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R2017-0051/1

February 28, 2017

Closing Date: Friday, March 17, 2017 at 6 p.m.

FROM: Vice President and Corporate Secretary

Panama - Burunga Wastewater Management Project

Project Appraisal Document

Attached is the Project Appraisal Document regarding a proposed loan to Panama for the Burunga Wastewater Management Project (R2017-0051), which is being processed on an absence-of-objection basis.

Distribution:
Executive Directors and Alternates
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Bank Group Senior Management
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The World Bank

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Report No: PAD1539

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$65 MILLION

TO THE

REPUBLIC OF PANAMA

FOR THE

BURUNGA WASTEWATER MANAGEMENT PROJECT

FEBRUARY 23, 2017

Water Global Practice
LATIN AMERICA AND CARIBBEAN

CURRENCY EQUIVALENTS

(Exchange Rate Effective {Nov 21, 2016})

Currency Unit =	Panamanian Balboa (PAB)
PAB 1 =	US$1

FISCAL YEAR

January 1 - December 31

Regional Vice President:	Jorge Familiar
Country Director:	J. Humberto Lopez
Senior Global Practice Director:	Guang Zhe Chen
Practice Manager:	David Michaud
Task Team Leader(s):	Miguel Vargas-Ramirez, Hector Alexander Serrano

ABBREVIATIONS AND ACRONYMS

AECID	Spanish Agency for International Development Cooperation
CABEI	Central American Bank for Economic Integration
CAF	Development Bank for Latin America (*Banco de Desarrollo para América Latina*)
CGR	Comptroller General's Office
CONADES	National Council for Sustainable Development (*Consejo Nacional para el Desarrollo Sostenible*)
DBO	Design, Build and Operate
EIB	European Investment Bank
EMP	Environmental Management Plan
EIA	Environment Impact Assessment
FM	Financial Management
GoP	Government of Panama
GRS	Grievance Redress Service
IADB	Inter-American Development Bank
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
IDAAN	National Water and Sewerage Utility (*Instituto de Acueductos y Alcantarillados Nacionales*)
IFR	Interim Financial Reports
ISO	International Organization for Standardization
IUWM	Integrated Urban Water Management
JICA	Japan International Cooperation Agency
M&E	Monitoring and Evaluation
MINSA	Ministry of Health (*Ministerio de Salud*)
NCB	National Competitive Bidding
O&M	Operation and Maintenance
OFID	OPEC's Fund for International Development
OM	Operational Manual
PCBSP	Panama City and Bay Sanitation Project
PCU	Project Coordination Unit (*Unidad Coordinadora del Proyecto*)
PSP	Panama Bay and City Sanitation Project (*Proyecto de Saneamiento de la Ciudad y Bahía de Panamá*)
RPF	Resettlement Policy Framework
SCD	Systematic Country Diagnostic
SOE	Statements of Expenditures
WSS	Water Supply and Sanitation
WWTP	Wastewater 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
17-Mar-2017	31-Dec-2021	B - Partial Assessment

Bank/IFC Collaboration
No

Proposed Development Objective(s)

The objectives of the Project are to: (a) improve access to sewerage services in selected areas of the Borrower's province of Panama Oeste; and (b) strengthen wastewater pollution management capacity in key sector institutions of the Borrower.

Components

Component Name	Cost (US$, millions)
Component 1: Construction of a New Sewerage System in Burunga	49.50
Component 2: Institutional Strengthening for Sustainable Wastewater Management	12.70
Component 3: Project Management and Administration	19.00

Organizations

Borrower : Republic of Panama

Implementing Agency : PCU, under the Ministry of Health

[✔] 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:
81.20	81.20	0.00
	Of Which Bank Financing (IBRD/IDA):	
	65.00	

Financing (in US$, millions)

Financing Source	Amount
Borrower	4.70
Development Bank of Latin America (CAF)	11.50
International Bank for Reconstruction and Development	65.00
Total	**81.20**

Expected Disbursements (in US$, millions)

Fiscal Year	2017	2018	2019	2020	2021	2022
Annual	0.00	6.00	18.00	20.00	19.00	2.00
Cumulative	0.00	6.00	24.00	44.00	63.00	65.00

INSTITUTIONAL DATA

Practice Area (Lead)

Water

Contributing Practice Areas

Environment & Natural Resources
Social, Urban, Rural and Resilience Global Practice

Climate Change and Disaster Screening

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

Gender Tag

Does the project plan to undertake any of the following?

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

Yes

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

Yes

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

Yes

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

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

8. Stakeholders	Moderate
9. Other	
10. Overall	Substantial

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

Article IV., Section 4.01 of the Loan Agreement: The Additional Event of Suspension consists of the following, namely, that the Cooperation Agreement or any of its provisions has been assigned, amended, abrogated, suspended, or waived so as to affect materially and adversely, in the opinion of the Bank, the implementation and/or the sustainability of the Project.

Sections and Description
Article IV., Section 4.02 of the Loan Agreement: The deadline for the effectiveness of the Co-financing Agreement is July 1, 2017. The Co-financing Agreement is the agreement to be entered into between the Borrower and CAF providing for the Co-financing.

Sections and Description
Schedule 2, Section I.A.1 (a) of the Loan Agreement: The Borrower shall maintain, throughout Project implementation, the PCU within MINSA, responsible for the management, coordination, implementation, monitoring and evaluation of the Project.

Sections and Description
Schedule 2, Section I, C.3 of the Loan Agreement: The Borrower, through the PCU, shall ensure that the terms of reference for any consultancies related to the technical assistance provided under the Project, shall be acceptable to the Bank following its review thereof and, to that end, such terms of reference shall duly incorporate the requirement of the Bank's Safeguard Policies then in force, as applied to the advice conveyed through such technical assistance

Sections and Description
Schedule 2, Section V, A. 1 of the Loan Agreement: The Borrower shall carry out the construction of the WWTP with due diligence and efficiency, and in conformity with appropriate technical, financial, economic, environmental and social standards and practices, including with the provisions of the applicable EMP and the WWTP Action Plan, all in a manner acceptable to the Bank.

Sections and Description
Schedule 2, Section V, A.2 of the Loan Agreement: Without limitation to the provisions of: (a) Section 5.03 of the General Conditions applicable to the Loan Agreement, the Borrower shall provide or cause to be provided, promptly as needed, the funds required for the construction and operation of the WWTP; and (b) Section 5.11 (b) of the General Conditions applicable to the Loan Agreement, the Borrower shall enable the Bank's representatives to visit the construction site in which the WWTP is being constructed.

Sections and Description
Schedule 2, Section V, A. 3 of the Loan Agreement: The Project Reports referred to in Section II.A.1 of Schedule 2 to the Loan Agreement shall also include information concerning the progress made in the construction of the WWTP, including the pertinent supervision reports prepared by the Borrower from time to time covering technical, social and environmental aspects as provided in the applicable EMP

Sections and Description
Schedule 2, Section V, B. 1 of the Loan Agreement: The Borrower shall ensure that CONADES, in close coordination

with MINSA, and in a manner acceptable to the Bank, promptly provides bathroom facilities to an estimated number of eight hundred poor households in the township of Burunga during Project implementation to ensure that they can benefit from the sewerage works carried out under Part 1 of the Project.

Conditions

Type	Description
Effectiveness	The Additional Condition of Effectiveness consists of the following, namely, that the Operational Manual has been adopted by the PCU. The Effectiveness Deadline is the date ninety (90) days after the date of the Loan Agreement (Article V of the Loan Agreement).
Disbursement	No withdrawal shall be made from the Loan Account until the Bank has received payment in full of the Front-end Fee (Schedule 2, Section IV.B.1 (a) of the Loan Agreement).
Disbursement	No withdrawal shall be made for payments made prior to the date of the Loan Agreement, except that withdrawals up to an aggregate amount not to exceed $12 million may be made for payments prior to this date but on or after the date that falls one year prior to the date of the Loan Agreement, for Eligible Expenditures (Schedule 2, Section IV.B.1 (b) of the Loan Agreement).

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Miguel Vargas-Ramirez	Team Leader(ADM Responsible)	Sr. Water & Sanitation Specialist	GWA03
Hector Alexander Serrano	Team Leader	Water Resources Management Specialist	GWA03
Daniel Jorge Arguindegui	Procurement Specialist(ADM Responsible)	Sr. Procurement Specialist	GGO04
Lourdes Consuelo Linares Loza	Financial Management Specialist	Sr. Financial Management Specialist	GGO22
Alberto Fabian Arbesu Cardona	Team Member	Program Assistant	LCCPA

Alejandro Neira Zavala	Team Member	Program Assistant	GWA04
Carlos Vargas Bejarano	Safeguards Specialist	Sr. Environmental Specialist	GEN04
Carmen Rosa Yee-Batista	Team Member	Sr. Water & Sanitation Specialist	GWA01
Carolina Abigail Delgadillo Medin	Team Member	Program Assistant	GWA03
Charles Delfieux	Team Member	Sr. Water & Sanitation Specialist	GWA04
Dmitri Gourfinkel	Team Member	Sr. Financial Management Specialist	GGO22
Elvira Cusiqoyllor Broeks Motta	Team Member	Program Analyst	GWA03
Irina Luca	Team Member	Practice Manager	GGOGI
Ntombie Z. Siwale	Team Member	Operations Analyst	GWA03
Pery Nazareth	Team Member	Consultant	GWA04
Pilar Elisa Gonzalez Rodriguez	Team Member	Sr. Counsel	LEGLE
Rocio Mariela Malpica Valera	Team Member	Sr. Counsel	LEGES
Sandra Monica Tambucho Perez	Team Member	Sr. Finance Officer	WFALA
Tatiana Cristina O. de Abreu Souza	Team Member	Finance Officer	WFALA
Victor Vazquez Alvarez	Team Member	Sr. Water & Sanitation Specialist	GWA04
Violeta Wagner	Team Member	Sr. Program Assistant	GWA02
Ximena B. Traa-Valarezo	Safeguards Specialist	Social Specialist	GSU04

Extended Team

Name	Title	Organization	Location
Luz Maria Gonzalez	Economist and Financial specialist		Ohio,United States

PANAMA
BURUNGA WASTEWATER MANAGEMENT PROJECT

TABLE OF CONTENTS

I. STRATEGIC CONTEXT

A. Country Context

1. **Panama's economic growth over the last decade has made headlines in Latin America**. The country of approximately 3.6 million citizens averaged 7.9 percent real gross domestic product growth between 2010 and 2015. In the near-term, growth prospects for Panama are promising with projections for 2014-2019 between 6 and 6.5 percent based on additional traffic through the expanded Canal and expected high levels of public and private investment.[1] Moreover, between 2010 and 2015, poverty declined from 29.8 percent of the population to 23 percent, and extreme poverty from 12.2 percent to 10.3 percent (using the national poverty line).[2] The population at the bottom 40 percent of the country's economic scale has benefitted from the economic boom, with incomes rising by 4 .1 percent per year from 2009 to 2014.[3]

2. **Nowhere is the economic growth more evident than in the transformation of Panama City, the economic engine[4] of the country and home to 43 percent of the population.** Over the past 20 years, the City of Panama has transformed into a rapidly growing, vibrant urban metropolis, with the first metro system of Central America and a series of high-rises doting the renewed waterfront.

3. **Despite this progress, significant challenges persist.** At 0.52, the Gini index remains high and above the regional average of 0.49.[5] In addition to economic inequality, the bottom 40 percent suffers disproportionately from poor infrastructure and weak service provision. Rapid urbanization and economic growth, largely concentrated in Panama City, have also created significant environmental and public service delivery challenges, in particular in peri-urban areas. The Panama Bay, where urban residents once bathed until the 1940's, is now highly contaminated, restricting human and economic activities. Biodiversity has significantly decreased in both the Bay and tributary rivers due to a low water quality as a consequence of poor sanitation and solid waste management services. Moreover, climate models indicate that low lying areas in the Panama Bay[6] - currently subject to recurrent flash flood events - will become even more vulnerable in the future.[7]

B. Sectoral and Institutional Context

4. **One area that has seen exceptional population growth is the Province of Panama Oeste,[8]**

[1] World Bank (2015). Country Partnership Framework for the Republic of Panama FY15-FY21.
[2] http://www.mef.gob.pa/es/informes/Documents/Actualizacion%20de%20las%20lineas%20de%20pobreza%20-%202015.pdf
[3] http://www.worldbank.org/en/topic/poverty/lac-equity-lab1/shared-prosperity/income-growth-bottom-40
[4] The Panama City Metropolitan Area generates approximately 68 percent of the country's gross domestic product (Panama Strategic Country Diagnostic).
[5] International Monetary Fund (IMF). 2015. *Regional Economic Outlook. Western Hemisphere: Northern Spring, Southern Chills*.
[6] Second National Communication on climate change, Autoridad Nacional de Medio Ambiente 2011.
[7] National Plan for Disaster Risk Management 2011-2015
[8] Panama Oeste is the tenth province of the Republic of Panama, created in January 2014 due to the region's rapidly growing population. Panama Oeste includes the Districts of La Chorrera, Arraijan, Capira, Chame and San Carlos.

which is situated west of Panama City. Panama Oeste's District of Arraijan, where the *corregimiento*[9] of Burunga is located, has registered 17 percent annual population growth rates in some areas, although many of its residents still live in poverty (29 percent).[10] This rapid urban growth has not been accompanied by infrastructure or basic services. Only 24 percent[11] of Panama Oeste's population is connected to a sewerage system, and many of the sewerage systems are in poor condition with some dating from 1941 and not connected to a treatment plant. The remainder of the population utilizes septic tanks (38 percent),[12] pit latrines or simple ground holes (37 percent use either system), many of which are dilapidated due to lack of maintenance. Septage management services are currently provided by unregulated private entities.

5. **The lack of quality Water Supply and Sanitation (WSS) services in Panama Oeste poses major risks to public health[13] and environmental sustainability of the Panama Bay and surrounding rivers[14] which are contaminated with the Province's untreated sewage.** The Inter-American Development Bank (IADB) estimates that approximately 114,000m^3 of untreated wastewater is directly discharged annually into surrounding water bodies in the area of Arraijan and La Chorrera, contaminating the rivers of Aguacate, Caimito, Prudente, Bernardino, Martin Sánchez and Perequetecito.[15]

6. **The responsibility for WSS services is shared between different institutions.** These include: (a) the Ministry of Health (*Ministerio de Salud,* MINSA), responsible for overall policy-making; (b) the National Regulatory Authority for Public Services (*Autoridad Nacional de los Servicios Publicos,* ASEP), responsible for service regulation; and (c) the National Water and Sewerage Institute (*Instituto De Acueductos y Alcantarillados Nacionales*, IDAAN) responsible for WSS service provision in urban areas. As the main provider of WSS services in Panama, IDAAN has been facing increasing technical and financial challenges as it is only able to cover about 66 percent of its operating costs. As a result, it relies on annual transfers of about US$67 million per year from the Government of Panama (GoP) to fund its financial deficit and required investments. Other key actors include the Ministry of Environment that regulates and monitors water quality, and the Ministry of the Presidency through its National Council for Sustainable Development (CONADES), responsible for the implementation of high priority WSS infrastructure programs, including a program for the provision and upgrading of in-house bathroom facilities.

7. **The World Bank has been active in the water sector since 2007**. Support includes investment projects, such as the on-going Metro Water and Sanitation Improvement Project (P119694) and technical assistance, providing an important platform to discuss IDAAN's challenges. The World Bank also partners with other actors to support the GoP in modernizing IDAAN, although the pace of reform has been slow.

[9] A *corregimiento* is a small political subdivision. Smaller than a district but larger than a neighborhood.
[10] MINSA-PCU Social Evaluation Study of Burunga Sector 2013
[11] Panama 2010 Census
[12] MINSA-PCU Social Evaluation Study of Burunga Sector 2013.
[13] In the first half of 2014, there were 18,000 cases of diarrhea in Panama Oeste, many of which are likely to have been caused by parasites transmitted through consumption of water or food that had come in contact with feces. (*http://www.panamaamerica.com.pa/tema-del-dia/casos-de-diarrea-se-han-dsuplicado-este-ano-en-area-de-panama-oeste*, *http://www.prensa.com/aleida_samaniego_c/mirada-cientifica-real-causa-diarrea_0_3176682365.html*)
[14] The direct disposal of wastewater and solid waste in several of Panama Oeste's rivers has increased contamination to a point at which the water is no longer considered apt for human consumption or bathing. Rivers include Aguacate, Caimito and Potrero, and present a medium level of contamination (an average of 58 percent on the Water Quality Index Scale, with 49 percent at its most contaminated monitoring point).
[15] http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=40309492

8. **Recognizing the urgent need to clean-up the Panama Bay and the shortfall in IDAAN's capacity to deliver the necessary sanitation services in the Metropolitan Area of Panama, the GoP put in place the Panama City and Bay Sanitation Project (PCBSP) under MINSA in 2001.** The goal of PCBSP is to improve sanitary conditions in low-income urban communities of Panama City and reduce the pollution discharged into the Bay. To implement the PCBSP, MINSA created a specialized Project Coordination Unit (PCU) that has been successfully implementing sanitation infrastructure investments in Panama City for the past 15 years, including oversight of contracts for the operation and maintenance (O&M) of the infrastructure. The PCU had over 60 experienced staff and a total budget allocation for capital works of US$178.6 million on average per year between 2014 and 2016.

Box 1: Support to the PCBSP

The PCBSP is a US$1.5 billion, 20-year effort to clean up the Panama Bay. It is an ambitious program of sanitary infrastructure activities, including eleven large contracts in its first phase (to be completed by 2017) and eight contracts in its second phase (to be completed in 2023). A complex network of large collectors, interceptors, tunnels, domiciliary and industrial sewerage systems plus three wastewater treatment plants expanding sanitation services thorough Panama City seek to restore the aquatic ecosystems and environmental health of the river network, and provide proper sanitation access and service improvements to over half a million people. Eight large bilateral and multilateral financiers, including the World Bank, have joined the GoP in this urban transformational initiative with 20 loans ranging from US$20 million to US$226 million that are changing the face of the City and the Bay of Panama, positioning this Metropolis as one of the most modern cities in Latin America.

9. **The first phase of investments of PCBSP focused on Panama City** (US$1 billion, including US$432 million in national financing). This included extension of sewerage networks, construction of a conveyance system, as well as construction of the first phase of a large-scale wastewater treatment plant (WWTP) at Juan Díaz for Panama's Metropolitan Area.[16] The bulk of these investments were completed in July 2013. Even though the major collection and treatment works in Panama City are fully operational, the impact on the quality of the Bay is still limited. Other factors contributing to environmental pollution include road runoff, storm water, garbage disposal and irregular sewerage connections to the drainage network, in particular, in peri-urban areas, among others.

10. **The GoP launched a second phase of the PCBSP in 2014[17] to continue wastewater management investments in the rapidly growing peri-urban areas of the city.** This phase also seeks to complement sanitation infrastructure programs by developing new models, tools and instruments to guide investments to maximize pollution reduction in the Bay, as well as use new methodologies such as an Integrated Urban Water Management (IUWM) Plan to coordinate interventions in Panama Oeste,

[16] The Juan Díaz WWTP serves the population east of the Panama Canal. The plant's current treatment capacity is of 2.7m^3/s. Under a second phase of investments, its capacity will be expanded to 5.5m^3/s.
[17] See Annex 1 - Table A1.1 Global PSP Schedule

monitor the impacts of wastewater discharges in the Bay and plan for future interventions in a more integrated manner while including climate change considerations to reduce current climate change vulnerability. Given the successful experience of the first Phase, and to support the Basic Sanitation Plan (*Plan de Sanidad Basica 100/Cero*),[18] the GoP extended the PCBSP PCU's mandate, through a presidential Decree to include the districts of Arraijan and La Chorrera in Panama Oeste and changed the name of the program to Panama Sanitation Program (*Programa de Saneamiento de Panama,* PSP).[19] The second phase of investments, currently under implementation, focuses on areas west of the Panama Canal and involves the construction of new sewer systems, as well as two new WWTPs. It totals US$577 million financed through loans from IADB, the Development Bank of Latin America (CAF), the European Investment Bank (EIB) and the China Fund (Annex 2 shows investments and financiers).[20]

11. **The broader scope and the need for additional financing and technical assistance has prompted the GoP to request support from both the World Bank and CAF**. Support in the amount of US$81.2 million is needed for sanitation investments in the Northwest part of Burunga and development of planning and monitoring tools to strengthen wastewater pollution management capacity.

C. Higher Level Objectives to which the Project Contributes

12. **As part of the PSP, the proposed Project will contribute to the reduction of untreated wastewater discharge improving conditions for the environmental recovery of the rivers in the Project's intervention area and of the Panama Bay.** The proposed Project will also contribute to a reduction in the incidence of gastrointestinal diseases caused by contaminated water, thereby increasing the population's quality of life and productivity.[21] A social assessment showed that the surveyed population identified improvements in their health, and reduction of the contamination of their rivers and in costs for septic tank cleaning as some of the benefits derived from the Project. Improvements of intra-domiciliary sanitation facilities could also be associated with increased safety of women/girls. The proposed Project is also expected to contribute to climate change resilience through infrastructure, such as the construction of ancillary hydraulic works, and the implementation of non-infrastructure measures. The latter will support an IUWM Plan contributing to the improvement of the climate change knowledge base and the development of climate change adaptation measures. Based on a preliminary analysis,[22] climate co-benefits are estimated at 50 percent of the Project amount (See Annex 1).

13. **The proposed Project is aligned with the World Bank's Twin Goals and the Country Partnership Framework (Report No. 93425-PA) discussed by the Executive Directors on April 7, 2015.** The Project directly supports the Framework's pillars: a) Ensuring Inclusion and Opportunities for Marginalized and Indigenous Groups, by improving access to sanitation services; and (b) Bolstering

[18] The Basic Sanitation Plan (part of the Strategic Government Plan 2015-2019) aims to achieve 100 percent, 24-hour-a-day access to potable water and eliminate the use of dry-pit latrines in the country, reducing both the disparities in access to running water and sanitation and the negative impacts in the environment caused by the disposal of untreated effluents.
[19] Executive Decree No. 18, March 3, 2016.
[20] Officially the China Cofinancing Fund for Latin America and the Caribbean, an agreement signed by the IADB and the People's Bank of China. The funds are managed by the IADB.
[21] Cairncross, S., Moraes, L.R.S., Azevedo, J., and Huttley, S. (2003) Impact of drainage and sewerage on diarrhea in poor urban areas in Salvador, Brazil. *Transaction of the Royal Society of Tropical Medicine and Hygiene*. 97: 153-158.
[22] Climate Change Corporate Commitments – Guidance for Water Operations.

Resilience and Sustainability, by reducing the amount of untreated wastewater discharged into water bodies and by supporting IUWM.[23] The Project also addresses Systematic Country Diagnostic (SCD) priorities, including water resource management and reduction of pollution through improved sewerage treatment capacity for Panama's environmental sustainability,[24] and the need for strengthened service providers and public institutions to keep pace with the country's rapid urbanization.[25] Finally, the Project is aligned with the Twin Goals of promoting shared prosperity for the bottom 40 percent and ending extreme poverty, given that it will finance comprehensive wastewater management in marginalized areas characterized by rapid urban growth,[26] high urban poverty levels (29 percent of the population of Northwest Burunga is poor, compared to the national average of 23 percent), and lacking sewerage systems (only 22 percent of households are connected to a sewerage network).[27]

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

14. **The objectives of the Project are to: (a) improve access to sewerage services in selected areas of the Borrower's province of Panama Oeste; and (b) strengthen wastewater pollution management capacity in key sector institutions of the Borrower.**

B. Project Beneficiaries

15. **The proposed Project has direct and indirect beneficiaries as well as Government agencies.** These include: (a) 20,000 residents[28] of Northwest Burunga who will directly benefit from improved sewerage collection; (b) around 50,000 indirect beneficiaries in Burunga who will benefit from the pilot IUWM intervention; (c) people and ecosystems in the Panama Bay area benefiting from improved wastewater management; and (d) GoP agencies involved in infrastructure planning and oversight of the PSP.

C. PDO-Level Results Indicators

16. **Achievement of the PDO will be measured by the following indicators**:

(a) At least 20,000 people are direct Project beneficiaries, of whom 49 percent are women and 29 percent are poor. [Core]
(b) At least 4,600 people provided with access to "improved sanitation facilities" under the Project of which 100 percent live in urban areas. [Core]
(c) An IUWM Plan prepared and under implementation in a pilot area.
(d) A monitoring report on water quality for the Panama Bay area published every year.

[23] IUWM is a planning strategy to provide water supply, wastewater, stormwater, and solid waste services in coordination with urban development objectives and within the context of the broader river basin to promote sustainable cities.
[24] Environmental sustainability depends on safeguarding Panama's water and natural resources and on putting in place adequate regulation to mitigate the effects of large infrastructure and extractive projects, rapid urbanization and risk from to natural disasters. (SCD, 2015)
[25] Increasing urbanization is not matched by adequate planning and service delivery capacity for safe and clean living conditions. (SCD, 2015)
[26] Annual population growth is estimated at 17 percent, making it the fastest growing district in Arraijan. (PSP)
[27] Socio-economic diagnosis of Project area carried out by the PCU, October 2015.
[28] Population numbers are projections to 2020 unless otherwise noted.

III. PROJECT DESCRIPTION

A. Project Components

17. ***Component 1: Construction of a New Sewerage System in Burunga (US$49.5 million, of which US$47 million IBRD and US$2.5 million GoP).*** **This Component will finance the construction of a sewerage system throughout the township of Burunga in the district of Arraijan, including carrying out of detailed construction designs and a sewerage network for wastewater**.[29] This will be implemented through a works contract estimated at US$47 million for which advanced bidding documents exist. The network will provide service to around 20,000 people by 2020 and consists of primary collectors, secondary sewers and a tertiary (smallest diameter) network. This Component will also finance the construction of long inter-domiciliary connections from households[30] to the main sewerage network, and closure and decommissioning of existing septic tanks or latrines. Finally, this Component will support the carrying out of minor drainage works, road access improvements and other ancillary hydraulic works to protect infrastructure from flash floods. The sewerage system will be connected to a WWTP, currently under tender, financed in parallel by CAF outside of the proposed Project. The WWTP construction contract includes the O&M of the plant and network for ten years.

18. ***Component 2: Institutional Strengthening for Sustainable Wastewater Management (US$12.7 million, of which US$12 million IBRD and US$0.7 million GoP).*** **This Component seeks to strengthen the technical capacity of the PCU in implementing the PSP and helping manage water pollution in the Panama Bay.** The Component will finance three subcomponents:

19. **Subcomponent 2A (US$7.5 million, of which US$7 million IBRD and US$0.5 million GoP) supports technical capacity building activities for the PCU and provision of management tools to control water pollution in the Panama Bay.** To contribute to the technical capacity building of the PCU, subcomponent 2A will finance: (i) the carrying out of a water quality baseline, including an assessment of the expected environmental and economic impacts of the PSP; (ii) the carrying out of a technical audit of the sewer and drainage system in Panama City; (iii) the design and implementation of a real-time hydrological/water quality monitoring system to serve as a basic decision support system; (iv) the design and implementation of a hydrodynamic model to measure transport of pollutants into the Panama Bay; (v) the preparation of a map locating and classifying sensitive coastal and river areas; and (vi) the preparation of an action plan for the intervention of critical sewerage areas. To contribute to the development of an IUWM Plan for an urban river basin in Panama Oeste, the Project will finance: (i) a diagnostic of the urban river basin; (ii) the identification of the key stakeholders; (iii) the participatory identification of river basin interventions; and (iv) the implementation of selected activities identified in the Plan in pilot areas of the basin for demonstrative purposes.

20. **Subcomponent 2B (US$2.6 million, of which US$2.5 million IBRD and US$0.1 million GoP) aims to strengthen the PCU's and IDAAN's technical capacity to supervise the operation, maintenance and management of wastewater infrastructure in the Panama Bay area.** The subcomponent will finance

[29] See Annex 1, Fig. A1.2 on WWTP technology and status.
[30] Internal plumbing works and bathroom appliances will be financed and implemented by CONADES for households currently lacking them.

technical training, short courses, workshops, technical assistance, and carrying out of study tours to exchange technical knowledge with experienced operators from other geographical regions.

21. **The objective of subcomponent 2C (US$2.6 million, of which US$2.5 million IBRD and US$0.1 million GoP) is to strengthen the PSP's social interventions by raising awareness, training and encouraging commitment to the Project's investments among community-based organizations in Burunga**. This subcomponent will finance: i) the creation and strengthening of socio-environmental community management committees, ii) the development of monitoring exercises to evaluate the sanitary conditions of the population; and iii) other community initiatives such as sweeping campaigns and cultural and sport events.

22. ***Component 3: Project Management and Administration (US$19 million, of which US$6 million IBRD, US$11.5 million CAF and US$1.5 million GoP).*** This Component will finance: (i) the costs associated with the supervision, quality control, monitoring, inspection and procurement support for the works under Component 1; and (ii) the PCU's Project management and administration activities. The PCU's Project administration activities will be financed by IBRD, including fiduciary management (including financial audits), procurement, reporting, monitoring and evaluation (M&E), and implementation of the Project's safeguard instruments.

B. Project Cost and Financing

23. **The total cost of the Project is US$81.2 million, to be financed by IBRD, CAF and GoP in parallel.** The World Bank will provide a loan of US$65 million, representing 80 percent of total cost, for an Investment Project Financing for five years. The Project will also be financed by GoP (6 percent of the total), and CAF (14 percent). Table 1 outlines financing by Component (with more details in Annex 2). Each bank will finance 100 percent of specific contracts, with IBRD exclusively financing Northwest Burunga and CAF financing the Project management consulting firm under Component 3.

Table 1. Project Cost and Financing (in US$ millions)

Project Components	Cost	IBRD	CAF	GoP	% IBRD
Component 1. Construction of a New Sewerage System in Burunga	49.5	47.0	0.0	2.5	*94.9*
- *Sector 4.4 Northwest Burunga*	*44.4*	*42.2*	*0.0*	*2.2*	*95.0*
- *Contingencies*	*5.1*	*4.8*	*0.0*	*0.3*	*94.1*
Component 2. Institutional Strengthening for Sustainable Wastewater Management	12.7	12.0	0.0	0.7	*94.5*
- *Sub-Component 2A*	*7.5*	*7.0*	*0.0*	*0.5*	*93.3*
- *Sub-Component 2B*	*2.6*	*2.5*	*0.0*	*0.1*	*96.2*
- *Sub-Component 2C*	*2.6*	*2.5*	*0.0*	*0.1*	*96.2*
Component 3. Project Administration	19.0	6.0	11.5	1.5	*31.6*
- *Project Manager – Burunga (all sectors)*	*12.3**	*0.0*	*11.5*	*0.8*	*0.0*

- *Project Administration*	*4.3*	*4.0*	*0.0*	*0.3*	*93.0*
- *Contingencies*	*2.4*	*2.0*	*0.0*	*0.4*	*83.3*
Front-End Fees					
Total Financing Required	**81.2**	**65.0**	**11.5**	**4.7**	***80.0***

(*) This is the contractual amount for the Project Manager for the WWTP and three sewerage systems in Burunga (Northwest, Center and East) to supervise an estimated overall construction and O&M value of US$189 million. If services were to be grossly allocated to service areas, the proportion corresponding to managing and supervision exclusively to the Northwest Burunga contract would be US$2.9 million, about 6.5 percent of estimated contract amount, well within international costs standards.

C. Lessons Learned and Reflected in the Project Design

24. **Several World Bank-financed projects, including the Lima Water Rehabilitation & Management Project (P008051) and Guayaquil Wastewater Management Project (P151439) have underscored the need to take into account the willingness and ability of users to connect to the network to ensure full use of the infrastructure and avoid large investments in sewerage networks that may not be used.** As such, Project design includes a household census to assess their sewerage infrastructure, an intensive social intervention (awareness creation, participatory diagnosis, creation of environmental committees, etc.) to ensure ownership of investments as well as financing of user connections to the service (from the network to the household). The sewerage system financed by the Project will include connection of existing facilities while CONADES will support the construction of bathrooms for households without one.

25. **This Project capitalizes on positive experiences with social management strategies of the Water Supply and Sanitation for Low-Income Communities Project (P082419), and with the ongoing Metro Water and Sanitation Improvement Project (P119694).** Lessons learned set out the importance of a single social engagement methodology to be followed by all actors: MINSA, Project Manager, the design consultant, and contractors. The stakeholder engagement will be applied from Project onset, during and after construction of civil works. This has proved to be effective for both user's appropriation of the built sanitation systems and to instill in the communities the social responsibility of paying for services. The civil engagement will reinforce the PSP's interventions under subcomponent 2C.

26. **The World Bank has financed projects in Bolivia, Peru and Paraguay using the condominial sewerage technology for adaptation to irregular urban layouts while permitting cost savings.** IDAAN's technical standards for pipe and manhole specifications are high, however, this Project has incorporated principles of condominial sewerage design, particularly inside the plots and areas with restricted traffic. This approach calls for shallower trenches and simplified chambers, reduced diameters and minimum slope requirements, as well as the adaptation of the sewerage layout to the irregular semi-urban setting patterns, in rocky or hilly conditions. These adaptations will allow for both some savings and reduction of nuisances to beneficiaries.

27. **An integral approach to water pollution control is needed**. Wastewater collection and treatment is only one part of the wider issue of water pollution in the Panama Bay. The Project employs an integral approach to pollution control, similar to the experiences learned in China (Guangdong Red

River Delta Project, P127815; Nanning Urban Environmental Project, P108627) and in Brazil (Teresina Municipal Governance Project, P088966) where pollution sources are analyzed beyond the contamination caused by untreated sewage. The Project will support a more ambitious diagnostic of the critical issues affecting water quality in the Panama Bay and development of tools to target particular pollution sources.

28. **The World Bank will also add value through sharing its international expertise on IUWM, such as the Blue Water Green Cities Initiative[31] among other sustainability-promoting practices that are innovative in Panama.** The World Bank will support knowledge exchange events between the PCU and Governments that have successfully implemented these models, participation in international workshops, as well as one-on-one capacity development with international experts. The World Bank will also bring relevant knowledge in the field of pro-poor service provision. It has extensive institutional and technical experience with large-scale wastewater and pollution control programs, such as the India National Ganga River Basin Project,[32] the Ho Chi Minh City Environmental Sanitation Project Phase II,[33] and the Cartagena Water Supply, Sewerage and Environmental Management Project.[34]

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

29. **The PSP's PCU, under MINSA, will be responsible for overall Project implementation.** The PCU is responsible for the administrative management and operation of the PSP, program planning and execution, progress report preparation, data collection and project monitoring, specialized technical assistance for Project execution, and environmental and social supervision of the works. The PCU is currently managing a contract portfolio of over US$1.5 billion, demonstrating its capacity to effectively manage and implement large-scale projects. As described in Annex 2, the PCU is well staffed and has qualified multidisciplinary personnel to fulfill its mandate. Moreover, the PCU recruited an international project management consulting firm in August 2015 (Project Manager) to support preparation of technical designs, environmental studies, licensing documents and bidding documents. The PCU will not delegate fiduciary responsibilities to the Project Manager. Finally, O&M of the infrastructure will be the responsibility of the company awarded the construction contract for ten years.

B. Results Monitoring and Evaluation

30. **MINSA, through the PCU, will have overall responsibility for Project M&E.** The PCU will prepare semi-annual progress reports[35] during Project implementation in a manner and format acceptable to the World Bank as defined in the Operational Manual (OM). These reports will describe the status of all Components and activities, progress towards the PDO, and other content specified in the OM.

[31] http://www.worldbank.org/en/region/lac/brief/latin-america-integrated-urban-water-management
[32] http://www.worldbank.org/projects/P119085/national-ganga-river-basin-project?lang=en
[33] http://www.worldbank.org/projects/P127978/second-ho-chi-minh-city-environmental-sanitation-project?lang=en
[34] http://www.worldbank.org/projects/P044140/cartagena-water-supply-sewerage-environmental-management-project?lang=en
[35] These reports will be based on supervision reports of the project management firm to be contracted under Component 3 and will include results indicators that will be monitored by the PCU.

C. Sustainability

31. **The short- and medium-term sustainability of the sewerage network investments is ensured through the Design, Build and Operate (DBO) contracts for the WWTP ensuring ten years of O&M for both the WWTP and the associated network, financed by the GoP.** The PCU has executed investments of over US$840 million in the last decade that are currently operated and maintained in a satisfactory manner. To effectively manage the rapid expansion of new sewerage infrastructure and IDAAN's delegation of responsibility for the O&M of PSP infrastructure, the PCU is actively strengthening its organizational structure. Under the IADB's Sanitation Program, the PCU has completed a combined certification for International Organization for Standardization (ISO) 14001, ISO 9001 and Occupational Safety and Health Administration 18001 to enable it to standardize O&M processes. The PCU is the first implementation unit in the country to achieve such a three-norm certification.

32. **The long-term sustainability of the infrastructure depends on the PCU, MINSA and IDAAN.** Executive Decree 18, dated March 3, 2016, guarantees resources for O&M, investment and the financing of the PCU's administrative and operational structure. Although the Decree provides for a transfer of responsibility to IDAAN once it can deliver service in an adequate, effective and sustainable manner, it also defines a robust framework for the operation of the PCU in the meantime. Once the DBO contract for the WWTP is signed, there will be more certainty about the additional time needed before O&M responsibility is transferred to IDAAN. In parallel, the World Bank is supporting IDAAN, through the Metro Water and Sanitation Improvement Project (P119694) and complementary technical assistance to strengthen IDAAN's capacity.

D. Role of Partners

33. **CAF, as a PSP partner, is financing the construction of the WWTP to which the Northwest Burunga sewage system will be connected.** A Loan to the Republic of Panama for the WWTP was approved by CAF's Board of Directors on July 19, 2016. In addition, under Component 3 of the Project, CAF is financing the Project Manager (without fiduciary responsibilities) for the supervision of the works of Burunga, including the works in Burunga Northwest financed by the World Bank. The Government of Panama has identified EIB as a partner for financing sewerage in Burunga outside the area of this Project.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

34. **Overall implementation risk of the proposed Project is rated Substantial, given substantial risks related to Sector Strategies and Policies and Institutional Capacity for Implementation and Sustainability.** These risks are due to IDAAN's lack of capacity for system O&M after a possible handover,[36] and the potential saturation of the PCU given the number of loans it will oversee in the near

[36] This risk is generalized and applies to all infrastructure being constructed under the PSP, not just the infrastructure financed by this Project.

future. The ten-year WWTP DBO contract, which includes the O&M of the sewerage networks (including Northwest Burunga), mitigates the risk of sustainability for at least a decade given IDAAN's low capacity. In addition, the Cooperation Agreement between MINSA and IDAAN establishes that infrastructure will not be handed over to IDAAN until it has demonstrated its O&M capacity, thus an extension of the handover deadline is already envisaged to allow for the ten-year O&M of the WWTP DBO Contract. PCU overload will be mitigated by a) hiring a Project Manager (under Component 3) to support implementation of Component 1; and b) hiring ten additional staff.

35. **Technical Design risk is also rated Substantial given the risk of not having the WWTP built and operational by Project completion caused by either construction delays or failed bidding/adjudication process.** To mitigate this, the PCU and the World Bank have agreed on an Action Plan for the construction of the WWTP, specifying the dates for bidding, contracting, and completion of works, including commissioning for the O&M of the WWTP to ensure that it is operational by the end of the Project. Moreover, the bidding process for the WWTP was already launched (published on November 2, 2016) and land for the WWTP site is already under public control through MINSA. Figure A1.1 in Annex 1 shows the main milestones for the development of the WWTP and the sewerage system.

36. **Fiduciary risks are also rated as Substantial.** These risks are related to: (i) the lack of information about the design of the sewerage system's minor civil works, which could affect competition and/or result in higher priced bids or problems during the contract implementation stage; (ii) the need for coordination between contracts for the sewerage system and for the WWTP financed by CAF as a result of potential delays in the WWTP commissioning date; (iii) the potential intervention of Comptroller General's Office (CGR) prior to signing of contracts, which could cause bottlenecks; (iv) the timely availability of counterpart funding that could delay Project implementation; and (v) the local procurement regulations that may include some practices that are not acceptable to the World Bank. A series of corrective measures were agreed upon, including: (i) the PCU shall have an appropriate bidding document for the design of the sewerage system; (ii) this bidding document shall include provisions that the Contractor will not make the completed works fully operational until the WWTP is commissioned; (iii) the PCU, MEF and the CGR, with the technical support of the World Bank, shall have advanced specific arrangements to avoid delays in the counter-signing of the contracts, interim payment certificates of works, and other required interventions; (iv) the PCU and the World Bank will work closely during the budget cycle with national institutions to ensure proper counterpart allocation; and (v) procurement under National Competitive Bidding (NCB) procedures will be conducted using bidding documents agreed with the World Bank as well as special procurement provisions included in the Loan Agreement.

37. **Finally, Environmental and Social risks are rated Substantial**. There is a risk that the sewerage works are completed before the WWTP is functional, resulting in sewage being discharged untreated into the Aguacate River or its tributaries. This is being mitigated by: a) ensuring proper scheduling of activities, in particular, the early launch of the bidding and construction of the WWTP so as to ensure an appropriate testing and commissioning before the completion of works; b) definition of an Action Plan for the WWTP specifying dates for bidding, contracting, completion of final design, start and completion of works, including commissioning for O&M; c) introduction of covenants in the Loan Agreement to ensure that: (i) the construction of the WWTP is carried out with due diligence and efficiency, and in

conformity with appropriate technical, financial, economic, environmental and social standards and practices, including with the provisions of the Environmental Management Plan (EMP) and the Action Plan; (ii) the Borrower provides the funds directly or indirectly for the construction and operation of the WWTP (in case CAF financing approved for such purpose fails to materialize or be continued); and (iii) the World Bank will have access to the reports on WWTP construction progress, including environmental, technical and social aspects. CAF has agreed to adhere to PSP's safeguard procedures, developed in collaboration with the World Bank. The PCU's safeguards instruments for involuntary resettlement have been designed according to the World Bank's standards, including those components financed by CAF. There will be complete harmonization of safeguards.

VI. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

38. **The PSP has played a transformational role in Panama Bay and City.** Along with the construction of the Coastal Beltway, PSP's works has allowed for the reduction of foul odors, as well as for the collection, transportation and treatment of sewerage as well as drainage control in key areas. These investments have transformed Panama City into a modern Latin American metropolis attracting tourism, real estate investments, and business and serving as a dynamic engine to the second highest growing economy in the Americas. This Project, the first one to expand PSP beyond the Canal, aims to expand this transformation to the district areas of Arraiján in Panama Oeste, as well as to curb the pollution in the Bay in areas west of the Canal.

39. **Economic benefits for this type of sewerage investment are usually estimated based on a combination of revealed and stated preference approaches.** An example of this type of sewerage investment is the Matanza-Riachuelo Basin Sustainable Development Project (Report No: 48422-AR). The revealed preference approach, which relies on data from observed transactions in the market or on expenditures by households or other agents, is normally used to estimate (i) the benefits from sewerage expansion through avoided costs and hedonic pricing methods; and (ii) the benefits of water quality improvement in the riparian River through the hedonic pricing approach. The stated preference technique, which is normally based on survey methods asking households how much they are willing to pay for an improvement in water quality, is normally used to estimate the benefits of the clean-up of nearby rivers. For the estimation of the benefits and costs associated with the clean-up of the Panama Bay (including restoration of the aquatic ecosystems and environmental health of the river network), economic evaluations take the following into consideration: (i) a solid baseline of key environmental health parameters; (ii) available scientific dose-response functions that have been calibrated to the Bay; (iii) a thorough understanding of Bay's hydrodynamics to identify the extent of biodiversity and environmental recovery that might accrue through a particular intervention; and (iv) an accurate schedule and magnitude of the interventions affecting the Bay to identify the timing of the costs and benefits, to model the discounted cash flows.

40. **Overall, estimating benefits of this large wastewater collection and treatment is complicated and costly due to the lack of baseline data.** This is also the case for the benefits coming from health improvements. It is difficult to quantify the expected economic and/or financial benefits and compare

them with the costs of Project activities, given the methodological problems posed by the assessment of such investments and the availability of data. These challenges render attempts to monetize these largely non-market benefits conjectural. Relevant information from the first phase of investments that could be extrapolated is not available given the different characteristics of Panama City and Panama Oeste.

41. **A baseline of robust economic and other data will need to be developed during the lifetime of the Project to quantify benefits with similar interventions worldwide.** Such analysis will be undertaken during Project implementation (as part of Component 2) to evaluate the economic impacts of the Project and assess the next investment phases. The investment cost of the Project will also be closely monitored as these tend to be very high in Panama (because of very stringent effluent standards and the very high water consumption levels), but unit costs are consistent with other PSP interventions elsewhere. The Water, Sanitation and Hygiene Poverty Diagnosis currently underway will provide useful information on the links between sanitation and health that could become a basis for quantifying health impacts.

42. **Urban sanitation (in this case sewage collection and treatment) improvements are justified public investments given their positive impacts on health, education, the environment, city competitiveness and tourism.** Public subsidies are especially needed in the intervention area where direct beneficiaries are unable to pay full price for sanitation services. An analysis of environmental restoration projects has shown that if evaluated from a purely private financing perspective, the economic justification of the intervention is limited. Thus a qualitative benefit assessment for different activities under each of the two Components has also been carried out.

43. **The benefits of Component 1 include improved health and water quality, reduced odors, and improved environmental standards, among others.** The new sewerage system in Northwest Burunga aims to improve sanitary conditions in low income neighborhoods and reduce pollution levels in urban streams and rivers within the City of Panama's metropolitan area. The benefits of the sewerage system are expected to include: (i) health benefits for the population with an improved/new sewerage system; (ii) reduction of foul odors in the areas of intervention; (iii) improvement of water quality conditions for maritime and river biodiversity; (iv) recuperation of environmental standards in creeks, rivers and the coastline where untreated effluent is now being discharged; and (v) promotion of human recreational activities in rivers and coastline.[37]

44. **The benefits of Component 2 include better water resource quality and security, among others.** Component 2 is designed to help improve the PCU's institutional capacity to manage water pollution through the development of new methodologies, information tools, plans and training. The expected benefits include: (i) reduction in the deterioration of the quality of water resources and decrease in third-party effects and other externalities that increasingly affect water security (in quality terms); (ii) decrease in the likelihood that vulnerable groups are affected by the uncontrolled water pollution; (iii) reduction in further environmental damage; and (iv) improvement in the awareness and participation of social stakeholders in the management of waste water. Additionally, implementation of

[37] The impacts on recreational and touristic values are still uncertain, because there is uncertainty on the geographical locations where the pollution will decrease to a level of appropriate recreation use.

the IUWM Plan is expected to improve the quality, relevance and timing of the investment program in Panama Oeste.

45. **Financial sustainability depends on Government subsidies.** Collection of tariffs, as the main source of financial resources for the WSS sector, is the responsibility of IDAAN. Over the last five years, the World Bank has been discussing the critical role of tariffs on the sustainability of services, as part of its engagement in the sector. The GoP has consistently preferred the use of subsidies and transfers to cover IDAAN's financial deficits as opposed to raising tariffs or improving collection. As a result, IDAAN has received on average around US$67 million annually from the GoP to fund its financial deficit as well as necessary investments. In the future, if the collection of tariffs is not improved or tariffs raised, the GoP will have to cover the annual O&M costs of PSP infrastructure, estimated to be US$9 million (0.04 percent of the 2016 national budget).

B. Technical

46. **The proposed Project relies on approaches and methodologies appropriate for the Panamanian context.** These include:

(a) The design process was carried out following IDAAN's technical specifications which are consistent with appropriate international standards. This process employs a technically sensible approach for sewage collection for peri-urban areas, incorporates elements of condominial sewerage design when required, and is acceptable under Panama's legislation. Moreover, the designs integrate adequate flood protection guaranteeing the stability of the works during a 100-year flood event. Finally, a hydraulic model and appropriate instruments and software (Sewer Cad) that are considered state-of-the-art were used to develop the designs;

(b) The Project includes robust technical assistance activities to strengthen the capacity of the PCU beyond the implementation of wastewater infrastructure, providing both the PCU and IDAAN with the tools and knowledge to address water pollution in an integral manner, as well as for the supervision of the DBO contracts for O&M of the new infrastructure; and

(c) The Project finances intra-domiciliary connections to ensure that people are connected to the sewerage system.

C. Financial Management

47. **Financial management (FM) will be carried out by the PCU, under MINSA.** Despite the fact that the PCU does not have previous experience implementing World Bank-financed projects, it has extensive experience with other International Financial Institutions and a suitable organizational structure with trained staff that possess the required experience and credentials to ensure responsible Project management.

48. **Measures have been agreed upon to strengthen the Project's internal control environment.** These include: (i) Project planning and implementation will be based on Annual Operational Plans and

the OM; (ii) the primary disbursement method will be advances to a Project-segregated Designated Account in United States Dollars to be administered by the *Banco Nacional de Panama*; (iii) MINSA, through the PCU, will prepare and submit semi-annual, unaudited Interim Financial Reports (IFRs) to the World Bank; (iv) Project financial statements and Statements of Expenditures (SOEs) will be subject to annual audits by eligible external auditors, who will be contracted based on terms of reference acceptable to the World Bank; and (v) the World Bank will carry out a supervision mission at least every six months.

D. Procurement

49. **Procurement for the proposed Project will be carried out by the PCU under MINSA**. As stated above, the PCU has experience with managing international financing. The PCU's organizational structure and its procurement team are considered satisfactory. The PCU has developed a Procurement Plan for the first 18 months of Project implementation, acceptable to the World Bank, which will be published within 30 days of Loan Effectiveness and updated annually in agreement with the World Bank or as required to reflect actual implementation needs. Moreover, bidding documents for the major sewerage works are expected to be completed by 2017 first quarter. In addition to regular supervision missions to evaluate progress on the Procurement Plan, post reviews of a selected sample of 10 percent of procurement actions will be carried out.

E. Social (including Safeguards)

50. **MINSA will apply its Social Management Strategy, including a gender strategy, for all investments irrespective of source of financing to employ the same social accompaniment processes when working with stakeholders and communities.** The Social Management Strategy, prepared by MINSA and approved by the Bank, includes a gender strategy to ensure that men and women participate equitably in all Project-based community activities and partake equally in Project benefits. The Strategy will be applied throughout implementation, including prior to works commencing, as well as during and after construction to ensure sustainability. The terms of reference of the Project Manager, contractors and consultants all include the Social Management Strategy in order to ensure the same social accompaniment process is followed when working with stakeholders and communities. In addition, a social assessment was carried out by the PCU through an international firm between June and October 2015. The assessment in Burunga included approximately 900 socio-economic surveys (one per household) in a sample equivalent to 10 percent of the target population. Six participatory assessments, three observation tours, six participatory workshops, and three focus groups were also carried out. Interviews took place with key players (i.e. mayors, community boards, health centers, school principals, church pastors, community leaders, educational bodies, and parent clubs). This assessment informed Project design on risks, impacts, opportunities, and communities' expectations, helping tailor the community intervention methodology, and the social management program under subcomponent 2C. A workshop for beneficiaries was held in April 2016 to present the results of the assessment. The social assessment was published in-country and on the World Bank's external website on May 17, 2016. The Social Management Strategy was designed based on the results of the social assessment and the consultations. A Grievance and Redress Mechanism (GRM) was designed by MINSA and approved by the World Bank, to allow stakeholders and beneficiaries to express their concerns and

complaints and to get responses within an agreed time-frame under the Specific Quality Procedure of the PCU.

51. **The Involuntary Resettlement Policy (OP4.12) is triggered.** The PCU has prepared a Resettlement Policy Framework (RPF), given that the precise location of the land needed for construction of pumping stations, culverts and other minor infrastructure which may need to be acquired by the Borrower is not yet known. Moreover, easement rights for collectors and the sewerage network will need to be negotiated and there is not yet enough information available to identify the exact location of the sites. The land presently under public domain will also need to be transferred from public agencies to MINSA (land for the WWTP is already under public control through MINSA). The RPF includes two parts: (a) a step-by-step process for land acquisition for easements and works; and (b) specific procedures for involuntary resettlement and compensation of affected households. In the case of resettlement, it is not clear whether resettlement of social units (families) or economic activities will be necessary. For every case of resettlement, a Resettlement Action Plan will be prepared and submitted to the World Bank for no objection prior to initiating construction. The RPF also includes a Form for Land Donation Contract to ensure absence of coercion in the transactions. A consultation process of the RPF was completed in mid-April 2016. The RPF was found satisfactory to the World Bank and published in-country and on the World Bank's external website on May 17, 2016.

52. **The Indigenous Peoples Policy (OP4.10) is not triggered**. The social assessment tried to identify Indigenous groups that meet the four characteristics called by the Policy (self-identification and identification as Indigenous by others, the presence of Indigenous Institutions, attachment to land, and Indigenous language) and concluded that there are no Indigenous groups fulfilling this criteria in the Project area. Nevertheless, the Social Assessment indicated that Indigenous families have migrated from the *Comarcas* (Ngäbe-Bugle, Guna, Embera, Wounaan) and mingled with non-Indigenous in urban areas. To ensure their participation in the benefits of the Project, the Social Management Strategy includes provisions to ensure all sectors of the population, men, women and elderly, are invited to participate in all Project activities, including training opportunities, participation in Committees, etc.

F. Environment (including Safeguards)

53. **In accordance with Environmental Assessment (OP/BP 4.01), the proposed Project is classified as Category B given that negative environmental impacts from civil works can be adequately mitigated.** Environmental and social impacts are expected to be positive and long lasting, especially in terms of public health, WSS services and environmental sustainability. Environmental benefits will be derived through the elimination of latrines and septic tanks polluting both surface and groundwater. In line with Panama's environmental regulations, particularly Executive Decree 123 of 2009, the PCU carried out a Category III Environment Impact Assessment (EIA) for the construction of the sewerage systems at Burunga and its associated WWTP, which was found to be satisfactory by the Ministry of Environment and the World Bank, leading to the issuance of the Project's environmental license. The EIA was published in Panama and on the World Bank's external website on May 31, 2016. To prevent, control and mitigate environmental impacts during the construction phase as well as during the operational stage, the EIA includes EMPs for Project-financed infrastructure as well as the WWTF. Regarding the timing of the construction of the WWTP vis-à-vis the Northwest Burunga sewerage

network, the WWTP Action Plan and associated legal covenants provide a reasonable level of certainty that the Project has mitigated the environmental risks associated with the collected sewage discharging untreated into the Aguacate River.

54. **Consultations have been carried out on the Project and its safeguard documents.** The PCU has launched the Project's socialization process, including the environmental measures to be adopted during implementation. In line with Panamanian regulations, a public consultation forum was carried out in April 2016, with both the EIA and EMPs being presented to the community. As a result of the consultation process, the activities included in the Project and the EIA and EMP received full endorsement from the local community. The Project was perceived as an improvement to the health and environmental issues in the community. Due to the positive feedback of the community the Project activities and the EIA and EMP were not modified. Consultation reports were published on both MINSA's and the World Bank's websites.

55. **Other environmental safeguards triggered for this Project include Natural Habitats (OP/BP 4.04) and Physical Cultural Resources (OP/BP 4.11).** These safeguards have been addressed through the EIA, which includes chance-finding procedures. Approximately 80 species and 5,500 trees have been identified in the 27 hectares in the direct influence area of the Project. The status of all the identified species were verified against the lists found in the Convention on International Trade in Endangered Species of Wild Fauna and Flora of the International Union for Conservation of Nature. None of the identified species are considered endemic in the area or region. The EIA contains all relevant measures for environmental protection, conservation and management of ecological values of the sites. Physical Cultural Resources (OP/BP 4.11) has been trigged in a preventive manner. The construction site will be monitored for archeological findings during the preparation phase of the terrain, with the permanent presence of a qualified archaeologist. In case archaeological remains are identified, the EIA details the procedures to register and recuperate archaeological findings if any.

G. Other Safeguard Policies (if applicable)

56. **The International Waterway Policy (O.P. 7.50) is not triggered**. Given the Project's location, its watershed and tributaries, the Project is not expected to have an impact on International Waterways.

H. World Bank Grievance Redress

57. **Communities and individuals who believe that they are adversely affected by a World Bank-supported project may submit complaints to existing project-level grievance redress mechanisms or the World Bank'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 World Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of World Bank 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 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 : Panama
Burunga Wastewater Management Project

Project Development Objectives

The objectives of the Project are to: (a) improve access to sewerage services in selected areas of the Borrower's province of Panama Oeste; and (b) strengthen wastewater pollution management capacity in key sector institutions of the Borrower.

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	20000.00	Once a year	Supervision reports. It is calculated by: (Number of new connections to the sewerage network constructed under the Project *5)	PCU
Female beneficiaries	✔	Percentage	0.00	49.00	Once a year	Supervision reports.	PCU
Poor Beneficiaries		Percentage	0.00	29.00	Once a year	Supervision reports.	PCU

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
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: People provided with access to 'improved sanitation facilities" under the proj.	✔	Number	0.00	4600.00	Once a year	Supervision reports. Target is estimated to be 23 percent of project beneficiaries per the social and environmental survey carried out as part of project preparation.	PCU
People provided with access to "improved sanitation facilities" - urban	✔	Number	0.00	4600.00	Once a year	Supervision Reports	PCU
Description: This indicator measures the cumulative number of people who benefited from improved sanitation facilities that have been constructed under the project. This includes people newly provided with access to "improved sanitation facilities" and does not include people benefiting from rehabilitation works. The baseline value is expected to be zero.							
Name: An Integrated Urban Water Management Plan		Text	No	Yes	Twice a year	Progress reports	PCU

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
prepared and under implementation in a pilot area							
Description: This indicator measures the development of the Integrated Urban Water Management Plan prepared and under implementation as part of the project. (component 2). The Integrated Urban Water Management Plan will be developed in a participatory manner, the Plan will start its implementation in one river sub-basin in the targeted areas as well as a pilot area. The Plan will (a) identify critical issues affecting the quality of the water bodies and (b) recommend corrective measures. Since MINSA shares the responsibility for sustainable wastewater management with IDAAN, IDAAN staff will participate in the development of the Plan.							
Name: A monitoring report on water quality for the Panama Bay area published every year		Text	No	Yes	Once a year	Progress Reports	PCU
Description: This indicator measures the publication of the report on water quality that will be financed as part of Component 2.							

Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: New household sewer connections constructed under the project	✔	Number	0.00	4000.00	Twice a year	Contractor records	PCU

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Description: This indicator is measured as the cumulative number of new sewer connections constructed under the project. The baseline value is expected to be zero.							
Name: Percentage of septic tanks that are properly closed down in the Project's intervention area.		Percentage	0.00	80.00	Twice a year	Supervision reports	PCU
Description: Septic tanks, including community septic tanks, are a common sanitation solution in the Project's intervention area. In order to ensure adequate septage management and to incentivize people's connection to the constructed sewerage network, septic tank will need to be properly closed down (decommissioned in a way that they do not represent a treat for public health).							
Name: Number of inter-domiciliary connection constructed under the Project		Number	0.00	4000.00	Twice a year	Supervision reports	PCU
Description: The Project will also include investments to connect all the households in Burunga to the sewerage network.							
Name: Real-time hydrological /water quality monitoring system established and operational		Text	No	Yes	Twice a year	Progress reports	PCU
Description: As part of component 2, the Project will finance the development of a real time hydrological and water quality modelling system that will allow the PCU to monitor the quality of the water in the Bay.							

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Socio-environmental community management committees created and operational		Number	0.00	4.00	Once a year	Progress reports	PCU
Description: This indicator measures the progress in the strengthening of the participatory mechanisms at local level, measuring the progress in the creation of 4 socio-environmental community management committees financed under component 2C.							
Name: Grievances registered related to delivery of project benefits addressed (%)	✔	Percentage	0.00	95.00	Twice a year	PCU's grievances and redress data base	PCU
Grievances related to delivery of project benefits that are addressed		Number	0.00	0.00	Twice a year	PCU's grievances and redress data base	PCU
Description: This indicator measures the transparency and accountability mechanisms established by the project so the target beneficiaries have trust in the process and are willing to participate, and feel that their grievances are attended to promptly. It is understood that local sensitivities and tensions will not allow grievance or redress mechanisms to be established in all projects.							
Name: Number of staff trained on Monitoring and Planning of Hydrodynamic model		Number	0.00	40.00	Once a year	Progress reports	PCU

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Number of Female staff trained		Number	0.00	20.00	Once a year	Progress Reports	PCU
Number of Male staff trained		Number	0.00	20.00	Once a year	Progress Reports	PCU
Description: Subcomponent 2B will finance the training of staff in the waste water management tools (hydrodynamic models, planning methodologies, other technical tools, etc).							
Name: Integrated Urban Water Management Plan developed		Text	No	Yes	Once a year	Progress Reports	PCU
Description: This indicator complements the PDO indicator #4. This indicator relates to the progress on the development tof the IUWM plan.							

Target Values

Project Development Objective Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	YR6	End Target
Direct project beneficiaries	0.00	0.00	0.00	0.00	9000.00	20000.00	20000.00	20000.00
People provided with access to 'improved sanitation facilities" under the proj.	0.00				2100.00	4600.00	4600.00	4600.00
An Integrated Urban Water Management Plan prepared and under implementation in a pilot area	No	No	No	No	Plan prepared	Yes	Yes	Yes
A monitoring report on water quality for the Panama Bay area published every year	No	No	No	No	Yes	Yes	Yes	Yes
Female beneficiaries	0.00	0.00		0.00	22.00	49.00	49.00	49.00
People provided with access to "improved sanitation facilities" - urban	0.00				2100.00	4600.00	4600.00	4600.00
Poor Beneficiaries	0.00				13.00	29.00	29.00	29.00

Intermediate Results Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	YR6	End Target
New household sewer connections constructed under the project	0.00	0.00	0.00	1000.00	2000.00	4000.00	4000.00	4000.00
Percentage of septic tanks that are properly closed down in the Project's intervention area.	0.00			30.00	60.00	80.00	80.00	80.00
Number of inter-domiciliary connection constructed under the Project	0.00				2000.00	4000.00	4000.00	4000.00
Real-time hydrological /water quality monitoring system established and operational	No	No	No	No	Yes	Yes	Yes	Yes
Socio-environmental community management committees created and operational	0.00	0.00	1.00	2.00	3.00	4.00	4.00	4.00
Grievances registered related to delivery of project benefits addressed (%)	0.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00
Number of staff trained on Monitoring and Planning of Hydrodynamic model	0.00		5.00	10.00	25.00	40.00	40.00	40.00

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	YR6	End Target
Integrated Urban Water Management Plan developed	No	No	No	No	Yes	Yes	Yes	Yes
Grievances related to delivery of project benefits that are addressed	0.00							0.00
Number of Female staff trained	0.00		2.00	5.00	12.00	20.00	20.00	20.00
Number of Male staff trained	0.00		3.00	5.00	13.00	20.00	20.00	20.00

ANNEX 1: DETAILED PROJECT DESCRIPTION

COUNTRY : Panama
Burunga Wastewater Management Project

1. **The proposed Project will contribute to the Panama Sanitation Program (PSP) in the Panama Oeste Province.** Table A1.1 shows the timeline for providing sewerage services for both phases of the PSP. The Project will also help the PCU address water pollution in a more integral and participative manner.

2. **The total cost of the proposed Project is estimated at US$81.2 million.** The World Bank will provide financing of US$65 million, the CAF US$11.5 million and the GoP US$4.7 million. The Project will finance three Components. A detailed description of the Components is presented below. Components 1 and 2 will be financed mainly by IBRD, with a contribution from the GoP. Component 3 will be financed by IBRD, the GoP and CAF, with the latter financing the cost of the Project Manager.

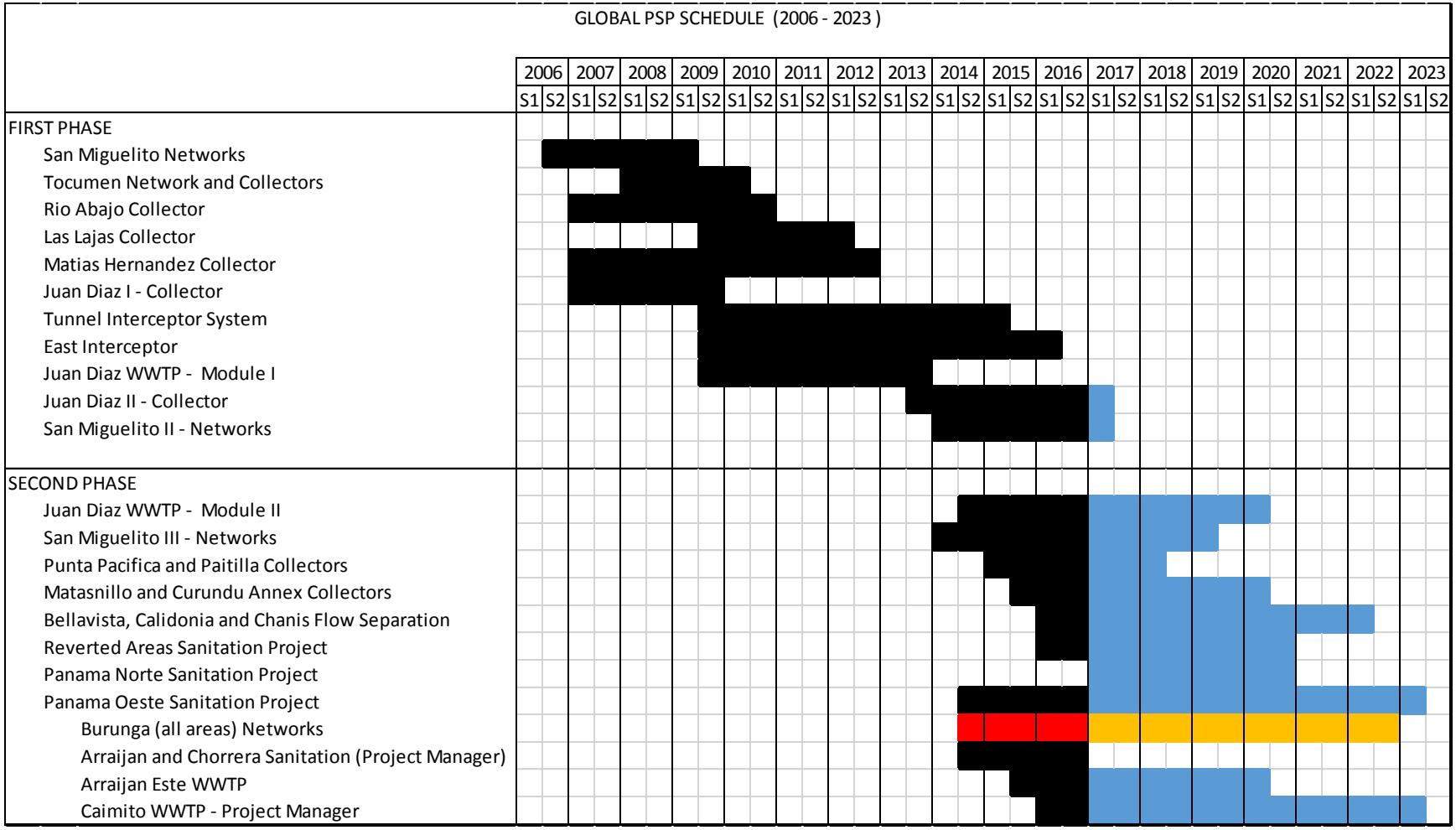
3. ***Component 1: Construction of a New Sewerage System in Burunga (US$49.5 million, of which US$47 million IBRD and US$2.5 million GoP).*** **This Component will finance the Construction of a sewerage system throughout the township of Burunga in the Borrower's district of Arraijan, including carrying out of detailed construction designs and a sewerage network for wastewater**. Around 20,000 people live in the targeted area, with households mainly depending on onsite sanitation solutions. After the Project, every household in this area is expected to have a flush toilet that is connected to a sewerage system. This Component will finance the largest of PSP's three sewerage sectors in Burunga (Northwest Burunga). The system will consist of 52 km of sewers, including a primary collector (8", 10", 18", and 24" diameter), a secondary network (6"and 8" diameter), and a tertiary network (6" diameter and in selected cases 4"). The urban density of Burunga is currently low, with disperse population and high ground infiltration rates due to the low area of impermeable soil. Therefore, the need for a drainage network is still considered a low priority. The sewerage network will thus be designed only for wastewater. In addition to the sewerage construction, this Component will finance traffic accesses, rivers and creeks overpasses, drainage overflow channels, river channel protection and other ancillary hydraulic works required to safeguard the investments against recurrent flash floods.

4. **The sewerage system contract will also finance the construction of long inter-domiciliary connections within each lot from households to the main sewerage system.** The Project will also support households in closing and decommissioning of existing latrines or individual septic tanks if any. No contributions are expected from the households. The relative positions of the households with respect to the location of the sewer will determine the configuration and design of the household connections. Connections may be: (a) directly in front of the household; (b) through a long easement; or (c) through a communal easement shared by more than one household.

5. **Although the Project will finance the connection of the system to existing bathrooms and other household facilities, CONADES will support the construction of bathroom facilities for an estimated 800 poor households currently lacking them.** These will include internal plumbing works and bathroom appliances. The Loan Agreement for the proposed Project includes a covenant to ensure that

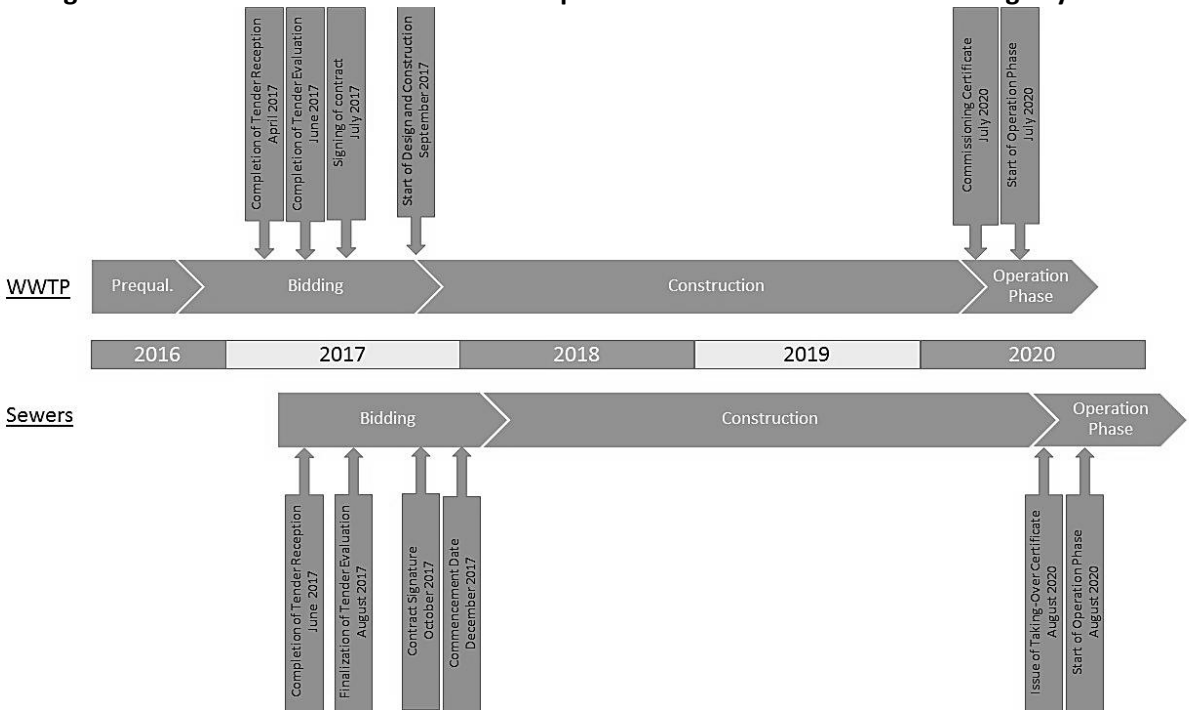
CONADES, in close coordination with MINSA, provides these facilities to target poor households in the township of Burunga during Project implementation to ensure that they can benefit from the sewerage works.

Table A1.1 Global PSP Schedule



6. **Robust anchorage systems will be provided for the main collectors at the riverbeds, which are prone to erosion due to intense runoff after heavy rainfall given the pronounced slopes and soil materials of the river beds.** The main collectors will run buried along the river shores, some of which will have to be protected through gabions and other structural measures to avoid erosion and protect the pipes. The operator of the sewerage network will be the same as that of the WWTP, and will operate and maintain the network for a period of ten years. Annex 4 shows a preliminary configuration of the sewerage network. The main milestones in the development of the WWTP and the sewerage system are shown in Figure A1.1.

Figure A1.1 Main Milestones in the Development of the WWTP and the Sewerage System



7. **Treatment tecchnology options include conventional activated sludge, trickling filters plus anaerobic treatment, and Up-flow Anaerobic Sludge Blanket plus activated sludge.** During Project preparation, several proven treatment technologies capable of complying with the effluent standards were assessed based on a series of factors, including the capacity to meet the discharge standards, capital expenditure, operating expenditure, complexity of construction and operation, flexibility of operation to changes in the incoming pollution loads, odor and vector control, production of sludge, and the experience of the PCU in operating the existing WWTP of Juan Diaz. Based on these factors, the above options were identified. The bidding document will allow for companies presenting any of the other two technologies including corresponding variations if these comply with the technical and environmental requirements of the Project. The firm that satisfies all the technical and quality requirements and has the lowest life cycle cost (capital cost plus discounted operating cost) will be chosen as the DBO contractor.

8. ***Component 2: Institutional Strengthening for Sustainable Wastewater Management (US$12.7 million, of which US$12 million IBRD and US$0.7 million GoP).*** **This Component seeks to strengthen the technical capacity of the PCU in implementing the PSP and helping manage water pollution in the Panama Bay.** As the PCU does not have a long-term mandate to implement the activities of the IUWM Plan, there is a need to enhance inter-institutional coordination and collaboration with others, such as IDAAN, Ministry of Environment, etc. The Component will finance three subcomponents.

9. **Subcomponent 2A (US$7.5 million, of which US$7 million IBRD and US$0.5 million GoP) supports technical capacity building activities for the PCU and provision of management tools to control water pollution in the Panama Bay.** This includes the strengthening of the technical capacity of the PCU and supporting the PCU in the preparation of an IUWM Plan for an urban river basin in Panama Oeste. The PCU has identified a particular need for technical support from the Bank in the development of these activities. The World Bank will provide this support throughout the implementation of the Project.

10. **To contribute to the *strengthening of the technical capacity in the PCU to control water pollution in the Panama Bay,* this subcomponent will finance six critical activities.** These include: (i) the carrying out of a water quality baseline, including an assessment of the expected environmental and economic impacts of the PSP; (ii) the carrying out of a technical audit of the sewer and drainage system in Panama City; (iii) the design and implementation of a real-time hydrological/water quality monitoring system to serve as a basic decision support system; (iv) the design and implementation of a hydrodynamic model to measure transport of pollutants into the Panama Bay; (v) the preparation of a map locating and classifying sensitive coastal and river areas; and (vi) the preparation of an action plan for the intervention of critical sewerage areas. These activities are expected to cost US$4.3 million, of which US$4.0 million will be financed by IBRD.

11. **The detail of these six activities is described hereafter:**

(i) **Carrying out of a water quality baseline** will be similar to what was already developed for Panama City, and will include measurement campaigns in rivers, streams and coastal areas in Arraiján and La Chorrera. It will also include an assessment of the environmental conditions, establishment of environmental indicators and ecological status of surface water bodies and marine waters in Panama Oeste (Arraiján-La Chorrera) to enable quantification of the economic and environmental benefits of the intervention. These analyses will also enable the PCU to define the initial conditions of the water bodies, generate reliable information on the impact of measures from both the environmental and economic point of view to address pollution, and establish environmental status indicators. Finally, this activity will also include an assessment of the expected environmental and economic impacts of the Project;

(ii) **Carrying out of the technical audit on the status of the sewer and drainage system in Panama City** will assess the impact of rainfall drainage on part of the sewerage network system managed by the PCU, including field measurements and modeling of the drainage system. The objective of this activity is to prepare information for the development of a Sanitation and Drainage Plan for the Bay of Panama, which will be used to carry out all future investments in sanitation and drainage;

(iii) **Design and implementation of a real-time hydrological/water quality monitoring system**. This activity will include the installment of remote control instruments and post-processing software at the PCU office in five new monitoring points selected for continuous monitoring, in addition to the existing five monitoring points. This system will serve as a basic decision support system that could be expanded in the future;

(iv) **Design and implementation of a hydrodynamic model** to measure transport of pollutants in the Panama Bay and in the downstream sections of the main river channels. This activity aims to assess the impact of pollution discharges in the Panama Bay through a water quality model by firstly obtaining adequate bathymetry, and secondly simulating existing discharges in a numerical model. The model will simulate the effects of structural and non-structural pollution control measures in the most sensitive areas of the Bay;

(v) **Preparation of a map locating and classifying sensitive coastal and river areas** (recreational areas, areas of special economic interest, etc.) requiring special attention when analyzing the baseline, or that are deemed to have a high priority for recovery (returning to its intended land use) or improvement. This information will be included into a Geographic Information System database that will also contain the critical sections in the drainage / sewerage network impacting the Bay that would need to be fixed/repaired as per the results of technical audit conducted of the network; and

(vi) **Preparation of an action plan for interventions in critical areas** of the sewerage system. The Plan will budget, schedule and prioritize these interventions. The ultimate goal of this Plan is the optimal operation of the sewerage and wastewater treatment systems in Panama and it will be incorporated in the PSP and implemented in the years following the completion of the Project.

12. **To contribute to the development of an IUWM Plan for an urban river basin in Panama Oeste (covering the area of the works being financed under Component 1), the Project will finance activities with an estimated cost of US$3.2 million (of which US$3.0 million will be IBRD financing).** Specifically, the Project will finance the following activities:

a) **A diagnostic of the urban river basin.** The information collected in existing studies such as the *Sanitation Master Plan for Arraijan and La Chorrera*, and the information produced by the monitoring network and water quality baseline will serve as key inputs for the diagnostic. The diagnostic will also include an assessment of possible climate change impacts and vulnerabilities in the basin;

b) **Identification of the key stakeholders in the basin**, such as water users, water pollutants, authorities (e.g. Ministry of Public Works in charge of drainage and roads, MINSA, Ministry of Environment for watershed protection), residents and civil society;

c) **Participatory identification of river-basin interventions**. This activity intends to identify in a participatory manner with the identified stakeholders (including mechanisms for the participation of women as defined in MINSA's Social Management Strategy) the issues related to water

management in the basin that the Plan needs to address, such as water supply (consumption rates per capita), drainage systems, solid waste management, erosion and soil loss, recreational use of rivers and future climate change impacts, among others; and

d) **Implementation of selected activities identified in the Plan in pilot areas of the basin for demonstrative and educational purposes**. A number of possible locations will be selected to develop a demonstrative action (pilot), which will allow key agencies to visualize and verify the improvements obtained by implementing the actions defined in the IUWM Plan. The locations will be chosen based on technical and social criteria. The implementation of the Plan may involve structural or non-structural interventions in areas that may not be within the jurisdiction of the PCU. These activities will be implemented after two years of Project implementation. A specific monitoring system for the selected areas will be developed so that improvements can be quantified and displayed for informative purposes.

13. **Subcomponent 2B (US$2.6 million, of which US$2.5 million IBRD and US$0.1 million GoP) aims to strengthen the PCU's and IDAAN's technical capacity to supervise third party operation, maintenance and management of wastewater infrastructure in the Panama Bay area**. The goal of this subcomponent is to help the PCU oversee the operators responsible for running the wastewater facilities and improve their efficiency. This subcomponent is part of the overall strategy to build technical and operational capacity in the wastewater management sector in Panama. Activities under this subcomponent include technical training, short technical courses, workshops, technical assistance, and study tours to exchange technical knowledge with experienced operators from other regions, among other activities. The PCU is currently developing a specific training needs plan with the support of IADB and the Japan International Cooperation Agency (JICA) from which concrete training activities are being identified. Specific key identified activities will be funded through this Project.

14. **The objective of subcomponent 2C (US$2.6 million, of which US$2.5 million IBRD and US$0.1 million GoP) is to strengthen the PSP's social interventions by raising awareness, training and encouraging commitment to the Project's investments among community-based organizations in Burunga**. This subcomponent will finance: i) the creation and strengthening of socio-environmental community management committees, ii) the development of monitoring exercises to evaluate the sanitary conditions of the population; and iii) other community initiatives such as sweeping campaigns and cultural and sport events. A social assessment was conducted during Project preparation to define the scope of these activities, as well as to ensure prioritization of low-income households. These activities will be carried out following the gender strategy prepared by MINSA as part of the Social Management Strategy.

15. ***Component 3: Project Management and Administration (US$19 million, of which US$6 million IBRD, US$1.5 million GoP and US$11.5 million CAF and US$1.5 million GoP).*** This Component will finance: (i) the costs associated with the supervision, quality control, monitoring, inspection and procurement support for the works under Component 1; and (ii) the PCU's Project management and administration activities. The PCU's Project administration activities will be financed by IBRD, including fiduciary management (including financial audits), procurement, reporting, M&E (including a M&E system), and implementation of the Project's safeguard instruments and Social Management Strategy,

which contains a Civil Engagement Strategy, gender analysis, and GRMs. A Project management consulting firm (Project Manager) will be financed by CAF to oversee works in Burunga (including procurement, supervision, quality control, monitoring, and inspection) for a total estimated cost of US$189 million, including those being executed under Component 1, as well as works in the neighboring areas of Burunga Center and Burunga East, and the construction of the WWTP. The PCU retains fiduciary responsibility for IBRD financing, but all tasks related to designs, studies and field supervision of works will be overseen by the Project Manager.

Climate co-benefits, estimated at 50 percent of the Project amount are described in this section*:*

16. **More frequent and intense storms, floods, and droughts are causing economic losses and affecting the livelihoods of the poorest and most marginalized communities in Panama.** [38] In particular, vulnerable areas include the San Blas Archipelago, the coastal areas of Bocas del Toro, Colón, and western areas of Panama Oeste. This latter area, where the proposed Project is located, is especially known for its vulnerability to flash floods and landslides.

17. **Although the medium- and long-term impacts of climate change are still uncertain in the Project intervention area, to address this issue, the proposed Project includes activities with climate co-benefits.** The proposed Project's climate co-benefits are likely to include enhanced resilience to climate change in Panama Oeste's District of Arraijan. Moreover, climate change resilience will be improved through the implementation of "hard" (infrastructure) and "soft" (non-infrastructure measures). Infrastructure measures will include construction of ancillary hydraulic works, financed under Component 1 of the proposed Project, to protect infrastructure (sewerage and water networks, retention walls, roads and other urban service works) from flash floods in Burunga were the main sewerage network will be constructed. Non-infrastructure measures include financing of an integrated, participatory and basin-scale IUWM Plan (financed under subcomponent 2A), implementation of a real time hydrological/water quality monitoring system (financed under subcomponent 2A), and strengthening of the PCU's institutional capacity for waste water management (financed under subcomponent 2B).

18. **The proposed Project will also be carried out in accordance with international good practices for climate change adaptation (i.e. 2000 EU Water Framework Directive, United Nations Guidance on Adaptation and climate change, 2009).** Thus, the IUWM Plan will include an assessment of climate risks in the basin, and will use the real time hydrological/water quality monitoring system and hydrodynamic modeling tools as a basis for planning and monitoring, contributing to improvement of data collection on climate change effects and reduction of uncertainties related to climate impact. Moreover, the PCU will be trained in the use of these tools under the proposed Project.

19. **The IUWM Plan is an adaptive strategy for the management of water in the urban basin.** The cyclical approach of the IUWM planning process facilitates adaptive management of climate change impacts and enables the reassessment and adjustment over time of the Plan in response to climate change, taking into account extreme weather events, water allocation and water pollution control in the

[38] According to the World Bank Climate and Disaster Risk Screening Tool, *https://climatescreeningtools.worldbank.org/*

basin. Furthermore, the participatory identification of river basin interventions increase ownership, transparency, accountability and strengthening of local stakeholders, which, in turn, contributes to improved climate change resilience, sustainability of interventions and potential reduction of conflicts over water availability. Moreover, long-term climate assessments will be integrated into planning processes and design of future projects and interventions in the urban basin, yielding even greater climate benefits when implemented.

ANNEX 2: IMPLEMENTATION ARRANGEMENTS

COUNTRY : Panama
Burunga Wastewater Management Project

Project Institutional and Implementation Arrangements

1. **The PSP's PCU, under MINSA, will be responsible for the overall implementation of the Project.** The PCU was created by Executive Decree 144 of June 20, 2001, which was amended by Executive Decree 8 of March 3, 2016, and it is responsible for the administrative management and operation of the PSP, program planning and execution, preparation and updating of progress reports, data collection and project monitoring, specialized technical assistance to accompany project execution, and environmental and social supervision of the works. The PCU has managed international financing since 2004 including funding of over US$1.5 billion from multilateral organizations, such as IADB, CAF, Japan International Cooperation Agency, and EIB, among others. Table A2.1 shows projects currently under execution by the PCU and source of financing.

Table A2.1 Projects under Execution by the PCU

Financer	Credit Number/Name	US$	Description
EIB	N/A	40.00	East Interceptor, Lajas Collector
EIB	84465	50.00	II Module of the Juan Diaz WWTP & complementary works
EIB	Burunga	50.00	Sanitation of Burunga Center and Noreste
EIB	Panama Oeste	50.00	Sanitation of the Arraijan and Chorrera Districts
IADB	1719	75.00	Networks San Miguelito II, collector Juan Diaz II
IADB	3506 OC PN	60.00	II Module of the Juan Diaz WWTP & complementary works
IADB	3506 CH PN	50.00	II Module of the Juan Diaz WWTP & complementary works
IADB	Panama Oeste	150.00	Sanitation of the Arraijan and Chorrera Districts
CAF	6987	120.00	Tunnel and I Module of the WWTP
CAF	Burunga and A. Cabecera	95.00	Sanitation of Burunga and Arraijan Cabecera
CAF	9238 - 9239	110.00	II Module of the Juan Diaz WWTP & complementary works
CAF	9236	30.00	Networks of San Miguelito III, Packages 3
CAF	San Miguelito	45.00	Networks of San Miguelito III, Packages 1 and 2
CAF	8468	103.77	Networks San Miguelito II, collector Juan Diaz II, East Interceptor
OFID	1557 PB	52.00	Collectors Rio Abajo, Matasnillo and Curundu
OFID	1434 PB	20.00	Tunnel and I Module of the WWTP
JICA	PA - P1	226.00	Tunnel and I Module of the WWTP
IBRD	Burunga Wastewater Management	65.00	Sanitation of Northwest Burunga
AECID	Panama Oeste	50.00	Sanitation of the Arraijan and Chorrera Districts
CABEI	Panama Oeste	100.00	Sanitation of the Arraijan and Chorrera Districts
TOTAL		**1,541.77**	

2. **The PCU holds an impressive record of budget execution over the last ten years (92 percent), as shown in Table A2.2.** This is especially true when compared against other selected infrastructure institutions in Panama (average 73.8 percent).[39] The PCU's ability to transform financial resources into actual sewerage services through large infrastructure projects has positioned it as a trusted agency to undertake priority projects.

Table A2.2 Budget execution of the PCU

Year	Budget	Executed Budget	%
2006	$ 3,222,409	$ 1,987,288	62%
2007	$ 32,512,122	$ 22,871,784	70%
2008	$ 38,899,817	$ 31,316,782	81%
2009	$ 35,409,100	$ 32,458,897	92%
2010	$ 104,796,675	$ 98,342,774	94%
2011	$ 97,068,600	$ 88,816,670	91%
2012	$ 144,571,700	$ 142,130,431	98%
2013	$ 141,899,822	$ 133,483,765	94%
2014	$ 99,539,421	$ 91,714,768	92%
2015	$ 229,345,691	$ 206,150,560	90%
	927,265,357	**849,273,718**	**92%**

Financial Management

3. **FM tasks related to Project execution will be carried out by MINSA through the existing PCU for the PSP, and the PCU has a suitable organizational structure with trained staff that possess the required experience and credentials to ensure responsible Project management.** Despite the fact that the PCU does not have previous experience implementing World Bank-financed projects, it has extensive experience with other International Financial Institutions, as shown in Table A2.1. MINSA is a line Ministry of the GoP. Over the years, the Ministry has created three different project implementing units, which have been in charge of the implementation of a number of World Bank-financed projects, including: (i) *Unidad Coordinadora de Proyecto* (P082419); (ii) *Unidad de Gestión de Servicios Administrativos y Financieros* (P106445); (iii) *Unidad Coordinadora del Programa Saneamiento de Panamá* or PCU (P154275, proposed project). The PCU has experienced technical and administrative teams, which are currently financed with funds from the CAF, IADB and EIB among others. The PCU has suitable organizational structures with trained staff that possess the required experience and credentials to ensure responsible Project management. Hence, the PCU will be responsible for all Project FM-related tasks, including budgeting, accounting, internal controls, financial reporting, and preparation of withdrawal applications. Component 3 may finance additional PCU staff as needed.

4. ***Budgeting arrangements*. The Project has been registered in the National System for Public Investments, and Project funds will be allocated in MINSA's institutional annual budget once**

[39] This average includes the last four years for the Ministry of the Presidency, Ministry of Public Works, IDAAN and MINSA.

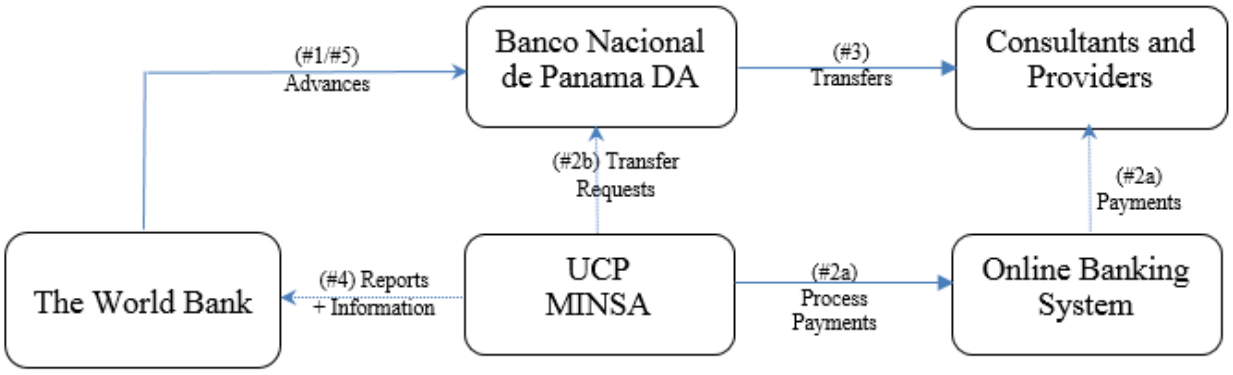
concurred by the Ministry of Economy and Finance and approved by the National Congress. Budget execution will also be subject to provisions of the General Law on Budgeting, the Budgeting Classification Manual, and the General Rules on Budgeting, among others. This set of legal and regulatory arrangements, together with use of the existing institutional Integrated System for Financial Administration System, provide for reasonably sound budget formulation, execution, and control. However, it should be noted that, on occasion, the original budget allocation recommended by the Ministry of Economy and Finance and approved by the Congress has not been sufficient, representing an additional risk in terms of overall Project implementation. In order to partially mitigate this risk, the PCU will prepare Annual Operational Plans for the Project in a timely manner that will be used for: (i) planning and budgeting purposes; and (ii) supporting the budget requests to be submitted to the Ministry of Economy and Finance.

5. ***Accounting system.*** **MINSA is subject to compliance with the Governmental Accounting Manual, issued by the CGR.** Hence, Project accounting will be carried out in accordance with the accounting standards applicable to the public sector, including the standardized chart of accounts. In 2014, the CGR promulgated a Decree on adoption of International Public Sector Accounting Standards, however, implementation of the Decree within MINSA has not yet begun and thus does not as yet affect the Project's accounting system and its chart of accounts. In terms of the FM Information System, MINSA currently uses the Integrated System for Financial Administration System, which is a modular system that allows for the recording of institutional budget in accordance with budget classifications used at the national level. It is expected that during 2016, MINSA will launch the implementation of the GoP's newly integrated FM Information System, which is also a modular system developed on the SAP platform. However, neither the Integrated System for Financial Administration System nor the new System include in their design an adequate transaction flow for projects financed by external credits. At the Project level, the PCU uses the Pentagon system, which is a modular system that includes procurement, accounting, budgeting, and disbursement modules, among others. This system is fully customized for World Bank-financed projects and allows, in addition to detailed registries of Project transactions by Component and disbursement category, for automatic preparation of required Project financial statements, including IFRs, SOEs, and banking reconciliations in formats agreed upon with the World Bank. The reconciliations between the Integrated System for Financial Administration System and Pentagon are carried out on a monthly basis.

6. ***Internal control and written procedures.*** **As with any other public sector entity, MINSA has an internal audit department, which alongside the CGR's oversight office is directly and indirectly involved in Project monitoring and supervision.** At the Project level, the internal control procedures, in addition to the use of the institutional framework and the Annual Operational Plan, will be mainly focused on: (i) proper segregation of FM-related functions; (ii) management and control of long-term assets; and (iii) adequate control of disbursements and flow of funds, among others. These procedures are documented in the OM, including a section on FM and disbursement arrangements. The OM was developed in conformity with the PCU's Operational Guidelines, which are applicable to all projects implemented by the PCU. The PCU will pursue the certification of their main unit's processes with ISO 9001 and ISO 14001 protocols within the next few years. All procurement and payments related to all Components will be subject to ex-ante approval by the CGR.

7. ***General flow of funds and information*. The primary Project disbursement method will be to advance to a single Project-segregated Designated Account in United States Dollars to be administered by the *Banco Nacional de Panama*.** In addition, the PCU may request: (i) reimbursements for expenditures pre-financed with local counterpart funds; and (ii) direct payments to the Project's consultants and contractors. Figure A2.1 shows the flow of funds, in which the solid lines represent the flow of funds and the dotted lines represent the flow of information.

Figure A2.1 Flow of Funds



(1) The World Bank advances the authorized amount into the Designated Account, to be administered by *Banco Nacional de Panama.*
(2) As expenditures are incurred, MINSA, through the PCU, will: (a) process payments to consultants and providers; (b) requests *Banco Nacional de Panama* to process national and international transfers.
(3) *Banco Nacional de Panama* processes payments to Project's contractors, consultants, and providers.
(4) Project eligible expenditures are aggregated and summarized by MINSA, through the PCU, in SOEs to be formally submitted, together with a loan withdrawal application, to the World Bank in order to document advances and/or to request new advances, whatever the case may be.
(5) The World Bank processes new advances corresponding to the documented expenditures.

8. ***Financial reporting and external audit.* MINSA, through PCU, will prepare semi-annual unaudited Project IFRs and annual financial statements.** These reports will be prepared in United States Dollars using the standard formats agreed upon for projects implemented in Panama. MINSA, through the PCU, will be also responsible for the submission to the World Bank of both IFRs and annually audited Project financial statements, to be financed under Component 3 of the Project. Such audits will be conducted by an independent audit firm recruited competitively based on terms of reference acceptable to the World Bank. The audits will include issuance of opinion on: (i) the reasonability of financial information and the eligibility of expenditures financed by the Project reported in the Project financial statements; and (ii) the confirmation of the use of loan's proceeds for intended purpose. The terms of reference for the audits will be agreed by the end of the first year of Project implementation and will be based on the World Bank's standard terms of reference used in Panama. The audit will cover all Project

Components and complementary investments financed by the CAF and the EIB. The audit reports will be subject to the World Bank's policy on Access to Information. Table A2.3 outlines the periodicity of financial reports to be submitted to the World Bank.

Table A2.3 Financial Reports

Report	Entity	Periodicity	Due date
Unaudited IFRs	MINSA	Semi-annual	February 15 and August 15
Audited Project financial statements	MINSA	Annual	June 30, or six months after the end of the audit period

Disbursements

9. **The proposed disbursement arrangements[40] are summarized in Table A2.4 while Table A2.5 shows disbursement by Category.**

Table A2.4 Summary of Disbursement Arrangements

Disbursement method	1. Advances to segregated Designated Account in United States Dollars to be opened in *Banco Nacional de* Panama to finance eligible expenditures as they are incurred and for which supporting documentation will be provided at a later date. 2. Reimbursement of those Project eligible expenditures pre-financed from the local counterpart funds. 3. Direct payments to suppliers, consultants and providers for eligible expenditures.
Designated Account	The ceiling of the Designated Account is US$6.0 million. Advances to the Designated Account will be documented on a quarterly basis.
Supporting documentation	Standard SOE[41] for eligible Works, Goods, Consultants' Services, Non-Consultancy Services, Training and Operational Costs financed under disbursement categories.
Limits	The recommended minimum value of applications for reimbursements and direct payments is US$250,000.
Retroactive expenditures	Retroactive financing will be up to US$12 million as follows: ✓ Expenditures incurred using World Bank Procurement Guidelines, and paid by MINSA within one year prior to the signing of the Loan Agreement. ✓ Expenditures are subject to the same systems, controls, and eligibility criteria described in this Annex as well as the regular Project external audit.

[40] For details, see the Disbursement Handbook for World Bank Clients.
[41] All SOE supporting documentation will be available for review by external auditors and World Bank staff at all times during Project implementation, until at least the later of: (i) one year after the World Bank has received the audited Financial Statements covering the period during which the last withdrawal from the Loan Account was made; and (ii) two years after the Closing Date. The Borrower and the PCU shall allow the World Bank's representatives to examine these records.

Table A2.5. Disbursement by Category

Category	Amount of the Financing Allocated (USD)	% of Expenditures to be Financed (including Taxes)*
(1) Works, Goods, Consultants 'Services, Non-Consultant Services under Component 1	47,000,000	100%
(2) Works, Goods, Consultants' Services, Non-Consultant Services, Training, and Operational Costs under Components 2 and 3	18,000,000	100%
Total	**65,000,000**	

(*) But excluding the financing of Taxes for the ITBMS *(Impuesto a las Transferencias de Bienes Corporales Muebles y la Prestación de Servicios*, the Borrower's tax on transfer of movable property and services). This specific ITBMS incurred on invoicing to the PCU will be paid with counterpart funds.

Procurement

10. **The PSP's PCU will carry out procurement.** It will do so in accordance with the provisions of: (i) the Loan Agreement; (ii) the World Bank's "Guidelines: Procurement of Goods, Works and Non-Consulting Services Under IBRD Loans and Bank Credits & Grants" and "Guidelines: Selection and Employment of Consultants Under IBRD Loans and Bank Credits & Grants by World Bank Borrowers," both dated January 2011, revised July 2014; and (iii) the OM. All procurement procedures are described in detail in the OM.

11. **Works to be financed under this Project include the construction of a sewerage system and household connections.** International Competitive Bidding (ICB) procedures will be used for works with the exception of contracts estimated to cost below the equivalent of US$7,500,000, which may be procured following NCB or shopping procedures according to contracts' estimated cost.

12. **Goods to be financed under this Project include vehicles, fiberglass and wood boats for water quality monitoring, office furniture and equipment and educational material.** ICB procedures will be used for goods with the exception of contracts estimated to cost below the equivalent of US$750,000, which may be procured following NCB or shopping procedures according to contracts' estimated cost.

13. **Non-consulting services to be financed under this Project include communication and diffusion of Project activities, and other services.** Contracts estimated to cost below US$750,000 will be procured following NCB or shopping procedures according to contracts' estimated cost. ICB procedures are not expected to be used.

14. **The World Bank's Standard Bidding Documents for Procurement of Works will be used for all ICB while procurement under NCB procedures will be conducted using bidding documents agreed with the World Bank.**

15. **Shopping will be used for contracts for works estimated to cost below US$70,000 and for goods and non-consultant services estimated to cost below US$50,000.**

16. **Direct Contracting is not foreseen.** However, this method could be needed during implementation of the Project. If so, it shall be included in a Procurement Plan approved by the World Bank before implementation.

17. **Framework Agreements will be permitted only for contracts of goods and Non-Consulting services estimated to cost below US$1,000,000.** These would be implemented by the *Dirección General de Contrataciones Públicas* and acceptable to the World Bank according to procedures set forth in paragraph 3.6 the Procurement Guidelines.

18. **Consulting Services to be financed under the Project include environmental assessments, the location and classification of sensitive coastal and river areas, technical audits, hydrological/water quality monitoring system, development of a hydrodynamic model, among other services.** These services will be rendered either by firms or by individuals, as indicated in the Procurement Plan. The use of methods other than Quality and Cost-base Selection are not expected. However, if needed, other methods will be included in the Procurement Plan approved by the World Bank before implementation.

Capacity of the PCU to Implement Procurement

19. **The PCU has experience in the implementation of internationally-funded operations and its organizational structure and procurement team are considered satisfactory following a capacity assessment to evaluate the ability of the PCU to carry out procurement under the Project.** The procurement team made up of three agents with adequate capacity and experience in the type of procurement activities that will be carried out under the Project. The PCU also has specialized engineers. Finally, the PCU is receiving technical and procurement support from a Project Manager (consulting firm without fiduciary responsibilities) since August 2015.

20. **There are nonetheless a number of risks related to procurement for Project implementation and thus the procurement risk is rated Substantial.** These include: (i) lack of information about the sort and quantities of works required to connect 4,000 household to the tertiary network and an appropriate definition of the final design of the main civil works of the sewerage system, which could affect competition and/or result in bids with higher prices and/or problems during the contract implementation stage; (ii) coordination between contracts for the sewerage system and for the WWTP financed by CAF and potential delays in the WWTP commissioning date; (iii) potential interventions of the CGR prior to signing of contracts, interim payments certificates of works, etc., could cause bottlenecks; and (iv) local procurement regulations that may include some practices that are not acceptable to the World Bank.

21. **A series of corrective measures have been agreed upon to mitigate this risk.** These include: (i) the PCU shall have an appropriate bidding document for the design of the sewerage system with clear definitions of household connections (quotation, execution, measurement and payment) and the main civil works; (ii) the sewerage bidding document shall include provisions for the Contractor not to make the completed works fully operational until the WWTP is commissioned; (iii) the PCU, MEF and the CGR, with the technical support of the Bank, shall have advanced specific arrangements to avoid delays in the counter-signing of the contracts, interim payments certificates of works and other required

interventions; (iv) procurement under NCB procedures will be conducted using bidding documents agreed upon with the World Bank; and (v) the following special procurement provisions are included in the Loan Agreement:

(a) foreign bidders shall not be required to be registered with local authorities as a prerequisite for bidding;
(b) no bids shall be rejected, and no provisional awards shall be made at the time of bid opening;
(c) the invitation to bid shall not establish, for purposes of acceptance of bids, minimum or maximum amounts for the contract prices; and
(d) the invitation to bid shall not require mandatory attendance to a pre-bid meeting as a condition to bid.

22. ***Procurement Plan.*** **The PCU has prepared a Procurement Plan for the first 18 months of Project implementation, acceptable to the World Bank.** It shall be published in the Systematic Tracking of Exchanges in Procurement within 30 days of Loan Effectiveness. The Procurement Plan will be updated annually in agreement with the World Bank or as required to reflect actual Project implementation needs. All contracts financed by the Project will be included in the Procurement Plan approved by the World Bank prior to implementation.

23. ***Frequency of Procurement Supervision.*** **In addition to prior review supervision, annual supervision missions will visit the field to carry out a post review of 1:10 procurement actions.**

24. **Details of the Procurement Arrangements Involving International Competition are included in the Tables below.**

a) Goods, Works, and Non Consulting Services: Table A2.6 shows the list of contract packages to be procured following ICB and direct contracting. All contracts estimated to cost above US$7,500,000 for Works and US$750,000 for Goods and Non-Consultant services are subject to prior review by World Bank. All other contracts will be subject to procurement post review unless otherwise identified in the Procurement Plan.

Table A2.6 Contract Packages

1	2	3	4	5	6	7
Contract (Description)	**Estimated Cost (USDM)**	**Procurement Method**	**P-Q**	**Domestic Preference (yes/no)**	**Review by Bank (Prior/Post)**	**Expected Bid-Opening Date**
Sewerage system and interdomiciliary connections in Burunga	47	ICB	No	No	Prior	June 2017

b) Consulting Services: Table A2.7 shows the list of consulting assignments with short-list of international firms. For contracts with Firms estimated to cost below US$300,000, the short list may be composed entirely of national consultants. All contracts with Firms estimated to cost

above US$1,000,000 and selection of Individual consultants estimated to cost above US$300,000 are subject to prior review by World Bank. All other contracts will be subject to procurement post review unless otherwise identified in the Procurement Plan.

Table A2.7 Consulting Assignments

1	2	3	4	5	6
Ref. No.	**Description of Assignment**	**Estimated Cost (USDM)**	**Selection Method**	**Review by Bank (Prior / Post)**	**Expected Proposals Submission Date**
1	Technical Support to PCU in Water Quality Management	**2,230,950**	QCBS	Prior	May 2018
2	Community, social and institutional management,	**2,140,000**	QCBS	Prior	October 2017
3	Pilot intervention from the IUWM Plan	**3,242,550**	QCBS	Prior	October 2018

Environmental and Social (including safeguards)

25. **In accordance with Environmental Assessment (OP/BP 4.01), the proposed Project is classified as Category B given that negative environmental impacts from civil works can be adequately mitigated.** Environmental and social impacts of the Project are expected to be positive and long-term, especially in terms of public health, WSS services and environmental sustainability of the area, mainly through the elimination of latrines and septic tanks which pollute both surface and ground waters. In line with Panama's environmental regulations, particularly Executive Decree 123 of 2009, the PCU prepared a Category III EIA for the construction of the sewerage systems at Burunga and its associated WWTP, which was found to be satisfactory by the Ministry of Environment and the World Bank, leading to the issuance of the Project's environmental license. The EIA was published in Panama and on the World Bank's external website on May 17, 2016.

26. **The bidding documents for the works financed under this Project incorporate key environmental and social responsibilities.** These relate to the implementation of the EMPs, compliance with industrial safety regulations and industrial hygiene, environmental permits and authorizations, and reporting of environmental performance. In addition, the World Bank and the PCU have agreed on contractor environmental and industrial safety responsibilities that will be incorporated in the bidding documents. Moreover, the bidding specifications include staff organizational requirements, as well as the number and profiles of the environmental and industrial safety professionals needed for Project implementation.

27. **Compliance with the EMPs for the collectors and sewerage network will be monitored by the Project Manager.** The PCU will follow-up closely with the Project Manager and will be directly responsible for ensuring the compliance with the Environmental Licenses awarded by the Ministry of the Environment. A legal covenant in the Loan Agreement ensures that the World Bank has access to Project Manager's report on compliance with safeguards, including EMPs.

28. **Other environmental safeguards triggered for this Project include Natural Habitats (OP/BP 4.04) and Physical Cultural Resources (OP/BP 4.11).** These safeguards have been addressed through the EIA, which includes chance-finding procedures. Approximately 80 species and 5,500 trees have been identified in the 27 hectares in the direct influence area of the Project. The status of all the identified species were verified against the lists found in the Convention on International Trade in Endangered Species of Wild Fauna and Flora of the International Union for Conservation of Nature. None of the identified species are considered endemic in the area or region. The EIA contains all relevant measures for environmental protection, conservation and management of ecological values of the sites. Physical Cultural Resources (OP/BP 4.11) has been trigged in a preventive manner. The construction site will be monitored for archeological findings during the preparation phase of the terrain, with the permanent presence of a qualified archaeologist. In case archaeological remains are identified, the EIA details the procedures to register and recuperate archaeological findings if any.

29. **MINSA will apply its Social Management Strategy, including a gender strategy, for all investments irrespective of source of financing to employ the same social accompaniment processes when working with stakeholders and communities.** The Social Management Strategy, prepared by MINSA and approved by the Bank, seeks to ensure participation during the pre-investment phase, the design phase, the construction, and sustainability of the works and services through the same process and guidelines for all stakeholders (donors, contractors, promoters, and others). To this end, the Strategy includes Consultation Mechanisms, an Outreach Plan, a Communications Strategy, and social support to communities as well as defines the social elements to be included in terms of reference of consulting firms and contractors, who will be required to include social specialists and promoters in their core teams. The Strategy also includes a gender strategy to ensure that men and women participate equitably in all Project-based community activities, and partake equally in Project benefits. The Social Management Strategy was completed in January 2016 and institutionalized under a Technical Instruction (IT-SSA-01).[42] The World Bank also provided guidance and approved the GRM that is under the Specific Quality Procedure of the PCU. The PCU has a team of social specialists to ensure oversight of social elements of all projects under execution.

30. **The PCU has completed a social assessment for Panama Oeste-Burunga.** The assessment in Burunga included approximately 900 socio-economic surveys (one per household) in a sample equivalent to 10 percent of the target population. Six participatory assessments, three observation tours, six participatory workshops, and three focus groups were carried out. Interviews took place with key players (i.e. mayors, community boards, health centers, school principals, church pastors, community leaders, educational bodies, and parent clubs). The social assessment informed Project design on the main risks, impacts, opportunities, and communities' expectations with regard to the Project. A workshop for beneficiaries was held in April 2016 to present the results of the assessment. The workshop and social assessments helped to tailor the community intervention methodology, as well as the social management program under subcomponent 2C.

31. **The Involuntary Resettlement Policy (OP4.12) is triggered and the PCU has prepared a RPF.** Given that the precise location of the land needed for construction of pumping stations, water tanks and other minor infrastructure which may need to be acquired by the Borrower is not yet known, a RPF was

42 As part of the Certification on ISO9001, ISO14001 and OCSHA, the PCU is documenting all its processes into Technical Instructions and Specific Quality Procedures.

prepared, which includes principles, organizational and financial arrangements for policy implementation for all investments irrespective of the source of financing, guaranteeing harmonization among financers. Moreover, easement rights for collectors and the sewage network will need to be negotiated and there is not enough information available at this point to identify the particular sites. The land presently under public domain will need to be transferred from public agencies to MINSA. The RPF includes two parts: (a) a step-by-step process for land acquisition for easements and works; and (b) specific procedures for involuntary resettlement and compensation of affected households. In the case of resettlement, it is not clear whether resettlement of social units (families) or economic activities will be necessary. For every case of resettlement, a Resettlement Action Plan will be prepared and submitted to the World Bank for no objection prior to initiating construction. A consultation process of the RPF was completed in mid-April 2016. The RPF was published in-country and on the World Bank's external website on May 31, 2016.

32. **The Indigenous Peoples Policy (OP4.10) is not triggered**. The social assessment did not identify Indigenous groups in the Project area. However, given that there are Indigenous Guna, Embera, Ngäbe families who have migrated to affected neighborhoods and intermingled with the mestizo population, the Social Management Strategy includes provisions to ensure these families have ample opportunities to benefit from the Project, participate in trainings, Committees, etc.

Monitoring and Evaluation

33. **Achievement of the PDO will be measured by progress on the Project's results framework.** This framework has been developed in close coordination with the PCU, who will consolidate the data at the Project level and produce semi-annual reports to monitor progress. These reports will indicate the progress made under the different Components and measure performance against the results indicators. The semi-annual progress reports will allow better monitoring of the implementation of agreed activities by also providing information on: (a) investment and disbursement performance over the period covered by the report and an updated disbursement calendar; (b) procurement performance and an updated Procurement Plan for activities under each of the Components and subcomponents of the Project; (c) accounting and FM performance; (d) progress in the implementation of the EMP, including problems identified and documentation of positive environmental and social impacts in the areas of intervention; (e) potential developments that could affect Project implementation, including a review of the main risks and the impact of mitigation measures; and (f) other relevant operational and administrative information. The second semi-annual report of each calendar year will also include an Annual Operation Plan for the following year. The PCU progress reports will be presented and submitted to the World Bank in accordance with the format established in the Project's OM. At the mid-term evaluation of the Project, a detailed review of the M&E system will be carried out to verify fulfillment of the agreed targets and compliance with other contractual commitments and recommend any necessary corrective action.

Role of Partners (if applicable)

Table A2.8 Detailed Financing Plan

Project Components	Project Cost	IBRD Financing	CAF Financing	Counterpart Financing	% IBRD Financing
Component 1. Construction of a new sewerage system in Burunga	49.5	47.0	0.0	2.5	*94.9*
- *Sector 4.4 Northwest Burunga*	*44.4*	*42.2*	*0.0*	*2.2*	*95.0*
- *Contingencies*	*5.1*	*4.8*	*0.0*	*0.3*	*94.1*
Component 2. Institutional Strengthening for Sustainable Wastewater Management	12.7	12.0	0.0	0.7	*94.5*
- *Sub-Component 2A*	*7.5*	*7.0*	*0.0*	*0.5*	*93.3*
- *Sub-Component 2B*	*2.6*	*2.5*	*0.0*	*0.1*	*96.2*
- *Sub-Component 2C*	*2.6*	*2.5*	*0.0*	*0.1*	*96.2*
Component 3. Project Administration	19.0	6.0	11.5	1.5	*31.6*
- *Project Manager – Burunga(All Sectors)*	*12.3(*)*	*0.0*	*11.5*	*0.8*	*0.0*
- *Project Administration*	*4.3*	*4.0*	*0.0*	*0.3*	*93.0*
- *Contingencies*	*2.4*	*2.0*	*0.0*	*0.4*	*83.3*
Front-End Fees					
Total Financing Required	**81.2**	**65**	**11.5**	**4.7**	***80.0***

(*)This is the contractual amount for the Project Manager for the WWTP and three sewerage systems in Burunga (Northwest, Center and East) to supervise an estimated overall construction and O&M value of US$189 million. If services were to be grossly allocated to service areas, the proportion corresponding exclusively to Northwest Burunga would be $2.9 million, about 6.5 percent of estimated contract amount, well within international costs standards.

34. **The Ministry of Economy and Finance of Panama seeks the support of different development partners in a given sector to enable the PCU to gain expertise and support from different international sources.** This diversification strategy also allows the PCU to use each partner's competitive advantage to maximize the flexibility and speediness of their investments. In particular for this Project, the financing among the different partners is shown in Table A2.8. In the event that any of the partner's financing fails to materialize in a timely manner putting at risk the achievement of the PDO, the counterpart has agreed to cover the financing gap with Government funds.

ANNEX 3: IMPLEMENTATION SUPPORT PLAN

COUNTRY : Panama
Burunga Wastewater Management Project

Strategy and Approach for Implementation Support

1. **Implementation Support from the World Bank will consist of the regular semi-annual full supervision missions, meetings and audio conferences between the World Bank and the relevant implementation agencies, and close coordination through World Bank staff located in Panama.** Field visits to major construction sites will also be carried out. Additional support will be provided by the World Bank's procurement, FM and safeguards specialists as well as international experts to advise the GoP and the PCU on the implementation of the Project's technical components, in particular the ones related to wastewater management. This strategy is an indicative and flexible instrument that may be revised during Project implementation based on emerging Project challenges and field conditions.

Implementation Support Plan and Resource Requirements

2. **Semi-annual supervision missions and short follow-up technical missions will focus on the following areas.**

3. ***Strategic support*:** Supervision missions will meet with national and local authorities to: (a) review progress on the Project's activities; (b) discuss strategic alignment of the Project's different activities, especially at the planning level between the relevant stakeholders; and (c) evaluate progress on cross-cutting issues such as M&E, training, communication, dissemination of Project results and experiences, and coordination between relevant stakeholders.

4. ***Technical support*:** Supervision will concentrate on ensuring the technical quality of bidding documents, evaluation reports and construction plans. During construction and commissioning, technical supervision will be provided to ensure that technical contractual obligations are met. Regular site visits will be carried out during Project implementation, and involve technical specialists as needed.

5. ***Fiduciary support*:** Periodic supervision of procurement and FM aspects will be carried out by the World Bank semi-annually to: (a) perform desk reviews of Project IFRs and audit reports, following-up on any issues raised by auditors, as appropriate; (b) assess the performance of control systems and arrangements; (c) update the FM rating in the FM Implementation Support and Status Report as needed; (d) provide training and guidance on carrying out procurement processes in compliance with the Procurement and Anti-Corruption Guidelines and the OM; (e) work with the PCU to enhance their capacity in procurement and FM to facilitate Project implementation; (f) review procurement documents and provide timely feedback to the PCU; (g) carry out the post review of 1:10 procurement actions; and (g) help monitor Project progress against the Procurement Plan.

6. ***Safeguards support***: Close supervision of safeguards implementation and compliance will be carried out throughout Project implementation and at least twice a year.

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First twelve months	1. Revision of biding documents for sewerage network contracting 2. Technical assistance to review terms of reference for the contracting of consultancies for Component 2	1. Experience in the design of sewerage networks and their biding processes 2. Experience in the design of IUWM Plans	1. 30 days of consultancy services 2. Idem	Provide support, international expertise and technical advice
12-48 months	1. Technical revision of progress reports for the construction of the sewerage network 2. International experience in the development of an real time water quality monitoring system 3. Experience in the design of an IUWM Plan	1. Experience in the construction of sewerage networks 2. Experience in the design and implementation of a real time water quality monitoring system 3. Experience in the design and implementation of an IUWM Plan	1. 30 days of consultancy services 2. Idem 3. Idem	Provide support, international expertise and technical advice
Other				

Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Senior Water Supply and Sanitation Specialist	15	10	
Water Resources Management Specialist	15	10	

Partners

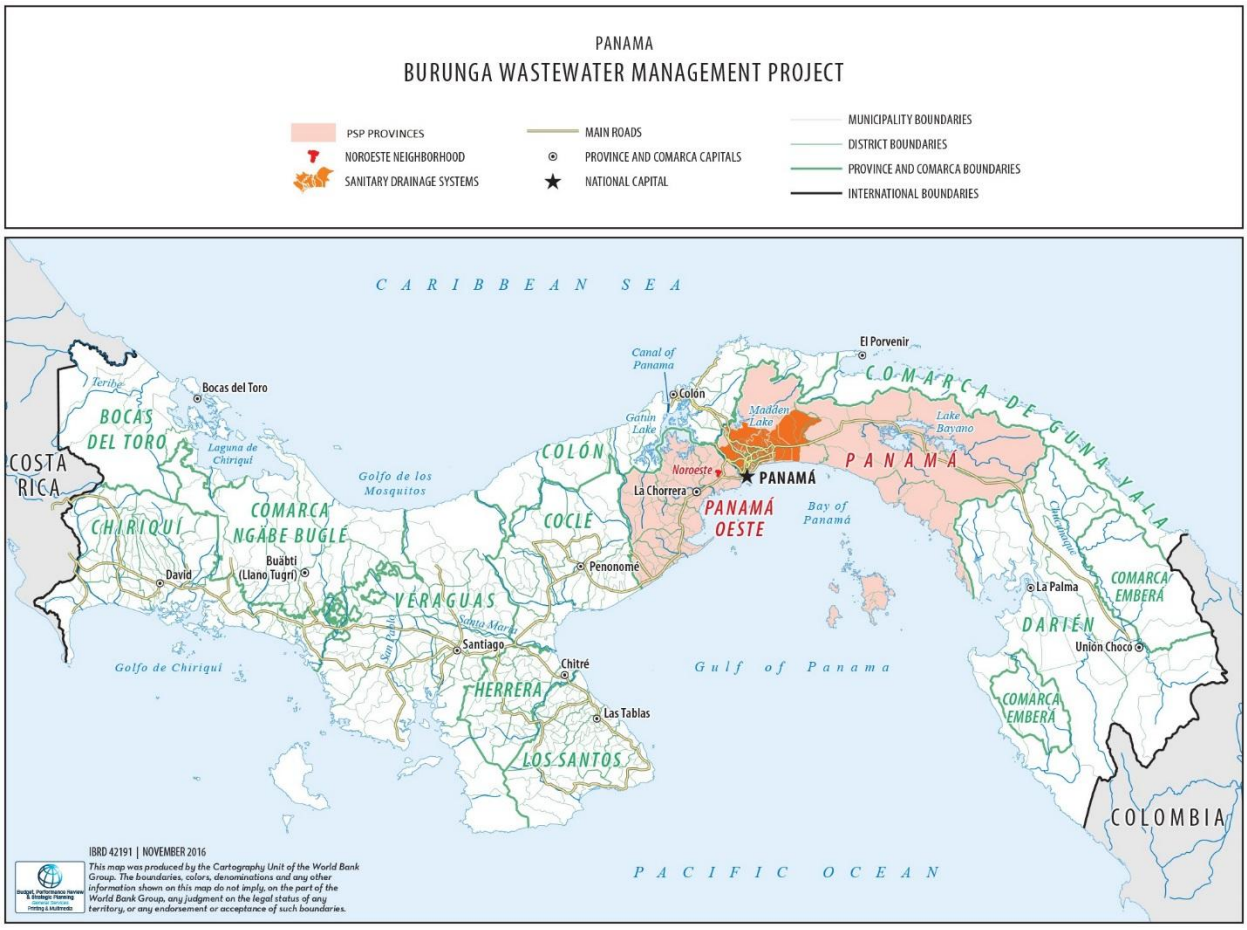
Name	Institution/Country	Role
Program Coordinating Unit (PCU)	MINSA/Panamá	Implementation of Project activities under assigned components

Ministry of Economy and Finance	Panama	Borrower
Ministry of Environment	Panama	Provide environmental license for all works. Ensure proposed activities are environmentally sound.
Development Bank for Latin America (CAF)	Venezuela/Panama	Co-financier (Parallel Financing)

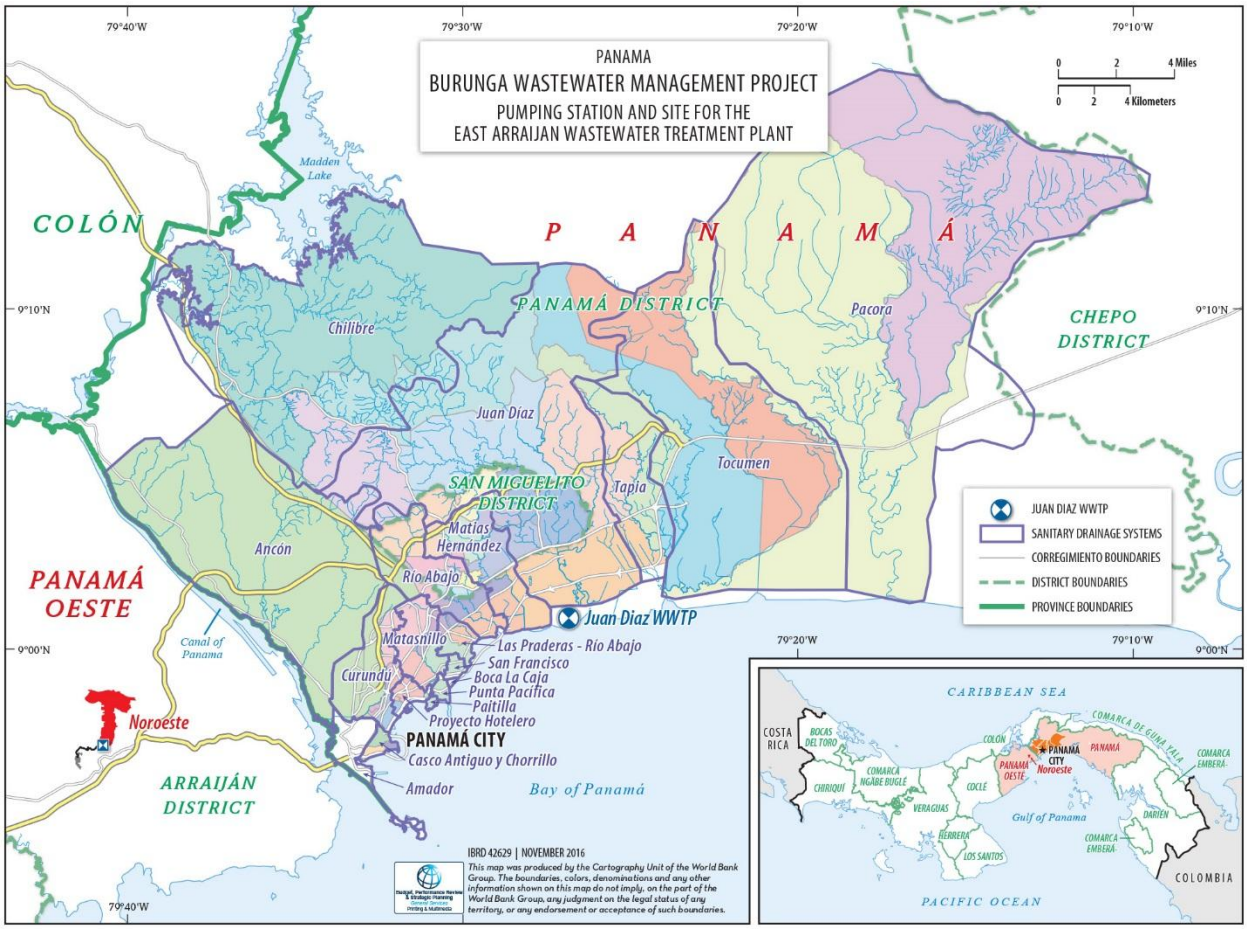
ANNEX 4: PROJECT MAPS

COUNTRY : Panama
Burunga Wastewater Management Project

Map 1. Burunga Waste Water Management Project



Map 2. Sanitary Drainage Systems



Map 3. Preliminary Configuration of the Sewerage Network