ENVIRONMENTAL AND SOCIAL IMPACT BRIEF[1]
ECUADOR

Project:	Guayaquil Water and Sanitation Project
Project Number:	EC 0208
Location:	Guayaquil
Borrower:	International Water Services (Guayaquil) Interagua Cia. Ltda.
Total Project Cost:	US$ 148 million
Loan:	US$ 50 million
Department:	Private Sector Department
Project Team:	Jean-Marc Aboussouan Raúl Sánchez Esteban Sarzosa Elizabeth Brito José Felix-Filho Pablo Cardinale George Rogers
Date:	April 18, 2003

I. INTRODUCTION

1.1 Until the mid-90s, there was no consistent financial policy for Ecuador's water sector. Low coverage of water supply and relatively poor quality in treatment systems prevailed across the country, with only 48 percent of the country's population having access to an adequate water supply and only 35 percent benefiting from appropriate sanitation facilities. As a consequence, Ecuador has become one of the countries in Latin America with the highest incidence of diseases linked to the lack of clean drinking water and pollution control of water sources, as indicated by the Pan-American Health Organization (PAHO).

1.2 The Government of Ecuador (GOE) has assigned a high priority to the expansion and rehabilitation of water and sewerage systems and services. In October 1997, Ecuador signed a loan agreement (1026/OC-EC – total cost US$ 50 million, loan US$ 40 million) with the Inter-American Development Bank (IDB) in order to finance a program to increase the city of Guayaquil drinking water and sewerage service through a long-term concession to the private sector. The program consisted basically of three components: (a) a concession component; (b) reconfiguration of the state-owned Guayaquil Water and Sewerage Authority (*Empresa Cantonal de Agua Potable y Alcantarillado de la Ciudad de Guayaquil* - ECAPAG); and (c) rehabilitation for water supply and sewerage systems, involving urgent works needed to prevent deterioration of infrastructure, keep systems in operation, and decrease their vulnerability. Under the first component, services would be transferred to the private sector. Technical, legal and financial studies would be conducted to prepare the respective bid specifications. In addition, that component would provide ECAPAG with assistance in selecting an operator, awarding and negotiating the concession, and carrying out other related activities.

1.3 The present project is a result of the upstream work successfully undertaken by the Bank during several years (EC-0002) to prepare the transfer of the concession to the private sector, undertake some emergency rehabilitation work of existing systems, and convert ECAPAG to eventually perform regulatory functions associated with the concession process.

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1.4 The water and sewerage services in Guayaquil are characterized by relatively low coverage rates (approximately 63 percent of urban population is connected to a drinking water distribution network, and only 45 percent to a sewerage collection network). The current drinking water network is highly inefficient, subject to numerous illegal connections, and suffers from inadequate metering and maintenance, insufficient pressure in several areas, high leakage and significant infiltration problems contaminating the water supply. Also, as is the case in many municipal utility operations throughout Latin America, Guayaquil has suffered from the lack of adequate administrative billing and collection procedures. Before the Concession, only 80 percent of the metered connections were billed and about 50 percent of these billed connections paid their bills on a regular basis.

1.5 On December 22, 2000, pursuant to an international bidding process, ECAPAG awarded to International Water Services (Guayaquil) Interagua Cia. Ltda. a 30-year water and sanitation concession in the district of Guayaquil. The project company ("Interagua" or the "Company") was specifically created by International Water Services to operate, expand, rehabilitate and maintain the drinking and sewerage networks and to provide services in the Concession Area. The Concession area corresponds to the district of Guayaquil. The concession contract was signed on April 11, 2001. Formal takeover of the services by Interagua took place on August 9, 2001. Upon transfer of the concession assets, ECAPAG was transformed from waterworks operator into sector regulator to ensure that the concession contract is fulfilled.

1.6 Interagua is currently owned 90 percent by International Water Services (Guayaquil) B.V. of Netherlands and 10 percent by Capital Business LLC. International Water Services (Guayaquil) B.V. is 59 percent owned by International Water Services Holdings B.V. and 41 percent owned by United Utilities. International Water Holdings B.V. (IW) is a 50 percent joint company between Bechtel Enterprises, Inc. and Edison S.p.A of Italy. IW is an integrated provider of water services, including collection, distribution and disposal. Together with its affiliate companies, IW arranged more than US$18 billion in project finance in the last decade. IW operates and maintains water utility assets in Ecuador, the Philippines, Australia, Bulgaria, Estonia, Poland and the U.K.

1.7 The concession term is divided into six five-year periods. The first five-year investment program will consist of US$148 million (the "Project"), and the Company has requested IDB's financial support to finance a portion of the Project. The contemplated financing will be made through an IDB A-loan of approximately US$50 million.

II PROJECT DESCRIPTION

A. Site Location

2.1 Guayaquil is located on the banks of the Guayas River, near the head of the Gulf of Guayaquil, in Ecuador's low-lying Pacific littoral, in the Ecuadorian province of Guayas **(see Figure 1 in Annex)**. The Concession Area corresponds to the district of Guayaquil (approximately 600,000 ha), which includes the urban area of the city of Guayaquil (approximately 33,800 ha) and the rural villages of Juan Gómez Rendón (Progreso), El Morro, Posorja, Puná and Tenguel.

2.2 However, during the first five-year term of the concession, the Concessionaire will have the responsibility of supplying, managing and rendering drinking water, sanitary sewerage and storm water drainage services to the city of Guayaquil, to the urban areas of Cerecita and Progreso, and to areas along the route of the Guayaquil-Santa Elena Aqueduct, up to the limit of the Guayaquil district.

2.3 In addition, during the first quinquennium, the Concessionaire must guarantee the supply of treated bulk water up to the limits of the district of Guayaquil, for subsequent distribution by the municipalities to areas in other districts.

B. Project Components and Facilities

2.4 The Project comprises both an Investment Plan of capital investments in expansion and rehabilitation of drinking water, sanitary sewerage and storm water drainage systems, and the operation of existing facilities and services. The Investment Plan to be financed by the IDB comprises basically three main components: (i) Expansion and Rehabilitation Programs; (ii) institutional component; (iii) environmental and social component.

2.5 **The Expansion Program** takes into account the projections of population, service demand and improvements in efficiency. It establishes the expansion works of the systems in order to reach, in the next 30 years, a 95 percent goal of drinking water coverage for about three million inhabitants, and a service compatible with the needs required by the population and satisfying the service quality standards established under the Concession Agreement (e.g.: in terms of water quality, pressure, etc.). The aim of this program is to ensure equitable access to affordable water supply and sanitation to communities that currently lack such services. The expansion targets the following areas:

- Drinking water: Isla Trinitaria, Los Vergeles, Mapasinge Este, Limonal, Imaconsa, Suburbio Oeste, Cisne II, San Nicolas, Cooperativa Maria Cordovez and Cooperativas Puertas al Sol **(see Figure 2 in Annex)**.
- Sanitation service: Isla Trinitaria and El Guasmo **(see Figure 3 in Annex)**.

2.6 In the first five years of the Concession agreement, a total of 55,238 drinking water connections and the same number of sanitation service connections will be installed. **Table 2.1 (in Annex)** presents the number of connections to be installed in each year.

2.7 In addition, the Concessionaire has to install fire hydrants every 120 to 250 m from new pipe systems or pipes that may be replaced or rehabilitated in the future. In commercial zones, the spacing between fire hydrants will have to be 120 m.

2.8 The Rehabilitation Program will address system inefficiencies and it is aimed at optimizing the use of the current infrastructure, in relation to the water supply, wastewater and storm water drainage systems.

2.9 The **institutional component** will finance the costs associated with project management, design and supervision of the water supply systems works, such as: financing of consultants; assistance in completion of detailed engineering designs, as required; preparation of procurement documents; assistance in supervision of all works; carrying out the financial management activities of the project.

2.10 The **environmental and social component** comprise the implementation of mitigation measures related to the environmental and social impacts of the project, such as:

- implementation of environmental supervision during construction;
- implementation of a monitoring program before and after construction;
- educational activities in the community to promote efficient and rational water use;
- educational campaign in relation to the protection of the storm water drainage system, to be implemented during the winter;
- communication and public participation programs.

C. Existing Operations and Facilities

2.11 The Project services and facilities comprise those in relation to the drinking water system, the sanitary sewerage system, and the storm water drainage system. The location of most relevant existing facilities is shown in **Figure 4 (in Annex)**.

(a) Drinking Water System

2.12 The drinking water services under the Concession Agreement include: (i) exploitation of all water sources currently used by ECAPAG, as well as any future alternative source; (ii) exclusive rights for production and distribution of drinking water in the area of the Concession; (iii) authority to allow new wells or seal those already in existence if these do not comply with basic sanitary conditions; (iv) maintenance, rehabilitation of existing stations and specific components of the water production and treatment facilities; (v) selling of bulk water to third parties; and (vi) expansion of the water production system.

2.13 The main production system is the one supplied by the Daule River. At the *La Toma* site located approximately 26 km north of the city of Guayaquil raw water is collected from the Daule River, by four pumping plants, each with its own pumping station. The average daily volume of pumped water is over 1,000,000 m^3.

2.14 Water treatment is carried out also at *La Toma* site, which is actually composed of three individual water treatment plants, designated as *Convencional*, *Lurgi* and *Planta Nueva*, with a combined nominal capacity of approximately 17,400 l/s (or about 1,500,000 m^3/d). The current working capacity is approximately 1,380,000 m^3/d and production is in the range of 1,000,000 m^3/d. The principal products used in water treatment are: liquid aluminum sulfate (approx. 24 thousand t/year); solid aluminum sulfate (approx. 2,6 thousand t/year); lime (approx. 1,7 thousand t/year); chlorine (approx. 1,5 thousand t/year).

2.15 The *Convencional* plant's estimated current operating capacity is 360,000 m^3/d. The *Lurgi* treatment plant was built in 1970 and its current nominal capacity is estimated at 160,000 m^3/d. The *La Nueva* treatment plant is divided into two sectors), each of which has a nominal capacity of 432,000 m^3/d.

2.16 Four water mains (aqueducts) originating from the treatment plants and with diameters of 42” (approx. 1070 mm), 50” (approx. 1270 mm), 72” (approx. 1830 mm) and 2000 mm, respectively, supply the city of Guayaquil and surrounding areas served by Interagua, all operating by gravity.

2.17 The three main storage reservoirs (*Tres Cerritos*, *Santa Ana* and *Bellavista*) are aboveground concrete tanks located on natural elevations, allowing supply of the network by gravity to most of the areas of the city. Other storage locations with smaller capacity exist and are aimed to supply smaller urban areas and specific villages, and for operational purposes related to water production. The total supply capacity of *Tres Cerritos*, *Bellavista* (or West) and *Santa Ana* is 158,081 m^3/day, whereas the total storage capacity for the city is 174,252 m^3.

2.18 The distribution network is about 3000 km long and constituted by pipes of different diameters (50 mm to 1800 mm), materials and ages. The distribution system is composed of three main sectors covering the urban area of the city of Guayaquil as follows:

- The Western, and partially the Southern sectors (supplied by the *Tres Cerritos* storage tank);
- The Northern sector (supplied by the 42”/1,070 mm diameter water main, the 50”/1,270 mm and the 72”/1,830 mm, and partly also by the *Tres Cerritos* storage tank);

- The *Pascuales* sector (supplied directly by the water mains coming from *La Toma*: 42”/1,070 mm; 50”/1270 mm; 72”/1830 mm).

2.19 In the Northern Sector the distribution of water is continuous whereas in the Center and Southern sectors the service is provided from 5:00 am to 10:00 am and from 5:00 pm to 10:00 pm.

(b) Wastewater Treatment and Sanitary Sewerage System

2.20 The coverage area of the sanitary sewerage system, is approximately 6,430 ha, equivalent to 19 percent of the total urban area of Guayaquil The sanitary sewerage services under the Concession Agreement include: (i) collection, processing and final discharge of wastewaters; (ii) operation and maintenance of current and future pumping, conduction and primary treatment facilities, with accountability for the planning, financing and construction of future wastewater treatment plants, to be included in the quinquennial investment plan and funded through the tariffs; and (iii) collection of the tariffs, rights and other duties under the agreement’s terms.

2.21 Total flow managed by the sanitary sewerage is approximately 3354 l/s. The main network collectors are: *Suburbio Oeste-La Chala-Colector 66, Colector Guasmo-Floresta, Argentina-O'Connor-White-Salem 80, Ferroviaria-Eternit-Parsons, Alborada-Sauces, Samanes-Guayacanes, La Garzota, Las Orquídeas, Los Alamos, El Cóndor, Puerto Azul, La Florida*.

2.22 The wastewater system is comprised of 8 sub-systems, 21 pumping stations, 12 treatment facilities and 11 final discharges in the Guayas and Daule Rivers and in the Aguas Piedras Inlet connected to the Estero Salado. **Table 2.2 (in Annex)** presents a list with the treatment units, their location and their associated discharge point; they are basically composed of wastewater treatment plants and a series of stabilization ponds.

2.23 The population served by the sanitary sewerage system is approximately 800,075 inhabitants, or 45 percent of the city’s total population; whereas 63 percent of the population is supplied by the drinking water system

(c) Storm Water Drainage System

2.24 The storm water drainage services under the Concession Agreement include the collection, conduction and discharge of storm water, through operation and maintenance of the transferred infrastructure current and financing and construction of future pumping, conduction and final disposal facilities, to be compensated through a drainage tax (0.6 per 1000 of the Municipal Property tax). In the first quinquennium, concessionaire responsibility for storm water drainage service shall be limited to levels of system capacity and quality achievable at time of transfer from ECAPAG.

2.25 The storm water drainage system has a total of 11 holding basins that discharge in the Guayas and Daule Rivers and in the Estero Salado. There are 59 drainage channels in the city, for a total length of 75,676 m.

D. Project Workforce

2.26 The Concessionaire will hire the employees needed for the proper operations under the concession contract, as such Interagua re-hired some of the 1,300 employees of ECAPAG. Currently with a workforce of approximately 990, Interagua’s employee structure is the following: approximately 13 percent engineers and executives; 35 percent administrative and technical; 52 percent workers. Furthermore, Interagua states that it generated around 2000 indirect jobs in its first year of operation.

E. Project Schedule and Costs

2.27 The concession term is divided into six five-year periods. Under terms of the Concession Agreement ECAPAG estimates that the capital expenditure program will require investments of the order of US$520 million from the 6th to the 30th year of the concession. The first five-year investment program is estimated at US$148 million (breakdown shown below) and is the Project to be partially financed by the IDB.

Interagua: Breakdown of First Five-Year Capital Expenditure Estimate

Drinking Water and Sewerage Network Extension	52%
Water Rehabilitation	15%
Sewerage Rehabilitation	7%
Storm Water Drainage Rehabilitation	3%
General (Vehicles and others)	23%

2.28 During the first five-year period Interagua is to maintain and improve service quality of the existing networks and plants, execute the rehabilitation projects designed by ECAPAG, increase the water pressure in various areas and install the 55,238 drinking water and sewage connections bid in the offer; **Table 2.1 (in Annex)** presents the number of connections to be installed in each year. Further commitments include the Company's achievement of such parameters as quality of service (water pressure, continuity of service, quality of water source, and drinking water and discharged wastewater quality standards).

2.29 The Concessionaire has to prepare a Master Plan at the end of the third year to incorporate supply and services to be provided to the rural villages of the district of Guayaquil as well as the corresponding investment for the entire remaining concession period. The Master Plan should include all foreseen services (drinking water, sanitary sewerage and storm water drainage) for each 5-year period including service level, new connections and tariff levels to support the Company's investments.

F. Project Alternative Analysis

2.30 The project involves essentially the utilization and improvement of existing infrastructure and facilities and the proposed interventions for the first five-year period do not involve implementation of new facilities that would require analysis of alternatives. Nevertheless, if in future interventions that may involve facilities and services that require alternative analysis the Company will consider such analysis.

III. INSTITUTIONAL AND LEGAL FRAMEWORK

A. Institutional

Water and Sanitation Sector

3.1 The National Council for the Modernization of State (CONAM) is the entity in charge of managing, coordinating and supervising the procedures for the Modernization of the State including the international bidding process organized for this concession. Decree N° 2328 establishes the main aspects related to concessions for drinking water and sewerage services, in particular regarding tariff regulations, general obligations of the concessionaire and users.

3.2 ECAPAG (*Empresa Cantonal de Agua Potable y Alcantarillado de la Ciudad de Guayaquil*) is responsible for regulatory functions, by supervising implementation of the Concession Agreement, including a yearly assessment of the fulfillment of acquired commitments. ECAPAG, a state-owned company was created by the GOE in 1994. ECAPAG resulted from the merger of *La Empresa Provincial de Agua Potable de Guayaquil* (EPAG-G) and *La Empresa Municipal de Alcantarillado de Guayaquil* (EMAG).

3.3 The Ministry of Urban Development and Housing is empowered to supervise the construction of wastewater treatment plants, as well as their operation and maintenance, according to Article 18 of the "Prevention and Control of Environmental Pollution Law" (*Ley de Prevención y Control de la Contaminación Ambiental*) Official Register N° 204, June 5, 1989.

Water Resources

3.4 The National Water Resources Council (*Consejo Nacional de Recursos Hídricos* or CNRH) is the institution responsible for management of water resources in the country, according to the National Water Resources Council Law on Waters (*Ley de Aguas del Consejo Nacional de Recursos Hidricos*), which also establishes hydrological resources as national property of public use, whose use and exploitation can only be ensured by means of a concession, authorizes the use of national waters by companies of public interest and regulates the volume of water that can be extracted.

Environment

3.5 Under the existing legal framework several institutions can intervene in relation to environmental protection and control issues in the area, such as: the Ministry of the Environment, Ministry of Health (*Subsecretaria de Saneamiento Ambiental*), Direction of Health of Guayas (*Subsecretaria de Salud del Litoral*), General Directorate of the Maritime Merchant, Municipality of Guayaquil, and ECAPAG in its new regulatory capacity.

3.6 In addition, the Inter-institutional Commission on the Protection of the Environment was created to implement the "Prevention and Control of Environmental Pollution Law" (*Ley de Prevención y Control de la Contaminación Ambiental*) Official Register N° 204, June 5, 1989.

3.7 The Municipality of Guayaquil and the Ministry of the Environment govern all aspects pertaining to the compliance of environmental commitments undertaken within the concession agreement. Works requiring environmental licenses are handled by the Concessionaire through the Municipality, which in turn acts in representation of the Ministry of the Environment. The Municipality, by constitutional mandate, is charged with developing and articulating a coherent set of actions that contribute to the sustainable development of the district, by promoting the application of environmental measures to prevent, mitigate and sanction pollution. Further, under Article 13 of the Environmental Management Law (*Ley de Gestión Ambiental*), municipalities are empowered to exercise control over their districts' environmental policy.

B. Legal

Water and Sanitation Sector

3.8 The Concessionaire must meet requirements concerning the level and quality established for the service provided. Water quality must comply with the rules and standards established by the World Health Organization (WHO) and the Ecuadorian Environmental Law.

Environment

3.9 The 1998 Constitution of the Republic of Ecuador, Articles 86-91, promotes the use of environmentally clean technologies and makes the state concessionaires responsible for environmental damages that may occur.

3.10 The "Prevention and Control of Environmental Pollution Law" (*Ley de Prevención y Control de la Contaminación Ambiental*) Official Register N° 204, June 5, 1989, is one of the most relevant environment legislation in Ecuador because of the important concepts and clarifications that are introduced, as well as by the breadth of environmental issues that are approached by this law ("prevention and control of environmental pollution; protection of air, water and soil resources; and conservation, improvement and restoration of the environment; activities that are declared of public interest"). It defines the concepts of environment, ecosystem, pollutant and contamination, and the role of Inter-institutional Commission on the Protection of the Environment, which has been created to implement the Law. This law establishes also what is an Environmental Impact Assessments (EIA) and when it is required. Furthermore, it defines the criteria and quality objectives of water that requires treatment for human and household consumption, specifying the physical, chemical and biological parameters, and their maximum admissible values, which shall be observed in the design of purification systems

3.11 The Environmental Management Law (Law Nº 37, RO/245 of July 30, 1999) is another important Ecuadorian environmental legislation because it establishes principles and guidelines for environmental policies, defines obligations, responsibilities and participation levels of the public and private sectors in the area of environmental management, and outlines pertinent admissible limits, controls and sanctions. This law provides the broadest judicial framework by which most regulations must abide: (i) it defines the main aspects related to environmental quality parameters, permit regulations and management licenses, (ii) assigns responsibility to the Ministry of the Environment for determining the works, projects and investments to be subjected to a process of environmental impact study approval process, (iii) establishes the grounds to coordinate with other competitive entities the enforcement of environmental quality standards regarding water, air, noise, waste and polluting agents, (iv) establishes the need for an assessment of environmental impacts and control of public and private investment projects.

3.12 In addition, it should be pointed out that the Health Code, Official Register N° 158, February 8, 1871, Articles 12, 17, 25, 31, and 207, relates to the prevention and pollution control of water resources.

Health and Safety

3.13 Among the most relevant laws relating to health and safety are the Social Security System (*Régimen de la Seguridad Social*) and Ecuadorian Labor System. The Social Security System, Volume 1- (4.23), establishes standards that are aimed at occupational health and safety, and to be observed by both employers and workers, it also refers that employers are required to commit to: (i) occupational health; (ii) safety in the work place; (iii) definition of the company's internal organization measures.

3.14 The Ecuadorian Labor System (*Régimen Laboral Ecuatoriano*) (12.59) emphasizes the importance of workers' health, establishes that all employers must prepare an internal regulation and make it known to management or work departments for their approval

C. Project Compliance

3.15 The Concession Agreement (Executive Decree N° 872 dated October 18th, 2000) integrates a series of requirements regarding compliance with water resources, environmental, social and health and safety regulations and standards. Reportedly, the Company is in compliance with the applicable legal and

regulatory environmental, social, health and safety regulations, including permits and authorizations. Interagua has also put in place a work program on emergency management, industrial safety and health, to be implemented at all project facilities. **Table 3.1 (in Annex)** presents a list of project related permit and authorizations.

3.16 Works to be developed in this period (the initial five-year period from 2001 to 2006) are essentially installation of new water and sewerage connections spread throughout the concession area and therefore do not require the preparation of an Environmental Impact Assessment (EIA). However, at the request of the IDB, the Company is conducting an Environmental Analysis (EA) for the interventions included in the five-year program.

3.17 The EA analyzes the environmental situation of prevailing water and sewerage services in the Guayaquil district, and the corresponding environmental and social impact mitigation measures and corrective actions to be carried out over the course of the first quinquennium, in accordance with terms of reference of the Concession Agreement.

IV. ENVIRONMENTAL AND SOCIAL CONDITIONS

4.1 The Project will develop in great part in urbanized areas of the district of Guayaquil and will have a strong local influence; therefore, some aspects of environmental and social conditions become more relevant, such as the ones detailed below.

A. Environmental

Climate

4.2 The climatic conditions in the city of Guayaquil are greatly influenced by marine currents. Furthermore, the climate is also influenced by the city's practically flat topography. These weather conditions reveal striking seasonal difference between Winter (January-April) and Summer (June-November); December and May are known to be months of transition. According to Koppen's classification, Guayaquil is characterized as having a "Tropical Savanna" type climate, with considerable amount of precipitation (yearly average of 1128 mm), concentrated mainly in the winter months. The average temperature is 25.4°C, variable throughout the year, with lower values in July and August, and higher temperatures in March and April (which coincide with the period of rainfall). Evaporation is high in the area, generally above 1200 mm yearly. Average relative humidity is approximately 75,35 percent, with significant daily variations, above all during rainy periods. Predominant winds are from SW (30 percent of total frequencies), with an average yearly velocity of 3,29 m/s, with maximums during the Summer (4,24 m/s, October) and minimums in Winter (2,44 m/s, March).

4.3 *El Niño Southern Oscillation (ENSO)* is a current of warm water that periodically flows along the Western coast of South America, usually with disastrous social and economic consequences in several areas of the littoral region and in all of Ecuador, in general: (i) floods in cities, affecting water, wastewater and storm water drainage systems, destroying highways, bridges and roads; (ii) mudslides; (iii) agricultural devastation; (iv) epidemic problems: cholera, leptospirosis, dengue and malaria; (v) increase in sea level causing coastal erosion and an influx of debris to the beaches.

Hydrology and Water Resources

4.4 The city of Guayaquil is surrounded by several important water bodies: (i) the Guayas River to the East, created by the confluence of the Daule and the Babahoyo Rivers, between which lies the Samborondon Forelan; (ii) the Daule River to the North; (iii) the estuary that crosses the center and

empties in the Gulf of Guayaquil, throughout a number of estuaries that originate in the West and South of the city. The Guayas province is bathed by the Guayas River basin, the largest hydrographic area in the West side of South America towards the Pacific Ocean. Its area covers 40,000 km², including the Santa Elena Peninsula that benefits from its water resources. The main tributaries of the Guayas River are the Daule, the Vinces and the Babahoyo Rivers, that join upstream in the consolidated Central Zone (La Puntilla), which has developed mainly along the right margin of the Guayas River and its tributary, the Daule. An important particularity is the Santay Island that faces the center of Guayaquil and divides the Guayas in 2 inlets.

4.5 Many streams in the Guayas River basin have formed alluvial fans composed of loose topsoil carried from the slopes of the Andes Mountains; these streams enrich the Guayas River basin with soils carried down from the Sierra, making the Guayas River basin Ecuador's most fertile agricultural zone. The Guayas River system is the largest and most important of the region's rivers. From its mouth to the city of Guayaquil, the Guayas River is less of a natural river and more of a commercially developed waterway.

4.6 The Daule River is the main tributary of the Guayas River and is the principal source of raw water for the Guayaquil water supply system. Urban, agricultural and industrial effluents originating upstream affect water quality of the Daule River. However, since the construction of the Daule-Peripa Dam (located upstream at the confluence of the Daule and Peripa Rivers), there has been an improvement in turbidity and salinity levels. Dam design allows a permanent minimum flow of 300 m³/s near *La Toma*, enough to prevent salt intrusion at the site of water intake. Similarly, this flow rate may contribute to reduce or eliminate the impact of water contamination incidents that may occur in the river such as chemical spills or other forms of pollution.

B. Social-Economic

Population

4.7 Guayaquil is the most inhabited city in Ecuador with approximately two million inhabitants, as well as the most significant in terms of trade and finance. The district of Guayaquil accounts for more than 25 percent of the Ecuadorian GDP (gross domestic product). More than 60 percent of the country's imports and 70 percent of its exports transit through the port of Guayaquil. The city is located at the south end of the hydrographic basin of the Guayas river, in the Gulf of Guayaquil. In 1962, Guayaquil accounted for 510,804 inhabitants, which by 1990 had risen to 1,590,803 inhabitants. The most significant demographic growth occurred between 1974 and 1982, with a yearly rate of 4.53 %, which decreased to 2.89 % in the following inter-census period 82-90. According to the last census made in 2001, Guayaquil has an estimated population of 1,952,029 inhabitants.

Health

4.8 The infant mortality rate in the urban area of the district of Guayaquil was 34.9 per thousand in 1990, below the 66.7 per thousand in rural areas of the district. A total of 58.8 health care personnel for each 10,000 inhabitants were registered, while this indicator was merely 43 in rural areas. In the public sector, medical personnel reached 18.19 members and in the private sector the figure was recorded at 40.63 members for each 10,000 persons. Infant mortality in the city of Guayaquil corresponds to 34.9 per 1000 in 1990 and 66.7 per 1000 in rural areas. Life expectancy has increased to an average of 65 years.

Housing

4.9 In the 4th Housing Census of 1990, 343,356 existing housing facilities were registered in the city of Guayaquil. Out of these, 99.9 percent were particular houses and 0.1 percent were collective housing.

Among the particular occupied housing, 59.2 percent corresponded to houses or villas, followed by the category of "*mediagua*" with 19 percent and apartments (13,2 percent). From a tenancy standpoint, most housing is under the category of being owned (68,2 percent) and rented (26,5 percent).

Infrastructure and Services

4.10 In 1990, out of the total existing housing in the city, 64 percent used water from public networks, but only 47.3 percent had drinking water available in its interior; 34.6 percent of homes relied on water delivered by trucks to satisfy their needs, consequently, this can be considered one of the most serious problems in the city from a sanitary standpoint. 55.2 percent of homes were connected to the sewer system in 1990 (this figure decreased in more recent years to approximately 45 percent). However, as much as 36.4 percent used septic tanks, while 4.7 percent of homes in the city did not rely on any type of disposal of wastewaters. Only 56.1 percent of homes were covered by garbage collection, while 30.3 percent incinerated or buried solid wastes, with the subsequent environmental and health impacts. Currently, the collection of solid wastes covers the entire city, although in greater measure in sectors of improved economy.

4.11 Infrastructure and services, including water wastewater and drainage systems, are usually affected during flood events, particularly in association with *El Niño*. Regarding other natural and extreme events, seismicity studies carried out for the district of Guayaquil suggests that the Northern part of the district can be considered as a zone of high concentration of seismic and tectonic activities, the Central zone classified as one of medium activity, and the Southern zone as one of low concentration.

V. ENVIRONMENTAL AND SOCIAL IMPACTS

A. Proposed Investment Plan

5.1 The major works that the Project will entails are those related to the expansion of the drinking water distribution and sanitary sewerage networks. Therefore, the most relevant environmental and social impacts expected during the construction phase are those typically associated with medium-sized construction works and will be related to activities such as preparation of the terrain, excavation of ditches and trenches, pipe laying, and installation of other appurtenances. These impacts may acquire a greater significance when those activities are performed in urban areas, such as is the case for most of the areas involved in the present project.

(a) Construction Phase

5.2 Most of the potential environmental and social impacts associated with the construction phase will be negative and temporary, and can be mitigated with the use of standard environmental management procedures.

5.3 While the specific construction impacts will be identified for the individual works/projects (e.g., as part of the environmental analysis presently being performed, or other future analysis that may be necessary to be performed), the following summarizes the principal likely environmental and social, and health and safety construction related impacts, if appropriate control measures are not adopted:

Environmental

5.4 Lowering of the water table level may potentially occur in the close surrounding areas when the excavation of ditches and trenches goes deeper than the former; this effect, combined with the decompression of the soil, may lead to increased terrain instability with potential risks to nearby infrastructures and buildings. Increased concentration of dirt in adjacent walkways and roads may also

be expected, as well as of particulate matter in the storm water drainage system or in nearby water bodies, in association with carriage during storm events of excavated material usually is stored adjacent to the ditch or trench. Soil and groundwater contamination may also potentially occur as a result of leaching of chemicals used sometimes as pipe coating or lining, and by spillage of oil and other products used as lubricants, fuel, etc.

Social

5.5 The construction activities presently envisioned will not involve the need of resettlement, or the installation of significant worker or construction sites. Therefore, the potential social impacts or nuisance will be those typically associated with construction activities that develop in or near urban areas, such as interference on traffic, limited access to streets when refurbishing or installing pipelines, and dust and noise generation in association with operation and circulation of heavy vehicles and equipment, as well as by wind dispersal of excavated material. Possible temporary disruption to water supply and wastewater services may also occur; however, this will be avoided and minimized to extent possible.

Health and Safety

5.6 Increased risks to health and safety of workers or bystanders in association with possible accidents in the trenches, or with the operation of heavy equipment and vehicles, if standard protection measures are not adopted.

(b) Operation Phase

5.7 The following summarizes the principal likely environmental, social and health and safety impacts and risks associated with the concession operations:

Environmental

5.8 Although it is expected substantial improvements will be achieved under the concession in terms of operation and maintenance of the facilities, there still remains the likelihood of occurrence of some impacts on receiving water quality from water and wastewater treatment plant discharges. Also, there may possibly occur under some circumstances the contamination of soil and water bodies by chemical and oil spillage at treatment plants, by wastewater infiltration at stabilization pond sites, and by wastewater overflow at treatment units and pumping stations. Similarly, albeit improvements in the maintenance of channels and other components of the drainage system that are expected under the concession, it is not possible to rule out some risks of floods related to obstructions occurring in the storm water drainage system associated with inadequate disposal of solid wastes by the population.

Social-Economic

5.9 Some of the most relevant potential social impacts that have to be considered are those related to public health risks if it is not possible to provide drinking water that complies with regulatory requirements. Another issue that need to be addressed is that related to potential social impacts associated with improvements in metering and administrative billing procedures, taking into account that before the concession only 80 percent of the metered connections were actually billed and only about 50 percent of these billed connections paid their bills on a regular basis. Also, it has to be taken into account the potential social and economic impacts associated with possible tariff increases. Additionally, it must be referred the social-economic impacts associated with reduction in number of employees at the water and wastewater Company.

Health and Safety

5.10 The Concessionaire will provide training for operation personnel and will adopt other safety measures; however, there still remains the possibility of some risks to health and safety of operation personnel due to inappropriate handling, or accidental release of chlorine or other chemicals at treatment plants. There may also persist risks to health of operation workers at wastewater treatment plants in association with exposure to pathogenic microorganisms present in the wastewater, sludge and other wastes generated at the plants. Similarly, it is still necessary to consider risks to health and safety of people and animals in association with accidents occurring at the stabilization ponds, if standard protection measures are not implemented.

C. Impacts of Existing Operations (Environmental Liabilities)

5.11 The most relevant existing environmental and social, and health and safety impacts are related to the deteriorated or insufficient capacity of the existing systems, as summarized below:

Environmental

5.12 Contamination of soil and water bodies (surface and groundwater) associated with inadequate disposal of sludge and other wastes generated at treatment plants. Interference with wastewater treatment processes and contamination of receiving water bodies resulting from non-authorized industrial discharges in the sanitary sewerage system. Increased risks of flooding due to obstruction of the storm water drainage system in association with inadequate control of solid waste dumping. Proliferation of uncontrolled septic tanks, as a result of lack of service availability, thereby creating a risk of unregulated release of domestic sewage.

Social-Economic

5.13 Nuisances (i.e., noise, odors, insects, rodents, lights) associated with water and wastewater treatment plant, stabilization ponds, as well as from pumping station operation. Health and economic impacts associated with water sold by vendors in tankers, without quality control. Health, social and economic impacts related to poor water quality and inadequate access to drinking water services, and also due to low coverage of sewerage system and services.

Health and Safety

5.14 Increased risks to health and safety of operation personnel due to inappropriate handling, or accidental release of chlorine or other chemicals at treatment plants. Accrued risks to health of operation workers at wastewater treatment plants in association with exposure to pathogenic microorganisms present in the wastewater, sludge and other wastes generated at the plants. Increased risks to health and safety of people and animals in association with accidents occurring at the stabilization ponds, if standard protection measures are not implemented. Aggravated consequences of fires due to low coverage or insufficient pressure associated with existing fire protection system.

D. Positive Impacts/Benefits

5.15 It is expected that as a result of the rehabilitation of wastewater treatment plants, improvements will be achieved in terms of quality of effluents released into the environment. In addition, the expansion and rehabilitation of sewerage network will greatly attenuate the release of sewage directly into the environment. Furthermore, improved water quality monitoring at the source and receiving water bodies, as well as in the distribution system will allow one more tool for enhancing water resources management. Also, better maintenance of sanitary sewerage and storm water drainage systems will contribute to reduce the risks of flooding.

5.16 Improvements in domestic hygiene and a reduction in health risks that were associated with poor water quality or inadequate access to services, as a result of improvements in drinking water quality and its availability. In addition, the provision of treated drinking water to the population that had to resort previously to the supply by tanker vendors will reduce the risks to public health associated with water borne diseases, and may also have a beneficial economic impact to these communities. Furthermore, the Concessionaire will promote a more sustainable use of water resources with improvements in the infrastructure to reduce losses and introduction of better metering and billing procedures to encourage more efficient use of water. In addition, rehabilitation of the water and sanitation sector infrastructure and implementation of a comprehensive metering program (of production and consumers) is expected to reduce the present rate of unaccounted water (75 percent) to a more acceptable level.

5.17 Improvements in terms of occupational health and safety conditions and training will significantly reduce risks in operation and construction both to the community and to plant personnel, particularly where chemicals are used and stored, such as chlorine gas. Emergency procedures will enable Interagua to respond quickly, safely and appropriately to accidents. Increased fire protection coverage and efficiency associated with expansion of water distribution network and hydrant installation.

VI. ENVIRONMENTAL AND SOCIAL MITIGATION AND MONITORING MEASURES

A. Mitigation Measures

6.1 Interagua is presently in the process of developing an appropriate environmental, health and safety management system to adequately mitigate and control the specific environmental, social, and health and safety impacts and risks associated with the concession, in addition to those already established in the Concession Agreement, and summarized below:

(i) Stipulates that the Concessionaire must execute the necessary procedures to guarantee the protection of the environment.
(ii) Requires quality objectives for the services in terms of water quality, water pressure, etc.
(iii) Seeks, through a rehabilitation plan, to ensure the required efficiency and quality levels in the drinking water and, sanitary sewerage and storm water drainage systems and services in the first five years.
(iv) Stipulates constant quality control of the water source, with the purpose of securing a verification of the water quality and determining any possible deterioration. The analytical methods and sampling procedures that have to be used to determine the required parameters are indicated in the Concession Agreement documents.
(v) Requires monitoring drinking water quality in the distribution network, based on a sampling program previously approved by ECAPAG, in which sampling frequencies, sampling locations, number of samples and type of analyses are denoted.
(vi) Seeks to guarantee the optimal operation of the pumping stations, screens and grit removal systems in the treatment of wastewaters, including requirement to remove any materials extracted by these units and dispose them in areas indicated by the ECAPAG.
(vii) Specifies the need to control the entry of storm water and cooling water into the system of sanitary wastewaters. Storm water shall only be emptied into collectors and storm water drainage channels. Cooling water will have to be drained into the storm water system, with prior authorization from the Concessionaire, who in turn will have to control the implementation of the required treatment systems and the quality of the effluents, in accordance with stipulated standards.

(viii) Seeks to guarantee health conditions of drinking water destined for human consumption, from the moment of its treatment and distribution through the network to its delivery at the final users' connection point.
(ix) Considers the use of self-monitoring to collect controlled parameter data, involving external personnel and audits of said measurements, which have to be performed by the Concessionaire.
(x) Contemplates supervision of compliance regarding discharge standards into receiver bodies and collection structures, including the treatment of sludge and other pollutants established by law.
(xi) Requires preparation of a yearly report on the quality of Industrial Wastewaters, expected to include the number of industries, with and without treatment, and the physical and chemical quality of the industrial wastewaters, with and without treatment.
(xii) Requires yearly generation and publication by the ECAPAG for the benefit of National Authorities and Institutions, of a consolidated report of results, on a national scale, of industrial establishments that dump wastewaters into public sewage systems.
(xiii) The concession agreement further establishes that Interagua has to comply with national social and safety laws.
(xiv) In addition, the current tariff structure has been in effect for 18 months prior to the concession, and cannot be modified during the first five years of the concession (although extraordinary revisions of the tariff could take place after the second year). The tariff structure includes three types of revisions: (i) automatic adjustments, (ii) ordinary revisions, and (iii) extraordinary revisions.

6.2 The following summarizes some of the proposed control actions:

Environmental and Social

6.3 As part of the environmental analysis, Interagua is identifying the need, and if applicable the type, for future environmental assessments for individual projects within the five-year plan and the specific requirements related to the applicable environmental, health and safety legislation.

6.4 The Concessionaire will be responsible for ensuring that adequate environmental and social mitigation measures are implemented during construction works, including by subcontractors. Based upon the environmental analysis and an Action Plan for Construction, the control measures to be adopted during construction will be defined. These will be subsequently, as necessary, modified and enhanced on a project/site specific basis. Relative to construction activities, and prior of the beginning of the works, the Concessionaire will inform the public on the nature of the works and improvements to be performed, relevant environmental and social impacts associated, and indication of some of the impact control measures that are envisioned.

6.5 Interagua will develop and implement the necessary management procedures (Environmental and Social Management Plan - ESMP) in order to properly manage environmental aspects associated with their operations, including written procedures, designation of responsibilities, training and reporting.

6.6 The following more specific measures are also being considered by the Concessionaire:

(i) Rehabilitation of sewerage interceptors to eliminate direct discharges in the Estero Salado.
(ii) Adequate maintenance of channels and drains of the storm water drainage system to prevent flooding.
(iii) Development of a management plan for the disposal of sludge and grit generated at treatment plants.
(iv) Preparation of a program aiming at controlling industrial effluents discharges into the sewerage system.
(v) Development of measures to reduce water leakage and loss in the system.

6.7 In addition, several public information, consultation and participation measures are envisioned by the Concessionaire to contribute for the attenuation of some of the social impacts; these measures are summarized in **Section 7**.

Health and Safety

6.8 Interagua has already begun implementing health and safety actions, such as the purchase of protective equipment and introduced procedures and training of operation personnel. Furthermore, health and safety procedures will have to be incorporated into all contracts for execution of works, and precise guidelines for the use of protective equipment, road signs and site access will have to be specified. The Concessionaire will also establish operation and maintenance codes to be adopted in all treatment plants, and is developing a Health and Safety Management Plan (HSMP), as well as an Emergency Prevention and Management Plan (EPMP).

B. Monitoring Measures

6.9 Concerning monitoring, the Concessionaire has to perform permanent and comprehensive water quality monitoring activities at the water supply source (Daule and Babahoyo Rivers), in the water distribution system and also at receiving water bodies (Guayas and Daule Rivers, Estero Salado, etc.). As part of the Concession Agreement, Interagua is required to submit periodic reports to the regulator (ECAPAG), which have to be certified by a technical external auditor, including reports on service levels, quality monitoring and implementation of the five-year plan. Furthermore, in general, water and sanitation operations require extensive monitoring activities in order to confirm compliance with operational standards. Interagua plans to introduce controls and quality standards for release of industrial effluents into the sewerage network.

VII. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

7.1 The Concessionaire has developed a series of measures to enhance public information, consultation and participation, which are summarized as follows:

(i) Interagua has organized more than 150 meetings at beneficiary communities and encouraged community leaders to help plan constructive activities to promote stakeholders involvement in decision-making process.
(ii) The Concessionaire is developing a second customer service desk and has a call center to receive and follow up complaints, and provide information.
(iii) Interagua will establish a dedicated project information center and is developing a project to design and adapt a bus or trailer to function as moving kiosk for project communication activities.
(iv) Interagua will implement awareness campaigns about water resource problems and also about *El Niño* and its consequences in coastal areas.
(v) The Concessionaire has created a web site in the Internet, which provides information of its activities to the public and also can be use to receive complaints, questions and comments form the population.

7.2 Furthermore, in agreement with information disclosure policy and requirements adopted by IDB, the Concessionaire is preparing an Environmental Analysis of the Project, which will be placed for consultation for the local public, as well as in the IDB Public Information Center.

VIII. RECOMMENDATIONS

8.1 The Bank, as part of the due-diligence process, will analyze the environmental and social aspects of the Project and the Company and prepare a project Environmental and Social Impact Report (ESIR) for review and approval by the Bank's Committee on Environment and Social Impacts. The environmental and social due-diligence will specifically include the components listed below.

(a) Assessment of Project and Company compliance status with applicable Ecuadorian (national, provincial, municipal, etc.) environmental, social, and health and safety regulatory requirements (e.g., laws, regulations, standards, permits, authorizations, applicable international treaties/conventions, etc.), as well as with project specific legal requirements contained in the Concession Agreement, and any applicable Bank environmental and social, as well as health and safety policy or guideline; particularly it should include confirmation that any future intervention should take into account compliance with IDB's operation policy OP-710 regarding involuntary resettlement. The evaluation should also include review of the technical capacity of *Empresa Cantonal de Agua Potable y Alcantarillado de la Ciudad de Guayaquil* (ECAPAG) related to environmental and social aspects.

(b) Evaluation of the proposed activities of the project Master Plan and the concession to confirm that the project's direct and indirect environmental, social, and health and safety impacts and risks have been properly identified. This will include in particular the evaluation of the following impacts and risks: (i) hydrological and water quality impacts related to water intake to supply drinking water system; (ii) watershed management and control measures, including how is the watershed being managed, potential or risky pollution sources or activities upstream that may affect the Project; (iii) impacts on soil and water bodies associated with possible disposal of sludge, other wastes, and effluents generated at water and wastewater treatment and pumping units; (iv) water quality and treatment impacts associated with discharge of industrial effluents in the sanitary sewerage system; (v) health and other social impacts associated with wastewater treatment plants, stabilization ponds and pumping stations construction, operation an maintenance; (vi) social and economic impacts due to employee reduction; (vii) social and economic impacts related to better metering and billing procedures, as well as to possible tariff increase; (viii) impacts and risks associated with leaks and spills of chlorine and other chemicals at treatment plants, including health and safety risks to workers handling wastewater or chemicals used in water treatment; (ix) potential public health risks associated with events leading to the impossibility of providing drinking water that complies with regulatory requirements (which represent some of the most relevant social-economic issues that will be assessed by this project); (x) potential health risks associated with possible generation of chlorinated organic carbons upon disinfection of water with chlorine; (xi) potential vulnerability of present and planned facilities to natural disasters and extreme climate events (e.g.: floods, earthquakes).

(c) Assessment that the Project will comply with Bank's operation policy OP-745 related to drinking water and sanitation, and verification that parallel to the provision of drinking water, a solution for the disposal of sanitary sewerage will be included in the Master Plan.

(d) Evaluation of environmental and social, as well as health and safety impacts and issues associated with existing water and wastewater treatment units (existing liabilities), including assessment of responsibilities in terms of formulation, management and implementation of control measures.

(e) Evaluation of the proposed corrective action plan to correct or mitigate the environmental, social, or health and safety non-compliance or liability associated with the existing project and company assets. In particular, this will include the potential process for implementation of corrective and monitoring actions.

(f) Evaluation of Interagua's environmental and social, and health and safety management systems, including plans (Action Plans, Management Plans, Contingency Plans, etc.) and procedures, responsibilities and resources, training, auditing, and reporting, and in particular all the system components necessary to ensure future projects and works which will be implemented will not generate significant negative impacts.

(g) Assessment of the proposed environmental and social mitigation, as well as health and safety measures and monitoring programs, in terms of their completeness, sufficiency of detail, implementation feasibility, cost, definition of responsibility, schedule, and quality control. In particular, this will include evaluation of the following: (i) environmental and social, and health and safety procedures during construction activities; (ii) waste management procedures for handling, storage and disposal of sludge and other wastes generated at treatment units; (iii) mitigation and monitoring procedures to address impacts outlined in **sub-Section 8.1 (b)**; (iv) industrial effluent control program with respect to legal and institutional responsibilities, enforcement capabilities, and availability of resources for the implementation; (v) operation monitoring programs at wastewater treatment units, especially related to wastewater discharges and odors.

(h) Evaluation to confirm adequate contingency plans (i.e., emergency and spill plans), including confirmation that all relevant environmental risks have been identified, proper procedures have been developed, and sufficient resources will be made available to ensure adequate implementation.

(i) Assessment of project-related information disclosure and public consultation activities that have been performed and those proposed, in order to ensure throughout the concession ongoing information disclosure and public consultation with the local population related to environmental, social, and health and safety aspects.

(j) Evaluation, and development as necessary, of Project supervision and evaluation procedures to ensure proper implementation of environmental, social, and health and safety actions and requirements.

(k) Assessment of existing and potential future environmental, social, or health and safety financial/credit risks and liabilities associated with the project/concession, the project/concession sites, and the Company.

(l) Evaluation of environmental and social, and health and safety terms and conditions in relevant project legal documents (e.g., construction contract, operations and maintenance contract, etc.), in terms of sufficiency, potential risks or liabilities, or issues.

8.2 The project ESIR will include a summary of the proposed project, in terms of environmental and social, and health and safety aspects. The ESIR will also present the IDB's project team recommendations related to environmental and social, and health and safety requirements for the project and the loan agreement.

ANNEX:

TABLES AND FIGURES

TABLE 2.1: EXPANSION PLAN - NUMBER OF WATER CONNECTIONS PER YEAR

Year 1	0%	-
Year 2	15%	8,285 connections
Year 3	20%	11,048 connections
Year 4	30%	16,571 connections
Year 5	35%	19,334 connections

TOTAL	**100%**	**55,238 connections**

TABLE 2.2: SANITARY SEWERAGE TREATMENT FACILITIES

Location	Type of Treatment	Final Discharge	Discharge Flow (m^3/dia)
La Pradera o Guasmo	Primary treatment	Río Guayas	83,418
El Progreso	Primary treatment	Río Guayas	129,555
Alborada Sauces	Oxidation pond	Río Daule	49,571
Guayacanes	Stabilization lagoon	Río Daule	12,470
Puerto Azul	Stabilization lagoon	Estero tres Bocas	2,720
Garzota	Secondary treatment	Canal de AALL	-
Girasol	Stabilization lagoon	Estero Salado	250
Montebello	Secondary treatment	Ducto AALL	-
Orquídeas	Stabilization lagoon	Canal AALL	-
Alamos	Secondary treatment	Canal AALL	-
Portofino	Secondary treatment	Canal AALL	-
Prosperina	Stabilization lagoon	Canal AALL	-

TABLE 3.1: LIST OF PROJECT RELATED PERMITS AND AUTHORIZATIONS

(i)	Quality Standards of Drinking Water and Industrial Effluents
(ii)	Environmental Management Law (Law N° 37 RO/245 1999)
(iii)	National Council of Water Resources Legislation on Waters
(iv)	Municipal Government Law
(v)	Environmental Pollution Prevention and Control Law
(vi)	The Law on Waters
(vii)	Social Safety System
(viii)	Ecuadorian Labor System
(ix)	Consumer Protection Law
(x)	The Law on Public Roads
(xi)	Commercial Law
(xii)	Process of Decentralization of Environmental Competencies, Ministry of the Environment #55
(xiii)	Official Register 438 of October 23, 2001.
(xiv)	Concession contract
(xv)	Decree N° 2393. Workers' Improvement of Health and Safety Regulation in the Labor Environment (*Reglamento de salud y seguridad de los trabajadores mejoramiento del medio laboral*).
(xvi)	Ministerial Agreement N° 011. Safety Regulation in Roadways works (*Reglamento de seguridad para el trabajo en vias y carreteras*).
(xvii)	Ministerial Agreement N° 013. Safety Regulation in Electrical works (*Reglamento de seguridad para los trabajos con electricidad*).
(xviii)	Resolution Nº 741 of the C.S IESS. Workers' Risk Insurance Regulation (*Reglamento del seguro de riesgos del trabajo*).
(xix)	Resolution Nº 010 of the Intervening Commission of the IESS. Responsibilities Regulation (*Reglamento de responsibilidades*).
(xx)	Agreement Nº 1404. Medical services for Companies Regulation (*Reglamento de servicios médicos para empresas*).
(xxi)	Law for the Modernization of the State, Privatization and Utilities Provided by the Private Sector

Figure 1: Project Location

Ecuador

Concession area

Area: 270,0

Population: 12.6

65% urban, 35%

Distinct geograph

zones:

Andean (Quito)

Coastal (Guaya

Figure 2: Expansion of the Drinking Water Distribution System

Water network Expansion Plan

No.	SECTOR	No. DE CONEXIONES	PERIODO					
			09-ago-01	09-ago-02	09-ago-03	09-ago-04	09-ago-05	09-ago-06
1	ISLA TRINITARIA	18,856						
2	LOS VERGELES	6,500						
3	COOPERATIVAS VARIAS		ELIMINADO					
4	MAPASINGUE ESTE	12,000						
5	LIMONAL	700						
6	IMACONSA	6,000						
7	SUBURBIO OESTE	4,636						
8	CISNE II	4,654						
9	SAN NICOLAS	500						
10	COOP. MARIA CORDOVEZ Y 31 DE AGOSTO	832						
11	COOP. PUERTAS AL SOL	560						
	Total	**55,238**						
	Número de conexiones		-	8,286	11,048	16,571	19,333	
	Porcentaje	100%	0%	15%	20%	30%	35%	

Rev. Dec. 2002

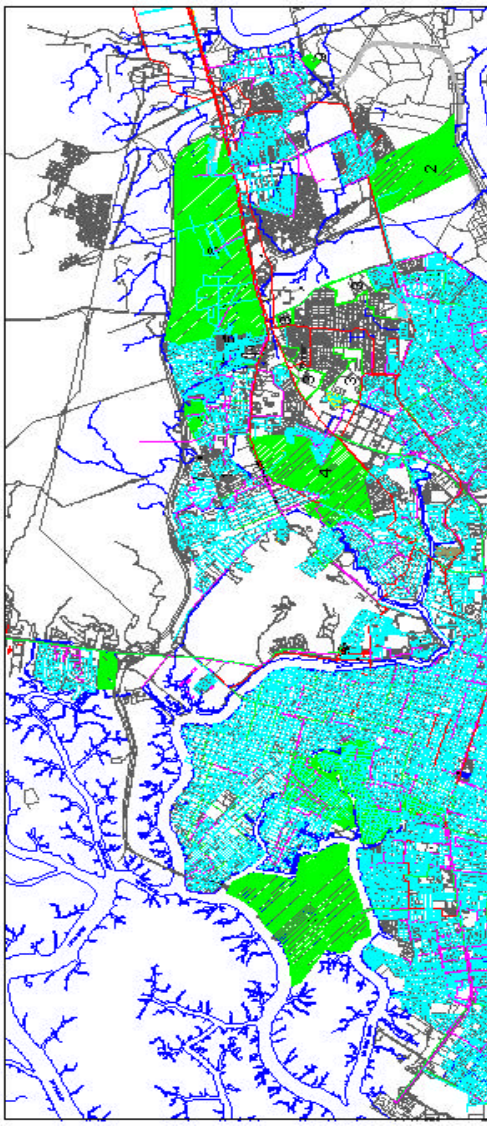


Figure 3: Expansion of the Sanitary Sewerage System

Sewerage Network Expansion Plan

No.	DESCRIPCION	No. de Conexiones	Sep-01	Sep-02	Sep-03	Sep-04	Sep-05	Sep-06
	PROYECTOS DE EXPANSION - ALCANTARILLADO							
1	ISLA TRINITARIA	16,484						
2	GUASMO	38,754						
	Total	**55,238**						
	Numero de conexiones		-	8,286	11,048	16,571	19,333	
	Por ciento de conexiones		0%	15%	20%	30%	35%	

Rev. Jan 2002

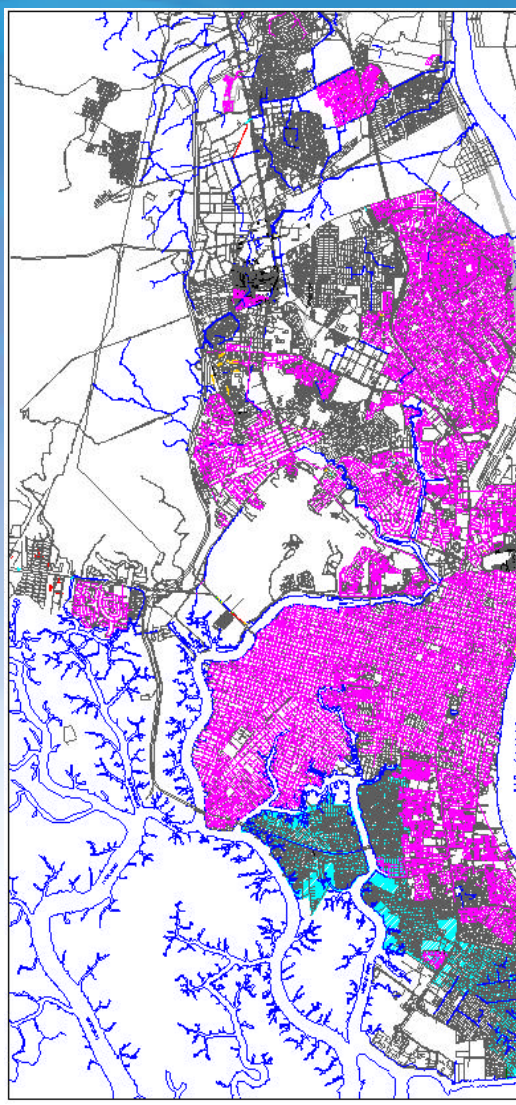
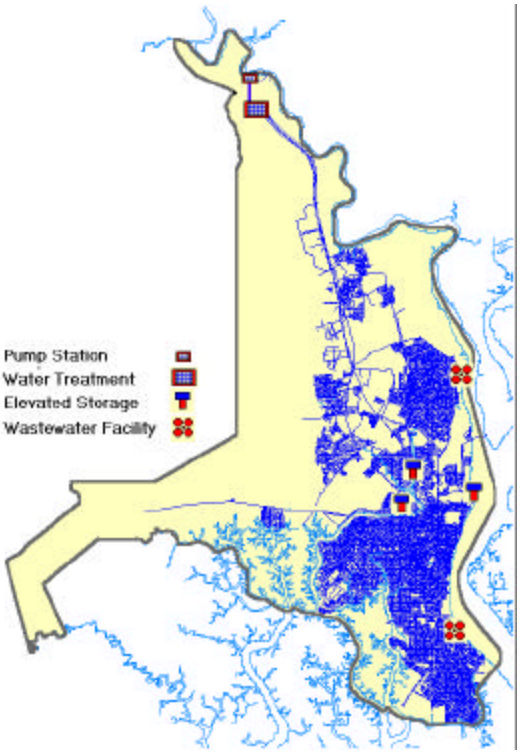


Figure 4: Location of Most Relevant Existing Facilities

Location of the facilities