW targets was evaluated. The Project remains viable even if the utility misses the NRW target by 30 percent.

B. Technical

71. The Project will support priority investments, included in the Government's NDP 11, which are intended to (i) support the emergency response to the ongoing drought, the worst to hit Botswana in 34 years; and (ii) improve medium to long term resilience against chronic droughts. The civil works and the technical assistance financed under the project, will support the Government and WUC in their efforts to manage water supply more sustainably vis a vis the scarce water resources of Botswana, thus improving water security in the long term. The scope includes (i) critical investments in water supply and wastewater treatment infrastructure, including targeted measures to protect and secure water resources for the long term; and (ii) institutional strengthening and capacity development measures to improve efficiency and sustainability of water services as well as sustainable development and management of surface and ground water resources.

72. The ongoing drought has increased levels of water stress in many parts of Botswana. Dammed reservoirs, rivers, and well fields have been running dry. Existing sources need to be better managed, new sources developed and schemes inter-linked in order to ensure sustainable exploitation of water resources, and to avoid overdrawing surface and ground water reserves. Enhancing and inter-linking existing supply systems will provide the redundancy necessary in case of outages or declining yield. In parallel, improved sanitation and wastewater treatment capacity will help to prevent contamination of clean sources and to allow re-use. The Project will enable greater re-use of treated wastewater by improving the quality of the effluent in three WWTPs, reducing the stress on fresh water reserves.

73. The proposed activities identified under Components 1 and 2 represent key infrastructure investments for improved water supply and wastewater treatment in high-priority service areas. The investments encompass interconnection of both schemes and sources, pressure management to reduce losses, improved water quality and, for WWTP, improved effluent quality. Coupled with institutional support activities under Component 3, the works will support service delivery improvements and operational efficiencies in MCs. Each proposed investment is further detailed in Annex 1, including estimated costs and their level of technical readiness— in terms of designs, environmental and social safeguards and bidding documents (BDs).

74. In order to speed up the response to the on-going drought, the investments identified for implementation have been selected because they are at an advanced stage of preparation, some of the interventions have been in the pipeline for the last few years and have now been included as priority investments in NDP 11. A subset of projects that are ready for implementation in year 1 have been prioritized for detailed review by the Bank's technical and fiduciary staff. Designs and bidding documents are being readied to launch procurement processes. Environmental and social safeguards documents are being reviewed and necessary assessments, including the impact of proposed pumping on the aquifers, will be updated or prepared and disclosed as needed prior to the launch of bidding.

75. In support of these investments, Component 3 will provide support for medium and long-term sustainability of investments under the Project, including measures to strengthen the operational capacity of MLWS (DWA) and WUC to adequately perform their functions. The project will support purchasing of monitoring equipment for ground water as well as surface water resources. MLWS (DWA) will benefit from training in water resource planning and management, increased knowledge of IWRM priorities; and systems for adequately monitor water resources. WUC will benefit from support to the process of institutional restructuring, including re-skilling of absorbed staff; improving financial sustainability; and business strategy development.

76. Particular focus will be given to supporting (i) NRW (currently about 40 percent) management efforts, which include pipeline and asset management, pressure reduction and control, repair to visible leaks, and application of active leakage control strategies. A Leakage Control Unit was established in 2014 and aims to install meters (including pre-paid meters) for all customers; (ii) innovation in wastewater and sanitation, including refining approaches to sanitation service delivery options and developing capacity for wastewater management, a responsibility assumed by WUC in 2013; and (iii) pricing and tariff setting - it is intended that tariff adjustments, along with measures to improve other performance dimensions, will continue. Adjustments to the wastewater tariffs are also planned[24]. In addition, a raw water pricing strategy will be supported, options for a drought tariff explored, and models for water supply and wastewater tariff setting developed.

C. Financial Management

77. **WUC**. Financial Management (FM) systems and arrangements at WUC are capable of producing periodic reports for monitoring the financial aspects of the project. The auditing arrangements are also considered acceptable. In view of this, WUC's FM system will be used for the implementation of the project, with the already laid-down oversight arrangements by MLWS and WUC's Board. WUC has an acceptable FM system that is capable of producing reliable and regular unaudited interim financial reports (IFRs) and other financial reports.

78. MFED will maintain a Designated Account (DA) at the Bank of Botswana for the receipt of the Loan Proceeds. WUC will maintain a local currency Designated Project Account (DPA) in a commercial bank for the implementation of Bank-financed components of the project. Disbursements by MFED into this account will be on quarterly basis and based on the approved work plan.

79. The key risk to be mitigated is the high level of vacancies identified during the assessment. Staffing requirements will be agreed with WUC as part of the capacity required for the WUC - PMO. WUC is also intending to fill current vacancies.

[24] Tariffs for the 540 schemes transferred to WUC had previously been set independently and therefore varied across the country. Due to these variations some customers were paying up to 300 percent more than others for the same quantity and quality of water. As part of the reform, tariffs were consolidated in four schedules in April 2015.

80. WUC's annual audit report together with the auditors' management letter and management's response are to be submitted to the World Bank within six months of the end of each reporting period, that is, by September 30, each year.

81. **MLWS**. MLWS has FM systems and arrangements that are capable of producing periodic reports for monitoring the financial aspects of the project. The operation of the DA will follow Government approved procedures.

82. The assessment of MLWS capacity has revealed a need to strengthen staffing arrangements. The current staffing arrangements cannot absorb the new project. MLWS is currently preparing consolidated government accounts, which might prove to be difficult to use to report on project level expenditure. To mitigate this risk, separate project sub-accounts will be required for auditing project expenditures.

83. In conclusion, both implementing entities meet the minimum World Bank requirements for Financial Management, with the following identified risks to be mitigated: (i) Staffing arrangements need strengthening; and; (ii) as both implementing entities are new to the World Bank procedures; training on the World Bank's financial management and disbursement guidelines will be necessary.

D. Procurement

84. All procurement to be financed under the proposed project will be carried out in accordance with the World Bank's new Procurement Framework (NPF) that became effective on July 1, 2016 (in particular the Procurement Regulations for investment project financing (IPF) Borrowers, July 2016) and the provisions stipulated in the Legal Agreement. A Project Procurement Strategy for Development (PPSD) was prepared to determine the approach to market, the selection methods and consequently the procurement plan. The project will carry out implementation in accordance with the 'Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD and IDA and Grants', dated July 1, 2016 (the Anticorruption Guidelines).

85. An assessment has been done of the MLWS Procurement Unit and the WUC Procurement Unit. Key issues for procurement include: (i) procurement planning not formalized and reinforced as a core part of project management leading to implementation delays; (ii) the current MLWS - PMO and WUC - PMO staffing structure may not be suited to implementing capital projects; and (iii) the absence of a formal role of the MLWS - PMO in contract monitoring may impede speedy resolution of contractual matters.

86. Proposed corrective measures to mitigate the overall risks include: (i) in conjunction with technical departments, regularly update the procurement plan and agree on responsibilities for its implementation; (ii) assigning a dedicated procurement officer to support project procurement and; (iii) formalizing the role of procurement officers in contract monitoring and developing a contract monitoring plan.

E. Social (including Safeguards)

87. The Project is being implemented under OP 10.00, paragraph 12 on Projects in Situations of Urgent Need of Assistance or Capacity Constraints. Safeguards have been deferred and the World Bank has agreed on the elements of an environmental and Social Safeguards Action Plan (SAP) with the Government. The SAP outlines activities to be undertaken during implementation in compliance with Bank policy. The SAP is included in Annex 4 and the Integrated Project Information Document/Safeguards Data Sheet (PID/ISDS) was disclosed on October 25, 2016.

88. The Project will rehabilitate or augment systems in areas that already have access to services, but are underserved due to inadequate wastewater treatment or water shortages arising from the drought. The project will increase water supply to predominately built-up settlements with medium density development. As it is expected that the bulk of the investments will be in-situ rehabilitation and upgrading or extending infrastructure to new water sources, this will largely involve transmission, storage, and pumping equipment. The majority of transmission lines are to be placed within existing rights of way of existing road reserves. However, there will be also new lines inter-connecting boreholes or some population areas such as some villages. The focus will be on ensuring that any physical activity undertaken in built up areas is well managed; and that land take for new transmission routes or sites for equipment follows required procedures to be documented in the Resettlement Policy Framework (RPF) that will be prepared and disclosed within two months after effectiveness. In addition, civil works will only start after the necessary safeguards documents have been prepared and disclosed.

89. World Bank Safeguard Policies and the Botswana Laws and Regulations will be adopted as standards for implementing social safeguard aspects of the project as required in the RPF. The following World Bank Safeguard Policies are triggered: (i) Physical Cultural Resources OP/BP 4.11; (ii) Involuntary Resettlement OP/BP 4.12; and (iii) Indigenous Peoples OP/BP 4.10.

90. *Physical Cultural Resources (PCR) OP/BP 4.11*: This policy is triggered. The Borrower will ensure that the initial environmental and social assessment screens for potential impacts on the physical cultural resources and include Chance Find Procedures in the ESIAs and bidding documents to ensure mitigation of any new discovery of physical cultural resources.

91. *Involuntary Resettlement OP/BP 4.12*: This policy is triggered. The project will undertake measures to mitigate the impact of the drought by equipping and connecting existing water sources to settlements that have experienced extended periods of rationing and/or been forced to rely on water bowsers as well as the expansion to under-served or drought affected communities. As the vast majority of infrastructure will be in-situ rehabilitation and upgrading, the extent to which any civil works under the project will require land acquisition and/or impact people's access will be determined during project preparation, including through the ESIA and planned social assessments. The proposed civil works may require land for temporary or permanent usage. The land acquired for this purpose may lead to loss of assets, sources of income or means of livelihoods, especially in rural communities - whether or not project affected people must move to another location. To ensure proper mitigation measures are set forth during the first year of implementation, based on the findings of ESIA, the national laws on land as well as OP 4.12 and social assessments will be applied. To enable this, within two months of effectiveness, the Borrower will prepare a Resettlement Policy Framework (RPF) to guide the

preparation of site specific RAPs. In addition, for a number of sites where land is acquired social audits will be carried out. Just as the other safeguards documents, the RPF will be fully consulted upon, reviewed and cleared by the Bank and publicly disclosed both in-country and the World Bank's external website prior to the start of civil works.

92. *Indigenous Peoples OP/BP 4.10*: In the context of the Republic of Botswana this refers to "Vulnerable Communities (VC)". There is a lack of sufficient detail on the proposed routing and development of infrastructure to be supported by the Project. However, as there may be VCs present or having a collective attachment to the proposed project sites, OP 4.10 has been triggered. Where relevant, if for any given activity, VCs were or are found to be present or to have a collective attachment to the area of the proposed project activity, a social assessment will be undertaken and a Vulnerable Communities Plan (VCP) will be prepared, based on prior informed consultations, disclosed, and implemented prior to the start of civil works in full compliance with the requirements of OP/BP 4.10.

93. *Projects in Disputed Areas OP/BP 7.60*: This policy is not triggered. The project will not finance any activities located in any known areas under territorial dispute as defined in OP 7.60.

F. Environment (including Safeguards)

94. As noted above, a SAP outlining activities to be undertaken during implementation has been prepared. The SAP is included in Annex 4 and the Project Information Document/Integrated Safeguards Data Sheet (PID/ISDS) was disclosed on October 25, 2016.

95. World Bank Safeguard Policies and the Botswana Environmental Impact Assessment Act and Regulations of 2011 will be adopted as standards for implementing safeguard aspects of the project. The project is classified as an environmental risk category "A". The key risk is potential environmental impacts likely to be generated from rehabilitation and expansion works at the Mambo WWTP. Currently, the treated effluent from the plant is discharged into the Tati River, a tributary of the Shashe River, which feeds into the Dikgatlhong Dam located at a distance of 3 km below the confluence of the Shahe and Tati River. Since the Dikgatlhong Dam supplies potable water to the city of Gaborone, it is essential that the quality of discharged effluent from the Mambo WWTP stringently complies with legislated standards during the construction and operational phases of the project. Most other subprojects are in locations that are predominately built-up with medium density development. It is expected that the vast majority of infrastructure developed will be in-situ rehabilitation and upgrading. In most subprojects, it is expected that new pipelines will be placed within existing rights of way.

96. The following World Bank Safeguard Policies are triggered (i) Environmental Assessment OP/BP 4.01; (ii) Projects on International Waters OP/BP 7.50; and, (iii) Safety of Dams OP/BP 4.37.

97. *Environmental Assessment OP 4.01.* This policy is triggered due to the potential environmental and social impacts associated with the project investments. The proposed investments include rehabilitation of existing WWTPs which may generate adverse impacts during the construction phase due to the location of the Mambo WWTP upstream of the Dikgatlhong Dam which supplies raw water to the city of Gaborone. Disposal of sludge from existing WWTPs during the construction and operational

phases of the WWTPs may also impact the environment within the area of influence of the project. Based on the preliminary screening of the proposed project activities, assessment of the baseline characteristics of potential project sites, and available Environmental Impact studies, the project is classified as Category A. As there may be adverse impacts within the project's area of influence this would require a full environmental and social assessment. ToR for an ESIA for Mambo WWTP have been prepared and have been disclosed.

98. *Natural Habitats OP/BP 4.04*. This policy is not triggered. However, during the implementation phase of the project, the proposed activities will be screened to determine if the activities are likely to alter or cause destruction of any critical or sensitive natural habitats. The team will also look for potential opportunities to generate positive impacts on natural habitats though project activities, should such opportunities present themselves.

99. *Forests OP/BP 4.36.* This policy is not triggered since the project will not support civil works located within forested areas or plantations as defined under OP 4.36.

100. *Pest Management OP 4.09*. This policy is not triggered since the project will not involve procurement of pesticides or fertilizers and does not have the potential to lead to increased use of pesticides or fertilizers.

101. *Safety of Dams OP/BP 4.37*. This policy is triggered as the project will rely on the performance of existing dams. Water from the Ntimbale dam will be used to supply 50 plus villages in the Masunga/Tutume area. The Letsibogo Dam will also be used to supply additional water to five villages in the Selebi Phikwe area. A Dam Safety Action Plan will be prepared to support compliance with the policy.

G. Other Safeguard Policies

102. *Projects on International Waterways OP/BP 7.50.* OP 7.50 is triggered because the treated effluent from the Mambo WWTP discharges into the Tati River, which flows into one of the major tributaries of the Limpopo River–the Shashe River. Preliminary assessment of the likely impacts of the effluent to the water quality of the Limpopo River, indicates an improvement in the quality of effluent discharged into the Limpopo River as the wastewater to be collected will be treated in newly rehabilitated WWTPs, in compliance with the national standards Chemical Oxygen Demand (COD) or Biochemical Oxygen Demand (BOD). The effluent is discharged into Tati River (a tributary of the Shashe River) and finally into the Limpopo River. The Shashe River contributes about 12.2 percent of the Limpopo's mean annual runoff. It originates from the northwest of Francistown on the border between Botswana and Zimbabwe and flows southeast along the border for approximately 362 km until it reaches the confluence point with the Limpopo River where Botswana, Zimbabwe and South Africa meet. The Limpopo River is classified as an international waterway. The Mambo WWTP, from which the effluent will be discharged is located close to the national Tati River which originates in Botswana and is the recipient of the treated wastewater from the plant. The Dikgatlhong Dam is located 3 km below the confluence of the Tati River with the Shashi River and 50km from the Mambo WWTP. It is a key source

of water supply to the city of Gaborone. The project will support rehabilitation works at the Mambo WWTP to ensure that the quality of discharged effluent from the plant stringently complies with legislated discharge standards and that the overall quality of the Shashe River is not adversely affected by contaminants during both the construction and operational phases of the project. As the project will have a positive impact on the quality of effluent discharged; and no new water sources will be developed by the Project, an exception to the Policy was granted by the Regional Vice President, Africa Region on September 1, 2016.

H. World Bank Grievance Redress

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 : Botswana
Emergency Water Security and Efficiency Project

Project Development Objectives

To improve availability of water supply in drought vulnerable areas, increase the efficiency of WUC, and strengthen wastewater management in selected systems.

Project Development Objective Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Direct project beneficiaries	✔	Number	0.00	580000.00	Annually	Project reports; Data showing population in the service area and the proportion that is female.	WUC
Female beneficiaries	✔	Percentage	0.00	50.00			
Description: Direct beneficiaries are people or groups who directly derive benefits from an intervention (i.e., children who benefit from an immunization program; families that have a new piped water connection). Please note that this indicator requires supplemental information. Supplemental Value: Female beneficiaries (percentage). Based on the assessment and definition of direct project beneficiaries, specify what proportion of the direct project beneficiaries are female. This indicator is calculated as a percentage.							
Name: Additional water made available by the investments under the		Cubic Meter(m3)	0.00	14500.00	Annually	Management center reports	WUC

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
project (per day)							
Description: Difference between baseline and end of project production (m3) in project areas and for selected schemes.							
Name: People benefiting from improved water supply through measures aimed at alleviating drought impact		Number	0.00	460000.00	Annually	Project reports; Data on people in the service area who are benefiting.	WUC
Description: People benefiting are considered those with more hours of water supply per day (i.e. reduction of water rationing) than they were receiving prior to the investment.							
Name: Revenue to operating cost ratio		Number	0.75	0.90	Bi-Annually	WUC Reports	WUC
Description: The objective of the indicator is to measure the ability of WUC to cover its operating costs with its revenues. A ratio below one indicates that WUC is not able to cover its operating costs with its revenues. For the purpose of calculation total annual operating revenue and expenses should be taken into account, including revenue and expenses from water supply and wastewater treatment for all customer categories. Baseline data is for 2014/15.							
Name: Average annual COD removal efficiency from wastewater at WWTP		Percentage	70.00	85.00	Bi-annually	WUC Reports, MC reports (Letlhakane, Francistown, Lobatse)	WUC
Description: Based on WUC effluent standard for ephemeral streams (COD equal to or less than 75 mg/L. Will be calculated for Lobatse, Francistown and Letlhakane WWTP only.							

Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Piped household water connections that are benefiting from rehabilitation works undertaken by the project	✔	Number	0.00	75000.00	Annually	Management Center Reports	WUC
Description: Number of piped household water connections benefiting from rehabilitation works. This indicator is measured as the number of piped household water connections benefiting from rehabilitation works. Rehabilitation works are undertaken so that existing customers see the quantity and/or quality of their water supply services enhanced.							
Name: Water delivered to consumers (per day)		Cubic Meter(m3)	30000.00	39500.00	Bi-annually	Management Center Reports	WUC
Description: Measured as water produced minus technical losses (estimated at 30% of production).							
Name: Additional wastewater treated in the facilities rehabilitated under the project (per day)		Cubic Meter(m3)	0.00	2620.00	Semi-annually	Treatment Plant Records	WUC
Description:							
Name: Policies, legislation, and regulations drafted or approved (to be specified)		Number	0.00	8.00	Annually	Project reports, Studies, Dissemination material, Government records.	DWA

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Description: This indicator will capture the status of policies, legislation, strategies, guidelines and regulations supported under the project							
Name: Laboratories for monitoring quality of WWTP effluent fully operational		Number	0.00	5.00	Annually	Project reports Botswana Standards	WUC DWA
Description: This indicator will assess whether laboratories supported by the Project are equipped and staffed to monitor compliance with Botswana Standards							
Name: Feasibility studies and/or master plans for future investments prepared under the project		Number	0.00	6.00	Annually	Project reports	DWA
Description: This indicator will record the number of feasibility studies and master plans not implemented under the project, but prepared to build a future investment pipeline.							
Name: Number of consultations held with communities under the project		Number	0.00	50.00	Bi-annually	Minutes of meetings (gender balance to be recorded)	WUC
Description: Consultations will be carried out with Community Liaison Committees (CLCs) on a number of issues, such as safeguards, demand management, sub-project							

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
design, policy dissemination, tariffs and pricing							
Name: Citizens feedback on service delivery registered and addressed by the service provider in accordance with service standards		Percentage	80.00	100.00	Bi-annually	Call Center Reports Greivance Redress Mechanism	WUC
Description:							
Name: Reduced technical losses in selected schemes under the project		Percentage	40.00	35.00	Bi- Annually	WUC Annual Reports MC Quarterly Reports	WUC
Description: Technical losses are measured as percent of water supplied to the distribution system that is not delivered to consumers. Measured for selected schemes (Masunga-Tutume, Ghanzi).							

Target Values

Project Development Objective Indicators

Indicator Name	Baseline	End Target
Direct project beneficiaries	0.00	580000.00
Additional water made available by the investments under the project (per day)	0.00	14500.00
People benefiting from improved water supply through measures aimed at alleviating drought impact	0.00	460000.00
Revenue to operating cost ratio	0.75	0.90
Average annual COD removal efficiency from wastewater at WWTP	70.00	85.00
Female beneficiaries	0.00	50.00

Intermediate Results Indicators

Indicator Name	Baseline	End Target
Piped household water connections that are benefiting from rehabilitation works undertaken by the project	0.00	75000.00
Water delivered to consumers (per day)	30000.00	39500.00
Additional wastewater treated in the facilities rehabilitated under the project (per day)	0.00	2620.00
Policies, legislation, and regulations drafted or approved (to be specified)	0.00	8.00

Indicator Name	Baseline	End Target
Laboratories for monitoring quality of WWTP effluent fully operational	0.00	5.00
Feasibility studies and/or master plans for future investments prepared under the project	0.00	6.00
Number of consultations held with communities under the project	0.00	50.00
Citizens feedback on service delivery registered and addressed by the service provider in accordance with service standards	80.00	100.00
Reduced technical losses in selected schemes under the project	40.00	35.00

ANNEX 1: DETAILED PROJECT DESCRIPTION

COUNTRY : Botswana
Emergency Water Security and Efficiency Project

Sector Context

1. As highlighted in the main text of the PAD, water is central to Botswana's continued economic success and sustained development gains. However, water resources are constrained, fragile, and subject to many competing demands. Due to a growing and increasingly prosperous population, as well as the development of industrial and other commercial uses (especially mining), demand continues to rise. By 2030 demand is forecast to reach 285.8 mega cubic meters (Mm3), or about one and a half times the 193.4Mm3 annual demand in 2000. Currently agriculture and mining are among the main water users, accounting for 42 percent and 23 percent respectively in 2013-2014, with domestic use, accounting for 25 percent in the same period. The water supply industry extracts about 47 percent from the environment while the remaining 53 percent is extracted by self-providers, mostly agriculture and mining. Both ground and surface water (rivers and dams) resources are utilized, however as most rivers are ephemeral, groundwater now accounts for three quarters of the country's requirements. Most water sources are in northern Botswana, while most people live in the south eastern region in and around Gaborone and Francistown.

2. As the climate is semi-arid, rainfall levels are low, unreliable, unevenly distributed, and highly variable from year to year. The average annual volumetric runoff is about 700Mm^3, with rainfall ranging from zero mm in western and central Botswana to over fifty mm per annum in the north. Surface water resources are restricted to ephemeral and perennial rivers and water stored in reservoirs. The perennial rivers (Limpopo, Chobe, Zambezi and Okavango) are shared watercourses, and their management and use are subject to the SADC Protocol on Shared Water courses. Groundwater resources are limited in quantity and quality, and are unevenly distributed over the country. Botswana's total groundwater resources are estimated at around 100 billion m^3 with an average annual recharge of 1,600Mm^3. Most well fields are located in the eastern and north eastern part of the country. Some areas, such as Western Botswana (where there is no surface water) rely entirely on groundwater (and extremely low recharge rates). Recharge is virtually zero in western Botswana rising to 40mm in the north. Groundwater depth relates to rainfall level (and recharge rates): around 20m in northern Botswana to more than 100m deep in south western Botswana. Groundwater abstraction has increased by a third, from less than 150 Mm^3 in 1990 to 195Mm^3 in 2013/2014.

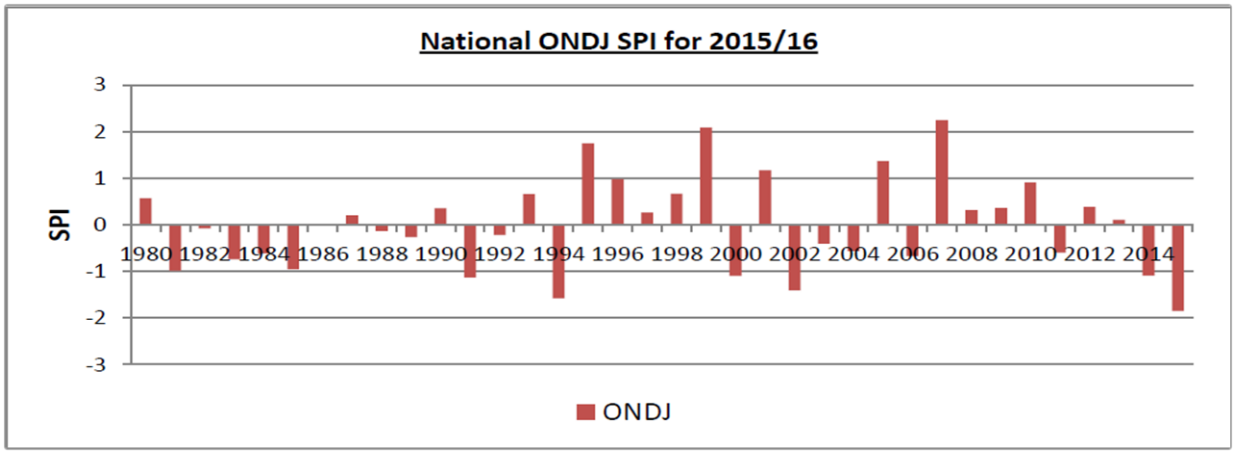
3. Botswana is one of four Southern Africa nations that could become "highly water stressed by 2040" if business as usual continues[25]. Six of the last ten years have been drought years, with some dry spells lasting as long as 3 years. Recurrent and protracted droughts, such as the one ongoing, are a

[25] Baseline water stress measures competition for surface water calculated as withdrawals over renewable supply. The Water Resources Institute ranking of 147 water stressed countries globally Indicates that water stress levels for Botswana, Namibia, and South Africa are expected to reach between 40-80 percent by 2040. Namibia and Botswana are the two countries in the ranking expected to face the greatest increase in water stress.

constant reminder of this fragility. Based on the Standard Precipitation Index (SPI), 2015 and 2014 were rated severely dry and moderately dry years (respectively). And precipitation in 2012 and 2013, which were marginally above the SPI mean, did not allow a full recovery after 2011 (another dry year). At the sub-national level, the analysis of precipitation highlights variations from district to district. The Southern (five subprojects), Ghanzi (three subprojects) South East, Kgalagadi, Kgatleng districts have experienced a string of moderately to severely dry years since 2011. The Central (two subprojects) and North East (three subprojects) districts have experienced a severely dry 2015 which followed a moderately dry 2014. Figure A1.1 below shows the chronic nature of droughts based on SPI data from 1980.

Figure A1.1 - Standard Precipitation Index for Botswana[26] – 1980-2015 (October to January)

c.



4. The meteorological department rates the 2015 drought "extremely severe"– the worst in the last 34 years and a drought emergency declared in 2015 has been extended for a second year[27]. Drought hotspots in the central, southern and western parts of the country have been significantly impacted. In addition to dams, rivers and well fields running dry, extremely low levels of rainfall (and or late rains) have led to significant loss of crops – a 70 percent decline in cereal crop when compared to 2014; and declining grasslands – which have affected both livestock (a 20 percent mortality rate in 2015 and again in 2016) and wildlife. Nationwide, dam levels fell below 20 percent of design capacity – the Gaborone dam fell as low as 1.6 percent in 2015, the lowest since 2000. Ground water recharge rates have been low, boreholes or wellfields in several subproject areas have run dry or become saline. The drought has prolonged periods of water rationing in many water supply systems. Most major settlements have had rationing schedules in place for 2-4 years. Many settlements are now being served by water bowsers at high cost.

5. Climate change projections for temperature include a rise of up to two degrees Celsius (January 2015 was the hottest year on record); a decline in river flows of up to 13 percent[28]; and a reduction in

[26] Drought and Household Food Security Outlook, 2015/6, Ministry of Local Government and Rural Development.
[27] Department of Meteorological Services (DMS), May 2016.
[28] Botswana's Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), December 2011.

rainfall of about 3 to 9 percent (or a 19 percent decline in cereal production). A climate risk assessment carried out by the World Bank in 2010 (using multiple measures, over multiple temporal scales) concludes that there is a definite bias towards increased droughts, and declining groundwater recharge rates. In addition to low rainfall, high open-water evaporation rates— ranging from 1,900 mm to 2,200 mm per annum (Food and Agricultural Organization 2009), also lower groundwater recharge and surface runoff levels, diminishing opportunities for storage. While droughts and storms are expected to increase (in frequency and severity) in western and northern Botswana, in south-mid eastern Botswana (part of the Limpopo basin), precipitation is likely to decrease, but with an increased risk in flooding[29].

6. Climate variability is a risk to GOB's economic diversification agenda. It is already a major constraint to the agricultural and mining sectors. Cereal production is rainfall dependent and only a small portion of land is under irrigation (around 1 800ha – Second Botswana National Water Master Plan). As mines and power generation are location specific, securing a sufficient water supply, typically groundwater, is a determining factor. As households, institutions and commercial establishments face serious water constraints during droughts, frequent droughts are a threat to current high levels of access— universal access has been achieved in urban areas, and access is also high in rural settlements. In the coming years, greater emphasis on climate change adaptation, and managing chronic drought will be required. The Draft National Water Conservation and Water Demand Management Strategy (2016-2021) note that this will require a significant shift to "…a water-wise and water-efficient society through changes in people's attitudes to water, how water is planned, managed and used…".

Project Description

7. The Project includes the three components: Component 1: Improve Availability of Water Supply and Efficiency of Services; Component 2: Improve Wastewater and Sludge Management; and, Component 3: Sector Reform and Institutional Strengthening. Several subprojects included under all components had earlier been prepared by WUC to be included in their financing cycles under the National Development Plans. However due to funding constraints these projects were not implemented. These projects have the objective of improving supply while addressing water security as well as water quality challenges. The following describes each component and its proposed investments:

8. **Component 1: Improve Availability of Water Supply and Efficiency of Services** (US$114.05 million including taxes). This component will support immediate as well as medium term investments and measures to mitigate the impact of the drought by improving availability of water to settlements that have experienced extended periods of rationing and/or been forced to rely on water bowsers. Specific investments will include: (i) water source management, optimization and development, including interlinking existing water sources (surface and ground) as well as of supply schemes to ensure backup supply and more sustainable production; (ii) expansion of water supply systems to reach underserved or drought affected communities; and (iii) measures to improve operational efficiency, including reducing technical losses along transmission lines. This component will be implemented by the WUC. The component includes safeguards assessment and management as well as design and supervision services for the civil works. All investments will be coordinated and will be supported by institutional strengthening activities (under Component 3) which aims to improve the long-term

[29]Botswana Climate Variability and Change: Understanding the Risks. World Bank, November 2010.

sustainability of service provision and water demand management. The investments proposed under this Component are detailed in Table A1.1.

Table A1.1. Description of Component 1 Investments

Management Center	Infrastructure investments Cost estimate (US$ million)[30]	Description of the investment	Description of works	Implementation Readiness – Preparation status including Safeguards
Selebi-Phikwe	Selebi-Phikwe to Serule water transfer scheme US$20 million	This investment is to improve water supply for about 29,840 beneficiaries in Mmadinare, Serule, Damuchojena, Gojwane, Topisi and Moreomabele villages, as well as boarding schools in the area. The investment is designed to reach a production capacity of 5463 m^3/day by connecting to the existing valve chamber in Selebi Phikwe. The project will interconnect three clusters: Cluster 1 in Mmadinare currently supplied from Mmadinare Treatment Plant; Cluster 2 in Damuchujena currently supplied from boreholes; and Cluster 3 in Serule, Moreomabele, Topisi and Gojwane currently supplied by from Molodi well field. Water for the Project is from treatment plant in Selibi Phikwe which get water from Letsibogo dam.	Construction of 120 km to connect Selebi Phikwe to Serule pipelines and additional distribution, associated offtakes; three booster stations; storage tanks and elevated tanks for a total of about 14,000 m^3 storage ensuring supply of potable water to five villages: Serule, Gojwane, Mmadinare, Moreomabele, Topisi and Damuchujena, and for boarding schools in the area.	To be procured in Year 1 (Y1) Designs completed and bidding documents ready Environmental and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP and DSAP to be prepared.

[30] These costs include design and supervision, environmental and social safeguards, and construction works

Management Center	Infrastructure investments Cost estimate (US$ million)[30]	Description of the investment	Description of works	Implementation Readiness – Preparation status including Safeguards
Letlhakane	Boteti Southern and Central Cluster Villages Water Supply Scheme US$20 million	This investment is to improve water supply for about 23,360 beneficiaries in eight villages (Mokoboxane, Kedia, Mopipi, Xhumo, Toromoja, Mmadikola, Rakops, and Xere). Production capacity will be increased to 2224$m^{3/}$day. The system is currently supplied by ground water from Xago well field through six low yielding boreholes. Seven boreholes will be equipped to improve the pumping regime of the aquifer and improve its sustainability.	Equipping of seven boreholes with electrical submersible pumps; construction of 31km of boreholes interconnecting pipework; construction of 18km gravity fed raw water transmission main from the raw water collector tank to the water treatment plant. 127 km of distribution mains - gravity. About 3200 m^3 storage and balancing capacity. Design and construction of a Reverse Osmosis (RO) treatment plant and associated mechanical, electrical and telemetry, booster station).	To be procured in Y1 Designs completed and bidding documents ready. Environmental (inclusive of groundwater assessment) and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP to be prepared.
Letlhakane	Mosu, Mokubilo and Mmea villages US$0.3 million	This investment is to improve quality and reliability of water supply for about 5,400 beneficiaries in Mosu, Mokubilo and Mmea villages. The villages are interconnected and the supply capacity will increase to 474m^3/day. A new borehole (BH) BH 7955 was equipped but the water is saline and requires treatment. There are no other sources in the vicinity of these villages.	Design, installation and commissioning of a Reverse Osmosis Plant to address salinity and improve water quality from the borehole. WUC will request the contractor to consider Solar power supply for the plant.	To be procured in Y1. Bidding documents ready. Environmental (inclusive of groundwater assessment) and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP to be prepared.
Ghanzi	Ghanzi township water supply expansion US$8.4 million	This investment is to improve water supply for about 41,470 beneficiaries in Ghanzi township by extending and rehabilitating the reticulation network. Production capacity is 2,710m^3/day. Water losses for the township average 21 percent of production and the project target is to reduce water losses to 15 percent of production.	Review and confirm or update the 2008 design. Investment to include a 1000 m^3 elevated tank, 44 km of new reticulation network, and rehabilitation of 10 km of reticulation network.	To be procured in Y2. Designs completed but to be reviewed and bidding documents to be updated. Environmental and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP to be prepared.

Management Center	Infrastructure investments Cost estimate (US$ million)[30]	Description of the investment	Description of works	Implementation Readiness – Preparation status including Safeguards
Ghanzi	Kuke water supply Master Plan project US$1.9 million	This investment is to improve water supply for about 930 beneficiaries in Kuke settlement. The current operational BH 487 cannot meet the demand estimated at 59 m^3 /day its yield continues to decline (it currently supplies about 20 to 32 m^3/day). A new well, will be put on line to improve the pumping regime of the existing well and reduce drawdown. This investment will end bowsing to Kuke.	Equipping BH Z9000 (with yield of 20m^3/hr) with PV power source; installation of 12km supply mains from source to Kuke settlement; construction of a new 75m^3 elevated tank; construction of 12 km reticulation network to the eastern part of Kuke.	To be procured in Y1/2. Designs completed and bidding documents ready. Environmental (inclusive of groundwater assessment) and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP to be prepared.
Ghanzi	Bere Settlement water supply augmentation project US$0.7 million	This investment is to improve water supply for about 626 beneficiaries in Bere settlement. The existing demand is met by an existing well BH9134 which is under stress. The project will equip another existing well BH 9135 (yield of 8m^3/hr) located 5 km from the village. The additional well will be run alternatively with BH9134. Together they will supply about 35 to 40 m^3/day. The project aims to reduce water supply disruptions and also to improve energy efficiency. This investment will end bowsing to Bere.	Equipping BH 9135 with PV power source, installation of 5 km supply mains from source to the settlement. Construction of a new 75m^3 elevated tank on a 15m stand.	To be procured in Y1/2. Designs completed and bidding documents ready. Environmental (inclusive of groundwater assessment) and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP to be prepared.

Management Center	Infrastructure investments Cost estimate (US$ million)[30]	Description of the investment	Description of works	Implementation Readiness – Preparation status including Safeguards
Masunga	North East and Tutume Sub District water supply upgrading project US$22 million	This investment is to improve efficiency and reliability of water supply for about 181,000 beneficiaries in 52 villages. The North-East Water Supply Scheme in recent years experienced acute water shortages. The villages are supplied by surface water from Ntimbale Dam and groundwater from Maitengwe wellfield. To increase supply the pumping capacity from Ntimbale Dam will be increased from 7,000 m^3/day to 14,000 m^3/d. The existing WTP has already capacity to treat 14,000m^3/day. The existing transmission system from the treatment plant is also to be retrofitted to convey 14,000m^3/day.	Upgrading of the North East and Tutume Sub-District water supply scheme, including water tanks, upgrading of offtake to Goshwe Tank; 6 km pipeline, Power Supply to Kalakamati booster pump station, village storage upgrades, improvement to chlorination and sludge handing systems at the treatment plant.	To be procured in Y1. Designs completed and bidding documents ready. Environmental and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP and DSAP to be prepared.
Masunga	Sowa Water Supply Master Plan (connection to Nata Cluster) US$18.5 million	This investment is to improve water supply for about 10,140 beneficiaries in Nata, Manxotai, Maposa and Sepako. The water source is the Dukwi Wellfield with a capacity of 2,640 m^3/d. Demand estimates for Gweta, Tsokatshaa and Zoroga are also included in the Nata 2M liter tank to allow for future expansion.	Equipping of five boreholes, 50km pipeline, 200mm gravity line (designed with pumping capacity to cater for growing demand) connecting a proposed 2M liter RC ground tank to existing 1000m^3 tank at Dukwi Water works. Water in the 2ML tank will be lifted to a proposed 300m^3 elevated GS tank to give gravity head for reticulation to demand areas in Nata, Manxotai, Maposa and Sepako.	To be procured by end of Y2. Designs need to be audited/updated and bidding documents need to be prepared. Environmental (including ground water assessment) and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP to be prepared.

Management Center	Infrastructure investments Cost estimate (US$ million)[30]	Description of the investment	Description of works	Implementation Readiness – Preparation status including Safeguards
Lobatse	Mmathethe US$9 million	This investment is to improve water supply for about 8,280 beneficiaries in Mmathethe, Magoriapitse and Metlojane. Currently these large villages are supplied by BH 5648, which produces 170 m^3/d and is operated for 12 hrs, and by supplemental bowsing. The project will finance the connection of these systems to Goodhope pipeline so that the supply can increase by up to 1296 m^3/day and bowsing can be discontinued. The pipeline from Lobatse to Goodhope was constructed and completed in 2014. The investment will extend this pipeline to Mmathethe.	Construction of 48km of pipelines (13 km from Goodhope to Mmathethe via Magoriapitse) and reticulation network, 1 booster station at Magoriapitse, construction of 200m^3 elevated tank, telemetry system.	To be procured in Y2. Designs Ready. Environmental and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP to be prepared.
Lobatse	Mokatako US$0.3 million	This investment is to improve water supply for about 1,307 beneficiaries in Mokatako, which is currently supplied with 27m^3/day, partly from a local borehole, BH 1255 (12m^3/day) the rest by bowsing. The supply is expected to be increased to 78m^3/day with the sole operation of Mokatako booster station; BH 1255 will be kept only as stand by. The booster pumps will be pumping into an existing 100 m^3 elevated tank. The booster system will be supplied by ground water from three boreholes: BH10946 from Sedibeng wellfield and BH10944 and BH10943 from Lepprung wellfield. All three boreholes have sufficient and reliable yield.	Construction of one booster pump station, construction of a 50m^3 sump, electrification of booster station, palisade fencing and associated works.	To be procured in Y1. Designs Ready. Bidding documents to be prepared. Environmental (including groundwater assessment) and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP to be prepared.

Management Center	Infrastructure investments Cost estimate (US$ million)[30]	Description of the investment	Description of works	Implementation Readiness – Preparation status including Safeguards
Kanye	Kanye/ Moshupa US$3 million	WUC plans to improve water supply for about 78,000 beneficiaries in Kanye and Moshupa by investing in new sources as well as supply efficiency (reduce losses). The current supply is 10,926 m^3/day and can be increased up to 14,426m^3/day by drawing more water from three wellfields (Selokolela, Ramonnedi and Kgwakgwe). At the same time, losses will need to be reduced by introducing pressure zoning and by replacing old pipes.	Adjust design to include an optimized solution to reduce losses, ensure adequate supply and sustainable exploitation of the aquifers.	To be designed in Y1 and procured in Y2 Environmental (inclusive of groundwater assessment) and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP to be prepared.
Molepolole	Malwelwe/ Molepolole/ Thamaga/ Thebephatswa Airbase US$10 million	Improve water supply to this area by investing in groundwater abstraction and improved operational efficiency. This investment is to improve water supply for 98 000 beneficiaries in Molepolole, Thamaga and Thebephatswa Airbase. Decline in borehole yields at Gaotlhobogwe Wellfield has resulted in water supply shortages. Demand is about 18,000 m^3/d against a supply of 11,136 m^3/d from Gaotlhobogwe, Malwelwe and East Suping Wellfield and Ramaphatle boreholes – i.e. deficit of 7,019 m^3/d. The additional boreholes will increase water supply to 15,660m^3/d, leaving a deficit of 2,495 m^3/d. For water sustainability water restrictions will be applied as and when necessary until additional supply to Thamaga is made available in 2017. The system is supplied by ground water through 24 wells.	Revisit designs to improve loss reduction; and equip and/or connect six additional boreholes; build interconnecting pipelines from boreholes; upgrading of Malwelwe Sump; upgrading of Malwelwe Booster station; construction of new pipeline from Malwelwe to Gaothobogwe; upgrading of the pump station at Gaotlhobogwe WTP; and provision of additional storage at Gaotlhobogwe.	Designs to be updated and procured in Y2. Environmental (inclusive of ground water assessment) and social assessment to be concluded. Land acquisition for servitudes and facilities or social audit to be done in accordance to the RPF. ESMP to be prepared.

9. As outlined in Table A1.1 above, the proposed measures are intended for settlements in drought affected areas where boreholes are running dry, becoming saline, or being mined/overdrawn, as a result of the drought. However, as droughts in Botswana are chronic (six of the last 10 years were drought years) the investments are designed to address medium term needs by ensuring that a sufficient supply

(and/or back up supply) of water is in place, and avoid having to resort to short term solutions (such as using bowsers) every time a drought occurs. As Botswana relies heavily on groundwater (60 percent) and the recharge rate for groundwater is low (average of only 5 mm per year) the proposed investments will bring water from more secure sources – e.g. dams or well fields that are reliable. Measures to reduce losses and manage demand will also be taken, including those in Component 3.

10. **Component 2: Improve waste water and sludge management** (US$21.65 million including taxes). This component will support strategic investments in refurbishment/rehabilitation of wastewater treatment plants to protect surface and groundwater sources and enable scaling up wastewater reclamation and reuse in Francistown and Lobatse through design and build contracts. In Letlhakane sludge management facilities will be rehabilitated and expanded— to reduce transport costs to the nearest facility which is 200km away in Serowe. The Francistown and Lobatse wastewater treatment plants require urgent attention to prevent environmental contamination, caused by discharge of inadequately treated wastewater into nearby water courses. Due to inadequate treatment of wastewater at the Mambo WWTP (Francistown) a key water supply dam for Gaborone (Dikgatlhong) may be at risk of pollution. The Tati river into which Mambo discharges is ephemeral and the effluent discharged during the dry season may also cause local contamination (e.g. nearby boreholes).

11. Given the limited water resources available in Botswana, the proposed measures will protect and conserve existing water supply, thereby reducing demand for the development of new sources. A key objective of the investments in Mambo and Lobatse is to bring the effluent to a quality level where it can be re-used. Many customers, including mines, local golf courses and other businesses have expressed their interest in re-using the effluent if WUC can treat it to adequate standards, which are set by law. In addition to improving treatment and operational efficiency (as measured by effluent quality), the Project also includes (under Component 3) activities to enhance WUC's capacity to holistically manage, treat, dispose of, and re-reuse wastewater and sludge through strategic investments in new or improved technology options. This Component will be implemented by WUC.

Table A1.2. Description of Component 2 Investments

Management Center	Infrastructure investments Cost estimate (US$ million)	Description of the investment	Description of works	Readiness Preparation status including Safeguards

Francistown	Mambo WWTP rehabilitation US$16 million	This investment is to improve operational performance of the WWTP and limit pollution of downstream water sources. The wastewater received from Francistown and Tatisiding is currently not treated to the required BOBS 93 standard. The effluent that is discharged into Tati River which feeds into the Dikgatlhong dam (50 km away) is high in COD, ammonia, phosphate, turbidity, solids, total coliforms and fecal coliforms. The Project aims to improve wastewater treatment so that the effluents conforms to standards for discharge into the environment as well as for potential re-use by nearby businesses. Given the physical distance and the ephemeral nature of the Tati river, the water quality at Dikgatlhong dam currently remains unaffected, and complies with the BOBS 32: 2009 requirements. The WWTP serves about 120,000 people.	Design and construction works for the rehabilitation of the existing Mambo WWTP including: inlet works and pre-treatment, primary treatment de-nitrification tanks, trickling filters and humus tanks, sludge digesters, control and instrumentation; water re-use system, and other auxiliary facilities.	To be procured in Y1 TORs for a design and build contract to be updated and tender to be launched. Full Environmental Impact Assessment (including analysis of the impact on ground and surface water sources) to be prepared. ESMP to be prepared. All works will be built within the footprint of the existing facilities. Land is not encroached and there is no claim to the land.

Letlhakane	Letlhakane wastewater treatment ponds expansion US$5 million	This investment is to improve operational performance of the WW and sludge management facility. This large village of about 22,000 people is fast growing. Most houses have cesspits requiring regular emptying. A centralized sewer system (with ponds) is currently serving businesses and two institutions. The Project will finance the rehabilitation and expansion of ponds to allow higher volumes of sludge to be treated, and avoid haulage of sludge to Serowe which is located more than 200 km away.	Rehabilitation of the existing 5 ponds, inlet, screens, grit chamber and discharge facility for septage. Design and construction for expansion of sludge ponds.	To be procured in Y2. Design and build contract. Environmental (including analysis of the impact on ground and surface water sources) and social assessment to be concluded. Social audit to be done in accordance to the RPF. ESIA and ESMP to be prepared.
Lobatse	Lobatse WWTP rehabilitation US$0.65 million	This investment is to improve operational performance of the WWTP and limit pollution of downstream water sources. At present wastewater treatment in Lobatse is non-compliant with the required BOBS 93 standard. The project will benefit a population of about 35,000.	Desludging of two pump stations, dewatering and desludging of three primary anaerobic ponds, construction of drying beds, refurbishment of effluent recycling pump station, replacement of three inlet works pumps, installation of ultrasonic flow metering devices, palisade fences, maintenance of existing ones.	To be procured in Y2 Design and build. All works will be built within the footprint of the existing facilities. Land is not encroached and there is no claim to the land. ESIA and to be prepared.

12. **Component 3: Sector Reform and Institutional Strengthening** (US$20.75 million). The Component's objective is to strengthen the institutional, policy, and legal framework as a means to improving long-term water security and increased efficiency of services. As such, policy and strategies need to be directed toward improving allocative efficiency, enhancing technological developments, strengthening service delivery, and improving water resources stewardship and water demand management. In addition, the capacity of project management offices for timely implementation of Project activities will be strengthened to ensure a timely and efficient response to the current drought emergency.

13. Component 3 will therefore focus on advancing the reforms initiated in 2009 (Sub-Component 3.1); developing capacity for water resource management and efficient service delivery by strengthening the operational capacity of MLWS (DWA) and WUC (Sub-Component 3.2); and, supporting long-term water supply and sanitation investment planning by developing a pipeline of strategic investments aimed at achieving long-term water security (Sub-Component 3.3). In addition, it will support Project implementation (Sub-Component 3.4). Activities funded by the Project will build on or complement grant funding from other development partners, such as GFDRR, the German Aid Agency (GIZ) and CIWA.

14. ***Sub-Component 3.1. Sector Reform*.** This will support DWA in the development or roll out of sector policies, and review of legislation to advance the reforms initiated by the Government in 2009. In order to conform to the new institutional arrangements, the GoB intends to develop or update several key legal, strategy and policy instruments. Recognizing that competition for water resources is growing and it is likely that in the future not every sector's demands can be met, this Sub-Component aims at further strengthening the water resources management framework, supporting the establishment of regulatory functions, and developing regulatory tools (e.g. a water abstraction and pricing strategy). Priority actions include: updating the 2006 National Water Master Plan; adoption of the IWRM-Water Efficiency Strategy (2013–2030); finalizing the National Water Conservation and Water Demand Management Strategy (2016-2021); and disseminating and implementing the recently adopted 2016 Water Policy.

15. The National Water Master Plan: The Government will update the National Water and Wastewater Master Plan. The most recent update (completed in 2006) extended the projection of water demand and potential supply made in 1991 for a planning period of thirty years. The Government is seeking funding from the Korean Government to update the Master Plan. The Project will complement these efforts by supporting complementary activities as outlined below.

16. The IWRM-Water Efficiency Strategy (2013–2030): was developed to enable IWRM implementation and seeks to "improve people's livelihoods and welfare through efficient, equitable and sustainable water resources development and management". The Project will enable the roll out of the strategy. This will complement support to DWA for the development of institutional arrangements for decentralized catchment management.

17. The draft National Water Conservation and Water Demand Management Strategy (2016-2021): emphasizes the need for Botswana to become a water-wise and water-efficient society, by changing people's attitudes to water, how water is planned, managed and used. A coordinated approach involving all key stakeholders will be initiated through the Project to improve water allocation, water demand management and shared benefits from water resources. The need to develop capacity for water accounting as a tool to enhance water allocation efficiency is also a priority.

18. The Water Resources Council[31]: in line with the 2016 Water Policy, the establishment of a Water Resource Council is planned. The project will support this effort as well as identify measures to increase capacity for enforcement of the various laws.

19. The 2016 Water Policy: provides a framework to enhance access to safe water by all users and promote the sustainable and long-term development of water resources to support economic growth, diversification and poverty eradication. The Project will provide support for the implementation of the Water Policy, as well as support for the development of regulatory capacity for water, wastewater and sanitation services, including addressing gaps in knowledge, improving decision-making tools, revising

[31] The Water Resources Council will be an autonomous entity supported by MLWS, in particular the DWA. It will allocate water resources among users, monitor water resources, and develop water related policies. Through the separation of service delivery activities, the Council is expected to ensure independence and equity in the sustainable allocation of water resources.

rules and procedures, introducing bulk water charging, and enabling more effective enforcement, for both surface and groundwater.

20. Raw water pricing model: As part of demand management the project will promote efficiency in water use, and support the development of a raw water pricing model. An important step toward this has been taken by recent recognition of groundwater as a strategic resource. Elements of a water pricing strategy are provided for in the 1968 Water Act and 1970 WUC Act which are to be revised with Project support. Improved water pricing is essential for sustainable groundwater abstraction and management.

21. ***Sub-component 3.2. Institutional Strengthening and Capacity Building.*** This Sub-Component will enable DWA and WUC to increase their capacity to implement sector policies and strategies; strengthen their overall operational performance; and, improve their corporate governance and management.

22. **Support for DWA** will be provided in the areas of water resource management and monitoring (ground water and surface water); and water quality monitoring. These efforts will be complemented by capacity building for the implementation of the: Water Policy, National Water Conservation and Water Demand Management Strategy 2016-2021, Water Abstraction Strategy, National Water Master Plan, National Wastewater and Sanitation Master Plan, and the 2016 Water Policy. As several of these are still under preparation, capacity building will be phased accordingly.

23. The Project will provide support to boost DWA's role in water resource management and monitoring by improving data collection and data management, particularly for groundwater. Activities will include: hydrological and groundwater modelling for drought, climate change, recharge estimation, balance estimation, sediment transportation; analyzing options for water pollution control and development of an action plan; and support for post-auditing of well fields studies for the efficient and sustainable use of groundwater. In addition, the Project will support the introduction of a catchment area approach by financing needed studies for the demarcation of catchment areas countrywide. The results of a GFDRR supported assessment will inform the determination of requirements for surface water and groundwater monitoring**.**

24. **Support for WUC** will be provided in the areas of demand management; operational and financial performance, including a financial recovery plan and optimization of water supply and wastewater treatment production processes; and PPPs. This will allow a shift towards water demand management, including reduction of non-revenue water (estimated at about 40 percent). In this regard, in addition to the support provided under Sub-component 3.1 on water pricing and Component 2, this sub-component aims at strengthening demand management from WUC by further implementing WUC's NRW strategy and undertaking a demand management options study. WUC intends to explore options for scaling up reuse and recycling. Treated wastewater amounts to an estimated 20 to 30Mm^3 per annum but only between 5 to 10 percent is currently reused. Wastewater treatment investments under Component 2 will improve the quality of the treated effluent - to comply with stringent Botswana Bureau of Standards (BOBS) standards.

25. *Demand Management*: In 2012 WUC drafted a Leakage Management Strategy Report, which emphasizes the need for network sectorization and pressure management to reduce NRW which

increased from about 19 percent of production to about 40 percent between 2009 and 2015. Between April 2015 and April 2016, the Corporation implemented a pressure management pilot in Gaborone West (the "Somarela Thoti" Pilot supported by GIZ, Department for International Development, and First National Bank of Botswana). Activities included network sectorization, installation of pressure reducing valves, leak detection and control, and household and industrial awareness campaigns. The pilot resulted in savings of about 2Mm^3 of potable water and BWP 10 million. The Project will support the scale-up of the Somarela Thoti initiative by expanding it to three major urban areas with substantial physical losses and suffering from high pressure (Selibi Phikwe, Francistown, and Gaborone East). In addition, the Project will provide support for network sectorization in nine other urban centers; calibration of bulk-water meters countrywide; and, training (for management and operational staff) on water loss reduction and demand management. The Project also incorporates support for the development of a demand management study, looking primarily at feasible options for further demand management in Botswana – including but not limited to rain water harvesting, grey water retrofitting from institutional/commercial/industrial facilities, and building codes.

26. *Operational Efficiency Improvements*: The Project will support WUC's effort to improve its operational and financial performance. The consolidation of over 540 water supply and wastewater treatment schemes under WUC (2009 to 2013) has contributed to the deterioration of WUC's operational and financial performance. In order to sustain the benefits of the investments in water and wastewater rehabilitation under Components 1 and 2, activities will support improved management of the asset base through improved maintenance planning (including dam safety action plans). Efforts will also aim to improve labor productivity currently around seven staff per thousand connections (due in part to the scattered nature of settlements). Finally, efforts will also be made to improve tariff setting, billing and collection and reduce energy and chemical use. These measures will help to improve the revenue to operating cost ratio.

27. *Institutional Restructuring*: The project will support WUC's ongoing institutional restructuring to ensure sustainability of existing systems and project investments; and improve the performance of the utility as a whole. Activities will include: (i) development of a long-term capital investment book to improve forward planning; (ii) a detailed assessment of the existing financial situation, leading to the development of a financial recovery plan; (iii) development of a short and medium term business strategy, including modernization of approaches to managing water supply, wastewater treatment, sludge management, and wastewater reuse and reclamation and sanitation; (iv) support for the implementation of performance based staff contracts; and (v) support for the optimization of water supply and wastewater treatment process, including development of an energy reduction strategy, solar water supply pumping and biogas utilization for wastewater treatment and preparation of water services and wastewater manuals and guidelines.

28. *Public Private Partnerships*: Recognizing the importance of continue investing in water supply, wastewater treatment, and wastewater reuse, and in light of growing financial constraints the GoB is increasingly interested in turning to the private sector for technology and innovation, and the transfer of knowledge. In particular, the Government is exploring options for attracting private sector engagement for wastewater reclamation and/or reuse for major WWTPs[32]. The Project will seek to engage the

[32] IFC is reviewing options for engaging the private sector for the Glen Valley Reclamation Project. The Glen Valley WWTP (Gaborone), has an average treated effluent of 55,000 m^3/day.

private sector through design-build contracts under Component 2 to rehabilitate existing facilities (e.g. Mambo WWTP). Other engagements with the private sector such as the reduction of NRW, will also be explored. As MLWMSS and WUC have limited experience in engaging the private sector, the Project will provide for capacity building for PPPs –in coordination with the MFED PPP unit in the country. In addition, the Project will provide budget for transaction advisory services should a transaction materialize.

29. ***Sub-Component 3.3. Forward Planning – Technical Assistance and Studies.*** The aim of this Sub-component is to advance the Governments water security agenda, by supporting the planning and development of projects for future financing. This will mainly involve technical assistance and studies. A sound investment pipeline will allow Government to advance its vast water investment program more rapidly and assist in closing the large investment gap. Activities will include: **Support to DWA** for nationally strategic technical studies required to develop a pipeline of priority investments aimed at improving long-term water security such as the Chobe-Zambezi and Lesotho-Botswana Transfer Schemes. **Support to WUC** will include the development of a Water Master Plan for the Western Region (including Ghanzi, Tsabong and Maun MCs) and support for other feasibility studies; detailed designs; environmental and social impact assessments; and expert inputs such as transaction design for PPPs, expert panels (e.g. for deep groundwater aquifer development), and technical assistance for setting up complex institutional/financing arrangements.

30. ***Sub-component 3.4. Project Management.*** This subcomponent will ensure that adequate project implementation capacity is built in both the MLWS - PMO and WUC - PMO. This includes support for project management and implementation, including funding for procurement of additional expertise. The Project will finance inputs required to ensure the effectiveness of the MLWS - PMO and WUC -PMO, including (as needed) equipment, running costs, logistical support, and other operating requirements. Responsibilities of the MLWS - PMO and WUC - PMO include project management and coordination, procurement and financial management, project monitoring and evaluation (including impact evaluation), social and environmental safeguards management and oversight, and strategic project communications and outreach. This will include:

- Core MLWS - PMO and WUC - PMO experts, including but not limited to Project coordinator, financial management, social and environmental safeguards, M&E, and procurement.
- External project audits as required.
- Independent technical, economic, and financial reviews of the Project as required.
- Preparation of the Project Operational Manual (POM), including procurement, FM, M&E, technical, safeguards and other sections as required (to be completed two months after Project effectiveness)
- Project procurement systems, and other requirements for effective procurement
- FM systems, and other requirements for effective FM
- Preparation of environmental and social safeguards instruments, including RPF, ESIA, ESMP (as appropriate), and social audits
- Data collection and studies for project evaluations, baseline beneficiary surveys, and alignment with the national M&E systems
- Project reporting, as required by the legal agreement and POM, including but not limited to the preparation of the Project mid-term review and implementation completion report (ICR)
- Design and implementation of the Project's information and communication activities

- MLWS - PMO and WUC - PMO running costs, including logistics, equipment, and other operating requirements associated with the Project implementation
- Gender balanced community consultation and communication activities with project beneficiaries, affected people and primary stakeholders. Balanced participation of men and women should be ensured.

Economic and Financial Analysis

31. This economic and financial analysis assesses the economic and financial benefits and related costs arising from investments implemented under Components 1 and 2 (Table A1.3). The results of the economic and financial analysis show that the Project is economically and financially viable with returns in present value of US$72 and US$3 million, respectively, when a 6 percent rate of return is used. The FIRR is 18.5 percent and the EIRR is 11.4 percent. This analysis is presented in detail in this Annex, complemented with sensitivity analysis.

32. The cost-benefit analysis carried out for Component 1 and 2 was undertaken from economic and financial perspectives. From an economic perspective, it was evaluated by converting financial cash flows into economic cash flows to eliminate distortions caused by taxes, subsidies and other externalities. From a financial perspective, it was evaluated by estimating costs and benefits at market prices, in the same way WUC will be paying or receiving from each input. The cost-benefit analysis estimates the economic/financial feasibility of the Project by calculating the net present value (NPV) of cost and benefit streams and by determining the EIRR/FIRR of the Project.

Table A1.3. Component 1 and 2 investments, expected benefits and cost estimates

Component 1. Availability of water supply and efficiency of services (US$114.05 million)			
Management Center	Infrastructure Investments	Expected benefits	Investment Estimates (US$ million)
Selebi-Phikwe	Selebi Phikwe to Serule water transfer scheme	Expansion of the water transfer scheme to increase availability and reliability water supply; and, reduce NRW	20.00
Letlhakane	Boteti Southern and Central Cluster Villages water supply scheme	Equipping of boreholes and construction of a water treatment plant, among other works, to meet insufficient water supply and decrease water rationing	20.00
Letlhakane	Mosu, Mokubilo and Mmea villages	Construction of needed pipeline to increase availability and reliability water supply	0.30
Ghanzi	Ghanzi township, Kuke, Bere,	Rehabilitation and upgrading water treatment, transmission and distribution infrastructure to increase availability and reliability water supply	10.95
Masunga	North East and Tutume Sub District water supply upgrading project	Upgrading of the North East and Tutume Sub-District water supply scheme to increase availability and reliability water supply; and, reduce physical losses	22.00
Masunga	Sowa Master Plan (Nata Manxotai and Maposa scheme)	Construction of the Dukwi-Nata Cluster Villages water supply scheme to increase availability and reliability water supply; and, reduce physical losses	18.50
Lobatse	Mmathethe and Mokatako	Expansion of the water transfer scheme to increase availability and reliability water supply; and, reduce NRW	9.30
Kanye	Kanye/Moshupa	Drilling, equipping and construction of interlinking pipework to increase availability and reliability water supply	3.00

Molepolole	Malwelwe/Molepolole/Thamaga/Thebephatswa (Phase 2)	Connection of boreholes and construction of interlinking pipework to meet insufficient water supply and decrease water rationing	10.00
Component 2: Improve wastewater and sludge management (US$21.65 million)			
Francistown	Mambo WWTP rehabilitation	Refurbishment and upgrade of WWTP to meet standards and enable wastewater treated effluent reuse/reclamation	16.00
Letlhakane	Wastewater treatment ponds expansion	Expansion of available ponds to receive and treat more sludge (about additional 900 m^3/day). This will avoid haulage of sludge to Serowe, which is located more than 100 km away	5.00
Lobatse	Lobatse WWTP rehabilitation	Refurbishment and upgrade of WWTP to meet the WMA 98 standard. Capacity of the WWTP to be expanded by about 1,700m^3/day; and enable wastewater treated effluent reuse/reclamation	0.65
Total			135.70

Methodology and assumptions

33. This economic and financial analysis evaluates the economic impact of improvements in water supply and wastewater treatment in eight MCs (Ghanzi, Francistown, Kanye, Letlhakane, Lobatse, Masunga, Molepolole, and Selebi Phikwe) benefiting from physical investments made under Component 1 and 2.

34. **Cost-benefit analysis**[33]. The economic/financial feasibility analysis of the Project compares estimated economic/financial benefits of the Project with its economic/financial costs. As the Project costs are given, the primary analytical challenge of this analysis is to most accurately estimate the expected benefits that are likely to occur as a result of project implementation.

35. From the economic analysis, costs include the investment costs of schemes under Component 1 and 2, which will be incurred during the project life; maintenance and rehabilitation cost, calculated as a percentage of the investment cost (4 percent used); and operational costs for the water supply and wastewater treatment facilities financed under Component 1 and 2.

36. The net benefit is the difference between the incremental benefits and the incremental costs of two scenarios: "*without*" and "*with*" the Project. The "*without*" Project scenario considers that utility consumers will face continuous deteriorating services. The "*with*" Project scenario considers the proposed Project and its associated targets.

37. In case the Project will not be implemented (the "*without*" Project scenario), for the purposes of the analysis it is assumed that the quality of service provision will not change and/or will decline and so

[33] Cost-benefit analysis is a method for comparing the economic pros and cons of policies and programs to help policymakers identify the best or most valuable options to pursue. Cost-benefit analysis monetizes all major benefits and all costs associated with a project so that they can be directly compared with each other as well as to reasonable alternatives to the proposed project. A cost-benefit analysis is generally considered the most comprehensive approach and, in many ways, the gold standard. World Bank, Investment Project Financing Economic Analysis Guidance Note, 2014.

will the efficiency with which the service is provided. *At present*, people in the project areas consume between 25 liters per day (in Bere settlement) and 65 liters per day (Kanye), for an average weighted per capita consumption in the project areas of 47 liters per day, which is below the national average per capita consumption of 53 liters per day. WUC is often required to complement consumption by bowsing water to project areas, which requires transportation over long distance given the scattered nature of settlements. Since 2012 WUC has not been able to provide a continuous water supply due to the chronic drought, which has led to 8 hour water rationing three days a week in most MCs. This situation has led to various coping strategies including installing household water reservoirs. Currently, the influent received at the Mambo WWTP from nearby towns–Francistown and Tati Siding- includes industrial waste, which is partially treated and does not meet the BOBS standards. Consequently, the effluent that is currently discharged to Tati River, is high in COD, ammonia, phosphate, turbidity, total suspended solids, total coliforms, and fecal coliforms. The Tati River is a tributary of the Shashe River which feeds into the Dikgatlhong Dam (located 50km downstream). Since the Dikgatlhong Dam supplies potable water to the city of Gaborone, it is essential that the quality of discharged effluent from the Mambo WWTP stringently meets the national legislated standards during the construction and operational phases of the Project. Physical losses in the schemes under the Project are estimated at between 30 to 40 percent, but there is inadequate information for estimating accurate losses for all the subprojects as some do not have accurate data on physical losses. Years of underinvestment and poor maintenance have resulted in an asset base that is in dire need of replacement and upgrading, in particular in those systems that were not under WUC management before the sector reforms. Without investments under Components 1 and 2 the services that are provided to customers will deteriorate. For instance, it can conservatively be assumed that technical or physical losses will continue to escalate, as seen in recent years, emergency maintenance will increase as a result of system and equipment failures, and the current quality of effluent from WWTPs will be the same if not worse.

38. Under the Project (the "*with* "Project scenario) the selected investments were carefully chosen. The activities were appraised measuring their flow of costs and benefits for the lifetime of the proposed infrastructure investments, estimated at 40 years for most of the investments to be made in water supply and wastewater treatment rehabilitation and expansion. The Project will make available an average of 75 liters per capita per day for each of the schemes, eliminating the need for bowsing and building household reservoirs as continuity of water supply is expected to be improved. As mentioned earlier, investments under Component 2 aim at improving the quality of wastewater treated effluent to comply with Botswana Standard 93.

39. The capacity building activities under Component 3 are important as they will help to improve IWRM, the governance of the water and wastewater, and will also help improve the efficiency and quality of services, because they essentially create and/or strengthen the enabling environment in which WUC and MLWS operate. Despite anticipated benefits from institutional strengthening and capacity building activities the economic and financial analysis focuses only on the investment under Components 1 and 2.

40. Costs and benefits are expressed in constant prices as of 2016.

41. **Discount rate**. The analysis was done using two discount rate assumptions: 6 and 10 percent. The 6 percent discount rate assumption corresponds to the recent World Bank guidance regarding discount rates for use in economic analysis[34].

Economic Analysis

42. **Benefits.** Project beneficiaries include existing consumers who will benefit from improved water supply and improved wastewater services. Other beneficiaries include participating MCs benefiting from investments made under Components 1 and 2. The Project will contribute to improve WUC's efficiency as it will support efforts towards financial and operational sustainability.

43. **Water Supply Benefits**. The Project aims at address immediate drought impact and enhancing water security. Benefits expected from the proposed investments include: (i) elimination of water rationing; (ii) additional water sales arising from increasing residential and non-residential demand; (iii) additional water sales arising from greater availability of water derived from decreased technical losses in the Masunga North East and Tutume Sub District and Ghanzi water supply schemes; and (iv) savings in operating costs due to reductions in technical losses in the same scheme. The total number of beneficiaries at full capacity of the infrastructure implemented under the Project is about 460,000. In addition, investments under Component 1 will benefit industrial, commercial, and government institutions; for instance, the works for the Selebi Phikwe scheme are expecting to benefit four large boarding schools in the area, which have a seasonal population of about 7,000 students.

44. **Elimination of water rationing.** Due to the on-going drought and limited water supply capacity of some schemes, services are not continuous in most MCs and water supply is rationed (three days a week for eight hours). From the customer perspective, water rationing has mainly been addressed in one of the following three ways: (i) drilling new water wells; (ii) buying water from water vendors; and (iii) building storage tanks to store water. For the Project, the rationing cost or coping costs used in this evaluation is the last one (the cost of building and operating storage tanks estimated at US$150 per reservoir), plus the average tariff per cubic meter (used as a proxy for the willingness to pay for the water that is not consumed due to rationing, see Table A1.4). The total rationing cost is estimated as the volume of water rationed times the unit rationing cost.

Table A1.4. WUC Tariff schedule for potable water

Schedule	Minimum charge	Price per m^3 per block of consumption (BWP per m^3))					Average price (BWP per m^3)
		0-5	>5-15	>15-25	>25-40	>40	if consumption is 20 m^3/month
1	50	7.2	19.2	25	40	50	19.1
2	20	2	8	13	20	25	8.8
3	20	2	8	13	20	22	8.8

[34] Based on estimated GDP per capita growth rates. The economy in Botswana is expected to rebound with projected GDP growth rates of 3.7 percent and 4.3 percent respectively in 2016 and 2017, driven mainly by an expected improvement in diamond prices as developed economies stabilize and fiscal stimulus that will propel non-mining activity. World Bank. Discounting Costs and Benefits in Economic Analysis of World Bank Projects. May 9, 2016.

4	20	2	6	11.5	15.5	22	7.4

Source: WUC, 2016. Tariffs as of April 1, 2015. In BWP per m^3
Note: Schedule 1 only applies to GoB entities; Schedules 2, 3, 4 apply to domestic, commercial and industrial customers based on their MC.

45. **Additional water sales arising from increasing residential and non-residential demand.** Due to the rehabilitation and extension of water supply infrastructure, leading to additional water production, it is expected that existing household connections will increase their water consumption (incremental demand) from an average of 47 liters/pp/day to about 75 liters/pp/day at Project closing. The incremental demand from existing water connections is expected to generate additional sales for WUC.

46. The estimated demand from households, based on 2015 WUC operational data, is as follows: assuming that 80 percent of household connections are metered, 95 percent of the metered connections are billed, 95 percent of bills are collected, and 62 percent of the water consumption is residential. The average household tariff per m^3 applicable varies by water supply as there are currently three schedules for residential customers (schemes 2, 3, 4 in Table A1.4), and it ranges between 7.4 to 8.8 BWP/m^3. Hence, based on the existing and projected capacity of the schemes it is expected that the additional residential consumption accounts for about 3.5 Mm^3 per year.

47. Similarly, to calculate the increase in non-residential consumption 2015 WUC data is used. About 38 percent of the water produced in 2015 was used by non-residential customers (16 percent commercial and industrial sector and 22 percent government institutions). The tariff applicable to government consumption represents a high subsidy to WUC operations as it is more than twice the average tariff applicable to residential and industrial customers: BWP 19.1 per m^3 (Table A1.4). It is estimated that annual government, commercial and industrial sectors will consume an *additional* 2.2 Mm^3 /year by 2021.

48. **Additional water sales arising from greater availability of water derived from decreased physical losses**. The Masunga (North East and Tutume Sub District) and Ghanzi water supply schemes to be rehabilitated under the Project will lead to reductions in technical losses, which in turn will lead to a greater amount of water billed and collected. The average level of existing technical losses in the Masunga and Ghanzi water supply scheme is 40 percent and Project investments will aim to reduce losses to 25 percent given the advanced state of dilapidation of the infrastructure. If the indicated investments are not implemented, given the current condition of the systems it is forecasted that technical losses will continue to increase from about 1.1Mm^3 per year lost at the moment. Under a conservative scenario it is assumed a 1 percent point increase per year if measures are taken to reduce technical losses. The estimation of additional water sales is based on reductions in technical losses, assuming that 80 percent of the water saved is billed and 95 percent of water billed is collected. Additional water sales are valued at the current average water tariff applicable to the respective MC.

49. **Savings in operating costs due to reductions in technical losses**. The benefits of savings on operating costs are estimated as unitary operating costs times the volume of water produced, which will be lower due to water loss reduction. The unit water supply operating cost reported by WUC for 2015 is about BWP 6 per cubic meter of water supply treated, including energy, staff, chemicals and other operating costs. This savings only apply to reductions in technical losses in the Masunga and Ghanzi water supply schemes.

Table A1.5. Present value of economic benefits of water supply investments

Benefit (US$, million)	**6%**	**10%**
Elimination of water rationing	58	35
Additional water sales arising from increasing residential and non-residential demand	36	22
Additional water sales arising from greater availability of water derived from decreased technical losses	13	9
Savings in operating costs due to reductions in technical losses	17	12
Total	124	77

50. The estimated economic benefits of the water supply investments to be implemented under the Project, using 6 and 10 percent discount rates, are presented in Table A1.5.

51. **Wastewater Treatment Benefits**. The Project includes wastewater treatment investments in Francistown and Tatisiding (Mambo WWTP), Letlhakane (Letlhakane WWTP), and Lobatse (Lobatse WWTP). The total number of direct and indirect beneficiaries of those investments is about 177,000. These subprojects include: upgrading of existing facilities to comply with effluent standards so that the wastewater treated can be reuse for agriculture and other purposes; and expansion of wastewater treatment facilities to allow for higher volumes of sludge and wastewater to be treated. As such, the Project will not finance new or rehabilitated connections to the sewerage system. Hence, the benefits of the wastewater treatment system include (i) increase in revenues from higher volumes of wastewater treated due to higher volumes of water supply; (ii) increased quality of the effluent from wastewater treatment facilities; (iii) avoided cost of sludge transportation; and, (iv) increased revenue from sludge emptying at Letlhakane WWTP.

52. **Increase in revenues from higher volumes of wastewater treated due to higher volumes of water supply**. Wastewater treatment revenues are calculated based on the wastewater service charge. Service charges are estimated by multiplying the volume of water billed to households with sewerage service by current wastewater treatment tariff (Table A1.6). As of 2015, only 19 percent of household connections were connected to the sewer. At Project completion, it is expected that more than 25,000 cubic meters per day of wastewater will be treated in the WWTPs under the Project at the prevailing standards: 15,000 in Francistown/Mambo WWTP; 3,180 from Letlhakane WWTP; and, 6,000 from Lobatse WWTP.

Table A1.6. WUC Tariff schedule for wastewater treatment

Schedule	Minimum charge	Block of consumption (in m^3 per month)				
		0-5	>5-15	>15-25	>25-40	>40
All	Not applicable	0.5	2	3	4	5

Source: WUC, 2016. Tariffs as of April 1, 2015. In BWP per m^3 per month

53. **Increase in quality of the effluent from wastewater treatment facilities.** The value of this benefit is difficult to measure. However, the wastewater surcharge paid by the consumers is used as a

proxy on the willingness to pay for improved quality of the effluent. As indicated in Table A1.6 this is a minimum fee paid based on the water consumed per month. For purposes of the calculation, only the fee paid by the direct beneficiates of the wastewater treatment investments has been considered, although the benefitting population is expected to be larger given that the dams and rivers where the effluent is disposed are used by a larger amount of people. Also, it is important to note that this benefit does not take into account greater volumes of wastewater reused and/or reclaimed as no accurate data is available.

54. **Avoided cost of sludge transportation for Letlhakane WWTP.** In the case of the Letlhakane wastewater and sludge treatment improvements there will be an avoided cost of haulage of sludge to the nearest treatment facility located in Serowe, about 200 kilometers from Letlhakane. At present the cost of transportation is about BWP 900 per trip, paid directly by the household to a private emptier and sludge transportation company. Due to the inadequacy of the ponds at Letlhakane more than 70,000 m^3 per year is transported to Serowe.

55. **Increased revenue from sludge emptying at Letlhakane WWTP**. The increased amount of sludge treated by the ponds in Letlhakane once the rehabilitation and expansion under the Project is completed will improve WUC's revenue stream. About 1,000 m^3 per day of additional sludge is expected to be treated. The fee to be paid to WUC is about BWP 100 per a 10 m^3 truck.

56. The estimated economic benefits of the wastewater treatment investments to be implemented under the Project, using 6 and 10 percent discount rates, are presented in Table A1.7.

Table A1.7. Present value of economic benefits of wastewater treatment investments

Benefit (US$, million)	6%	10%
Increased quality of the effluent from wastewater treatment facilities	88	51
Increase in revenues from higher volumes of wastewater treated due to higher volumes of water supply	98	57
Avoided cost of sludge transportation for Letlhakane WWTP	86	52
Increased revenue from sludge emptying at Letlhakane WWTP	5	3
Total	276	163

57. **Other Benefits**. Besides direct preventable economic losses, there are many other potential benefits that are not factored into the cost-benefit analysis described here. This is either because estimating such benefits is difficult due to the lack of data or it is challenging to quantify the value of those benefits because they might not be financial or economic in nature; for instance, access to improved water supply provides dignity. Some of the benefits excluded from the economic analysis are referred below.

58. *Enabling greater volumes of wastewater reuse and reclamation*. As demand for water increases in the future of Botswana, it will become necessary to optimize the use and reuse of all water sources and minimize losses and wastage. The top priority for use of treated effluent is to replace water supply demand currently using potable water but which does not require water of potable quality for the particular application. Investments included under Component 2 will enable greater volumes of wastewater to be reused and reclaimed. Rehabilitating existing facilities so that they comply with the BOBS Standards for treated effluent, will enable increased wastewater reuse. Current levels are

between 5 to 10 percent country wide - mainly for agriculture and industry purposes. Depending on the technology used and public perception and acceptance, the treated effluent could also be potentially used for potable water. For the purposes of this economic analysis this benefit is not estimated due to lack of data on wastewater flows, the market for it, and cost and pricing related information.

59. *Environmental benefits from higher volumes of wastewater treated at prevailing standards*. The Project will also produce public health and environmental benefits in those MCs where existing wastewater (including sludge treatment) facilities will be rehabilitated and upgraded. These environmental benefits will be reflected, for instance, in the reduction of environmental pollution loads and reduction in greenhouse gas emissions. The environmental and associated socio-economic benefits that Component 2 will bring include: water pollution control; savings on medical costs, due to reduction of illnesses from improper wastewater discharge and lack of treatment; savings on maintenance costs of the roads after adequate sewage collection is in place; potential scale up of commercial and industrial activity; potential benefits from water quality improvement along the rivers; and savings in public and household health expenditure due to increased labor productivity. Not enough data is available at the moment to calculate these benefits.

60. *Environmental benefits from recharging of groundwater sources.* Some of the schemes included under Component 1 are designed to allow one or more sources of groundwater water to be used as an alternative and/or back-up source should the need arise. As such, the Project will release pressure on existing boreholes and allow for the alternative/ back-up source to recharge so as to ensure the protection and sustainability of these groundwater sources. During project implementation groundwater assessments will be conducted as part of environmental impact assessments, so that the sustainability of the source is confirmed; this data will allow economic benefits to be assessed.

61. *Impact on women and girls*. A key impact of the Project is the reduction of the time spent by families on water collection from stand posts and bowsers (when delivery is not directly done at the household). Water collection is generally the responsibility of women and young girls: the Project will free time for them to engage in productive or educational activities generating substantial additional wealth and increasing the likelihood of girls receiving formal education. The Project will also create opportunities for women to participate in water committees and other community-based organizations and so contribute to a fairer gender balance in the management of water services.

62. *Decrease in morbidity and mortality rates*. The economic analysis does not consider the impact of improved water and sanitation services on both morbidity and mortality associated water borne and water related diseases. In addition to the expected reduction in diarrhea incidence, literature suggests that the effects of improved water and sanitation on child mortality go beyond their direct diarrheal effect. By lowering the exposure to fecal-transmitted diseases, access to improved water and sanitation also considerably lowers the risk of malnutrition as well as the risk of severe infection with other (not fecal-transmitted) diseases, enhancing the chances of survival for protected children[35]. Depending on the type of intervention, 10 to 27 lives per 1,000 births could be saved could among under-five year old population due to investments in water supply and sanitation. The morbidity and mortality benefits are not estimated as part of this economic analysis.

[35] The Impact and Cost of Water and Sanitation Infrastructure. Isabel Günther and Günther Fink. Policy Research Working Paper, 5618. March 2011.

63. Therefore, the estimated benefits of the Project described in this analysis can be considered conservative and it can be reasonably assumed that the actual benefits will be larger than the ones estimated by this economic analysis.

64. **Project costs**. The Project costs are the investments required for the various project activities, and the corresponding operation and maintenance costs associated with ensuring that the investments can generate the water and wastewater services in the short, medium, and long-term. A four percent maintenance and rehabilitation cost per year was assumed to ensure that the investments made under the Project are sustained over time. In addition, unit operation costs per cubic meter were multiplied by the respective volumes of additional water consumed (residential and non-residential and water savings from technical losses) and increasing wastewater treatment due to more water supply in the system and increasing wastewater treated in the three WWTP financed under the Project. The present value of the costs associated with the economic benefits estimated under this financial analysis are presented in Table A1.8.

Table A1.8. Present value of the costs associated with the estimated economic benefits

Cost (US$, million)	**Component 1 and Component 2**	
	6%	**10%**
Production costs (additional water sales residential and non-residential)	28	17
NRW associated production costs	18	13
Wastewater treatment	99	59
Investment cost and associated maintenance and rehabilitation costs	184	142
Total	**329**	**231**

65. **Consolidated Results of Economic Analysis.** The Project is economically viable when analyzed as a whole as well as component by component. Indeed, the cost benefit analysis for all subprojects analyzed generate positive rates of returns. The results of the analysis are robust, given that not all of the possible benefits of the Project were included because of the difficulty in quantification and valuation. For example, when the benefits of a reduction in greenhouse emissions are included the EIRRs increase significantly. The EIRR of the Project is 11.4 percent. A summary of the present value of benefits and cost, and the NPV of the Project, under the two discount rate scenarios, is presented in Table A1.9.

Table A1.9. Summary results of the economic analysis

Results	Component 1 and Component 2	
	6%	10%
Present value of benefits (US$, millions)	400	240
Present value of costs (US$, millions)	329	231
Net present value (US$, millions)	72	9
Benefit-cost ratio	1.2	1.0

Financial Analysis

66. Results of the financial analysis show that the Project is financially viable when the utility expands access to services and achieves reductions in technical losses for selected schemes under the Project. Under the set of assumptions considered[36], the IRR of the activities considered under the financial analysis is 18.5 percent and the NPV is US$3 million, using a 6 percent rate of return.

67. **Financial Benefits.** The financial benefits of the Project were measured in financial terms as the increase of revenue for WUC. Revenues were measured as volume of water billed times the average tariff per cubic meter, and then affected by a metering ratio of 80 percent and the collection revenue rate of 95 percent. No tariff adjustments were assumed for the financial projections. The increase of revenues will come from:

a. Additional water sales arising from increasing demand from existing connections;
b. Additional water sales arising from greater availability of water derived from technical losses reductions in the Masunga North East and Tutume Sub District and Ghanzi water supply schemes;
c. Savings in operating costs due to reductions in technical losses in the Masunga North East and Tutume Sub District and Ghanzi water supply schemes;
d. Increase in revenues when higher wastewater treatment occurs;
e. Avoided cost of sludge transportation for Letlhakane WWTP;
f. Increased revenue from sludge emptying at Letlhakane WWTP;

68. **Consolidated Results of Financial Analysis.** The FIRR for the Project is 18.5 percent. Table A1.10 summarizes annual values of the Project financial benefits and their present values, using a 6 and 10 percent discount rate.

Table A1.10. Summary results of the financial analysis

	Component 1 and Component 2	
Results for each discount rate	6%	10%
Present value of benefits (US$, millions)	224	136
Present value of costs (US$, millions)	262	159
Net present value (US$, millions)	3	2
Benefit-cost ratio	0.86	0.85

69. **Sensitivity Analysis.** A sensitivity analysis was carried out to measure the impact on the economic and financial results when changes in the production, treatment cost and technical loss reduction forecasts occur, assuming a 6 percent discount rate. Given the benefits accounted for in this economic analysis, changes in certain parameters does not compromise the economic viability of the Project.

[36] Most of the assumptions made to calculate the economic benefits and costs are kept for the financial analysis, unless otherwise stated.

70. *Changes in production and treatment costs*. A 30 percent increase and decline in production and treatment cost for water supply and similar for wastewater treatment were considered. The Project remains economically and financially viable under a 30 percent increase in these costs, as seen in Table A1.11.

Table A1.11. Sensitivity analysis for variations in production and treatment costs

Scenario	Economic Results		Financial Results	
	EIRR (%)	NPV	FIRR	NPV
Increase of 30%	8.7	36	5.1	-2
Base scenario (existing costs)	11.4	74	18.5	3
Decrease of 30%	14.1	111	129	49

71. *Changes in technical losses - trends*. A 30 percent deviation (in both directions) from the NRW targets was evaluated. The Projects remains viable even if the utility misses the NRW target by 30 percent, as seen in Table A1.12.

Table A1.12. Sensitivity analysis for variations in technical losses targets

Scenario	Economic Results		Financial Results	
	EIRR (%)	NPV	FIRR	NPV
Overachieving targets by 30%	11.8	78	37.1	8
Base scenario	11.4	74	18.5	3
Missing targets by 30%	11.0	69	6.1	-1

ANNEX 2: IMPLEMENTATION ARRANGEMENTS

COUNTRY : Botswana
Emergency Water Security and Efficiency Project

Project Institutional and Implementation Arrangements

1. In 2009, the GoB restructured the water supply and sanitation sector in order to separate service delivery and policy functions. The reform effort was supported by World Bank technical assistance through a RAS (2008). Through the reform water and sanitation services were consolidated under WUC (which previously managed five urban schemes). By 2013 WUC had assumed responsibility for all 540 waters supply schemes and all wastewater systems nationwide from MLWS (DWA) and District Councils. However, WUC and District Councils still retain joint responsibility for ensuring access to sanitation services at household level.

2. Currently, MLWS is responsible for the formulation, direction, coordination, development and implementation of national policies and programs for land management, water and sanitation. The Ministry carries out these responsibilities through various divisions, departments and parastatals. In the water sector the DWA, MLWS - PMO and WUC are responsible for water matters. Other key agencies include the Department of Geological Survey (DGS), Department of Local Government and Development (DLG&D), Local Authorities, Ministry of Agriculture (MoA) and the Department of Waste Water Management and Pollution Control (DWWMPC). The Permanent Secretary is the officer in charge of the Ministry and there are various officers under his supervision. All projects implemented under the Ministries portfolio are managed by the MLWS - PMO. The MLWS - PMO is headed by a Programme Coordinator.

3. With respect to the Project, as Borrower and Implementing Agency, MLWS will take the lead role in overseeing implementation through its MLWS – PMO, which will be responsible for overall Project coordination, and consolidation of monitoring and reporting functions. This includes the preparation of a consolidated work plan, procurement plan, monitoring reports, financial reports, and fulfilling other legal requirements for the Project.

4. MLWS - PMO will also be responsible for enabling the implementation of Component 3 institutional and capacity building activities that fall under the mandate of MLWS (DWA). Based on the division of responsibilities for all Component 3 activities agreed between MLWS (DWA) and WUC, a Component 3 work program and procurement plan identifying the specific activities and budgets allocated for WUC and MLWS (DWA)— including training, capacity building, technical assistance and studies, will be prepared and updated annually. Each entity (MLWS - PMO, and WUC) will be responsible for preparing the inputs to the annual work program and procurement plan (e.g. TOR, budgets). The MLWS - PMO will consolidate information provided by WUC and MLWS (DWA) for the Project as a whole. To do so, MLWS - PMO intends to procure additional M&E, procurement and financial management capacity.

5. The DWA, a unit within MLWS, is the Government lead on water resources policy and management, including the IWRM Strategy, the National Water Master Plan, the Sanitation Master Plan

and draft Water Conservation Policy. In addition, it is responsible for monitoring and regulating water resource use; and developing long term strategic water supply schemes.

6. With respect to the Project MLWS (DWA) will be responsible for the day to day implementation of priority sector reform and capacity building activities identified under Component 3. This includes updating, revising or rolling out policy, regulations, legislation, plans and strategies to strengthen climate change adaptation, drought and water resources management. For this purpose, DWA has assigned existing focal points to lead the implementation of these activities; but it will work through the MLWS - PMO to execute these functions. As noted above MLWS - PMO will assign procurement and financial management staff to support DWA in the execution of tasks identified under Component 3 of the Project. DWA focal points will report to the Deputy Secretary responsible for the MLWS - PMO who will provide the necessary support for the implementation of all MLWS activities.

7. WUC was established by the Water Utilities Corporation Act of 1970 with the mandate of providing potable water to Botswana's urban centers. As a corporation, WUC is expected to operate on commercial lines, including accessing both private capacity and private finance to support the delivery of water services. However, since the 2009 reforms, when its mandate was expanded to include 540 schemes nationwide, including many small and remote rural schemes, it has been receiving subsidies from GoB. WUC is responsible for delivering water to domestic, manufacturing, and commercial customers countrywide; mining and energy users in remote areas often develop ground water supplies independently. WUC also has operational responsibility for waste water and water treatment, pumping, storage and distribution to customers, and has partial responsibility for sanitation services

8. With respect to the Project, WUC will be the implementing agency for Component 1, 2 and part of 3. In this capacity, WUC will be responsible for the bulk of project implementation. WUC will discharge this implementation function through its WUC - PMO, which currently falls under the Technical Services Department. As part of an ongoing institutional restructuring effort, the capacity of both MLWS and WUC - PMO's will be strengthened. As responsibility for the day to day management of WUC activities will be delegated to the WUC - PMO, a dedicated team of experts will be contracted to support: financial management, procurement, monitoring and evaluation, environmental and social safeguards and project coordination functions. These experts, will be dedicated to the implementation of the Project. WUC - PMO will implement the proposed subprojects and activities through its existing structures under the supervision of the Technical Services Department and WUC's management team. The execution of investments and activities supported by the Project will therefore be led by designated Project Engineers as part of the overall NDP 11 work program. In line with current practice, where necessary WUC will also support the MLWS – PMO and MLWS (DWA), in the execution of their obligations under the Project.

9. **Project Oversight Arrangements**. High level project progress updates will formally be communicated weekly, monthly and quarterly by the Project teams. Firstly, the portfolio will be reported through MLWS - PMO during the existing weekly Ministers' Dashboard meetings. These meetings chaired by the MLWS - PMO coordinator are held every Friday of the week. In preparation for these meetings, progress updates for WUC will be coordinated by the WUC - PMO as the secretariat and submitted to MLWS - PMO every Thursday, as is common practice (progress updates for DWA follow the same process). All project managers and the MLWS - PMO and WUC -PMO managers are members of this dashboard meeting. They will track weekly progress and report progress on behalf of WUC. The

existing progress reporting templates that have been adopted by MLWS - PMO will be adopted as reporting tools.

10. Lastly, the Project team will generate information for the GoB quarterly report called "His Excellency's" report. The MLWS PS and his executives, the DWA executive and the WUC executive management form the team that presents this report to Office of the President. This report is also coordinated by the respective strategy offices for WUC, DWA and WUC. MLWS overall performance is graded on the basis of the outcomes from this report.

Financial Management

11. The World Bank conducted an FM assessment of WUC and MLWS as required by the World Bank's policy on Financial Management, OP 10.00[37]. WUC and MLWS will be the implementing entities for the proposed Emergency Water Security and Efficiency Project. The main objective of the assessment, which included a review of the budgeting, accounting, internal controls, flow of funds, financial reporting, auditing arrangements at WUC and MLWS, and completion of FM assessment questionnaire by some officials of the entities, was to ensure that acceptable financial management arrangements are in place for the implementation of the Project. Acceptable FM arrangements ensure that:

a. Funds are used for the intended purposes in an efficient and economical way,
b. All transactions and balances are correctly recorded to support preparation of regular and reliable financial statements that are subject to auditing arrangements acceptable to the World Bank, and
c. Internal controls are considered capable of safeguarding the entity's assets.

12. WUC and the Government through MLWS will implement the Project. The implementing entities' Finance units will be responsible for the FM aspects of the project implementation. WUC, established in 1970, is wholly owned by the Government and dominates the water sector by providing potable and wastewater services in Botswana.

Overview of the Project and implementation arrangement

13. The Project is estimated to cost about US$160 million to respond to the Government's ongoing drought emergency by rehabilitating, augmenting and upgrading water supply and sanitation services. A detailed description of the Project and components is provided in Annex 1.

14. For the FM implementation of the Project, WUC and MLWS will use their existing FM systems with appropriate oversight by MFED. The following table shows the identified FM risks and the proposed mitigating measures. The risk rating is moderate.

[37] A further review will be conducted to assess any changes that may affect this rating following the merger of the Water and Sanitation functions in the Ministry with Land Management.

Table A2.1: FM Risk Mitigation Assessment

Risk	Rating	Risk mitigation measures	Residual risk	Negotiation/ effectiveness condition (Y/N)
Entity Level The FM units responsible for the FM of the Project are not familiar with and therefore has limited knowledge of the World Bank's FM and Disbursement policies and procedures.	M	The World Bank will conduct a comprehensive training on the World Bank's FM and Disbursement policies and procedures by effectiveness of the loan agreement. Staff in the Finance and the Internal Audit units will be encouraged to participate in the World Bank's periodic training program in FM and disbursement, and in courses organized by Bank recognized training institutions. MFED will be responsible for the preparation and submission of withdrawal applications and is familiar with the World Bank's procedures.	M	N
Project Level. Variations to the Project scope and supplier price variations might affect the budget estimates	M	Through review of the Project scope against the desired objective and sign off by both parties. Contingent budget provision for unavoidable variations.	M	N
Control Risk. Budgeting: due to the nature of the Project, the risk that budget process may not be based on realistic cost estimates and procedures for approvals and variations may not be clearly laid out.	M	WUC procurement procedures provides guidelines on scope variations of the projects. Variations are approved by management tender committee and board tender committees.	L	N
Accounting. No identified risk at this stage. WUC and MLWS prepares monthly financial statements reviewed by the audit committee of the Board. WUC uses the SAP accounting software, and MLWS uses GABS accounting software which are capable of producing the required financial reports. The Finance units are headed by the professionally qualified accountants with sound track record in finance.				N
Internal Controls and staffing. The risk that accounting policies and procedures may not be followed consistently might weaken the control environment. The FM assessment has identified vacancies in the FM unit that might compromise implementation of the Project.	M	WUC has an effective Internal Audit Unit. The Internal Audit that has unrestricted access to the chairman of the Audit Committee. That oversees WUC's internal control systems and their effectiveness. The Ministry also has Internal Audit supplied by the MFED. Through Component 3 of this project the staffing arrangements will be strengthened.	L	N

Risk	Rating	Risk mitigation measures	Residual risk	Negotiation/ effectiveness condition (Y/N)
Funds Flow. The risk of timely settlement of contractors and supplier's invoices and certificates as a result of likely placement of funds in fixed deposits.	M	WUC will maintain a separate bank account for the funds received from MFED under the IBRD Loan for the implementation of the World Bank financed components of the Project. The quarterly disbursement from MFED will be based on the contractors' agreed schedule of payments and cash forecasts.	M	N
Financial Reporting. Timeliness of reporting to MLWS that could impact on the submission of IFRs to MFED and the World Bank.	M	WUC produces timely quarterly financial statements and submits same to the Audit Committee for discussion. WUC will produce quarterly IFRs through its system and submit the reports to MFED through MLWS. Quarterly submission of the reports will be as agreed with Government in the loan agreement.	L	N
Auditing. No specific audit risk, both implementing entities are mandated by their establishing Acts to produce annual audited financial statements				N
Overall FM Risk Rating	M	The overall FM residual risk is "Moderate" with the implementation of the FM actions described in Table 28 below. The country, entity, and project levels inherent risks are mitigated by use of WUC's FM system, assessed as satisfactory for the implementation of the Project, and the functioning oversight arrangements provided by MLWS and MFED.	M	

Risk Rating: H (High), S (Substantial), M (Moderate), L (Low)

15. **Major strengths**. The Project FM is strengthened by the adequate external audit arrangements and the noted timely production of the financial statements and audit thereof within a period of four months. External auditors' observations and recommendations are followed-up promptly by the Audit Committee.

16. **Weaknesses and action plan**. WUC and MLWS have not been involved in the implementation of World Bank financed projects, the World Bank's FM specialist will deliver workshops on the World Bank's financial management and disbursement, policies and procedures, including reporting requirements. The assessment has also revealed a high vacancy rate at WUC and limited capacity on MLWS to absorb the Project. This will be addressed under the capacity building support in Sub-component 3.4.

17. **Budgeting**. WUC's budget cycle starts in June of each year with budgets compiled in three parts, namely, revenue, minor capital and major capital items. Capital items from BWP 250 000 are accompanied by project appraisal documents for presentation to management tender committee that consists of executive directors. These budget items are also accompanied by draft timetable showing dates and period of implementation. The heads of department are responsible for the analysis and

control of the expenditures for which they are accountable. These procedures are assessed to be adequate for the project implementation.

18. MLWS use the GABS for budgeting, accounting and financial reporting. MLWS will defend the Project's annual budget under the Ministry's budget, but as a line item. The Ministry will also submit "Project Memo" to MFED on quarterly basis, requesting for funds to finance the World Bank's eligible expenditure.

19. **Accounting**. WUC Finance unit is headed by the Chief Financial Officer, a professionally qualified accountant. WUC uses the SAP accounting software and the financial statements are prepared in accordance with International Financial Reporting Standards (IFRS). MLWS is headed by a highly qualified Finance Manager with Masters in accounting. MLWS uses GABS accounting software (run son Oracle). The systems are adequate to record and report on uses of the Project funds.

20. **Staffing**. WUC has six critical positions in the finance department. However, of concern is that three of these positions are vacant at the time of the assessment. The assessment has also revealed a limited capacity at MLWS to absorb this Project. This has been highlighted as one of risk to be mitigated. Both WUC and MLWS will contract additional expertise to ensure there is adequate capacity for financial management.

Internal control and internal audit arrangements

21. **Internal control**. Approval and authorization controls are documented in the policies and procedures manual and compliance therewith is monitored by well experienced accounting staff. The financial and accounting policies and manuals, including the payment, purchasing manual and procedures stock purchasing, payments processing will be adopted for the Project.

22. **Internal audit**. The internal audit department is headed by the Head of Internal audit at director level. The director reports to the Board functionally, through the Internal Audit Committee, and to the Chief Executive Officer (CEO) administratively. The department has six established positions. The review of audit committee charter, internal audit charter and internal audit manual gives assurance that this oversight function can relied upon. The review of the audit operational plan 2015/2016 and 2016/2017 has revealed adequate coverage of the business operations. However, four randomly selected reports between July 2015 and April 2016 revealed a number of audit actions that were not adequately addressed in the follow up audit.

Financial reporting

23. The Project will produce and submit IFRs to the World Bank on quarterly basis. These reports are designed to provide sufficiently detailed and timely information to the Project management, the coordination committee, MFED, and MLWS, and will include:

a. A narrative summary of the Project implementation highlights;
b. Sources and uses of funds by disbursement categories;
c. Uses of funds by project component/activity- both actual and cumulative;

d. The DA activity statement;

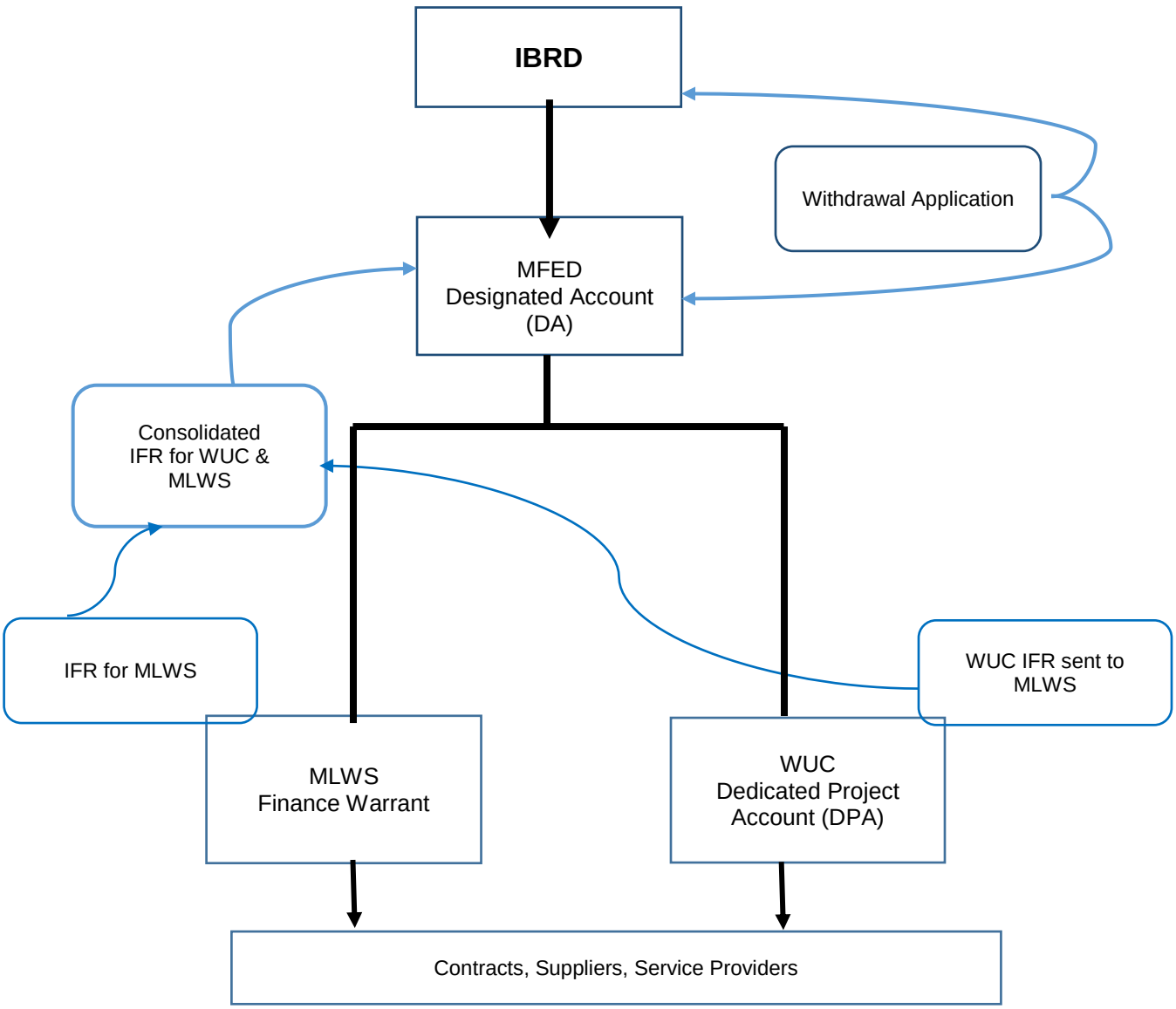
e. Summary of payments made for contracts subject to the Bank's prior review; and

f. Summary of payments made for contracts not subject to the Bank's prior review.

24. The accounting systems are capable of producing the quarterly reports. The reports will be submitted to the World Bank through MFED within 45 days of the end of the reporting period.

Funds flow and disbursement arrangements

Figure A2. 1. Funds Flow Diagram



25. **Flow of funds**. Upon the signing of the Loan Agreement, the World Bank will open a Loan Account in its books, in the name of the Government. Funds will flow from the World Bank (Loan Account) into a DA maintained by the Government through MFED at the Bank of Botswana. For the implementation of the World Bank financed components of the Project, WUC will maintain a local currency DPA into which funds will flow from the DA based on IFRs. MLWS will spend from the DA through the existing government procedures.

26. **Disbursement arrangements**. The Project will use the Advance Disbursement method whereby withdrawals from the loan account will be deposited in the DA for payment of the Bank financed eligible expenditures. Disbursements from the loan account will be based on quarterly IFR documents to be prepared and submitted by WUC and MLWS to MFED. The IFRs will be supported by documentation as may be required by MFED. For withdrawal from the loan account, MFED will be responsible for submitting withdrawal applications supported by IFRs, within 45 days of the end of each reporting period. The Government will also have the option of using: (i) the Direct Payment disbursement method involving direct payment from the Loan Account on behalf of the Government to suppliers of goods and services that have a value above a set threshold; (ii) the Reimbursement disbursement method, whereby the Government makes payments for the World Bank eligible expenditures and submits withdrawal applications for reimbursement; and (iii) the Special Commitment method whereby the World Bank at the request of the Government, will issue special commitments to suppliers of goods under the World Bank financed components. Upon the effectiveness of the loan agreement and submission of a withdrawal application, the World Bank will disburse an amount equivalent to six month's expenditure into the DA. Subsequent disbursements will be based on forecasted six-monthly estimated expenditure, taking into account the balance in the DA at the end of the reporting period.

Table A2.2 Eligible Expenditures

Category	Amount of the Loan Allocated (expressed in USD)	Percentage of Expenditures to be financed (exclusive of Taxes)
Goods, works, non-consulting services, consulting services, Training and Operating Costs under the Project	145,500,000	100%
Total	145,500,000	

Auditing arrangements

27. **Audited financial statements**. WUC's financial statement will be acceptable to the World Bank without a requirement for a separate audit report for the Project. The auditors will, however, express an opinion on the quality of IFRs produced and submitted to the World Bank during the period covered by the audit. The financial statement will also include a summary of all the withdrawals from the loan account during the period with assertion that the loan proceeds had been used for the intended purposes and in accordance with the Bank legal agreements. The Government will prepare the audit terms of reference in consultation with the World Bank to ensure adequate coverage of the scope of the audit. However, should the auditors opt to apply International Standard on Related Services (ISRS) 4400, being the Engagement to perform agreed upon procedures regarding the Bank funded activities, the arrangement will be acceptable to the Bank. WUC will be required to submit the normal audit report, management letter and the supplementary audit carried by Auditors under ISRS 4400.

28. MLWS produces a consolidated government accounts which might not be detailed enough to disclose the Project activities. To mitigate this risk, project specific accounts will be produced for the activities implemented by MLWS. The accounts will be audited by the office of the Auditor General. The following table identifies the audit reports that are required to be submitted to the Bank by the Government and the due date for submission.

Table A2.3: Audit reports

Audit report	Due date
Continuing Entity Financial Statements- April-March (WUC)	September 30 each year
Special opinion on the: (i) Quality of the IFRs used for withdrawal from the Loan Account (ii) Operation and usage of the DA (iii) Delivery of specified/agreed output/services- of the Project	As part of the annual audit report
Project Specific accounts – April – March (MLWS)	September 30 each year

29. **Supervision plan**. Based on the Project's "Moderate" FM risk rating, the Bank will carry out the onsite FM supervision of the Project twice a year. In addition, the Bank's FM specialist will carry out desk-based quarterly review of the IFRs and the annual audit reports.

30. **Governance and accountability**. WUC's governance arrangements and the oversight provided by the Government through MLWS, MFED, and other stakeholders, which include the general public, are considered adequate for the implementation of the Project. The Head of Internal Audit and the external auditors have unlimited access to the chairman of the board. The internal audit director also has access to the audit committee, the board or directly, depending on the issues at stake.

31. **Overall conclusion**. Based on the proposal to use WUC and MLWS's FM system for accounting and reporting the Project receipts, expenditures and asset management, including commitments, the overall conclusion of the assessment of the system is that the proposed FM arrangements meet the Bank's minimum requirements for financial management under OP 10.00.

Procurement

32. Procurement risk is rated "Moderate". For MLWS - PMO and WUC - PMO key issues for procurement include: (i) procurement planning not formalized and reinforced as a core part of project management leading to implementation delays; (ii) the current Procurement Unit (PU) staffing structure may not be suited to implementing capital projects; and (iii) the absence of a formal role of the PU in contract monitoring may impede speedy resolution of contractual matters. A PPSD was prepared to determine the approach to market, the selection methods and consequently the procurement plan. The PPSD concluded that both implementing agencies have the skills required for successfully planning, procuring, monitoring contracts and implementing large scale capital investment programs. However, measures must be put in place to ensure adequate human and institutional capacity to manage the procurement planning process, procurement document preparation, evaluation, award process and contract supervision of the various packages. In addition, there is adequate capacity, both in terms of numbers and capability, of contractors and consultants to compete for the packages, which are considered attractive because their values are high and complexity is within range of what has been executed before.

33. **Risk Mitigation Action Plan**. Proposed corrective measures to mitigate the overall risks include: (i) in conjunction with technical departments, develop a procurement plan and agree on responsibilities for its implementation; (ii) assigning a dedicated procurement officer to support project procurement; and (iii) contracting additional expertise to increase capacity; and (iv) formalizing the role of procurement officers in contract monitoring and developing a contract monitoring plan. Actions indicated in Table A2.4 are proposed to mitigate the procurement risk and facilitate the implementation of the Project.

Table A2.4. Procurement Management Action Plan to Mitigate Procurement Risk

Risk	Mitigation/Action	Responsibility
Procurement planning not formalized and reinforced as a core part of project management leading to implementation delays.	In conjunction with technical departments, develop a procurement plan and agree on responsibilities for its implementation.	MLWS/WUC
The current PU staffing structure may not be suited to implementing capital projects.	Assigning a dedicated procurement officer to support project procurement and contracting additional expertise as needed.	Bank/MLWS – PMO and WUC - PMO
The absence of a formal role of the PU in contract monitoring may impede speedy resolution of contractual matters.	Formalizing the role of procurement officers in contract monitoring and developing a contract monitoring plan.	Bank/MLWS – PMO and WUC - PMO

34. All procurement to be financed under the proposed project will be carried out in accordance with the World Bank's New Procurement Framework (NPF) that became effective from July 1, 2016 (in particular the Procurement Regulations for IPF Borrowers, July 2016) and the provisions stipulated in the Legal Agreement. The Project will carry out implementation in accordance with the 'Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD and IDA and Grants', dated July 1, 2016 (the Anticorruption Guidelines).

35. The Public Procurement and Asset Disposal (PPAD) Act of 2002 established the PPAD Board which is responsible for all public procurement and asset disposal. The PPAD Act applies to MLWS. Being a state owned entity, WUC procurements are subject to the WUC Tender Regulations and Procurement Procedures of July 2016.

36. The PPAD Board or its committees established at Ministerial level (called MTCs) are responsible for adjudication (approving key procurement decisions like recommendations for contract award) of all procurements done at Ministry level. In practice the accounting officer (Permanent Secretary) at Procuring Entity level recommends to PPADB the staff within his/her entity to serve on the MTC. These staff though based at Ministry level serve on the MTC as agents of PPADB and not as agents of their Ministry. MTCs are therefore accountable to PPADB and not to the head of a Ministry. Various thresholds exist for procurements that can be adjudicated at Ministry level and those to be adjudicated at PPADB level. The current threshold for MLWS is BWP 300,000,000 (US$30,000,000).

37. A Procurement Unit is in place at MLWS and it is tasked with managing all procurement processes. It is comprised of a Procurement Manager and assisted by a Procurement Specialist. As PUs are the responsibility of the procuring entity, most of PPADBs interventions are targeted at MTCs and DATCs and not PUs.

38. At WUC there exists the Board Tender Committee (BTC) and the Management Tender Committee (MTC) responsible for approving awards of contracts in BWP 5m to BWP 20m for the BTC and between BWP 0.25m and BWP 5m for the MTC. The BTC recommends to the full Board all procurements in excess of BWP 20m.

39. PPADB conducted an Organisation for Economic Co-operation and Development - Development Assistance Committee self-assessment in 2007 and key areas arising included the need to distinguish clearly between ICB and NCB tenders; the possibility of establishing rules of participation of SOEs in procurement; strengthening procurement planning from being project based to an operational function; the dual and sometimes contradictory roles of PPADB as a regulator and also approval body for contract awards; the need for an information management system to collect and disseminate procurement data; and, the need for a training program for private and public sector stakeholders.

40. Over the last nine years PPADB has addressed these issues through two five-year strategic plans:

41. The 2008-2013 strategic plan that focused on gradual devolution of procurement authority to Ministerial Tender Committees (MTCs) and District Administration Tender Committees (DATC); capacity building to Procuring Entities (PEs), committees of the Board and the contracting community.

42. The 2013-2018 strategic plan that will focus on stakeholder satisfaction by devolution to a procurement regulatory authority, improved public confidence in the procurement system, improved quality of service, achieving value for money; optimizing of key processes through improving and simplifying processes and reducing costs of tendering; improved corporate governance processes and internal efficiency ; financial sustainability through contributing 10 percent of the government grant; high performance culture by being a center of excellence. National Procurement Procedures: A review of the Public Procurement and Asset Disposal (PPAD) Act of 2002, the Public Procurement and Asset Disposal Regulations of 2006 and the Public Procurement and Asset Disposal – Independent Complaints Review Committee Regulations of 2006 concludes that Botswana's national procurement procedures meet the Banks New Procurement Framework provided the following are included in national bidding documents and contracts: (i) the Bank's right to review and access documentation; (ii) the Bank's Anti-Corruption Guidelines; and (iii) the Bank's right to sanction, inspection and audit rights.

43. **Procurement of works**. The civil works to be procured under this Project include construction of water reticulation pipelines, tanks and associated infrastructure; borehole pump installation works; supply and installation of water treatment facilities; installation of photo-voltaic energy systems; rehabilitation and construction of waste water treatment plants and sewerage ponds and associated works. All works are estimated in aggregate at not more than US$125 million.

44. **Procurement of goods**. Goods to be procured under this Project include Water quality monitoring equipment; surface and groundwater monitoring equipment for IWRM and; assorted laboratory equipment Goods are estimated in aggregate at not more than US$5 million, United Nations' agencies and direct contracting may also be considered with the Bank's prior review and approval.

45. **Procurement of services** (other than consultants' services). Services (other than consultants' services) to be procured under the Project will include loss reduction services and demand management. Services are estimated in aggregate at not more than US$2 million.

46. **Selection of consultants**. Consultants' services required for firms and individuals by the overall project are estimated in aggregate at not more than US$30m to cover consultancies for design and construction supervision; sector and policy studies; development of master plans and feasibility studies; environmental and social safeguards services and; project management support.

47. **Training.** This category will cover all costs related to the carrying out of study tours, training courses, and workshops, that is, hiring of venues and related expenses, stationery, and resources required to deliver the workshops as well as costs associated with financing the participation of community organization in short courses, seminars and conferences including associated per diem and travel costs. Training projects would be part of the Annual Work Plan and budget and will be included in the Procurement Plan. Prior review of training plans, including proposed budget, agenda, participants, location of training, and other relevant details, will be required only on annual basis.

48. **Operating costs.** Incremental operating costs include expenditures for maintaining equipment and vehicles, fuel, office supplies, utilities, consumables, allowable travel per diems and, allowable travel and accommodation expenses, workshop venues and materials. These will be procured using the borrower's administrative procedures, acceptable to the Bank.

49. *Procurement Manual*. The procurement procedures and standard bidding documents to be used for World Bank-funded procurement will be presented in the Procurement Manual in line with the guidelines of the Bank[38]. The Procurement Manual will include the component descriptions, institutional arrangements, Regulatory Framework for procurement, approval systems, activities to be financed, procurement and selection methods, thresholds, prior review and post reviews arrangements and provisions, filing and data management and the Procurement Plan for the first 18 months for all project components. The Procurement Manual will be updated from time to time by the MLWS. It will form an integral part of the POM.

50. **Assessment of the MLWS and WUC PU's capacity to implement procurement**. The MLWS PU comprises a Procurement Manager and a Procurement Specialist. Both have experience in development partner procurement and large capital projects. WUC PU comprises the Logistic and Materials Management Manager who oversees 20 staff tasked with Inventory Control and Purchasing. Assigning dedicated procurement staff to assist project procurement, formalizing procurement planning and involving procurement staff in contract monitoring as seen as key to implementation success.

51. As all WUC procurements irrespective of value will be approved within WUCs structures of full Board, BTC or MTC delays are not anticipated. However, procurement in excess of MLWS threshold will be adjudicated by PPADB and prior planning to account for this has to be taken into account.

52. **Procurement supervision**. Given the country context and the project risk indicated above, an Annual Post Procurement Review will be conducted in addition to the semiannual supervision missions by the World Bank. The Annual Post Procurement Review will be carried out either by the World Bank or World Bank-appointed consultants. The frequency of procurement supervision missions will be once

[38] The procurement manual will form part of the Project Operational Manual to be prepared within two months of effectiveness.

every six months and special procurement supervision for post procurement reviews will be carried out at least once every twelve months.

53. To enhance the transparency of the procurement process, the recipient shall publish the award of contracts procured generally within two weeks of receiving the World Bank's no-objection to the recommendation of award of contract, in accordance with the Procurement and Consultants Guidelines. Additional procedures, as elaborated in the Procurement Manual, will govern the disclosure under other procurement and selection methods.

54. **Procurement Plan**. The borrower has prepared a draft Procurement Plan to guide project implementation. The Procurement Plan will be updated annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

Goods and Works and non-consulting Services

55. *Prior Review Threshold.* Procurement decisions subject to prior review by the Bank as stated in Appendix 1 in the Procurement Guidelines.

Table A2.5 Prior Review Threshold

		Procurement Method	Procurement Method Threshold (US$)	Prior Review Threshold (US$) MODERATE RISK PROJECT
	Works			
1.		ICB	≥ 7,000,000	> 15,000,000
2.		NCB	> 200,000–< 7000,000	As per Procurement Plan
3..		Shopping (small contracts)	< 200,000	As per Procurement Plan
4.		Direct contracting	n.a.	All
	Goods and non-consulting services (excluding consultant services)			
1.		ICB	> 1,000,000	> 3,000,000
2.		NCB	>100,000 – <1,000,000	As per Procurement Plan
3.		Shopping	<100,000	As per Procurement Plan
4.		Direct contracting	n.a	All

56. Procurement Packages Subject to World Bank Prior and Post Review with Selection Methods and Time

Table A2.6. Procurement Packages Subject to World Bank Prior and Post Review

Ref No.	Contract (Description)	Estimated Cost (US$)	Procurement Method	Approach to market	Review by Bank (Prior/ Post)	Expected Bid-Opening Date
WORKS						
1	Masunga MC - Sowa Water Supply Master Plan (connection to Nata Cluster)	16,650,000	Request for Bids	Open International	Prior	March 2019
2	Lobatse MC - Mmathethe Water Supply	8,100,000	Request for Bids	Open International	Prior	December 2017
3	Lobatse MC -Mokatako Water Supply	270,000	Request for Proposals	Open National	Post	June 2017
4	Selebi Phikwe MC -Selibi Phikwe - Serule Water Transfer Scheme	18,000,000	Request for Bids	Open International	Prior	June 2017
5	Masunga MC - North East/Tutume Water Transfer Scheme	19,800,000	Request for Bids	Open International	Prior	May 2017
6	Letlhakane MC - Boteti Southern and Central Cluster Villages Water Supply Scheme	18,000,000	Request for Bids	Open International	Prior	June 2017
7	Letlhakane MC – Mosu, Mokubilo and Mmea Villages Water Supply	270,000	Request for Proposals	Open National	Post	May 2017
8	Ghanzi MC - Ghanzi Township Water Supply Expansion	7,560,000	Request for Bids	Open National	Prior	November 2017
8	Ghanzi MC - Kuke Water Supply Master Plan Project	1,710,000	Request for Bids	Open National	Post	November 2017
10	Ghanzi MC – Bere Settlement Water Supply Augmentation	630,000	Request for Bids	Open National	Post	November 2017
11	Kanye MC - Kanye/Moshupa Water supply Project	2,700,000	Request for Bids	Open National	Post	April 2018
12	Molepolole MC - - Malwelwe/Molepolole/Thamaga Thebephatswa (Phase 2)	9,000,000	Request for Bids	Open International	Prior	April 2018
13	Francistown MC - Mambo Waste Water Treatment Plant Rehabilitation	14,400,000	Request for Proposals	Open International	Prior	July 2017
14	Lobatse MC - Lobatse Waste Water Treatment Plant Rehabilitation	585,000	Request for Proposals	Open National	Post	April 2018
15	Letlhakane MC – Letlhakane Waste Water Treatment ponds expansion	4,500,000	Request for Proposals	Open National	Post	April 2018
GOODS						
1	Water quality monitoring equipment (WUC)	1,200,000	Request for Bids	Open International	Post	April 2017
2	Ground water monitoring equipment (WUC)	460,000	Request for Bids	Open International	Post	April 2017
3	IWRM Equipment for surface and groundwater monitoring	2,000,000	Request for Bids	Open International	Prior	November 2017
4	Equipment for Operational Forecasting and Early Warning	2,600,000	Request for Bids	Open International	Prior	November 2017
NONCONSULTING SERVICES						

Ref No.	Contract (Description)	Estimated Cost (US$)	Procurement Method	Approach to market	Review by Bank (Prior/ Post)	Expected Bid-Opening Date
	Loss reduction support program	1,450,000	Request for Bids	Open International	Prior	April 2017

Selection of Consultants

57. *Prior Review Threshold.* Selection decisions subject to prior review by World Bank as stated in appendix 1 to the Guidelines Selection and Employment of Consultants.

Table A2.7. Prior Review Threshold for Consultants

	Selection Method	Selection Method Threshold (US$)	Prior Review Threshold MODERATE RISK PROJECT (US$)
1.	QCBS and QBS	≥ $300,000	>1m
2.	FBS, QBS, LCS, and CQS	< $300,000	>1m
3.	Single Source (Firms)	n.a.	All
4.	Individual Consultants	n.a.	>300,000
5.	Single Source (Individual Consultants)	n.a.	All

Note: QCBS = Quality-and-Cost-Based Selection (Section II of the Consultants' Guidelines); LCS = Least-Cost Selection (Para 3.6, of the Guidelines); CQS = Selection based on the Consultants' Qualifications (Para 3.7 of the Guidelines); FBS= Selection under a Fixed Budget (Para 3.5 of the Guidelines); QBS = Quality-Based Selection (Para 3.2 of the Guidelines)

58. Short list comprising entirely of national consultants. Short list of consultants for services, estimated to cost less than US$300,000 equivalent per contract, may comprise entirely of national consultants in accordance with the provisions of Paragraph 2.7 of the Consultant Guidelines. All terms of reference irrespective of the value of the consultancy assignment are subject to prior review.

Table A2.8 Consultancy Assignments with Selection Methods and Time Schedule

Ref No.	Description	Estimated Amount (US$)	Procurement/ Selection Method	Approach to market	Prior or Post Review	Expected Proposal Submission/ Opening Date
	Review and Roll out of Non-Revenue Water Strategy (WUC)	900,000	QCBS	Open International	Prior	
	Review of Billing and Collection strategies, including benchmarking (WUC)	100,000	CQS	Open National	Post	
	Review of water supply and (sanitation) wastewater manual (WUC)	200,000	CQS	Open National	Post	

	Energy reduction Strategy – with focus on climate change mitigation, solar pumping and biogas utilization (WUC)	100,000	CQS	Open National	Post	
	Engineering Services for Masunga MC - Sowa Water Supply Master Plan - Connection to Nata Cluster (WUC)	1,850,000	QCBS	Open International	Prior	June 2018
	Engineering Services for Lobatse MC - Mmathethe Water Supply (WUC)	900,000	QCBS	Open International	Prior	October 2017
	Engineering Services for Lobatse MC - Mokatako Water Supply (WUC)	30,000	CQS	Open National	Post	May 2017
	Engineering Services for Selebi-Phikwe MC - Selibi Phikwe - Serule Water Transfer Scheme (WUC)	2,000,000	QCBS	Open International	Prior	May 2017
	Engineering Services for Masunga MC - North East/Tutume Water Transfer Scheme (WUC)	2,200,000	QCBS	Open International	Prior	May 2017
	Engineering Services for Letlhakane MC - Boteti Southern and Central Cluster Water Supply (WUC)	2,000,000	QCBS	Open International	Prior	May 2017
	Engineering Services for Letlhakane MC - Mosu Water Supply (WUC)	30,000	CQS	Open National	Post	May 2017
	Engineering Services for Ghanzi MC - Ghanzi Township Water Supply Expansion(WUC)	840,000	QCBS	Open International	Prior	July 2017
	Engineering Services for Ghanzi MC – Kuke Water Supply Master Plan project (WUC)	190,000	CQS	Open National	Post	May 2017
	Engineering Services for Ghanzi MC –Bere Water Supply Augmentation (WUC)	70,000	CQS	Open National	Post	May 2017
	Engineering Services for Kanye MC - Kanye/Moshupa Water Supply (WUC)	300,000	CQS	Open National	Post	July 2017
	Engineering Services for Molepolole MC - Malwelwe/Molepolole/Thamaga Thebephatswa Water Supply (Phase 2) (WUC)	1,000,000	QCBS	Open International	Prior	July 2017
	Engineering Services for Francistown - Mambo Waste Water Treatment Plant Refurbishment (WUC)	1,600,000	QCBS	Open International	Prior	August 2017
	Engineering Services for Lobatse Waste Water Treatment Ponds Rehabilitation (WUC)	65,000	CQS	Open National	Post	November 2017
	Engineering Services for Letlhakane Waste Water Treatment Ponds Expansion (WUC)	500,000	QCBS	Open National	Prior	November 2017
	Water and Sanitation Policy dissemination program (MLWS)/DWA)	50,000	IC	Open National	Post	June 2017
	Water Act Training and outreach facilitator and dissemination program (MLWS)/DWA)	50,000	IC	Open National	Post	December 2017
	National Conservation strategy advisory and technical assistance (MLWS)/DWA)	50,000	IC	Open National	Post	November 2018

	Update of the 1968 Water Act, including alignment/amendment of related pieces of statutes (MLWS)/DWA)	50,000	CQS	Open National	Post	June 2017
	Finalization and dissemination of National Water Conservation and Demand Management Study (MLWS)/DWA)	50,000	CQS	Open National	Post	December 2017
	Development of water abstraction and pricing strategy (MLWS)/DWA)	450,000	QCBS	Open International	Prior	December 2017
	Regulatory Capacity Building (MLWS)/DWA)	500,000	QCBS	Open International	Prior	December 2017
	Water quality monitoring programs (MLWS)/DWA)	300,000	QCBS	Open National	Post	December 2017
	Demarcation of catchment areas study (MLWS)/DWA)	200,000	CQS	Open National	Post	November 2018
	Study and design of aquifer recharge options (MLWS)/DWA)	400,000	QCBS	Open International	Prior	December 2017
	Study and design of saline groundwater use options (MLWS)/DWA)	400,000	QCBS	Open International	Prior	December 2017
	Support for implementation of Institutional Strengthening (WUC)	300,000	QCBS	Open International	Prior	December 2017
	Development of WSS capital investment book, business strategy, financial recovery plan, and WSS services strategies (including stand posts, sanitation), (WUC)	800,000	QCBS	Open International	Prior	September 2017
	Optimization of WSS treatment processes (WUC)	1,350,000	QCBS	Open International	Prior	November 2017
	Support for development of Public Private Partnerships (WUC)	280,000	CQS	Open International	Post	November 2017
	Western Region Master Plans - Tsabong, Ghanzi and Maun (WUC)	1,800,000	QCBS	Open International	Prior	November 2017
	Pre-feasibility studies and technical assistance for Chobe-Zambesi Transfer Scheme (MLWS)	525,000	QCBS	Open International	Prior	November 2017
	Pre-feasibility studies and technical assistance for Lesotho-Botswana Transfer Scheme (MLWS)	525,000	QCBS	Open International	Prior	November 2017
	Study on Effluent Reuse options at institutional level (MLWS)/DWA)	200,000	CQS	Open International	Post	December 2018
	Groundwater desalination options and feasibility study (MLWS)/DWA)	200,000	CQS	Open International	Post	December 2018
	PPP technical implementation support, transaction advice (WUC)	800,000	QCBS	Open International	Prior	June 2017
	Audits (technical, financial, procurement)	100,000	LC	Open National	Post	December 2017

	Economic and financial review consultant	100,000	IC	Open National	Post	June 2017
	Project Operational Manual consultant	10,000	IC	Open National	Post	March 2017
	Project procurement systems consultant	50,000	IC	Open National	Prior	June 2017
	Financial management systems consultant	50,000	IC	Open National	Prior	June 2017
	Environmental and Social Safeguards instruments, Resettlement Policy Framework Dam Safety Action Plan monitoring (WUC)	450,000	IC	Open International	Prior	June 2017
	Project monitoring, reporting and ICR consultant	100,000	IC	Open National	Post	January 2021
	Communication consultant (WUC)	200,000	IC	Open National	Post	October 2017
	Community consultation and development of Grievance Management Systems (WUC)	100,000	CQS	Open National	Post	June 2017
	Project Management (WUC and DWA)	3,000,000	IC	Open National	Prior	June 2017

Monitoring and Evaluation

59. To the extent possible, Project results indicators and data collection will be aligned with existing monitoring and reporting systems in the sector. At the national level, Project indicators will be aligned with the monitoring and evaluation framework being developed by the NSO as part of the NDP 11. This effort is being supported by a Bank RAS currently being negotiated with the Government. At the utility level, proposed results indicators will be drawn from an existing set of WUC indicators; and supplemented with Bank core sector Indicators. This approach is intended to enable the Government and the World Bank to monitor and aggregate results beyond the Project. Alignment with WUC operational indicators will also help ensure improvement is data used to monitor operational efficiency. The Results Framework for the Project is included in Section VII.

60. Overall responsibility for consolidating M&E data for the Project will lie with MLWS - PMMO. An M&E expert and computerized database will be procured through the Project to enable timely monitoring, reporting, and communication of results during execution of the Project. Key M&E requirements are: qualitative and quantitative information on the execution of selected subprojects or activities; progress in procurement and contractual matters, accounting and financial recording, and any other Project reporting requirements. As monitoring activities will be undertaken by WUC for tasks it is responsible for, and by MLWS (DWA) for activities it is responsible for, arrangements for data gathering at these levels will be coordinated by MLWS - PMMO. Currently, WUC M&E systems focus on collecting and compiling operational data from its MCs for monitoring operational efficiency, and informing maintenance, investment planning and other decisions. For the purpose of this Project, WUC will engage a full time M&E specialist to support the collection of baseline; compile and update output data from subprojects; track implementation progress

across the Project; and assist WUC in fully integrating and utilizing data gathered through the Project for management purposes.

ANNEX 3: IMPLEMENTATION SUPPORT PLAN

COUNTRY : Botswana
Emergency Water Security and Efficiency Project

Strategy and Approach for Implementation Support

1. The Implementation Support Plan (ISP) provides the framework for the World Bank's operational approach to supporting MLWS's and WUC's implementation of the Botswana Emergency Water Security and Efficiency Project and monitoring implementation progress. The ISP has been developed taking into consideration: (a) the risks identified for the Project; (b) the limited experience of MLWS and WUC staff with respect to Bank and internationally financed projects; (c) the importance of large civil works contracts in overall implementation and in the achievement of the PDOs; (d) the importance of environmental and social safeguards; and (e) the role of WUC financial sustainability in the long-term sustainability of project investments and the reliability of water supply in the context of extended drought. The ISP team reflects these key considerations.

2. To support project implementation a POM will be prepared and implemented by the MLWS and WUC. The POM will provide overall guidance on project implementation and will include information such as the detailed project description, financing plan, roles and responsibilities for implementing agencies, the role of the Bank during implementation, key actions required to meet the project development objectives, fiduciary requirements - procurement, financial management and environmental and social safeguards and the M&E arrangements. The Bank will support implementation through regular missions and will provide guidance on implementation arrangements. To ensure timely response from the Bank team, particularly with respect to procurement, existing service standards will be incorporated into the POM.

3. Five core activities form the foundation of the ISP: hands on operational support; fiduciary – financial management procurement, and safeguards training; adequate technical assistance – including detailed design and procurement processes; regular and appropriate arrangements for M&E ; and, semi-annual implementation support missions to Botswana, involving Bank staff and technical consultants. This approach will provide comprehensive support and oversight for project implementation and enable quick and responsive interactions between project officials and Bank staff.

Implementation Support Plan and Resource Requirements

4. **Hands on operational support.** Because the MLWS and WUC have not implemented a Bank-financed project directly, the Bank team will need to provide extensive hands on operational support, in addition to those provided during the semi-annual missions, especially in the first two years of implementation. Also, intergovernmental knowledge sharing and learning will be encouraged throughout all stages of implementation, in particular regarding PPPs and M&E systems. In between semi-annual missions, regular interaction with the client will continue to enable timely implementation of activities.

5. **Fiduciary, procurement, and safeguards training.** Fiduciary, procurement, and safeguards training will be provided as part of the operations clinic during the Project launch. Fiduciary,

procurement, and safeguards staff are all based in Pretoria and thus will allow timely support to the PMT as well as the implementing entities. During the semi-annual implementation support mission, the fiduciary, procurement, and safeguards team will join field trips (as needed) and provide hands-on support to county counterparts.

6. **Technical designs support and procurement process**. Given the advanced status of preparation of the key works to be financed, during the first 12 months of implementation the focus will be placed on supporting the comprehensiveness and quality of the technical designs and the procurement processes for the contracting of qualified, capable and financially sound contractors through competitive and transparent processes in compliance with Bank procurement guidelines. Dedicated backup consultants will be hired in the first 6 months (e.g. wastewater consultant, environmental specialist, and water supply engineer) to ensure a smooth start to the project.

7. It is expected that the contracting of a significant amount of works under the Project will be finalized or well underway after the first year of project implementation. Therefore, the focus of ISP during the second year (and onwards) will be on supporting a smooth start of works contract execution and the implementation of ESMPs, as well as providing quality enhancement reviews for the strategic studies under development under Component 3. The World Bank team will work closely with the client to ensure that service standards (e.g. timely approvals, clearances, no-objections) are maintained.

8. **M&E support.** The task team will work closely with the MLWS and WUC to plan and implement the required Project monitoring and evaluation arrangements. The Bank team in collaboration with the Client will assess current capacity for M&E, and propose measures to strengthen capacity. The Bank team has shared model terms of reference for experts to assist the implementing entities to strengthen their capacities for M&E, including through hands-on training and development of computerized systems for tracking and reporting on inputs, activities, outputs, and results. **Semi-annual implementation support missions and mid-term review.** While the operations analyst based in the country office will provide general implementation support for all operational aspects, semi-annual missions will be organized to review the progress and mitigate any risks in advance. Semi-annual missions will be completed by TA missions as needed. A formal midterm review will be organized about 30 months into implementation to assess Project implementation progress and make any changes necessary to accelerate implementation.

9. The main inputs and focus with regard to support to implementation are summarized in the tables below.

Table A3.1 Technical Requirements for Implementation Support

Time	Focus	Skills Needed	Resource Estimate (US$)	Partner Role
First twelve months	Contract launch and management Confirm reporting and monitoring and evaluation formats Confirm financial reporting Confirm safeguard monitoring and reporting Technical assistance procurement	Team leader Engineer Institutional development and reform specialist FM Specialist Procurement Specialist Social Safeguards Specialists	320,000	GFDRR for drought response TA for PPPs

		Environmental Safeguards Specialist M&E specialist Operations Analyst		
12-48 months	Contract management Safeguards Ongoing procurement Civil works and engineering issues, if any Monitoring and evaluation WUC financial results Project financial management	Team leader Engineer Institutional development and reform specialist FM Specialist Procurement Specialist Social Safeguards Specialists Environmental Safeguards Specialist M&E specialist Operations Analyst	320,000	TA for PPPs
48-60 months (Year 5)	Contract closings Safeguards Civil works and engineering issues, if any M&E WUC financial results Project FM ICR preparation	Team leader Engineer Institutional development and reform specialist FM Specialist Procurement Specialist Social Safeguards Specialists Environmental Safeguards Specialist M&E specialist Operations Analyst	200,000	
Mid-term review	Contract management Progress on civil works Safeguards Project sustainability WUC financial results	Team leader Engineer Procurement FM specialist Environmental specialist Social specialist M&E specialist Utility institutional specialist Financial analyst Team assistant	120,000	
Implementation completion reporting	Project results and evaluation Financial and economic analyses	Team leader Engineer Institutional development and reform specialist ICR author Financial analyst Economist Team assistant	80,000	

Skills Mix Required

Skills Needed	Number of Staff Weeks*	Number of Trips	Comments
Task Team Leader	24	6	Pretoria, South Africa
Water supply and sanitation specialist (institutional support)	20	8	Nairobi
Water supply and sanitation specialist (investment implementation support)	15	8	Washington, DC
Waste water specialist (investment implementation support	10	4	Washington DC
M&E Specialist	16	6	Nairobi
FM Specialist	15	4	Pretoria, South Africa
Procurement Specialist	15	4	Pretoria, South Africa
Social Safeguards Specialist	10	3	Pretoria, South Africa
Environmental Safeguards Specialist	10	3	Pretoria, South Africa
Team assistant	4	-	Country office based

Note: * Number of staff weeks required per year in the first two years of implementation.

ANNEX 4: SAFEGUARDS ACTION PLAN

The following section outlines the requirements of the Environmental and Social Safeguards Action Plan that has been prepared to ensure compliance with safeguards in line with the World Bank's Operational Policy OP 10.0 paragraph 12.

Background

1. The Botswana Water Security and Efficiency Project is prepared and implemented according to Paragraph 12 of the World Bank's Operational Policy 10.00, which allows for certain exceptions to the requirements of the Investment Project Financing policy, including deferral of safeguards requirements, if the Bank deems the client to be in urgent need of assistance. In July 2015, Botswana declared a drought emergency, following poor or failed rains across most of the country. The meteorological department rated the drought "extremely severe"– the worst in the last thirty-four years. The drought emergency has since been extended for a second year. Given the urgency and in light of Water Utilities Corporation's (WUC) human and financial capacity constraints, the team's proposal to defer the preparation of required safeguard instruments to the implementation stage was approved by the Regional Vice President, Africa Region on June 16, 2016. The deferral enables the client to receive the necessary resources to complete the preparation process and shorten the response time.

2. Botswana is a water stressed country and is one of the four Southern Africa countries that will become highly water stressed by 2040 –under a business as normal scenario. The ongoing drought has increased levels of water stress in many parts of the country, which have seen dams, rivers and well fields run dry. Drought hotspots in the central, southern and western parts of the country have been significantly impacted, leading to (i) a 70 percent yield decline in cereal crop compared to 2014, and (ii) severe rationing of water–lasting up to a week in some settlements. Nationwide, dam levels fell below 20 percent of design capacity–the Gaborone dam in particular dropped as low as 1.6 percent (the lowest level since 2000). Boreholes have also been affected by the slow rate of ground water recharge following several years of low rain. Many settlements are now being served by water bowsers at high cost. In light of the modest human and financial capacity of the main implementing agency–the Water Utilities Corporation (WUC)–the initial response was insufficient to meet increased demands brought about by the drought.

3. In line with the deferral, this SAP is intended to guide the preparation of safeguards documentation during implementation. The SAP is guided by the dual objective of ensuring that there is a roadmap for safeguards compliance during project implementation and providing clear guidance to the GoB on the actions and instruments required to expedite implementation of the Project activities. It is a project-level safeguards planning document that provides a time-bound plan setting forth the steps, sequential planning and coordination of project activities, and preparation/disclosure requirements for the relevant safeguard instruments, to ensure that the Project is in compliance with the World Bank's safeguard requirements.

4. The deferral of safeguards granted for the Project postpones the disclosure of safeguard instruments to the implementation phase of the project. A Resettlement Policy Framework (RPF) and site-specific safeguard instruments (Environmental and Social Management Plans-ESMPs, and/or

Resettlement Action Plans-RAPs or Social Audits) will be required during implementation. These instruments are required for all investments financed under the Project. The safeguard instruments would need to be ready, acceptable to the Bank and disclosed as required below. While the RPF will be disclosed within 2 months of the start of the Project to guide preparation of specific actions. ESIAs will be prepared to inform the preparation of ESMPs, RAPs or social audits and VCPs if required. ESMPs will be disclosed, before issuing bidding documents to ensure that the cost of mitigation measures is reflected in the bidding documents. In addition, all RAPs will be disclosed and implemented prior to the start of civil works. Given the specific risks associated with the Mambo WWTP, terms of reference for the ESIA have been disclosed.

5. Key factors to consider are:

a. The Project is rated a Category A primarily due to the investments in Mambo WWTP (Francistown) required to prevent pollution of the Dikgatlhong Dam, which supplies water to Gaborone. All other subprojects are rated Category B.

b. An initial review of safeguards documents prepared for Year 1 investments confirms that these are of an acceptable quality. However, where necessary these documents will be updated or social audits conducted, to ensure compliance with safeguard policies.

6. **Project Description**. The PDO is to "improve availability of water supply in drought vulnerable areas, increase efficiency of WUC, and strengthen wastewater management in selected systems."

7. The Project is designed to respond to Botswana's ongoing drought and reduce vulnerability to drought in the medium to long term. The drought declared in July 2015 was the worst in the past 34 years and it has been extended for another year (in July 14, 2016) with a slightly lower level of severity[39].

8. The Project includes critical water supply investments in urban and rural areas that are needed to mitigate drought impacts and wastewater treatment investments or to comply with effluent standards thus preventing pollution of vital downstream water sources.

9. Proposed water supply and wastewater infrastructure investments amount to US$136 million. They include measures to rehabilitate, augment, and upgrade water supply and wastewater/sludge treatment schemes; and, improve the operational efficiency of WUC, particularly in underperforming MCs. In addition, support for US$20.75 million is included to strengthen the institutional capacity to plan and deliver services, and enable the reform of key policies and legislation. The Project is organized under three components, as follows: Component 1: Improve availability of water supply and efficiency of services; Component 2: Improve wastewater and sludge management; and Component 3: Sector Reform and Institutional Strengthening.

10. **Component 1: Improve Availability of Water Supply and Efficiency Services (US$114.05 million including taxes)** - This will support immediate as well as medium term investments and measures to

[39] The Southern Africa region is experiencing a widespread drought. The Bank is actively engaged in helping SADC with its El Nino response, including providing several IDA countries with supplemental finding from the Banks Crisis Response Window,

mitigate the impact of the drought by improving availability of water to settlements that have experienced extended periods of rationing and/or been forced to rely on water bowsers. Specific investments will include: (i) water source management, optimization and development, including interlinking of existing water sources (surface and ground) as well as of supply schemes to ensure backup supply and more sustainable production; (ii) expansion of water supply systems to reach underserved or drought affected communities; and, (iii) measures to improve operational efficiency, including reducing technical losses along transmission lines. This component will be implemented by the WUC. The component includes safeguards assessment and management as well as design and supervision services for the civil works. All investments will be coordinated and will be supported by institutional strengthening activities (under Component 3) aimed at improving the long-term sustainability of service provision and managing water demand.

11. The proposed measures are intended for settlements in drought affected areas where boreholes are running dry, becoming saline, or being mined/overdrawn, as a result of the drought. Given the chronic nature of drought, the investments are designed to address the medium term needs by ensuring sufficient supplies (or back up supplies) are in place to avoid resorting to short term solutions (such as using bowsers) every time a drought occurs. As Botswana relies heavily on groundwater (60 percent) and the recharge rate for groundwater is low (average of 5 mm per year) the proposed investments will bring water from more secure sources – e.g. dams or well fields that are reliable.

12. **Component 2: Improve Wastewater and Sludge Management (US$21.65 million including taxes)** - This component will support strategic investments in refurbishment/rehabilitation of wastewater treatment to protect surface and groundwater sources; and enable scaling up wastewater reclamation and reuse in Francistown and Lobatse through design and build contracts. In Letlhakane sludge management facilities will be rehabilitated and expanded— the nearest facility is 200km away. The Francistown and Lobatse wastewater treatment facilities require urgent attention to prevent environmental contamination caused by discharge of inadequately treated wastewater into nearby water courses. Due to inadequate treatment of wastewater at the Mambo WWTP (Francistown) a key water supply dam (Dikgatlhong) may be at risk of pollution. The river into which Mambo discharges is seasonal and the effluent discharge during the dry season can cause local contamination.

13. Given the limited water resources available in Botswana, the proposed measures will protect and conserve existing water supply, thereby reducing demand for new sources. A key objective of the investments in Mambo and Lobatse is to bring the effluent to a quality level where it can be re-used. Many users, including mines, local golf courses and other businesses have expressed their interest in re-using the treated water if WUC can treat it to adequate standards, which are set by law. In addition to improving treatment and operational efficiency (as measured by effluent quality), the Project also includes (under Component 3) activities to enhance WUC's capacity to holistically manage, treat, dispose of, and re-reuse wastewater and sludge through strategic investments in new or improved technology options. This component will be implemented by WUC.

14. **Component 3: Sector Reform and Institutional Strengthening (US$20.75 million).** The Component's objective is to strengthen the institutional, policy, and legal framework to support Botswana to achieve long-term water security and increase efficiency of service delivery. Botswana faces major challenges in ensuring the sustainable development and efficient utilization of its scarce water resources to support further economic growth, diversification and the eradication of poverty. As

such, policy and strategies need to be directed toward improving allocative efficiency, enhancing technological developments, and improving water resources stewardship and water demand management. Activities financed under Component 3 will include:

15. **Sub-Component 3.1. Sector Reform.** This will include the development or roll out of sector policies, legislation and institutions in support of the reforms initiated in 2009. In order to conform to the new institutional set-up in the context of increasing water scarcity, the water sector is in the process of developing or updating several key legal, strategy and policy instruments. Prioritized activities will enable implementation of the development agenda outlined in NDP 11, with a strategic focus on improving water security and developing resilience to droughts and water shocks. In addition, the Sub-Component will support the improvement of water resources management and planning capacity, including strengthening the effectiveness of WRM instruments.

16. **Sub-component 3.2. Institutional Strengthening and Capacity Building.** This Sub-Component will enable DWA and WUC to increase their capacity to implement sector policies and strategies; strengthen their overall operational performance; and, improve their corporate governance and management. Support for MLWS (DWA) will include strengthened capacity for water resource planning and monitoring, groundwater development, monitoring, and regulation among others. Support for WUC will include support for the institutional restructuring, business strategy development, efficiency improvements (e.g. through demand management, cost recovery, energy reduction, non-revenue water, and innovative ICT use); and refinement of water supply and waste water supply guidelines. Activities will focus on training and reskilling WUC staff in underperforming MCs. This sub-component will be implemented by MLWS (DWA) and WUC.

17. **Sub-Component 3.3. Forward Planning – Technical Assistance and Studies.** This Sub-Component includes support for technical studies required to develop a pipeline of priority investments aimed at improving long-term water security (e.g. Chobe-Zambezi and Lesotho-Botswana Transfer Schemes). This could include feasibility studies; detailed designs; environmental and social impact assessments, transaction design for PPPs, expert panels for deep groundwater aquifer development, and the like. A sound investment pipeline will allow Government to advance its vast water investment program more rapidly and support the development long-term drought response/climate resilience investments. This sub-component will be implemented by WUC and MLWS.

18. **Sub-component 3.4. Project Management.** This subcomponent includes support for adequate project implementation capacity in the MLWS - PMO and WUC - PMO, including funding for MLWS - PMO and WUC -PMO contracted experts and technical assistance. In addition, the project will finance inputs required to ensure the effectiveness of implementing agencies including (as needed) office space, equipment, running costs, logistical support, and other operating requirements. Responsibilities of the MLWS - PMO and WUC - PMO include project management and coordination, procurement and financial management, project monitoring and evaluation (including impact evaluation), social and environmental safeguards management and oversight, and strategic project communications and outreach. This sub-component will be implemented by WUC and MLWS.

19. **Project Locations and Some Salient Social and Environmental Characteristics**. It is expected that the Project will be implemented in at least 70 villages located within eight (8) WUC Management Centers as follows:

a. Selebi Phikwe and Letlhakane - located in the Central District of Botswana.
b. Ghanzi - located in the Kalahari Desert in the western part of Botswana.
c. Masunga - located in the North-East and Tutume Sub-District of Botswana.
d. Molepolole - located in the south east of Botswana in the Kweneng District,
e. Kanye - located in mountainous region of Southern Botswana, and
f. Lobatse - located in South-Eastern Botswana, 70km south of the capital city Gaborone and situated in a valley running north toward Gaborone.
g. Francistown – located in the eastern region of Botswana

20. As the Project will rehabilitate and augment systems that serve settlements that are predominately built-up with medium density development, it is expected that the vast majority of infrastructure will entail in-situ rehabilitation and upgrading along transmission lines, in existing plants, and storage or pumping stations. However, there will be some new transmission lines connecting some of the sources to the population centers and/or villages as well as pipes inter-connecting boreholes. The following section describes the proposed activities by location. As the Project supports the Governments drought response, and the drought has been extended by an additional year, the description of actual investments may be adjusted during design and in accordance with ESIAs to improve the outcome.

Water Supply

a. Selebi-Phikwe MC: Selebi Phikwe to Serule water transfer scheme: Construction of water supply pipelines, a booster station and collector tanks to supply identified villages with improved drinking water quality from the water treatment facility for the Letsibogo Dam with the objective of improving efficiency and reliability of water supply for Serule, Damuchojena, Gojwane, Topisi and Moreomabele villages.
b. Letlhakane MC: Boteti Southern and Central Cluster - Village water supply scheme: Equipping and electrifying 7 boreholes and booster stations, inter-connecting pipework between the boreholes, (i) installing a Reverse Osmosis water treatment unit at the well field site, (ii) installing a clear water pumping station, (iii) transmission mains, (iv) water storage tanks, and (v) installing associated mechanical, electrical and telemetry equipment.
c. Letlhakane MC: Mosu, Mokubilo and Mmea Village Water Supply Scheme: Placing a portable Reverse Osmosis water treatment unit on an existing new borehole.
d. Ghanzi MC: Ghanzi Town Water supply expansion: Erection of a 1000 m^3 elevated tank, rehabilitation of existing network and extension of reticulation to the southern part of Ghanzi town.
e. Ghanzi MC: Kuke Water Supply: Equipping boreholes with Photovoltaic power source, installation of 12km supply mains from source to the settlement, construction of a new 75m^3 elevated tank, construction of reticulation of water to the eastern part of the settlement.

f. Ghanzi MC: Bere Water Supply Augmentation subproject: Equipping boreholes with Photovoltaic power source, installation of 5km supply mains from source to the settlement, construction of a new 75m^3 elevated tank on a 15m stand.

g. Masunga MC: North-east and Tutume sub-district Water Supply: Construction of a pump station at Kalakamati, Increased storage at Mbalambi and Zwenshambe, construction of a command reservoir/storage tank at Jackalas I and upgrading of both the Ntimbale Treatment Works Pump station and Mbalambi Pump station. Water will be sourced from Ntimbale dam.

h. Masunga MC: Sowa Water Master Plan (connection to Nata Cluster): Design audit and construction of the Dukwi- Nata Cluster Villages water supply scheme. The project will rehabilitate and upgrade the transmission mains and water storage tank at Dukwi waterworks, which currently experience frequent breakdowns resulting in significant water losses. Rehabilitation of networks will be done at three major villages of Nata, Dukwi and Mosetse.

i. Lobatse MC: Mmathethe Water Supply: Construction of about 48km of pipelines from Goodhope to Mmathethe via Magoriapitse, installation of 3 pumps in pump station, construction of a 200m^3 elevated tank and telemetry system.

j. Lobatse MC: Mokatako Water Supply: Design and construction of booster pumps station, collector tank, palisade fencing and associated works.

k. Kanye MC: Kanye/Moshupa Village Water Supply: The Project will electrify and equip four existing boreholes to serve 2 villages and construct an interlinking pipework, connecting the four additional boreholes in Selokolela Wellfield to Kanye Water Supply. The proposed interlinking pipelines will deliver water into existing concrete water tanks.

l. Molepolole MC- Molepolole/Malwelwe/Thamaga/Thebephatswa Water Supply: Equipping and connection of six (6) additional boreholes in Malwelwe wellfield, construction of interlinking pipework, upgrading of existing Malwelwe booster pump station, upgrading of existing 315mm diameter pipeline to accommodate increased flow from the six additional boreholes, and upgrading of Gaotlhobogwe Treatment Plant Pump Station.

Wastewater

m. Francistown MC: Mambo WWTP: Design and construction works for the rehabilitation of the plant to improve the operational performance of the WWTP and improve the quality of effluent discharged to the river system.

n. Lobatse MC: Lobatse WWTP: Desludging of 2 pump stations, dewatering and desludging of 3 primary anaerobic ponds, construction of drying beds, refurbishment of effluent recycling pump station, replacement of 3 inlet works pumps, installation of ultrasonic flow metering devices, and maintenance of existing ones.

o. Letlhakane MC: Letlhakane wastewater treatment ponds: Construction of 10 new oxidation ponds including maintenance and rehabilitation of existing facilities.

21. **Possible Social and Environmental Impacts/Risks**. The World Bank Safeguard Policies and the Botswana Environmental Impact Assessment Act and Regulations of 2011 are adopted as standards for implementing safeguard aspects of the Project. Based on the assessment of the baseline conditions of

the four subproject sites visited (in Francistown at the Mambo WWTP; in Letlhakane at the Wastewater Treatment ponds; in Lobatse at the WWTP; and, in Masunga at the Ntimbale Dam), and the initial screening of the proposed project activities, the Project is classified as environmental risk Category "A". Adverse impacts could potentially be generated from during the rehabilitation works at the Mambo WWTP and during the operational phase of the plant. Currently, the influent received at the Mambo WWTP from nearby towns–Francistown and Tati Siding- includes industrial waste, which is partially treated and does not meet the BOBS 93 discharge standards. Consequently, the effluent that is currently discharged to Tati River, is high in COD, ammonia, phosphate, turbidity, total suspended solids, total coliforms, and fecal coliforms. The Tati River is a tributary of the Shashe River which feeds into the Dikgatlhong Dam (located 50km downstream). Since the Dikgatlhong Dam supplies potable water to the city of Gaborone, it will be essential that the quality of discharged effluent from the Mambo WWTP stringently meets the national legislated standards as stipulated by the Bureau of Standards (BOBS 93) as well as the maximum limits stipulated in the World Bank's Pollution Prevention and Abatement Handbook both during the operational phases of the Project.

22. Although the overall Project will result in significant positive environmental and public health impacts, there are uncertainties relating to the performance of the Mambo WWTP with respect to ecological flows current impacts of treated wastewater discharged into the river system that feeds into the Dikgatlhong Dam; and inadequate management of sludge generated from the wastewater treatment processes. As such, ToR for a comprehensive, full-scale environmental and social assessment are being developed to establish a wider project area of influence that goes beyond the physical boundaries of the planned investments, makes provision for undertaking accumulative impact assessments, and generates good quality data for monitoring different water quality parameters at different locations during the operational phase of the wastewater treatment plant.

23. The following World Bank Safeguard Policies are triggered: (i) Environmental Assessment OP/BP 4.01, (ii) Physical Cultural Resources OP/BP 4.11, (iii) Involuntary Resettlement OP/BP 4.12, (iv) Projects on International Waters OP/BP 7.50, (v) Dam Safety OP/BP 4.37; and (vi) Indigenous Peoples (OP/BP 4.10). The applicable safeguard policies have been confirmed.

24. *Environmental Assessment OP/BP 4.01:* This policy is triggered due to the potential environmental and social impacts associated with the project investments. The proposed infrastructure investments will include rehabilitation of existing wastewater treatment plants which could potentially generate adverse impacts which are likely to go beyond the physical boundaries of the planned investments during the rehabilitation of facilities. Disposal of sludge from existing wastewater treatment plants during the rehabilitation and operational phases of the wastewater treatment plants may also impact the environment within the area of influence of the Project.

25. *Physical Cultural Resources (PCR) OP/BP 4.11.* The Borrower will ensure that the initial environmental and social impact assessments screen for potential impacts on the physical cultural resources include Chance Find Procedures in the environmental and social plans and bidding documents to ensure mitigation of any new discovery of physical and cultural resources.

26. *Involuntary Resettlement OP/BP 4.12*. The Project will undertake measures to mitigate the impact of the drought by equipping and connecting existing water sources to settlements that have experienced extended periods of rationing and/or been forced to rely on water bowsers as well as the

expansion to under-served or drought affected communities. As the vast majority of infrastructure will be in-situ rehabilitation and upgrading, the extent to which any civil works under the Project will require land acquisition and/or impact people's access will be determined during project preparation, including through the ESIA and planned social assessments. The proposed civil works may require land for temporary or permanent usage. The land acquired for this purpose may lead to loss of assets, sources of income or means of livelihoods, especially in rural communities whether or not project affected people must move to another location. To ensure proper mitigation measures are set forth during the first year of implementation, based on the findings of the ESIA, the national laws on land as well as OP 4.12 and social assessments, within two months of effectiveness, the Borrower will prepare a Resettlement Policy Framework (RPF) to guide the preparation of site specific RAPs once such details are known before any civil works start. In addition, for a number of sites where land is acquired social audit will be done before any civil works start. Just as the other safeguards documents the RPF will be fully consulted upon, reviewed and cleared by the Bank and publicly disclosed both in-country and the Banks external website.

27. *Indigenous Peoples OP/BP 4.10* In the context of the Republic of Botswana this refers to "Vulnerable Communities (VC)". There is a lack of sufficient detail on the proposed routing and development of infrastructure to be supported by the Project. However, as there may be VCs present or having a collective attachment to the proposed project sites, OP 4.10 has been triggered. Where relevant, if for any given activity, VCs were or are found to be present or to have a collective attachment to the area of the proposed project activity, a social assessment will be undertaken and a Vulnerable Communities Plan (VCP) will be prepared, based on prior informed consultations, disclosed, and implemented prior to the start of civil works in full compliance with the requirements of OP/BP 4.10

28. *Projects on International Waterways OP/BP 7.50*. This policy is triggered because the sources of water and the rivers into which treated effluent from the Mambo WWTP will be discharged connect with tributaries of an international waterway, the Limpopo River. Effluent discharges into the Tati River, which flows into one of the major tributaries of the Limpopo River – the Shashe River. The Shashe contributes about 12.2 percent of the Limpopo's mean annual runoff. It originates from the northwest of Francistown on the border between Botswana and Zimbabwe and flows southeast along the border for approximately 362km until it reaches the confluence point with the Limpopo River where Botswana, Zimbabwe and South Africa meet.

29. The Dikgatlhong Dam, located 50 km downstream of the Mambo WWTP is a key source of water supply to the city of Gaborone. The Project will support rehabilitation works at the Mambo WWTP to ensure that the quality of discharged effluent from the plant stringently complies with legislated discharge standards and that the overall quality of the Tati and Shashe Rivers is not adversely affected by contaminants during the rehabilitation of the Project.

30. The findings from site visits and a preliminary assessment of the likely impact of effluent from the wastewater treatment plant on the water quality of the Limpopo River, indicate that there will be significant improvement in the quality of the effluent discharged into the Tati River from the investments supported by the Project. With the installation of preliminary treatment equipment and upgrades at the Mambo Wastewater Treatment Plant, the rehabilitated wastewater treatment plant will be able to comply with the national standards (BOD and COD) before discharging into the Tati River. COD is used to measure the efficiency of the treatment, in line with international best practice in case of

wastewater influenced by industrial pollution from different sources. This will be a key indicator for the Project. The Project will not support new sanitation connections, and therefore the wastewater treatment plant will not receive incremental hydraulic load as a result of its interventions.

31. In accordance with paragraph 1(a), OP 7.50 is applicable since the Limpopo River is an international waterway, and considering that the Project intervention at the Mambo WWTP will involve rehabilitation of an existing WWTP. Further, OP 7.50 is also applicable in accordance with paragraph 1(b) because the wastewater discharge location is the Tati River, a tributary that runs exclusively within Botswana and which is part of the Limpopo River basin. Considering that the Project will improve effluent quality from the Mambo WWTP an exception to OP 7.50 was granted by the Regional Vice President on September 1, 2016.

32. *Natural Habitats OP/BP 4.04*. This policy is not triggered. However, during the implementation phase of the Project, the proposed activities will be screened to determine if the activities are likely to alter or cause destruction of any critical or sensitive natural habitats. The team will also look for potential opportunities to generate positive impacts on natural habitats though project activities, should such opportunities present themselves.

33. *Forests OP/BP 4.36:* This policy is not triggered since the Project will not support civil works located within forested areas or plantations as defined under OP 4.36.

34. *Pest Management OP 4.09*: This policy is not triggered since the Project will not involve procurement of pesticides or fertilizers and does not have the potential to lead to increased use of pesticides or fertilizers.

35. *Safety of Dams OP/BP 4.37*: This policy is triggered as the Project will rely on the performance of two existing dams. Water from the Ntimbale dam will be used to supply 50 plus villages in the Masunga/Tutume area. The Letsibogo dam will also be used to augment the supply to Selebi Phikwe MC.

36. *Projects in Disputed Areas OP/BP 7.60*: The Project will not finance any activities located in any known areas under territorial dispute as defined in OP 7.60. Therefore, the policy is not triggered.

37. **Safeguard Instruments, Mitigation Process and Implementation Schedule**. The proposed investments to be included under the Project will need to be supported by environmental and social assessments. The appropriate safeguard instruments will need to be prepared based on the level of environmental impacts and risks, in order to guide implementation, monitoring and reporting. ESIAs and/or associated ESMPs will prepared and disclosed in-country and on the Banks external site and ESMPs included in bidding documents. With respect to social safeguards, within 2 months of effectiveness an RPF will be prepared to guide the preparation of RAPs or social audits during implementation. Implementation of RAPs or social audits will be required prior to the start of civil works. Although there are no known VCs present or having a collective attachment to the proposed project sites, the policy has been triggered to make provisions for any findings. If for any given activity, VCs were or are found to be present or have a collective attachment to the area of the proposed project activity, a social assessment will be undertaken and a VCP will be prepared, based on prior informed consultations, disclosed, and implemented prior to the start of civil works. Finally, with regard to dam

safety, the Bank has reviewed the latest (2015) annual dam safety reports for the Ntimbale and Letsibogo Dams as well as the Policy and Procedure Statement – Dam Safety and Maintenance by Water Utilities Corporation (2016) and considers that some remedial/ safety improvement works should be undertaken. Sufficient dam safety and maintenance programs should also be put in place. The recommended actions will be documented in a time bound and costed Dam Safety Action Plan, prepared in in accordance with the Dam Safety Policy. The Dam Safety Action Plans will be finalized within 2 months of effectiveness.

38. As required, GoB will set aside funds in its annual budget for compensation of project affected people and acquisition of land. This will enable timely compliance with the applicable safeguards prior to the start of any civil works under the subprojects. In addition, the Project will provide funding for the implementation of safeguards actions, including preparing assessments, plans and audits, and conducting supervision and consultations. Dam safety remedial actions including refurbishment of monitoring instruments and preparation of dam safety and maintenance program will be incorporated in the TOR/technical specifications for relevant tendering packages associated with the relevant subprojects (Masunga and Selebi Phikwe).

39. **Year 1 investments.** In order to comply with National Laws (e.g. Environmental Impact Assessment law) and World Bank Safeguard Policies, the first-phase of investments (Year1) will need to have existing environmental and social impact assessments reviewed or updated as necessary. WUC and MLWS have advanced the preparation of environmental and social studies for some subprojects in line with national EIA and permitting requirements. The Bank is currently reviewing all existing ESIAs and ESMPs to ensure that the quality is consistent with OP 4.01 before either updating or disclosing them in-country and on the World Bank's external website. This review process will be completed prior to board presentation and any recommendations for updating existing safeguards document will be discussed, and necessary actions and support agreed, with the client. The level of detail and scope of each ESMP will be determined by the type of activities to be implemented. This will be indicated in the TORs for ESMPs. In line with overall safeguard requirements for the Project the disclosure of the approved documents will be required prior to issuing bidding documents. ToRs for the ESIA for Mambo WWTP have been disclosed.

40. In line with OP 4.11/BP and OP/BP 4.12, all safeguards instruments will be subject to national consultations and approved by the relevant GoB institution (e.g. DEA for environmental documents) before the Bank's clearance and approval. The table below summarises the requirements of each sub-project with regard to the World Bank safeguard requirements.

Table A4. 1 Summary of environmental and social management instruments required by investments under Component 1

Management Center	Infrastructure investments Cost estimate (US$ million)	Safeguard Requirements to comply with World Bank Safeguard Policies

Management Center	Infrastructure investments Cost estimate (US$ million)	Safeguard Requirements to comply with World Bank Safeguard Policies
Selebi-Phikwe	Selebi-Phikwe to Serule water transfer scheme US$ 20 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in country and at the Bank's external site prior to issuing bidding documents. The ES should be included in the bidding documents. RAP or social audit (if required) will be prepared prior to civil works. Compliance with the Dam Safety policy is required. A Dam Safety Action Plan outlining outstanding activities from the 2015 dam safety report, including a budget and timeline will be prepared. Mitigation measures associated with the ESMP and Dam Safety Action Plan to be incorporated in the Bidding Documents.
Letlhakane	Boteti Southern and Central Cluster Villages Water Supply Scheme US$ 20 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works.
Letlhakane	Mosu, Mokubilo and Mmea villages US$0.3 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works.
Ghanzi	Ghanzi township water resource study and supply expansion US$8.4 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works.
Ghanzi	Kuke water supply Master Plan US$1.9 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works.
Ghanzi	Bere Settlement water supply augmentation US$0.7 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works.
Masunga	North East and Tutume Sub District water supply upgrading US$22 million	Review and Update of existing EIA to ensure compliance with requirements of a full-scale site specific environmental and social assessment. An Environmental and Social Management Plan will be required. This will also to address sedimentation at the WWTP as interventions to control soil erosion in the catchment are inadequate. Compliance with the Dam Safety policy is required. A Dam Safety Action Plan outlining outstanding activities from the 2015 dam safety report, including a budget and timeline will be prepared. Mitigation measures associated with the ESMP and Dam Safety Action Plan to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works.

Management Center	Infrastructure investments Cost estimate (US$ million)	Safeguard Requirements to comply with World Bank Safeguard Policies
Masunga	Sowa Water Supply Master Plan (connection to Nata Cluster) US$18.5 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works.
Lobatse	Mmathethe US$9 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works.
Lobatse	Mokatako US$0.3 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works.
Kanye	Kanye/ Moshupa US$ 3 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works. RAP or social audit (if required) will be prepared prior to civil works.
Molepolole	Malwelwe/ Molepolole/ Thamaga/ Thebephatswa (Phase 2) US$10 million	Site-specific environmental and social assessment to be carried out. An Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. RAP or social audit (if required) will be prepared prior to civil works.

Note: A detailed description of Component 1 Investments is provided in Annex 1, Table A1.1

Table A4.2 Summary of environmental and social management instruments required by investments under Component 2

Management Center	Infrastructure investments Cost estimate (US$ million)	Safeguard Requirements to comply with World Bank Safeguard Policies (OP 4.01)

Management Center	Infrastructure investments Cost estimate (US$ million)	Safeguard Requirements to comply with World Bank Safeguard Policies (OP 4.01)
Francistown	Mambo WWTP rehabilitation US$16 million	A full-scale site specific environmental impact assessment: terms of reference (ToR) have been prepared for an Environmental Impact Assessment with the associated Environmental Management Plan. As this Project is rated Category A, the assessment will cover the Project area of Influence including the dam area, and accumulative impacts. - Tati river is a sensitive environmental receptor, due to the existing water supply dam located 50km from the discharge point. - Sludge management requires a comprehensive E&S assessment to determine the quantity generated, treatment, transport and disposal/usage. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents
Lobatse	Lobatse WWTP rehabilitation US$0.65 million	A site specific environmental and social assessment is required: An Environmental Impact Assessment study report with the associated Environmental Management Plan will be prepared Sludge management is a key significant environmental issue that requires a comprehensive E&S assessment to determine the quantity generated, treatment, transport and disposal/usage. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents
Letlhakane	Letlhakane Waste Water treatment pond expansion US$5 million	A site specific environmental and social assessment is required: An Environmental and Social Impact Assessment study report with the associated Environmental and Social Management Plan will be prepared. A RAP or social audit (if required) will be prepared, disclosed and implemented prior to civil works. Sludge management requires a comprehensive E&S assessment to determine the quantity generated, treatment, transport and disposal/usage. Mitigation measures associated with the ESMP to be incorporate in the Bidding Documents.

Note: A detailed description of Component 2 Investments is provided in Annex 1, Table A1.2

41. **Institutional Arrangements for Implementing Safeguards**. The proposed implementation arrangements for the Project require WUC to be responsible for preparing, implementing, and monitoring all the safeguard instruments under the Project. WUC has a designated Safety, Health, Environmental and Quality (SHEQ) unit which is tasked with the responsibility of carrying out environmental and social assessments for all water supply and sanitation infrastructure investments in Botswana; including supervision, monitoring and reporting on the implementation of the mitigation measures in compliance with the Botswana EIA law. The unit is staffed with an environmental manager, a principal environmental officer, and a senior environmental officer. WUC has the experience of carrying out environmental and social assessments in line with the national EIA Act and regulations but has limited experience in the application of the World Bank Safeguard Policies.

42. **Borrower's institutional capacity to prepare, implement and monitor safeguard instruments**. At the national level, the Botswana Department of Environmental Affairs (DEA) is the regulatory agency and competent authority responsible for enforcing environmental regulations and ensuring that all infrastructure investments in Botswana are in compliance with the national EIA law and. DEA works closely with environmental officers at the line Ministries and other Government agencies who are responsible for site level environmental management of project activities. For this Project, the Safety, Health, Environmental and Quality (SHEQ) unit at the WUC will be required to ensure compliance with these laws. To support the implementation of these safeguards requirements, the implementing agencies (WUC and MLWS) will procure the services of a dedicated environmental specialist and social specialist. These specialists will support the implementation, monitoring and reporting of the mitigation measures described in site-specific ESMPs and RAPs. They will work with staff in WUC - PMO and support the SHEQ unit in the execution of all safeguards actions. Recruitment of these specialists is a legal covenant to be implemented within 2 months of effectiveness

43. Annual Audits on the implementation of ESMPs will be prepared by WUC and submitted to DEA for approval before submitting to the Bank. WUC will bear the full responsibility of preparing the studies. During the project implementation period, supervision and monitoring will be crucial to ensure that the proposed mitigation measures are implemented. WUC (with DEA oversight) will be responsible for monitoring of the environmental and social aspects of the Project. Indicators for monitoring changes in the physical, biological, and socio-economic environments should be developed during the preparation of the design stage site specific ESIA and ESMPs, and the monitoring component fully elaborated as part of the detailed site specific assessments.

Table A4 3. Actions, responsibilities, and implementation schedule - Summary Safeguards Action Plan

SN	Action	Responsibility	Due Date
1	Review all existing site-specific ESIAs and ESMPs for the prioritized year 1 project activities. To be sent to the World Bank for review.	WUC Principal Environmental and Social Officer	Review of all existing Year 1 ESIAs and ESMPs will be completed - by Board Presentation. (completed) Recommendations for required improvements will be provided to the client for action.
2	Prepare ToR for a full the ESIA of the proposed rehabilitation of the Mambo WWTP.	WUC	Disclosed.
3	Prepare an RPF to guide the preparation of the site specific RAPs or Social Audits.	WUC Principal Environmental and Social Officer/s	Legal Covenant – RPF to be completed within 2 months of effectiveness.
4	Finalized site-specific ESMPs and/or RAPs and social audits for all the prioritized Year 1 Project investments. To be sent to the WB for review.	WUC Principal Environmental and Social Officer/s	Year 1 Site-specific environmental and social assessment to be carried out and Environmental Management Plans and RAPs prepared, consulted and disclosed in-country and at the Bank's external site. All mitigation measures associated with the ESMP to be included in the Bidding Documents for civil works. All social audits to be completed and site specific RAPs fully implemented prior to the start of civil

			works.
5	All required site specific ESMPs and RAPS finalized and disclosed and compensation paid to project affected people.	WUC Principal Environmental and Social Officer	All site specific Environmental Management Plan to be prepared, consulted and disclosed in-country and at the Bank's external site prior to issuing of bidding documents. Mitigation measures associated with the ESMP to be incorporated in the Bidding Documents. All requirements in site specific RAPs to be fully implemented prior to the start of civil works.
6	ToR for recruitment of Environmental and Social Specialist/s to the WUC - PMO finalized.	WUC Principal Environmental and Social Officer	By Negotiations (completed).
7	Finalize the selection of Environmental and Social Specialist/s for the WUC - PMO.	WUC	Prior to Effectiveness.
8	Recruitment of Environmental and Social Specialist/s to WUC - PMO.	WUC	Legal Covenant -Within 2 months of Effectiveness or as otherwise agreed with the Bank.
9	The client will hire independent dam specialists to carry out the actions specified based on the dam safety inspection reports and Bank's recommendation and provide a written report of findings and recommendations for any remedial works and safety related measures necessary to upgrade the dams to an acceptable standard of safety.	WUC	Experts to be selected prior to Effectiveness. ToRs and selection of dam specialists are subject to Bank's review. Expert recommendations will form an input to ToRs /technical specification for relevant tendering packages to be prepared in 9. Below.
10	As recommended in 9 above, a dam safety action plan outlining any remedial work to be done including dam safety instruments will be prepared. These actions will be incorporated into the bidding documents for the relevant subprojects.	WUC	Dam Safety Action Plan to be prepared within 2 months of effectiveness. Any mitigation measures to be incorporated in bidding documents for the relevant packages.
12.	Incorporate required actions to identify and address VC issues in the ToR for the relevant ESIAs, ESMPs or RAPS.	WUC	Updated ToR for ESIAs, RAPs and ESMPs and/or other documents.
13	If required a VCP will be prepared based on prior, free, informed consultations. The plan will be disclosed and implemented according to the IP policy.	WUC	VCP disclosed in country and on Banks external website prior to civil works.