

PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC14825

Project Name	EC Guayaquil Wastewater Management Project (P151439)
Region	LATIN AMERICA AND CARIBBEAN
Country	Ecuador
Sector(s)	Wastewater Treatment and Disposal (70%), Wastewater Collection and Transportation (30%)
Theme(s)	Pollution management and environmental health (50%), City-wide Infrastructure and Service Delivery (50%)
Lending Instrument	Investment Project Financing
Project ID	P151439
Borrower(s)	Municipality of Guayaquil
Implementing Agency	EMAPAG-EP
Environmental Category	A-Full Assessment
Date PID Prepared/ Updated	17-Dec-2014
Date PID Approved/ Disclosed	19-Dec-2014
Estimated Date of Appraisal Completion	09-Feb-2015
Estimated Date of Board Approval	15-Apr-2015
Concept Review Decision	Track I - The review did authorize the preparation to continue

I. Introduction and Context

Country Context

- During the last decade, Ecuador has seen a period of relative political stability. During the past six years, the Government (GoE) has invested heavily in infrastructure and social sectors in an effort to stimulate growth, reduce inequality and promote inclusion for a total population of slightly more than 15.7 million inhabitants. As Ecuador's urban areas continue to expand, with urbanization levels reaching 65 percent in 2010, increased resources and attention are needed for housing, infrastructure and urban services, particularly in the two major cities of Quito and Guayaquil.
- Growth combined with falling inequality has led to important gains in reducing poverty and promoting shared prosperity. Over the last decade (2003-2013), GDP per capita growth in Ecuador was above regional average levels (2.7 percent vs 2.5 percent), while progress in reducing inequality has exceeded regional trends. Growth has moderated in the last years, but remains strong

at 3.5 percent year-on-year in the second quarter of 2014, and above the projected regional average of 1.9 percent for 2014. Income distribution was significantly improved, as expressed by the Gini coefficient, declining from 0.54 in December 2006 to 0.49 in June 2014. Likewise, between 2006 and June 2014, income poverty at the national poverty line fell from 37.6 percent to 24.5 percent, while extreme poverty fell from 16.9 percent to 8 percent. Notwithstanding these significant strides in poverty reduction and growth of middle class, more than half of the population in Ecuador remains poor or vulnerable to falling back into poverty.

3. Poverty in Guayaquil is high compared to the other main Ecuadorian cities. The poverty level (measured by income) in Guayaquil was 11.1 percent in September 2014, only second to Machala (12.8), amongst five of the largest Ecuadorian cities by population: Ambato (8.4 percent), Quito (7.0 percent) and Cuenca (5.0 percent). Importantly, more poor people live in Guayaquil than in any other urban area in Ecuador, because Guayaquil is the biggest city in the country with 2.35 million people (of which 260,952 are living below the national poverty line).

4. The Government of Ecuador has placed universal access to improved water and sanitation services at the core of its Poverty Eradication Strategy. The National Development Plan – the “Plan Nacional del Buen Vivir 2013-2017”- established the ambitious goal of having 95 percent of the households connected to a public drinking water distribution system and 95 percent of the household with access to adequate sanitation services by 2017. An Interim Strategy Note (ISN) for Ecuador discussed at the World Bank Board in April 2013 identified access to basic services at the sub-national levels as a key priority for the authorities to contribute to the country's goal for inclusive and sustainable growth.

5. Guayaquil's Municipal Development Plan (MDP) identifies access to affordable improved wastewater management services as a key element of its social inclusion and urban regeneration policies. The MDP, in alignment with the “Plan Nacional del Buen Vivir” and the Bank's Twin Goals, considers as part of its development objectives: (i) the reduction of inequalities in terms of access to affordable and quality basic services; and (ii) the regeneration of degraded urban areas and environmental assets as a driver for economic growth, social inclusion and competitiveness improvement. In this regard the MDP establishes the goal of reaching by 2014 a 100 percent access rate to piped sewer services, and identifies the regeneration of the Estero Salado – a highly contaminated estuary- and riparian neighborhoods as a key development objective. The contamination in the Salado Estuary is caused by untreated industrial and domestic wastewater discharges. The environmental recuperation of the Estero Salado is also one of the environmental priorities of the Central Government, which plans to invest around USD 200 million by 2017 to contribute to its restoration.

Sectoral and Institutional Context

6. Although access to improved water sources and sanitation has experienced a great progress over the last decade, the level and quality of service provided in Ecuador remains low in comparison with the regional average. In 2010 the percentage of households connected to a public drinking water distribution network was 72 percent in urban areas and 27 percent in rural areas, while the average in the Latin American and the Caribbean region was 94 percent and 62 percent respectively. Coverage of sewer systems (54 percent, 71 percent in cities and 23 percent in rural communities) and wastewater treatment rate (24 percent in urban areas) are also low. The overall quality of service varies significantly across cities and regions, but with a few significant exceptions (Quito, Cuenca, Ibarra, Guayaquil). In small and medium sized cities and rural areas the service generally

requires important improvements in terms of continuity, efficiency, resiliency and sustainability.

7. The recently created Secretary of Water (SENAGUA) heads the water and sanitation sector's institutional framework at the national level. SENAGUA holds the responsibility for developing and applying policies, standards, norms and regulations for water resources in general and for the provision of drinking water and sanitation services. The responsibility over drinking water and sanitation services was recently transferred to SENAGUA from the Ministry of Housing and Urban Development (MIDUVI) and an important effort remains to be made to reinforce the capacity of the Secretariat to effectively exercise it. Municipal governments are responsible for the provision of these services within their area of jurisdiction, either directly or through delegation to a public company or a community based organization.

8. In the City of Guayaquil, since 2001 and motivated by the poor performance of the municipal water and sanitation utility at the time, the Empresa Cantonal de Agua Potable y Alcantarillado de Guayaquil (ECAPAG), a 30 years concession contract was awarded to a private consortium, Interagua, for the provision of water and sanitation services within the city. ECAPAG was transformed into a regulatory agency, today called Empresa Municipal de Agua Potable y Alcantarillado de Guayaquil (EMAPAG EP), in charge of supervising and controlling Interagua's performance amongst other functions.

9. During the last thirteen years, effective access to water and sanitation and quality of services have significantly improved in the City of Guayaquil. According to the audits performed by the National Audit Office between 2001 and 2009: (i) water supply distribution network coverage increased from 30 to 95 percent ; (ii) sewerage network coverage has reached 80 percent city-wide; (iii) unaccounted water was reduced by 14 percent ; and (iv) staff-to-connection ratio decreased from 6/1,000 to 3/1,000. During these years billing and delinquency rates significantly improved too (delinquency decreased from 50 percent in 2001 to 10 percent in 2006), contributing, together with the enlargement of the client base and improvements in productivity, to enhance the financial sustainability of the services. Nonetheless, important challenges remain, particularly in terms of environmental sustainability and equity of access: (i) unaccounted water rate remains still high (60.5 percent in 2012); (ii) just 20 percent of the wastewater generated is currently being adequately treated; and (iii) effective access to the services lags significantly behind coverage rates, particularly when it comes to wastewater management.

10. In order to meet the ambitious environmental and access to basic services goals set by the MDP and the National Development Plan, EMAPAG EP and Interagua have designed a comprehensive wastewater management investment program to be implemented within the next decade. For the past several years, the City of Guayaquil has been studying a solution for the treatment of its municipal wastewater before its discharge to the Guayas river. The consulting firm Hazen and Sawyer (HS) was hired to prepare the feasibility study for the treatment of 100 percent of the wastewater of the City of Guayaquil. Under this task, a large number of studies have been prepared including, among others, basic studies, study of alternatives, conceptual design of the selected alternative, preliminary dimensioning of the installations, detailed environmental impact assessment, economic and financial analysis, cost estimates, technical specifications, and ongoing preparation of the detailed design of the wastewater treatment plants (WWTPs) of Las Esclusas (covering the Southern districts, with 1.2 million inhabitants) and Los Merinos (covering the Northern districts with 1.3 million inhabitants).

11. The City of Guayaquil needs to significantly increase its investment pace to execute its plans for the universalization of wastewater management services. Interagua's annual investment commitments equal on average USD 21.5 million, both for water and sanitation. EMAPAG EP complements this investment effort with an average annual investment flow of USD 30 million financed by the Municipality. However, Guayaquil requires estimated quinquennial investments of USD 137 million to reach 100 percent access rate to water supply, USD 196 million for rehabilitation and expansion of sewerage networks to reach 100 percent access to wastewater collection services, and USD 345 million for the construction of the two wastewater treatment systems. In this context, the proposed IBRD operation, with co-financing from the European Investment Bank (EIB) and the Municipality of Guayaquil, will facilitate funding for the construction of the wastewater treatment system of Las Esclusas in the City South. This Project is expected to benefit around 1.2 million people with wastewater treatment services, as well as increased access to wastewater collection services for around 150,000 people, and will help satisfy these significant investment requirements while bringing relevant knowledge in the field of pro-poor service provision.

Relationship to CAS

12. The proposed Project is fully consistent with the World Bank's ISN for Ecuador for the period 2014-2015, which focuses on providing investment project financing on three strategic areas. The proposed project is consistent with the first two, namely "Sustainable and Inclusive Growth" and "Access to Social Protection and Quality Services for All". The Project is also consistent with the country's Plan Nacional del Buen Vivir, where two out of its twelve key objectives outline the access to water and sanitation as key intermediate priorities to ensure quality of life and social cohesion for its citizens.

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

13. The Project Development Objective (PDO) is to reach sustainable universal access to wastewater management services in the Southern districts of the City of Guayaquil. The Project will therefore improve environmental conditions in Guayaquil's water bodies (the River Guayas and the Salado Estuary) and bring better livelihood conditions for its residents in selected neighborhoods, contributing to the reduction of poverty and increase of shared prosperity in the City.

14. This Project will particularly benefit the residents of "Trinitaria" and "Suburbio Oeste", two riparian districts of the Estero Salado estuary where sewer mains will be rehabilitated -what will contribute to the decontamination of this important environmental asset-, and where poor households -the vast majority in the area - will enjoy eased conditions to get connected to the sewer network (a detailed socioeconomic characterization of the benefiting population in the mentioned riparian districts will be undertaken during the project preparation phase).

Key Results (From PCN)

15. The Bank's core sector indicators and other additional indicators will be used to measure Project results and PDO achievement. The target value for each of these indicators and any additional results indicators (in particular to reflect quality and sustainability aspects) will be confirmed during Project preparation and will include the following:

- New household sewer connections constructed under the project (30,000);
- Households trained to improve hygiene behavior or sanitation practices under the project

(30,000)

- BOD pollution loads removed by the treatment plant supported under the project and safely being disposed (target value to be calculated and included in the PAD).

III. Preliminary Description

Concept Description

16. The proposed project would achieve the above mentioned objectives through the implementation of four main components. The pre-investment cost, including the preparation and development of feasibility studies, environmental impact assessment and final designs, as well as the acquisition of the land required for the construction of the new wastewater treatment plant is being financed by the Municipality of Guayaquil through EMAPAG EP for a total amount of USD 6.5 million. This will be considered as counterpart financing.

17. Component 1: Universalization of Household Connections (USD 18 million with USD 2.8 million of IBRD loan financing). This Component will finance the installation and rehabilitation of household connections in specific areas within the southern districts of the City of Guayaquil. These districts are equipped with a dense sewerage collection network which, although requiring rehabilitation of main collectors to reduce infiltration, reaches and could serve all inhabited areas. Nonetheless, despite having coverage of almost 100 percent, just 82 percent of the households of the area are currently actually connected to the system. Most of the remaining 18 percent (around 30,000 families) are poor households located in “Suburbio Oeste” and “Trinitaria”, two riparian district of the “Estero Salado” estuary, where household toilets discharge directly to the estuary or to reportedly poorly constructed and maintained pits or septic tanks, which contributes to the degradation of the Estero Salado. These families have not been connected despite having a sewer passing in front of their households – and despite legal mandate to do so - mainly because of the cost of the connection fee , but also because of technical issues (toilets mostly located at the back of their houses or at a lower level than the condominial sewer branch) and lack of information about their entitlement to enjoy a social tariff and/or about the benefits that getting connected would bring them in terms of livelihood improvement.

18. This component of the project aims at increasing effective access to sewerage collection services in the south districts of Guayaquil to reach a rate of around 100 percent. To achieve this objective, household connection costs -including the cost of required indoor works like piping, flooring and others – will be partially subsidized and financed by EMAPAG (clients will pay to EMAPAG the nonsubsidised segment in installments trough the water bill). In parallel, a communication campaign will be launched to inform the beneficiaries about this initiative and its benefits and to promote improved hygiene and sanitation practices required to ensure the proper functioning of the condominial sewer system. The design of this component will be developed based on previous successful experiences led by EMAPAG EP, which managed to increase effective access to piped sanitation up to 98 percent in other districts of the city with high poverty rates.

19. Component 2: Rehabilitation of Primary Sewerage Network (USD 37 million, 100 percent financed by IBRD). This Component will finance the rehabilitation of the main collector sewers of “Las Ranas” and “La Chala” neighborhoods within the “Suburbio Oeste” district, which as stated above is riparian to the Salado estuary. These main collectors have been identified to require urgent rehabilitation to reduce wastewater loses and enable their effective collection function. This

component of the Project aims at reducing infiltrations in the south sewerage subsystem, thus contributing to the reduction of the contamination of the Salado estuary from domestic wastewater. The magnitude of the infiltration issue is currently illustrated by the following:

- Approximately 71 percent of the wastewater yearly collected in the sub-basin of La Chala in Guayaquil gets lost due to infiltration, which causes groundwater contamination;
- The wastewater volume discharged from the south subsystem into Guayas River during the rainy season is 82 percent higher than the volume discharged during the dry season due to rain and ground water infiltration into the sewerage system, which also increases wastewater pumping and treatment costs.
- Some segments of the “Suburbio Oeste” sewer network meant to work as gravity mains get pressurized during periods of high tide.

20. Component 3: Wastewater Treatment and Disposal Facilities (USD 161 million, with USD 58.5 of IBRD loan financing). This component will finance the construction of a new wastewater treatment plant (WWTP), called “Las Esclusas WWTP, and associated pumping and transmission facilities to treat 100 percent of the wastewater collected in the southern districts of the City of Guayaquil within the design year of 2030. Wastewater generated in the south subsystem is collected in two sewer mains: (i) the “Guasmo” sewer main, which conducts an average flow in dry weather of 0.60 m³/s into the “Guasmo H” pump station from where wastewater is pumped directly into the Guayas River through a 180 meters long pipeline and an underwater outfall diffuser; and (ii) the “Parson’s Sur” sewer main, which conducts on dry weather 2.10 m³/s into the “La Pradera” treatment plant, equipped with a mechanized pretreatment, a disinfection system that is out of service and a underwater outfall diffuser. Therefore, wastewater is currently discharged into the Guayas River with none or very little treatment, failing to comply with the contaminants concentration thresholds established in the National Norm on Environmental Quality and Effluent Discharges (NCADE in its Spanish acronym).

21. To address this situation, EMAPAG EP plans to construct a new wastewater treatment plant in the proximity of the current point of discharge of the Guasmo sewer main, which will treat all the sewerage collected in the south subsystem and will require:

- The adaptation of the Guasmo H pump station and the construction of a new pipeline to drive pumped water to the new treatment facility;
- The decommissioning of La Pradera treatment plant, the construction of a new pump station in the premises, and the construction of a pipeline to drive pumped water to the new treatment facility;
- Construction of a new treatment facility for a design dry and wet flows of 2.7 l/s and 3.5l/s. The facility will be equipped with mechanized pretreatment, chemically enhanced primary treatment (CEPT), disinfection system, underwater outfall diffuser and hypochlorite production; and
- Construction of the sludge digester.

22. Different technological alternatives were analyzed by the consulting firm hired by EMAPAG to develop the design of the treatment facility and were discussed with the WB team. These alternatives reviewed included, among others, advanced preliminary treatment, chemically enhanced primary treatment (advanced primary treatment), and secondary treatment, including aerobic and anaerobic processes. The CEPT option was retained since it allows to consistently meet the regulatory authorized limits set for the Total Suspended Solids (TSS), Biochemical Oxygen Demand (BOD) and all other pollutant concentrations, eases the implementation of effective odor control measures and it is a technology that has extensively and successfully been adopted

worldwide in municipal wastewater treatment plants of similar size which effluent does not require a complex treatment process, considering existing effluent quality, effluent quality standards and existing quality, quality standards and dilution capacity of receiving water body . Las Esclusas treatment facility is being designed to allow for a secondary treatment system to be incorporated into the treatment process in the future should it be required.

23. Sludge Management: Depending on working conditions and on actual contaminants concentrations of the raw wastewater, the treatment process may generate up to 94 tons per day of primary sludge that would be digested and disposed in the municipal landfill. An agreement has already been reached between EMAPAG and the consortium running the landfill, “Las Iguanas”, which has all required environmental permits to receive this type of waste. The landfill has the capacity to receive the expected volume of sludge during the first eight to ten years of operation of the treatment facility, based on its current rate of exploitation. A new municipal sanitary landfill is under design which will allow the continuation of the sludge disposal in this manner.

24. Component 4: Project management and Administration, including Communication Plan and Management of Social, Environmental and Safety Issues (USD 5.4 million with USD 4.2 million of IBRD loan financing). This component will finance activities associated with overall Project management by EMAPAG EP, including project-related audits, monitoring and evaluation, equipment and training to strengthen implementing entities, as well as individual consultants. It will include support to EMAPAG EP related to the management of environmental and social issues and safeguards.

25. The project is expected to also include a Non-lending Technical Assistance Activity to improve the capacity of EMAPAG to provide better sanitation services to the poor, financed with funds from the Water and Sanitation Program (WSP). The WSP activity will support technical assistance directed at the improvement of the mechanisms currently employed by Interagua and EMAPAG to promote the installation of sewerage household connections among the population of areas that are already equipped with a sewer network or that will benefit from a network extension or densification project. These existing mechanisms, which focus on the creation of financial incentives accompanied with an effective communication campaign, have demonstrated in the past their usefulness to achieve close to 100 percent sewer sanitation access rates, but failed to promote among the targeted population the sealing of septic tanks and cesspools that should be decommissioned when connected to the public sewer network. This work is expected to study the reasons behind this failure and explore the socio-economic characteristics of the households in question and identify bottlenecks towards an effective closure of existing on-site solutions. EMAPAG is also looking for unconventional solutions to provide sustainable quality sanitation services to peri-urban communities where conventional sewer systems are not technically, financially or socially viable. In this context the Bank, through the Water and Sanitation Program (WSP), will provide technical and financial support to identify and adapt to the local reality alternatives having successfully been implemented internationally in similar contexts.

26. Flood Risk and Climate Change Preparedness: Given that Guayaquil suffers from a significant flood risk level, an assessment of the resiliency of the infrastructure to be built under the Project, and the incorporation of appropriate flood risk management measures, are expected to be included under the proposed Project and will be discussed with EMAPAG/Interagua during Project preparation. This assessment will cover any climate change adaptation measures that are deemed necessary.

27. Technical and financial sustainability: According to the concession contract signed between EMAPAG and Interagua, the latter will be responsible for the operation and maintenance of all wastewater treatment facilities and sewer mains to be constructed within the concession period for the provision of sanitation services to the population living in the concession area. As described in paragraph 9 above, Interagua has demonstrated to have the necessary capacity to ensure the technical sustainability of the project. On the other hand the provisions contained in the concession contract regarding the revision of the tariff charged for water and sanitation services, which are based on the principles of economic efficiency and financial viability, ensure the financial sustainability of the service provision.

IV. Safeguard Policies that might apply

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

V. Financing (in USD Million)

Total Project Cost:	227.90	Total Bank Financing:	102.50
Financing Gap:	0.00		
Financing Source		Amount	
Borrower		22.90	
International Bank for Reconstruction and Development		102.50	
EC European Investment Bank		102.50	
Total		227.90	

VI. Contact point

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