Environmental and Social Strategy (ESS)
Wastewater Rehabilitation Program
TT-L1026

28th March, 2012

1. Summary

Project Name:	Wastewater Rehabilitation Program
Project Number:	TT-L1026
Country	Trinidad and Tobago
Project Team:	Evan Cayetano (WSA/CTT), Project Team Leader; Marcello Basani (WSA/CGY); Rodrigo Riquelme, Lucio Javier Garcia Merino, Efrain Rueda (INE/WSA); Dale James (CCB/CTT), Denise Salabie, Shireley Gayle (PDP/CTT); Stefanie Brackmann and Natasha Ward (VPS/ESG).
Borrower:	Government of the Republic of Trinidad and Tobago (GORTT)
Executing Agency:	Water and Sewerage Authority (WASA)
Financing Plan:	IDB: US$600 million Local: 0 Total: US$600 million
Safeguard Policies:	OP-703 (B.4, B.5, B.7, B.9, B.11), OP-102, OP-704
Environmental Category:	B

2. Project Description

2.1. The general objective of the Wastewater Rehabilitation Program is to continue with the effort to improve the environmental conditions of Trinidad and Tobago (T&T) by decreasing the uncontrolled discharge of untreated wastewater into the environment. The specific objective is to improve the existing wastewater management services in San Fernando and Malabar catchment areas, through: (i) the construction of wastewater treatment plants (WWTPs) and installation of trunk sewers for each facility; (ii) the takeover, refurbishment, upgrade and eventual integration, or decommissioning, of malfunctioning wastewater treatment facilities in the respective catchment areas; (iii) expansion of the wastewater collection system; and (iv) the strengthening of WASA operational and maintenance performance. The project is comprised of the following activities:

2.2. Construction of two wastewater treatment plants and collection system for the San Fernando catchment and the Malabar catchment areas. Financing will also be available for take-over by WASA of the orphaned plants with the catchment and integration into the new WWTP.

2.3. *San Fernando:* The project involves the establishment of a new WWTP, centrally located at the existing San Fernando WWTP site, the integration of existing sewers into a centralized collection system and the provision of new sewers to service all un-sewered properties within the wastewater catchment area. The new WWTP is to replace all nine currently existing plants within the project boundaries.

2.4. *Malabar:* The project proposes the decommissioning of the existing Arima WWTP and the construction of a new conventional activated sludge plant in Malabar, south of the existing

Malabar WWTP. The new plant will consist of two modules to treat flow from all existing WWTPs as well as the currently unsewered portions of the catchment. Treated effluent from the plant will be discharged into a creek, which drains into the Mausica, then Caroni Rivers.

2.5. The Project will also finance capacity building activities required for WASA to be able to manage the implementation of this operation.

2.6. In October 2011 the Bank approved aloan for US$50 million for the Wastewater Infrastructure Improvement Program[1]. WASA is the executing agency for this operation and is working on compliance with conditions precedent to disbursement.

3. Institutional and Regulatory Context

Compliance with National Environmental Assessment and Permitting Requirements

3.1. The T&T Environmental Management Authority (EMA) is mandated to write and enforce laws and regulations for environmental management. Government policy is that any activity likely to have significant effects on the environment, including water and sewerage systems, is to be made subject to an environmental impact assessment before consent is given[2].

3.2. The EMA has produced in 2006 Water Pollution Rules[3]which set standards for discharge of effluent from industrial processes and domestic WWTPs. However, throughout Trinidad and Tobago, a large number of plants are currently discharging water pollutants that do not comply with these Standards. The Cartagena Protocol entered into force in 2003 and GORTT has ratified the Protocol Concerning Pollution From Land-Based Sources (LBS) Protocol.

3.3. *San Fernando EIA:* An application for a Certificate of Environmental Clearance (CEC) for the San Fernando and Environs wastewater collection system and treatment plant was submitted to the EMA in August 2006. The EMA determined that an EIA was required. This was completed in May 2010. The EIA found that there are no significant long term negative impacts to the social or biophysical environment, only short-term impacts during construction, the most significant of which are expected to be noise and traffic disruption. The EIA also concluded that the proposed project will have a positive impact to the rivers and surrounding environment in San Fernando through the proper collection, treatment and disposal of wastewater that is presently discharging into rivers and watercourse. The project will decrease waterborne diseases, safeguard public health and improve the overall quality of life of the residents. The EIA includes analysis of alternativesand a summary of the potential cumulative impacts. The EIA underwent consultation during 2009 and 2010, which included meetings with relevant agencies, a key stakeholders meeting and 2 public consultation meetings. The CEC was granted on 12th January 2011.TheEIA reported the presence of sensitive habitats in the Project area but it was not clear if the Project would in fact affect these areas, and as such this will be discussed with WASA, with a view to ensuring that analysis of the impacts and risks is undertaken, and that mitigation measures, commensurate with the identified impacts and risks, are appropriately designed and implemented.

3.4. *Malabar EIA:* An application for a CEC for the Regional WWTPs at Maloney and Malabar was submitted to the EMA in accordance with CEC Rules, who determined the need for an EIA.

[1] TT-L1018/ Loan 2600/OC-TT.

2 National Environmental Policy (2005), edited September 2009 by the EMA.

3Amendment of the Water Pollution Rules from 2001.

This was submitted/completed in June 2009. The EIA found that the impacts associated with the Project were principally: traffic congestion during construction, temporary disruption to sewage disposal and an increase in air pollutants and noise levels. These were not found to be significant, and proposed mitigation measures (e.g., traffic management, measures to reduce dust and noise levels), when implemented, will reduce residual impacts to minor or beneficial during the construction and operational phases. The EIA found the following beneficial aspects of the proposed project: increased sewerage disposal efficiency, improvement in river water quality; minor employment opportunities; decrease in human health and environmental concerns regarding untreated wastewater. The EIA includes analysis of alternatives. A cumulative impact study was stated as not pertinent to the project in the EIA. The EIA underwent consultation during 2008, which included two public consultation meetings in each of Maloney and Malabar. The CEC was granted on 5th August, 2010. The scope of the EIA did not extend beyond the immediate outfall location for the WWTP, and therefore lacks sufficient analysis on the downstream impacts, and as such this will be discussed with WASA, with a view to ensuring that analysis of the impacts and risks is undertaken, and that mitigation measures, commensurate with the identified impacts and risks, are appropriately designed and implemented.

Compliance with IDB Environmental and Social Safeguard Requirements

3.5. Key policies and directives triggered in this project include B.4 (Other Risks), due to the limited capacity of the EA; B.5 (Environmental Assessment); B.6 (Consultation), B.7 (Supervision and Compliance), B.9 (Natural Habitats and Cultural Sites), and B.11 (Pollution prevention and abatement) of the Environment and Safeguards Compliance Policy (OP-703), Disclosure of Information Policy (OP-102); and the Disaster Risk Management Policy (OP-704).

3.6. It is not likely that Involuntary Resettlement Policy (OP-710) applies, however this, will be assessed during the due diligence process, particularly with respect to any new, or recent, land acquisition that is required for either project. Additionally, the due diligence will affirm whether the Gender Equality in Development Policy (OP-270) is triggered.

3.7. The potential negative impacts of the Program areexpected to be localized and in areas that have for the main part, previously been developed, and as such it is classified as a Category "B" under OP-703 (see section V). Potential impacts and risk will be managed through the implementation of mitigation measures specifically designed for the Project's construction and operation. The Project is initially being considered as high risk due to the potential limited capacity and pending restructuring of the environmental function of WASA to be able to adequately manage and monitor (particularly the water quality) the Projects.

3.8. In accordance with Directive B.5 (Environmental Assessment) of the Environment and Safeguards Compliance Policy and the Disclosure of Information Policy (OP-102) the Environmental Impact Assessments for both operations will be disclosed in the T&T country office and on the IDBs website.

4. Environmental and Social Setting

4.1. Wastewater infrastructure only covers approximately 30% of T&T's population, with the remaining 70% being serviced by septic tanks and pit latrines. Overall, the wastewater sector faces following challenges: (i) limited expansion of the central sewers; (ii) limited financial and human resources; (iii) poor designs; and (iii) poor maintenance. As a consequence, the sewerage system is currently in a state of emergency and in urgent need for rehabilitation.

4.2. Over the last five decades, population growth and housing developments have not been matched with adequate expansion of the central sewerage systems. As a result, the GORTT required residential and industrial land developments to build and operate their own sewers and small packaged WWTPs,many of which are not properly operated or maintained, or have been abandoned (about 200). However, to date many of these malfunctioning facilities have not been adequately decommissioned closed or rehabilitated and connected to a central wastewater management system.In 2004, WASA received the mandate to assume responsibility for all sewerage treatment plants and associated lift stations owned by the Ministry of Housing, its agencies, and the Urban Development Company of Trinidad and Tobago Limited.

4.3. Untreated or below-quality-standard effluents from existing facilities are often discharged into nearby water courses or upstream of water intakes, posing serious public health and environmental risks and increasing the treatment costs to produce potable water. Additionally, the continued disposal of untreated sewage into rivers, underground waterways and coastal waters impacts the quality of aquatic life, posing environmental and ecological threats, as well as an economical threat to the tourism sector.

San Fernando Environmental and Social Setting:

4.4. The proposed Project site is located in the Southof Trinidad in San Fernando, in the county of Victoria. The San Fernando catchment covers an area of 42 km^2. All wastewater will be conveyed to the new San Fernando WWTP located at the end of Riverside Drive, Gulf View, at the site of the existing San Fernando WWTP.

4.5. The biophysical environment where the San Fernando Project is located is largely influenced by anthropogenic activities including agriculture, industry and commercial development. Few natural areas remain within the project boundaries. The remaining areas are categorized as low vegetation with scrub, agricultural and forested areas.

4.6. Water quality testing was carried out on the Cipero, Guaracara, Marabella, Vistabella Rivers and Alley's Creek to assess the effects of the existing situation on the receiving rivers and streams in the San Fernando Catchment. The results of the water quality testing program indicated high levels of fecal coliforms in the rivers, indicative of significant raw seweragedischarges.

4.7. Flora and fauna studies were conducted and a land use map was developed, as part of the EIA. The main part of the project area is currently developed by human activities(commercial and residentiallow density buildings,and for agricultural). A small percentage of the project area is composed of mangrove forest, Riparian Forest and National Parks, and there is the potential that some vulnerable and rare species can visit the project area. A fish survey in the rivers and in the coastal waters surrounding the San Fernando wastewater catchment area found relatively low diversity in fish species compared to other rivers in Trinidad, likely to be the result of the poor water quality among other reasons.

4.8. The San Fernando WWTP and Collection System have been designed up tothe year 2035; the population is projected to increase to 111,600 by this time. The San Fernando Wastewater Catchment area is occupied predominantly by residential communities that have been developed both by private entities and the government sector. The proposed San Fernando Wastewater Collection System will service all the buildings within the wastewater catchment including future developments.

Malabar Environmental and Social Setting:

4.9. The Malabar catchment consists of an area of 2,766 hectares (ha) and is situated north of the Caroni River and south of the Northern Range with the Maloney catchment to the West and the Valencia/Wallerfield catchment to the East. Resident population of Malabar area for 2035 is estimated to be 108,630 inhabitants. At present, approximately 29% of the total population equivalent of the Malabar catchment has access to sewerage facilities and as with the other catchment areas, the majority of the existing sewerage systems are either abandoned or in a dire state of disrepair.

4.10. The Malabar plant is approximately 14 kilometers east of the eastern edge of the Caroni Swamp, which is a Ramsar Site, Important Bird Area (IBA), National Park and Wildlife Sanctuary. The plant drains into a small un-named tributary river, which in turn drains into another small river (the Mausica River), which in turn drains into the Caroni River.

4.11. The project is located in a largely residential and commercial area. The EIA reports that the area is not the habitat of any endangered or protected species. Topography is gentle to undulating and soils consist of clays and loams. As such soil instability, erosion and drainage do not present as major factors of concern in the project area. An analysis of surface water quality of the Malabar and Maloney catchment areas revealed very high levels of total and fecal coliforms, high Biological Oxygen Demand and high levels of nutrients. Fish species recorded from samples taken from the Caroni tributary system represented only 65% of the potential species known for the Caroni river system, a probable indicator that the health of the river system is compromised.An avifauna study was conducted as part of the EIA and noted a total of 31 avifaunal species were encountered.

4.12. The social environment was assessed as part of the EIA through reviews of data, reports in the public domain, Central Statistical Office and primary data collection via household surveys. Over 900 households were interviewed in the conduct of the survey. The investigation revealed that respondents have an overall sense of benefit to be derived from the project, both on a personal and community level including factors such as employment generation, cleaner water courses and the reduction of potential harm to aquatic life. On the negative side some were apprehensive regarding the technology involved in chemical treatment of water and the risk to human health. Of particular interest is the general concern regarding poor road surfaces in the project area since implementation of the project will require severe but temporary disruption of roadways, property access and traffic diversions.

4.13. The Malabar Catchment comprises the Borough of Arima and sections of the Regional Corporation of Tunapuna/Piarco. The total area is approximately 2,766 ha and the Malabar facility will be sited on 11.06 ha of land. The Malabar Catchment contains several developments and several industries, and Industrial park and a variety of small to medium sized commercial businesses, which are currently served by the existing Malabar WTTP. The catchment area contains institutional facilities such as the University of Trinidad and Tobago, the Arima Regional Hospital and several government schools.

Natural Disasters:

4.14. T&Tis located within the Atlantic hurricane belt, and as such is subject to tropical storms and hurricanes. The country is also located on the Circum-Caribbean Tectonic Belt, which has produced several earthquakes in magnitudes exceeding 7.0 since 1900; and is subject to floods.

5. Environmental and Social Impacts and Risks

5.1. In general terms, the San Fernandoand Malabar WWTPs will have a positive impact to the rivers and surrounding environment in the respective areas of the projects through the proper collection, treatment and disposal of wastewater, presently discharging into local rivers and watercourses; and will decrease waterborne diseases, safeguard public health and improve the overall quality of life of local residents.

5.2. The two projects are not expected to have significant and/or irreversible negative impacts on the social or biophysical environment, rather they are expected to have mostly local and short-term impacts typically resulting from construction and operation with large infrastructure works, the most significant of which are expected to be noise and traffic disruption.

Environmental and Social Impacts during Construction and Decommissioning

5.3. Potential environmental impacts during construction are noise, dust, soil, air and water pollution and inadequate solid waste management. This is also expected to include a moderate disruption of traffic during construction from increased construction vehicles.

5.4. There is also the potential for impacts related to the removal and disposal of liquids and sludge presently deposited in existing WTTPs. Improper disposal of such liquids, sludge and contaminated soil can result in contamination of surface and underground water. Another water contamination issue relates to silty runoff which may arise from water which is being pumped out of trenches excavated for the installation of sewers and from erosion of cleared areas. Surface and underground water may be contaminated by spills and leaks of hydrocarbons (fuels and lubricants) from construction equipment.

5.5. The potential impacts on habitats is not expected to be significant, however will be assessed in more detail during due diligence.

5.6. Potential health issues as a result of exposure of workers involved in the removal of sludge and fecal matter from the handling of fecal matter and sludge of older/abandoned WWTP facilities. Also, the public may also be exposed if the liquids and sludge are improperly disposed of or if there are spills during transport. Workers and the public may also be exposed to unpleasant odors.

5.7. There are also potential social impacts of loss of livelihoods associated with land acquisition for both sites, particularly if such land is currently, or was until recently, used for agricultural purposes by local communities, as well as potential impacts associated with local businesses affected during the construction phases. These will be assessed further during due diligence.

Environmental and Social Impacts duringOperations

5.8. Potential environmental and health impacts could be linked to inadequate soil, water and solid waste pollution control and prevention measures, air pollution, noise and odors. These impacts may be more significant in the event that the plants are not well operated and/or maintained, resulting in the release of contaminated waters and/or chemicals affecting surface and underground water resources as well as living organisms that depend on such resources.

5.9. Depending on the type of system to be implemented (combined or not), and whether it will treat industrial wastewater, these impacts may be exacerbated. It is unclear at this stage the extent to which the wastewater standards to be applied for this Program(Trinidad and Tobago

Specification for the Liquid Effluent from Domestic Wastewater Treatment Plants into the Environment) are sufficient to manage industrial wastewater.

5.10. There are potential risks and impacts related to the discharge from both plants into their respective receiving water bodies, and consequent impacts on natural habitats. In particular, the Malabar plant, drains to the Caroni River which is partially connected to the Caroni Swamp National Park, which supports a large concentration of waterbirds and is considered Critical Natural Habitat. This will be assessed further during due diligence.

Environmental and Social Risks

5.11. Risks during construction, operation and decommission could occur from: inadequate health and safety management; inadequate management of hazardous materials and solid waste; accidental spills, degradation of soil, flora and fauna and impacts on water quality due to effluent discharge which do not meet effluent standards.

Other Risks

5.12. There is a risk associated with the capacity of WASA to manage and monitor the construction and operation of the two Projects concurrently, particularly with respect to the implementation of effluent standards and monitoring of water (surface and underground) quality during both construction and operation, which could result in damaging impacts on the natural environment and human health.

5.13. Though operating with sufficient technical know-how and a solid internal and external control system (with noted advances made in the EIA review process and health and safety), WASA suffers from many constraints, which include lack of autonomy and insufficient financial resources. A substantial cause of inefficiency is represented by the organizational structure and personnel level, consequence of the politically-driven increase in state companies' employment of the past decade as well of the lack of effective performance-based systems. A restructuring effort is currently underway.

5.14. Given T&T's location just to the South of the Atlantic hurricane belt, it is susceptible to tropical storms; however the risk from hurricanes is low. There is also a persistent risk from seismic activity and it is subject to floods. It is unclear at this stage which standards and building codes are being applied during design and construction to ensure that the projects are designed to withstand potential natural disasters.

6. Environment and Social Due Diligence

6.1. The focus of the environmental and social due diligence (ESDD) will be on the potential environmental and social impacts and risks during all phases of the proposed program. The ESDD will especially focus on water and waste pollution control, compliance with effluent standards and noise standards, sludge management and disposal, proper decommissioning of existing WTTPs, and the EA's capacity to identify, mitigate and manage these impacts and risks.

6.2. More specifically, the ESDD will look at the following aspects:

i. Evaluation to confirm that the program has sufficiently defined project design details and environmental and social baseline information to assess potential impacts, risks, and mitigation requirements. This will be done through detailed assessment of the EIAs and corresponding CECs, to confirm that the Program's direct, indirect and cumulative

negative environmental and social impacts have been properly identified and evaluated, and that proper mitigation and management measures will be implemented. This assessment will identify any gaps and requirements for further analysis;

ii. Determination of wastewater effluent and treatment standards applicable to the program, to ensure that the impacts on surface and ground water is sufficiently mitigated and managed throughout construction and operation. In the case that they do not meet the international standards a justification of the selected standards will be provided;

iii. Determination of noise level standards applicable to the program. In the case that they do not meet the international standards a justification of the selected standards will be provided;

iv. Determination of the applicable building standards being applied to the program to ensure that the projects are designed to withstand potential natural disasters;

v. Assessment of compliance with applicable IDB environmental and social policies, including specifically the Environmental and Safeguard Compliance Policy (specifically B.9 and B.11), Access to Information Policy, Disaster Risk Management Policy;and, if appropriate, the Involuntary Resettlement Policy and Gender Equality in Development Policy.

vi. Assessment of the downstream impacts on receiving water bodies and the potential impacts on natural and critical natural habitats.

vii. Assessment of compliance status with the applicable environmental, social, health and safety, and labor legal requirements in T&T (e.g., laws, regulations, standards, permits, authorizations, applicable international treaties/conventions, etc.);

viii. Assessment of the process in place for land acquisition with respect to relocation or displacement of agricultural lands, and or formal or informal communities (if relevant);

ix. Assessment of the public consultations undertaken as part of the Projects' preparation, and plans and programs in place for continued consultation during construction and operation;

x. Evaluation of the proposed ESMP for the construction, operation and decommission of the wastewater treatment facilities (e.g. confirmation that the plans define the environmental and social control, management, and mitigation measures, monitoring programs, costs, schedule of implementation, designated responsibilities). Particular attention will be given to traffic management and monitoring plans; noise and water quality monitoring;

xi. Confirmation that adequate health and safety and contingency plans and procedures will be established and implemented for construction, operation and decommission (including sub-contractors) to address potential worker health and safety risks associated and project-related accidental events (e.g. spills, fires);

xii. Confirmation that the natural disaster risks have been adequately identified, and that proper mitigation is implemented in the design of the facilities and into the operational plans of the facilities;

xiii. Assessment of WASA's capacity to mitigate and monitor environmental, social, health and safety and labor aspects;

xiv. Evaluation of project-related information disclosure and public consultation activities that have been performed including confirmation that the participation processes of stakeholders has been adequately conducted and that the proposed future actions to provide adequate ongoing information disclosure and public consultation with the local population is in compliance with IDB policies.

6.3. As part of the ESDD process, the Bank will prepare an Environmental and Social Management Report (ESMR) presenting the conclusions of the ESDD for consideration by the Bank's Quality and Risk Review Committee. The ESMR will outline a series of recommendations and requirements for inclusion in the relevant legal documents.