



# Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS)

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Appraisal Stage | Date Prepared/Updated: 10-Apr-2018 | Report No: PIDISDSA23783



**BASIC INFORMATION**

**A. Basic Project Data**

Country Ecuador	Project ID P165716	Project Name Guayaquil Wastewater Management Project AF	Parent Project ID (if any) P151439
Parent Project Name EC Guayaquil Wastewater Management Project	Region LATIN AMERICA AND CARIBBEAN	Estimated Appraisal Date 17-Apr-2018	Estimated Board Date 20-Jun-2018
Practice Area (Lead) Water	Financing Instrument Investment Project Financing	Borrower(s) Municipality of Guayaquil	Implementing Agency EMAPAG-EP

Proposed Development Objective(s) Parent

The Project Development Objective (PDO) is to increase access to improved sanitation services and to reduce wastewater pollution in selected areas of the City of Guayaquil.

Components

- Component 1: Installation of Household Connections
- Component 2: Rehabilitation of Sewerage Network
- Component 3: Wastewater Treatment and Disposal Facilities
- Component 4: Project management and Administration, including Communication Plan and Management of Social, Environmental and Safety Issues

Financing (in US\$, millions)

**SUMMARY**

<b>Total Project Cost</b>	239.60
<b>Total Financing</b>	239.60
<b>Financing Gap</b>	0.00

**DETAILS**

<b>Total World Bank Group Financing</b>	233.60
World Bank Lending	233.60



<b>Total Government Contribution</b>	6.00
Environmental Assessment Category	
Full Assessment (A)	
Decision	
The review did authorize the preparation to continue	

Other Decision (as needed)

## B. Introduction and Context

### Country Context

**1. Ecuador’s macroeconomic situation deteriorated significantly since the approval of the parent project.** Steep spending hikes during the oil boom fueled growth, but crowded out private investment, depressed productivity growth and undermined competitiveness while increasing vulnerabilities, spending inefficiencies and plunging Ecuador in a steep recession once commodity prices declined. Consequently, poverty and inequality dynamics have changed in the country in 2014: Poverty incidence at the national level increased from 22.5 to 22.9 percent between 2014 and 2016. At the regional level poverty increased in the Sierra and Amazonian regions from 18.4 to 21.0 percent and from 39 to 49 percent respectively during the same period, while poverty incidence in the Coastal region decreased from 24.5 to 22.3 percent. While income inequality remains stagnated at the national level at 2013 levels, when the GINI coefficient was 0.48, it has been significantly reduced in the Coast, where GINI coefficient decreased from 0.48 to 0.44 between 2013 and 2016. Increased poverty incidence in the Sierra and Amazon regions boosted migration to Guayaquil, which remains the municipality with the highest poverty headcount in the country.

**2. In this challenging macroeconomic context, enhancing access to quality basic services is key to retain poverty reduction gains achieved during the early years of the Correa administration.** As highlighted by the World Bank in its 2018 Ecuador Systematic Country Diagnostic, increasing the provision of infrastructure and basic social services across regions and populations in Ecuador remains a major challenge to prevent reversals achieved in poverty alleviation as well as sectorial advancements. Significant gaps remain to address access to clean water and sanitation, education and health services in the country, which still weigh more heavily amongst the most vulnerable and poorest groups. Per the National Planning Secretariat (SENPLADES in its Spanish acronym), reaching access targets set in the 2014-2017 Poverty Eradication strategy<sup>1</sup> for water supply and sanitation (WSS) services alone, could have trigger reductions in poverty and extreme poverty of 3.8 and 1.6 percent, respectively. The recently published 2017-2021 National Development Plan (NDP), the ‘Plan Nacional para el Buen Vivir’, continues placing access to WSS services at the core of the Government’s development agenda to continue reducing poverty incidence moving forward. Aligned with national development goals, the 2014-2024, Water Supply and Sanitation Sector Strategy (ENAS in its Spanish acronym)<sup>2</sup> establishes the ambitious goal of reaching

<sup>1</sup> As set forth in the Poverty Eradication Strategy: connecting 83 percent of the population connected to public water distribution system and 75 percent to a sewer network by 2017.

<sup>2</sup> Developed in 2016 by the National Water Secretariat (SENAGUA in its Spanish acronym).



universal access to potable water and basic sanitation services across the country by 2024, estimating the investments required to reach this ambitious goal at US\$ 7.3 billion.

### Sectoral and Institutional Context

**3. The largest share of the population lacking access to adequate sanitation is concentrated in urban areas of large and medium size municipalities of the coastal region.** At national level, access to adequate water supply and sanitation services, as defined in the standards set forth by the ENAS, has seen great progress over the last decade, reaching 86.2 and 73.2 percent in 2014, respectively. Although in percentage terms WSS access rates in rural areas still lag significantly behind access in urban areas, the greatest concentration of people without adequate access to sanitation services can be found in urban areas of the country (626,000 people in 2014, as compared to 410,000 in rural areas). On the other hand, when comparing access rates across cities of the country, the greatest concentration of urban citizens without access to sewer services, is in medium and large cities of the coastal region 464,000 in 2014, 171,000 of which were in Guayaquil.

**4. The Municipality of Guayaquil remains committed to increase access to affordable and safely managed sanitation services as to operationalize its social inclusion and urban regeneration policies and goals.** Guayaquil's current Municipal Development Plan (MDP), promulgated before the launching of the Parent Project, has the following as part of its development objectives: (a) the reduction of inequalities in terms of access to affordable and quality basic services, and (b) 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 universal access to sewerage wastewater collection and identifies the regeneration of the Estero Salado and riparian neighborhoods as a key development objective.

**5. In the City of Guayaquil, WSS services are provided through a public-private partnership (PPP) arrangement with a private operator.** Since 2001, a 30-year concession contract was awarded to a private consortium, Interagua, for the provision of WSS services within the city. ECAPAG EP was later transformed into a regulatory agency, today called Empresa Municipal de Agua Potable y Alcantarillado de Guayaquil (EMAPAG EP), which is in charge of supervising and controlling Interagua's performance, among other functions. The quality of services increased significantly as a result of the delegation of service provision responsibilities to Interagua.

**6. Since the concession contract was signed, access to water and sanitation and the quality of services has significantly improved in the City of Guayaquil.** According to the audits performed by the national Audit Office between 2001 and 2009: (a) water supply distribution network coverage has increased from 30 to 95 percent; (b) the sewerage network coverage has reached 80 percent city-wide; (c) unaccounted water was reduced by 14 percent; and (d) staff-to-connection ratio decreased from 6/1,000 to 3/1,000. During these years, billing and delinquency rates also improved significantly (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 enhancing the financial sustainability of the services. Nonetheless, two important challenges regarding sanitation services remain: (a) just 20 percent of the wastewater generated is currently being adequately treated and (b) effective access (actual connections to the sewerage network) is about 85 percent of potential service coverage under the current network extension.

**7. To meet the ambitious environmental and access to basic services goals set by the MDP and the NDP, EMAPAG EP and Interagua have designed a comprehensive wastewater management investment program to be implemented within this decade.** In 2010, EMAPAG EP commissioned a feasibility study for the treatment of 100 percent of the wastewater of the city of Guayaquil, which concluded with the preparation of the detailed engineering design of the wastewater treatment plants (WWTPs) of Las Esclusas (covering the southern districts, with around 1.2 million inhabitants) and Los Merinos (covering the northern districts with 1.3 million inhabitants).



**8. Although the City of Guayaquil is allocating substantial resources to the WSS sector, it needs to significantly increase its investment pace to implement sustainable wastewater management services in the City.** The costs of improving urban sanitation to attain universal sewerage and wastewater treatment coverage are estimated to be US\$541 million until 2020. Interagua's annual investment commitments are, on average, US\$21.5 million (both for water and sanitation services), and EMAPAG EP currently complements this investment effort with an average annual investment flow of US\$35 million financed by the municipality.

**9. EMAPAG is using fiscal transfer from the municipal government to leverage concessional financial resources to expedite investments in sanitation.** In this context, the Parent Project of this additional financing (AF), financed by EMAPAG, the World Bank and the European Investment Bank (EIB), will invest US\$ 247.8 million to achieve universal access to piped sanitation services in the southern wastewater catch basin of the city- where approximately 1.5 million people live- and ensure that 100 percent of the wastewaters generated in this basin are treated to meet applicable environmental standards. The proposed US\$ 233.6 million financing (AF) aims to replicate the approach adopted for the parent project in the northern wastewater catch basin of the city, where approximately 1 million people live.

### C. Proposed Development Objective(s)

Original PDO

**10. The Project Development Objective (PDO) is to increase access to improved sanitation services and to reduce wastewater pollution in selected areas of the City of Guayaquil.**

Current PDO

**11. No changes have been introduced to the PDO of the Parent Project.**

Key Results

**12. The PDO level results indicators and target values are as follows:**

- (i) At least 128,000 people in urban areas provided with access to improved sanitation services under the Project.
- (ii) At least 14,000 tons of Biochemical Oxygen Demand (BOD) pollution loads removed annually by the Las Esclusas and Los Merinos WWTPs
- (iii) Operating ratio for the water supply and sanitation service provider (Interagua) to be kept in a range below 0.90 during the life of the Project (indicating that all operating costs are covered by revenues from tariffs and an operating margin of at least 10 percent is achieved)
- (iv) Total Project beneficiaries of over 2.2 million, of which around 50 percent are female beneficiaries

### D. Project Description

**13. Description of the Additional Financing. The proposed AF seeks to scale-up the Parent Project's investments, expected results and impact.** Particularly, proposed AF activities would complement investments contemplated under Interagua's fourth 5-year investment plan as to ensure that, by 2023, 100 percent of the wastewaters generated by all 904,000 households located in the northern macro-wastewater basin are collected and appropriately treated. Similarly to the Parent Project, the AF would finance the costs associated with the extension of the sewer network to reach unserved neighborhoods of the northern basin of the City (Pascuales and Juan Pablo II); the installation of additional sewerage household connections as to reach a 100 percent sewerage service access ratio in areas of the



northern basin covered by the sewer network<sup>3</sup>; and the construction of wastewater collection, conveyance and treatment facilities to treat wastewater of the northern districts of the city as to meet applicable standards. The total cost of the AF is US\$ 239.6 of which US\$ 233.6 million will be financed by the IBRD and US \$ 6 million by the counterpart EMAPAG EP. Part of the sewer extension and pre-investment costs (including the preparation and development of feasibility studies, Environmental Impact Assessment Plan, final infrastructure designs, and expenses to compensate the family owning the property that will be affected by the construction of the access road to Los Merinos WWTP) is being considered as counterpart financing for the AF.

**14. The scale-up of activities under component 1 will increase effective access to sewerage collection services in the city of Guayaquil.** The AF will finance costs associated to the installation of additional household connections and extension of the sewerage network in northern districts of the city. In the northern wastewater basin of the city, 88 percent of the households are in areas covered by the sewer network but just 83 percent are connected to the service. Most of the 9,000 families that are not connected despite having a sewer main running in front of their houses are poor households located dispersedly across different neighborhoods in this area, Flor de Bastion, Cooperativas Varias, Bastion Popular and Vergeles, and their toilets usually discharge directly to poorly constructed and maintained pits or septic tanks. As per the findings of the social survey conducted neighborhoods benefiting from Component 1 activities of the Parent Project, most of the families that have not been connected despite having the possibility and the legal mandate to do so, is mainly because of financial constraints<sup>4</sup>, technical issues<sup>5</sup>, or lack of information about their entitlement to enjoy a social tariff and/or about livelihood benefits derived from the enjoyment of an enhanced sanitation solution.

**15. To achieve this objective, household connection costs -including the cost of indoor works like piping, flooring and sealing the septic tank- will be partially subsidized and financed by EMAPAG.** Clients will pay to EMAPAG EP the nonsubsidised segment in installments through the water bill (approximately US\$ 0.25 per month for 15 years). In parallel, a communication campaign will be launched to inform the beneficiaries about this initiative and its benefits and to promote improved hygiene and maintenance practices required to ensure the proper use and functioning of the sewer system. The design of this component, already adopted for the Parent Project Component 1 activities, was developed based on previous successful experiences with connection campaigns 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.

**16. The AF will also finance the extension of the sewer network to serve households of the northern wastewater basin located in neighborhoods currently outside the service area.** Component 1 of the AF would finance the extension of the construction of the sewer network in residential areas of the Pascuales district, as well as the installation of the household connections to reach 100 percent household connectivity rate in this district, i.e. 8,700 households.

**17. Households neighboring Los Merinos WWTP will also be connected to the sewer system.** Juan Pablo II is an informal settlement housing 131 families located between the “*Terminal Terrestre – Pascuales*” highway and the plot where currently the Saucos-Alborada and the Guayacanes-Samanes wastewater stabilization ponds are located, which will be partially decommissioned to build in their place the Los Merinos WWTP. The land where this informal settlement and treatment facilities sit belongs to the Ecuadorian Housing Bank, a State-owned financial institution which has granted the right of usufruct of land to the Government of Guayaquil. As per local regulations, no municipal infrastructure investments are made in informal settlements. As such, Juan Pablo II streets are not paved, there is no sewer network

<sup>3</sup> All northern neighborhoods except for certain areas of “Inmaconsa”, where the network will be extended and households connected by Interagua through its fourth 5-year investment plan.

<sup>4</sup> The cost of the connection is US\$ 600 and includes the cost of emptying and sealing of the septic tank or other on-site sanitation solution.

<sup>5</sup> Toilets mostly located at the back of their houses or at a lower level than the condominial sewer branch.



and the population gets water at the household level through hoses connected to three public fountains. The municipal government is working on granting property rights to Juan Pablo II residents over the land where their houses are located, and Interagua will install the drinking water network in the area once this is done. The AF would finance the expansion of sewer network and household connections to serve these 131 families. Juan Pablo II would also benefit from the construction of Los Merinos WWTP and the decommissioning of the stabilization ponds, as the technology proposed for Los Merinos will significantly reduce odor emission as compared to existing treatment facilities.

**18. The AF will finance under Component 3 the required infrastructure to collect, convey and treat 100 percent of the wastewaters generated in the northern basin of the city as to meet applicable environmental standards.** Specific activities that would be financed with AF resources under this component are: (i) the transformation of the Progreso preliminary treatment plant into a pumping station collecting all wastewaters generated in north-center districts of the city (1,920 l/s) and pumping them to the new Los Merinos WWTP; (ii) the construction, using trenchless technologies, of the Progreso – Los Merinos wastewater transmission pipeline (1,100 mm of diameter, 5 Km. long); (iii) the decommissioning of the Sauces-Alborada and Guayacanes-Samanes stabilization ponds, which are currently overloaded; and the construction of the new Los Merinos WWTP, which will be designed to manage an average flow in dry and wet seasons of 4.0 m<sup>3</sup>/s and 4.9 m<sup>3</sup>/s, respectively; (iv) the construction of a sludge digester equipped with a co-generation facility to produce electrical energy; and (v) the procurement of specialized independent supervision services for the construction works described above.

**19. The AF will also allocate additional resources under Component 4 to fund incremental project management costs,** associated with the broader scale of Project activities and extended timeframe allotted for their completion. These include project supervision, M&E, safeguards management, procurement and financial management costs.

**20. The AF will not finance any additional investments under Component 2 of the project,** which is focused on the rehabilitation of existing sewerage networks in southern districts of the city.

## E. Implementation

### Institutional and Implementation Arrangements

**21. Implementation arrangements will remain unchanged, but the safeguards management team within the Project Implementation Unit (PIU) will be reinforced as to ensure the required capacity to manage scaled-up investments.** The PIU established under EMAPAG EP's General Manager will continue being responsible for day-to-day Project implementation and overall coordination, procurement, FM, as well as for management and supervision of the results framework, monitoring, and Project IE. The PIU functions with its own general coordinator and is staffed with technical and fiduciary specialists as well as dedicated environmental and social safeguards staff, with support from EMAPAG EP (particularly from the Finance, Legal, and Social Directorates). On the safeguards management front, the PIU will be strengthened as to create a safeguard management structure integrated by (i) a Senior Environmental Specialist with experience managing health and safety issues of major infrastructure construction projects, who will coordinate all the aspects related to compliance with Safeguards Policies; (ii) an environmental specialist that will assist the safeguards coordinator in the preparation of performance reports and ensuring compliance with applicable environmental regulations; (iii) a senior health and safety management specialist with experience in the supervision of major civil works; and (iv) a social management specialist who will coordinate compliance with Social Safeguard regulations.

**22. As per the concession contract signed between EMAPAG EP and Interagua, the latter will be responsible for the operation and maintenance of all facilities and infrastructure that will be financed by the AF.** Interagua has a dedicated environmental management unit under the Regulatory compliance and Quality Control Directorate, and a social management unit under the Commercial Management Directorate. Interagua's majority shareholder is Veolia, a French





multinational specialized in the provision of environmental services with wide experience managing water supply and wastewater treatment facilities. Interagua management system is ISO 14001, ISO 18001, and ISO 9001 certified.

#### **F. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)**

The City of Guayaquil is surrounded by the Daule and Guayas Rivers on the East and by the Estero Salado Estuary on the West. The Guayas River and its tributaries form the largest watershed in South America draining into the Pacific Ocean, with an extension of 32,130 km<sup>2</sup> partially covering eight provinces of the country. The Guayas River rises at the intersection of the Daule and the Babahoyo, located 5km north of the city, and has a flow that varies from 230 m<sup>3</sup>/s in the dry season (60 percent coming from Babahoyo) to 1500 m<sup>3</sup>/s during the rainy season (66 percent from Babahoyo). Due to its proximity to the ocean, at the vicinity of Guayaquil, the Guayas presents the characteristics of an estuary: its water is saline (with a salinity range of 5,000 -10,000 mg/l) and its actual flow, influenced by the tides ebb and flow patterns, varies from -15,000 to +15,000 m<sup>3</sup>/s during the cycle. The Guayas River is affected by several wastewater discharges and other pollution sources (e.g., storm water runoff) upstream of the Project location with none or very limited treatment. The wastewater collection and transportation network of Guayaquil serves 1,705,000 people (representing around 80% of the population of the city) through a sewer network composed of 3,926 km of sewer mains and 61 pump stations that drains primarily into the Daule and Guayas Rivers. The sewer network of the city comprises four urban wastewater macro-basins, being the main ones in terms of population size (i) the southern-center basin, with approximately 1.5 million inhabitants, and where 100 percent of the wastewater generated will be achieved by 2020 thanks to the parent project, along with universal access to wastewater collection services (discharging to the Guayas river); (ii) the northern basin, with around 1 million inhabitants, and where AF financed activities will be concentrated (discharging to the Daule River).

#### **G. Environmental and Social Safeguards Specialists on the Team**

Carlos Vargas Bejarano, Environmental Safeguards Specialist  
Carlos Tomas Perez-Brito, Social Safeguards Specialist





**SAFEGUARD POLICIES THAT MIGHT APPLY**

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	<p>Proposed AF activities would complement investments contemplated under Interagua’s fourth 5-year investment plan as to ensure that, by 2023, 100 percent of the wastewaters generated by the one million inhabitants of the northern macro-wastewater basin are collected and appropriately treated. Similarly to the Parent Project, which activities are concentrated in the southern basin of the city, the AF would finance the costs associated with: (i) the extension of the sewer network to reach unserved neighborhoods of the northern basin of the City (Pascuales and Juan Pablo II); (ii) the installation of additional sewerage household connections as to reach a 100 percent sewerage service access ratio in areas of the northern basin covered by the sewer network ; (iii) the transformation of the Progreso preliminary treatment plant into a pumping station collecting all wastewaters generated in north-center districts of the city (1,920 l/s) and pumping them to the new Los Merinos WWTP; (iv) the construction, using trenchless technologies, of the Progreso – Los Merinos wastewater transmission pipeline; (v) the decommissioning of the Sauces-Alborada and Guayacanes-Samanes stabilization ponds, which are currently overloaded; and the construction of the new Los Merinos WWTP, which will be designed to manage an average flow in dry and wet seasons of 4.0 m3/s and 4.9 m3/s, respectively; and (vi) the construction of a sludge digester equipped with a co-generation facility to produce electrical energy.</p> <p>As the Parent Loan, the AF has been classified as category A due to the nature and size of the works to be financed under component 3, i.e. of Los Merinos WWTP and ancillary facilities.</p> <p>An Environmental and Social Impact Assessment (ESIA) has been developed for Los Merinos WWTP and ancillary facilities. The ESIA includes an assessment of impacts, including mathematical</p>



modeling of potential odor and downstream water quality impacts during plant operation, and an ESMP. Alternative analyses in terms of WWTP technological and design options and site locations were conducted as part of the regional water planning work, the WWTP feasibility study and Project design, and the ESIA. The analysis of alternatives and selection of site locations for the treatment plant was conducted in 2004 as part of the Master Plan for Water Supply and Sewerage Services of Guayaquil, which was updated in 2011. The potential risk of flooding at the WWTP has been addressed in the Project design. For works under Components 1 (sewer network extension and household), an ESMP was developed and includes an assessment of potential impacts and proposed mitigation and monitoring measures.

Two sets of ESIA consultations activities have been undertaken, as required by OP 4.01 for category A projects. At a first stage, in December 2017, a workshop was organized to present and get feedback from key project stakeholders on the draft terms of reference prepared for the development of the EISA (participants in this workshop included local leaders from neighborhoods located within the area of influence of the project; representatives from local and national environmental authorities, the academia and a local chamber of commerce). The corresponding consultation report and adjusted terms of reference were published in EMAPAG website. At a second stage, in February 2018, a draft complete version of the ESIA was disclosed and discussed with key stakeholders in a number of workshops, meetings and interviews (participants in this second round of consultations included neighbours and local leaders from communities located within the area of influence of the project; local and national environmental authorities; Guayaquil Transit authority; representatives from industry associations; Guayaquil Airport Authority and the academia, among others).

The extension of the sewer network in the Pascales area has yet to be designed. The Project would finance both the designs and construction of these



works. Construction activities include the opening of shallow trenches in sidewalks to install household's sewer lines, and deeper trenches in certain main streets. To avoid and mitigate limiting access to households and businesses, metal sheets over trenches would be used to ensure full access during construction. An Environmental and Social Management Framework (ESMF) includes these and other mitigation measures. Furthermore, a Community Relations Plan for Construction will be included as a requirement for contractors in the bidding documents. Since final designs are yet to be finalized, the ESMF contemplates possible mitigation measures such as: (i) continuous consultation and information with surrounding household and business on construction activities; (ii) alternative access roads to the area if needed; (iii) additional safety and traffic signaling at constructions sites; and/or (iv) additional parking areas with security only if needed.

Construction of the Progreso - Los Merinos wastewater transmission pipeline. This pipeline will be constructed using trenchless technologies along a 50m wide highway easement and there is certain flexibility on where the tunneling chambers should be installed. For this reason, street closings in the area are not expected. Nonetheless, since the works will be bided under a design and build approach, there is still uncertainty on the location of the tunneling chambers. However, the location of these chambers will be factored in the evaluation of the technical proposals of the bids received as to avoid and minimize any potential impact on households and businesses in the area. The ESIA includes the corresponding Community Relations Plan (Plan de Relacionamiento Comunitario, section XIV.4.6) and traffic management plan (Plan de Seguridad Vial, section XIV.4.4.11). The ESMP also includes a Plan for the management of unforeseen impacts (XIV.4.6.44) which calls for the contractor to develop an inventory of the properties along the concerned highway before the beginning construction activities. The concerned ESMP contemplates other social impact mitigation measures such as: (i) continuous consultation and information with surrounding



household and business on construction activities;  
(ii) alternative access roads to the area if needed;  
(iii) additional safety and traffic signaling at constructions sites; and/or (iv) additional parking areas with security only if needed

No potential significant impacts on natural habitats were identified for AF financed activities. Nonetheless, OP/BP 4.04 continues being triggered on a precautionary basis due to the proximity to the Estero Salado Estuary of the works performed under components 1 and 2 of the Parent Project and the proximity of Los Merinos WWTP to Los Samanes Urban Park, a 842 ha. protected area managed by the Department of Parks of the Municipality of Guayaquil. Applicable measures have been included in the ESMPs for each component as needed under OP/BP 4.01.

The area where Los Merinos WWTP will be built, which currently houses the Sauces-Alborada and Guayacanes-Samanes wastewater stabilization ponds, is crossed by a canal (Canal 16) through which stormwaters coming from nearby neighborhoods drain into the Daule River. Canal 16 has a mixed vegetation formation with native and introduced species that have created a suitable habitat for small mammals and birds. The presence of these birds responds to the regional ecological dynamics (temporal and spatial), between the Los Samanes National Recreation Area, located in the vicinity of the project area, the riverbanks along the Daule and Guayas Rivers, and other neighboring areas that are natural habitat to these species.

The Ministry of Environment has already granted EMAPAG the permits required to intervene the canal, which will be partially channeled through a box culvert. This alternative was selected over the option of diverting the existing channel towards the northern perimeter of the plot, since it allows to keep a quarter of the course of the canal (100 m.) in its original condition.

As per the ESIA, trees that will be affected by the covering of the Canal and are mature enough, will be transplanted to the bank of the Daule river. Likewise,

Natural Habitats OP/BP 4.04

Yes



a program to rescue, protect and relocate the affected fauna will be implemented under the supervision of a biologist and a forest engineer. Compensatory tree planting will take place to compensate for those trees that cannot be transplanted. Moreover, an area of 1.5 ha. contiguous to the WWTP will be reserved for the construction of a nature interpretation center.

The construction of the subaquatic outflow may cause changes in the Daule river dynamics. This may entail temporary suspension of sediments and a slight increase of turbidity (it should be noted that natural suspended solids' levels in the Daule river are high due to the tidal influence: between 1,170 and 2230 mg/l). The total length of the outflow will be 100 m., while the overall width on the Daule River is 650m. The ESIA contemplates the measures to monitor water quality in the Daule river during construction, as well as to ensure safety of the subaquatic outflow installation process.

Activities under the AF will totally take place in urban areas. That means no forested area is expected to be impacted.

The Project does not involve the purchase or use of significant quantities of pesticides. However, The proposed activities will trigger OP 4.09 on pest management. This is due to the presence of vectors (rats), and the need to use pesticides to control them, in the area of the wastewater stabilization ponds that will be decommissioned for the construction of Los Merinos WWTP. Following the requirements of OP 4.09, a pest management plan has been developed as part of the ESMP. It is expected that the presence of rats in the area will decrease once the ponds are decommissioned.

While no potential significant impacts on physical cultural resources were identified for Components One, Two or Three, this is policy is triggered and an archeological monitoring program and chance find procedure are included in the ESMPs as a preventive measure.

There are no indigenous peoples present that meet the criteria defined by OP 4.10 in the Project area. According to the 2010 census, less than 1.4% of the

Forests OP/BP 4.36

No

Pest Management OP 4.09

Yes

Physical Cultural Resources OP/BP 4.11

Yes

Indigenous Peoples OP/BP 4.10

No



		<p>population of Guayaquil identify themselves as indigenous. This population is not concentrated in the Project area, nor does it have a collective attachment to land in that area, which is used for modern urban residential or industrial purposes.</p>
Involuntary Resettlement OP/BP 4.12	Yes	<p>The Los Merinos WWTP, financed under Component 3 of the AF, would be located on a piece of land owned by a Government banking institution over which the Borrower has the right of usufruct. However, OP 4.12 on Involuntary Resettlement is triggered because of an affectation to a privately-owned house located within said property where the WWTP access road will have to be constructed. For this reason, an Abbreviated Resettlement Action Plan (RAP) has been developed for the AF. As per the new RAP, the affected household will be compensated following OP 4.12 guidelines.</p> <p>Activities included under Component 1 of the AF (domestic connections and sewer lines) will not result in any impacts covered under OP 4.12. The adhesion to the sewerage connectivity program is voluntary for the beneficiaries.</p>
Safety of Dams OP/BP 4.37	No	<p>The Project will neither support the construction or rehabilitation of dams nor will it support other investments which rely on services of existing dams.</p>
Projects on International Waterways OP/BP 7.50	No	<p>The Project will not finance activities involving the use or potential pollution of international waterways.</p>
Projects in Disputed Areas OP/BP 7.60	No	<p>The Project will not finance activities in disputed areas as defined in the policy.</p>

**KEY SAFEGUARD POLICY ISSUES AND THEIR MANAGEMENT**

**A. Summary of Key Safeguard Issues**

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:

AF financed works under component 1, particularly the extension of the sewerage network in the Pascuales district, have relatively moderate potential negative environmental impacts and can be readily mitigated with standard measures. The overall Project impact is expected to be positive due to the improved effluent quality that will be discharged into the Daule River and the reduction of wastewater that is presently getting infiltrated from poorly constructed septic tanks existing in households of the northern wastewater basin of the city that are not yet connected to the sewer network. The effluent quality from the Los Merinos WWTP to be financed under the AF will



allow compliance with current environmental regulations in Ecuador. EMAPAG EP has planned for the future expansion of the WWTP if it is required by the Ecuadoran environmental regulations later during the life of the Project.

The main expected positive impacts of the AF are: (i) Improvement in the public health conditions in the city of Guayaquil thanks to the expected reduction of the contamination of the Daule river; (ii) recovery of the ecosystems of the Daule and Guayas River through the improvement of the landscape and the preservation of its flora and fauna (iii) Improvement in the quality of life of the communities neighboring the current treatment system (Sauces-Alborada and Guayacanes-Samanes estabilization ponds), due to the elimination of offensive odors that have been present for several years; (iv) reduction of ground water contamination; and (v) a significant reduction of Greenhouse Gas emissions , which are expected to decrease by 53 percent when compering those that will be generated in Los Merinos WWTP with the ones currently generated in Guayacanes-Samanes and Sauces-Alborada treatment facilities, which will be decomisioned as part of the AF. The expected reduction is due to the switch from predominantly anaerobic to aerobic wastewater treatment conditions, and the use pf of the methane generated as a byproduct of the sludge treatment process to produce renewable electric power.

There are no anticipated negative large scale, significant or irreversible environmental impacts.

Main environmental risks relate to potential failure of the WWTP to properly operate (which would result in impacts similar to present conditions), failure to properly dispose of biosolids from the WWTP, and failure to adequately mitigate environmental and social impacts on local population during construction of sewer networks in the Pascuales district.

With regards to the management of the sludge generated by the WWTP Los Merinos, depending on working conditions and on actual contaminants concentrations of the raw wastewater, the treatment process may generate up to 120 tons per day of primary sludge that would be digested and disposed in the existing municipal landfill, which is currently handling 4,500 tons of waste per day. An agreement has already been reached between EMAPAG and the consortium running the landfill Las Iguanas, which has all the required environmental permits to receive this type of waste. The landfill has the capacity to receive municipal waste, including the expected volume of sludge during the operation of the WWTPs of the city (Las Esclusas y Los Merinos).

The main significant impacts in the construction phase are, urban congestion and traffic, noise during foundations and piloting, the excavation of wells for the construction of the line of impulsion and increase of vehicular traffic. The construction of the subaquatic outflow may cause changes in the Daule river dynamics, which may entail temporary suspension of sediments and an slight increase of turbidity . The total length of the outflow will be 100 m., while the overall width on the Daule River is 650m. The required environmental and social management plans have been developed, identifying measures to mitigate these potential impacts.

In the area of the project there are strong precipitations during the winter, which added to the increase of the tide of the Daule River, bordering the place; could cause flash floods inside the facilities. The tidal conditions in Guayaquil change every 12 hours, with differences of approximately 3 m between the high and low levels. In the designs, the necessary works have been planned to protect the installations from the risk of flooding.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area: Main anticipated indirect impacts relate to vehicular congestion and noise generation. There are no anticipated negative long term environmental impacts.





3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

The construction of the Los Merinos WWTP is part of the Municipality of Guayaquil's Program for the Universalization of Sewerage and Wastewater Treatment Services in the city. The analysis of alternatives and selection of site locations for the treatment plant was conducted in 2004 as part of the Master Plan for Water Supply and Sewerage Services of Guayaquil, which was updated in 2011. The Master Plan considers the expansion of the sewer network and the installation of household connections to reach an effective access rate close to 100 percent; the rehabilitation of the oldest and most degraded segments of the existing networks to reduce infiltration; and the rehabilitation and construction of five wastewater treatment facilities, including Los Merinos, to treat all the wastewater generated in the city.

As part of the feasibility study for the treatment of wastewater in the city of Guayaquil which concluded in 2014, an analysis of alternative technologies was undertaken for the treatment of the wastewater flows collected in the four wastewater catchment basins that compose the main sewer system of the city: the Guasmo H, Las Praderas, Los Merinos and Progreso subsystems. The selection of the treatment technology to be employed in the different subsystems was undertaken using multi-criteria decision making methods. Each of the prescreened technologies was modelled and a simulation was run to evaluate its performance and undertake a pre-dimensioning of the different phases and elements of the treatment process using different criteria (including environmental). The CEPT (Chemically assisted primary treatment) option was retained since it allows to consistently meet the authorized regulatory limits set for the Total Suspended Solids (TSS), Biochemical Oxygen Demand (BOD), bacterial contamination (fecal coliforms) and all other pollutant concentrations, and eases the implementation of effective odor control. The feasibility study for Los Merinos WWTP was updated in 2017 to consider recent data on raw wastewater quality and volumes.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

For Component 3 of the AF (Los Merinos WWTPs and ancillary facilities), an Environmental and Social Impact Assessment (ESIA) has been developed by a local consulting firm. The ESIA includes an assessment of impacts, including mathematical modeling of potential odor and downstream impacts during plant operation. For Component One, an ESMP and an ESMF was developed for sewerage connections and sewerage network expansion activities respectively. These include an assessment of potential impacts and proposed mitigation and monitoring measures.

The Project Implementation Unit (PIU) established under EMAPAG's General Manager to manage the Parent Project, will also be responsible for day-to-day implementation of AF activities, including safeguards aspects. The PIU has been staffed with dedicated qualified environmental, health and safety and social management specialist who will be responsible for the supervision of safeguard requirements.

The operation and maintenance of the Project, once constructed, will be the responsibility of INTERAGUA, which is the private consortium to which EMAPAG EP has delegated the management of Guayaquil's drinking water, wastewater and drainage systems. Interagua has a dedicated environmental management unit under the Regulatory compliance and Quality Control Directorate, and a social management unit under the Commercial Management Directorate. Interagua's majority shareholder is Veolia, a French multinational specialized in the provision of environmental services with wide experience managing water supply and wastewater treatment facilities. Interagua management system is ISO 14001, ISO 18001, and ISO 9001 certified. Interagua has been managing all environmental and social related aspects of water supply and sanitation service provision in a satisfactory manner for the last 17 years.

Through the implementation of the Parent Project, EMAPAG EP has gained significant experience managing



safeguards related issues under World Bank financed projects. On the other hand INTERAGUA has environmental staff, experience managing wastewater treatment facilities and its management system is ISO 14001, ISO 18001 and ISO 9001 certified. Specific details on environmental and social safeguards responsibilities and supervision has been established in the Project's Operational Manual.

An abbreviated Resettlement Action Plan (ARAP) has been developed to contemplate the measures to be adopted to compensate the family owning of the house that will be partially affected by the construction of Los Merinos WWTP access road. The affected house and the future WWTP are located on a piece of land owned by a governmental financial institution over which the Borrower has the right of usufruct.

All the above safeguard documents provide detailed mitigation measures to ensure sustainability and compliance with Ecuador regulations and legislations, as well as with the Bank's environmental and social safeguard policies.

All bidding documents for civil works will have embedded environmental and social clauses, in order to enable contractors to follow up on environmental and social due diligence and to mitigate the anticipated negative risks and impacts. Bidding documents employed for the procurement of works will require its employees and subcontractors to abide by contractor's code of conduct, which shall include specific provisions on community relations, sexual harassment and labor influx, among others. A Supervising Consultant Firm will be hired by the project to oversee the construction works (including implementation of environmental and social measures by the constructor) on behalf of the PIU.

To date, EMAPAG and the Contractors hired for the implementation of the parent project, have been applying satisfactorily the environmental and social management instruments agreed with the WB. These included the required community relations plan covering aspects related with the contractor's code of conduct, such as measures to manage labor influx and prevent sexual harassment. There have been no environmental nor social incidents or work accidents since the Parent Project was approved; nor are sanctions and / or observations registered by the environmental authorities of Ecuador. During the supervision missions, direct inspections were carried out on the different works financed by the Parent Project (Las Esclusas WWTP, rehabilitation of La Chala wastewater network, and the sewer household connectivity program), where the application of the mitigation measures contemplated in the corresponding environmental and social management plans was observed. Recommendations have been offered for continuous improvement. During the first quarter of 2018, in compliance with the conditions established in the environmental license granted by the Ministry of Environment for the construction of Las Esclusas WWTP, the first environmental and social compliance audit will be carried out. This audit may also identify opportunities for improvement.

The Borrower procured the land required for the construction of Las Esclusas WWTP under the Parent Project before the involvement of the Bank in the project, following national regulations on land acquisition for public investment projects. The client prepared a Remedial Resettlement Action Plan (RAP) explaining the extent to which the expropriation process followed conformed to World Bank Policy on Involuntary Resettlement, and the additional measures required to address gaps identified. The RAP demonstrated that the borrower offered replacement cost to five of the six affected landlords as compensation for the land to be acquired by using market comparators as a basis for valuation. The owner and the resident of the affected property that did not benefit from an appropriate compensation in the first place were the subject of remedial measures documented in the RAP. As anticipated at the appraisal stage, no resettlement impacts nor economic displacement have occurred, nor are expected for component 1 and component 2 activities financed under the Parent Project.



5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

The key stakeholders are: (i) the communities benefiting from the sewer connectivity program that will be financed through component 1 activities of the AF, located in the Flor de Bastion, Cooperativas Varias, Bastion Popular and Vergeles districts (these are areas of the city with high poverty rates); (ii) the inhabitants of the Pascuales district, where the AF would finance the extension of the sewer network; and (iii) the community that neighbors the plot where Los Merinos WWTP will be constructed.

Juan Pablo II is an informal settlement housing 131 households located between the "Terminal Terrestre – Pascuales" highway and the plot where currently the Sauces-Alborada and the Guayacanes-Samanes wastewater stabilization ponds are located, which will be partially decommissioned to build in their place the Los Merinos WWTP (see section B for more details on this). The land where this informal settlement and treatment facilities sit belongs to the Ecuadorian Housing Bank, a State-owned financial institution which has granted the right of usufruct of land to the Government of Guayaquil. As per local regulations, no municipal infrastructure investments are made in informal settlements. As such, Juan Pablo II streets are not paved, there is no sewer network and the population gets water at the household level through hoses connected to three public fountains. The municipal government is working on granting Juan Pablo II inhabitants property rights over the land where their houses are located, and Interagua will install the drinking water network in the area once this is done. The AF would finance the expansion of sewer network and household connections to serve these 131 families. Juan Pablo II would also benefit from the construction of Los Merinos WWTP and the decommissioning of the stabilization ponds, as the technology proposed for Los Merinos will significantly reduce odor emission as compared to existing treatment facilities.

As explained above, the Borrower has prepared the required ESIA and associated ESMPs. A first draft of these documents were disclosed in February 2018. Draft safeguard documents were consulted with project beneficiaries and stakeholders as to enhance the quality of these instruments. This included a first consultation to enhance the terms of reference for the preparation of the required ESIA, which consisted in a workshop which took place in December 2017. The socialization of the draft a fist complete draft of the ESIA, ESMPs and ESMF took place during the month of March 2018, through a number of workshops, interviews and informal meetings with benefiting and affected communities and project stakeholders. The final versions of the project safeguards instruments were disclosed in April 2018.

**B. Disclosure Requirements (N.B. The sections below appear only if corresponding safeguard policy is triggered)**

Environmental Assessment/Audit/Management Plan/Other		
Date of receipt by the Bank	Date of submission for disclosure	For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors
21-Nov-2014	16-Dec-2014	11-Mar-2015
<b>"In country" Disclosure</b>		
Ecuador		
16-Dec-2014		
Comments		



**Resettlement Action Plan/Framework/Policy Process**

Date of receipt by the Bank

06-Feb-2015

Date of submission for disclosure

20-Feb-2015

**"In country" Disclosure**

Ecuador

20-Feb-2015

Comments

**Pest Management Plan**

Was the document disclosed prior to appraisal?

Yes

Date of receipt by the Bank

02-Feb-2018

Date of submission for disclosure

14-Feb-2018

**"In country" Disclosure**

**If the project triggers the Pest Management and/or Physical Cultural Resources policies, the respective issues are to be addressed and disclosed as part of the Environmental Assessment/Audit/or EMP.**

If in-country disclosure of any of the above documents is not expected, please explain why:

**C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting) (N.B. The sections below appear only if corresponding safeguard policy is triggered)**

**OP/BP/GP 4.01 - Environment Assessment**

Does the project require a stand-alone EA (including EMP) report?

Yes

If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?

Yes

Are the cost and the accountabilities for the EMP incorporated in the credit/loan?



Yes

**OP/BP 4.04 - Natural Habitats**

Would the project result in any significant conversion or degradation of critical natural habitats?

No

If the project would result in significant conversion or degradation of other (non-critical) natural habitats, does the project include mitigation measures acceptable to the Bank?

NA

**OP 4.09 - Pest Management**

Does the EA adequately address the pest management issues?

Yes

Is a separate PMP required?

Yes

If yes, has the PMP been reviewed and approved by a safeguards specialist or PM? Are PMP requirements included in project design? If yes, does the project team include a Pest Management Specialist?

Yes

**OP/BP 4.11 - Physical Cultural Resources**

Does the EA include adequate measures related to cultural property?

Yes

Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?

Yes

**OP/BP 4.12 - Involuntary Resettlement**

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?

Yes

If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?

Yes

Is physical displacement/relocation expected?

Yes

Provide estimated number of people to be affected    1

Is economic displacement expected? (loss of assets or access to assets that leads to loss of income sources or other means of livelihoods)

No

**The World Bank Policy on Disclosure of Information**

Have relevant safeguard policies documents been sent to the World Bank for disclosure?



Yes

Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?

Yes

### All Safeguard Policies

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?

Yes

Have costs related to safeguard policy measures been included in the project cost?

Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?

Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?

Yes

## CONTACT POINT

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