

Border Environment Cooperation Commission Water and Wastewater Collection Project in Tecate, Baja California.

1. General Criteria

1.a Project Type

The City of Tecate, Baja California proposes the expansion of its drinking water and wastewater collection system.

This project belongs to BECC's *Wastewater Treatment* and *Domestic Water and Wastewater Hookups* Sectors.

1.b Project Category

The project belongs to the category of *Community Environmental Infrastructure Projects – Community-wide Impact*. The project will improve the quality of the water and wastewater collection services in the community of Tecate resulting in a positive impact to this community.

1.c Project Location and Community Profile

The city of Tecate is located in the northwest area of the state of Baja California, which borders the United States, and in particular the state of California. About 3.22% of the population of Baja California resides in the municipality. Its economy centers on the manufacture industry (38.84%), followed by the service industry (25.08%), which includes the tourism sector, followed by the retail (12.99%) and the construction industry (10.0 %).

Figure 1 (see below) depicts the location of the City of Tecate, Municipality of Tecate, in far northwest Baja California.

Demographics

According to the National Institute of Statistics, Geography and Data Processing (2000) (INEGI, for its initials in Spanish) and to the National Population Council (CONAPO for its initials in Spanish), the current population (2007) ¹ of the City of Tecate has been estimated at 97,960 inhabitants, with a growth rate of 5.2%. The average per capita income amounts to US\$ 6,750².

¹ Source: CONAPO – Individual Municipal Growth Projections for the 2006-2030 periods.

² Source: COCEF estimations based on statistics from CONAPO and the Comisión Nacional de Salarios Mínimos. Exchange Rate 11 pesos per dollar



Figure 1. Project Location - Tecate, Baja California.

Municipal Services

Water System

Tecate's drinking water system has three sources: 1) Colorado River aqueduct and its diversion structure to the "Las Auras" aqueduct that carries the water to the "Nopalera" water treatment plant with a capacity of 175 liter per second; 2) The "El Carrizo" dam and the diversion structure to the aqueduct "Carrizo-Cuchuma" that carries the water to the Cuchuma water treatment plant with capacity of 100 l/s; and 3) 30 deep wells; of which only 15 wells are in operation due to low water table levels as a result of lack of rain, all together provide a flow of 78 l/s. The water distribution system consists of 178 km with pipe diameters ranging up to 20-in. and with 97 km of aqueducts and interconnections. Potable water reaches 97% of the city's population. There is a regulation capacity of 16,140 m³ and there are a total of 24,593 water connections.

Sewer System

The Tecate's wastewater collection system covers 90% of the sanitary sewer needs. The system includes laterals, manholes, and collectors. The wastewater discharges are routed through a system of collectors and lift stations to the existing wastewater treatment plant. There are 22 805 hook-ups connected to the wastewater collection system.

Wastewater Treatment

Domestic sewage is treated at the wastewater treatment plant located in the sector "Rincón Tecate I". The WWTP has a 200 l/s capacity, and it currently treats about 150 l/s. The treated effluent is discharged into the Tecate River. The secondary treatment process consists of a biomass biological process including high-rate sprinkling filters.

Pavement and Solid Waste

The community of Tecate has solid waste collection coverage of 100%. According to the Department of Public Works of Tecate, the pavement coverage is of 60%.

1.d Legal Authority

The project sponsor is the Public Services State Commission of Tecate (CESPTe for its initials in Spanish). The CESPTe was created May 20 of 1992 under state decree No. 134. The legal authority of CESPTe is described in the Baja California Law for State Service Commissions³. The CESPTe is an agency with its own assets, liabilities and legal personality, and has the authority to provide water and wastewater collections services to the community, including the design and construction of urban water infrastructure projects.

The project complies with international agreements between Mexico and the United States, targeted at improving the environment and the quality of life of border residents. There are six bilateral agreements between both countries related to air quality, water quality, land protection and pollution control, and all of them have been taken into account since the onset of the project. These agreements are:

- 1889 International Boundary Convention
- 1944 Water Treaty
- 1983 La Paz Agreement, or Border Environmental Agreement
- 1990 Integrated Border Environmental Plan (IBEP)
- 1994 North American Free Trade Agreement (NAFTA)
- Border 2012 Program

The project complies with the spirit of all these agreements, and all of them have been considered since the onset of the project.

1.e Project Summary

Project Description

The Project consists of the expansion of the water distribution and wastewater collection systems for the east and southwest sectors of the city of Tecate, Baja California. The water distribution system will consist of an 8.40 km network, a pump station (average flow of 27.7 l/s), 2.2-km force main and a tank with 1,000 m³ storage/regulation capacity. The wastewater collection system expansion will consist of a 12.64 km of laterals, a 300-mm diameter and 2.25 km long collector; a lift station, and a force main that will conduct the wastewater to Tecate's wastewater treatment plant. The following chart describes the areas to be included in the project herein:

³ <http://www.congresobc.gob.mx/legislacion/estatal/>

Chart 1. Water and wastewater projects to be developed in Tecate B.C

Project Components	Project Type Water-W Wastewater- WW	Water/ Sewer Meters)	Number of Connections	Benefited Population	Estimated Cost (Pesos)
Fracc. El Escorial	W	5,400	524	2,148	3,404,811
Fracc. Rincón Tecate VI	W	2,973	206	845	1,384,342
Col. San José Sur	WW	2,649	25	103	4,962,824
Fracc. Rincón Tecate VI	WW	2,289	206	845	2,433,252
Colector y Emisor Poniente	WW	1,989	2231	9957	5,472,833
Fracc. El Mirador	WW	4,019	729	2,989	8,715,591
Fracc. La Sierra	WW	3,678	493	2,021	4,451,273

The Project cost will be \$ 30.83 million pesos.

Project Justification

The expansion of the drinking water system will benefit the population residing at the west side of the city since it lacks the service and does not have a reliable and safe source to fulfill its basic water needs. If the project does not take place, the people will continue to receive a limited water ration through water trucks, and because of the lack of tap water, the population will continue to be exposed to health risks.

With respect to the proposed sewer improvements, these lines will collect wastewater, thus reducing the potential contact that the people could have with sewage and vectors carrying diseases. Additionally, the risk of contaminating the aquifer and surface water bodies would be significantly reduced by eliminating latrines and cesspools. The collected wastewater would be treated at the existing WWTP which has enough capacity to treat the discharges from the project area. The treated effluent will be discharged to the Tecate River, hence contributing an environmental and human health benefit to the residents of Tecate.

Important issues for Certification:

The Project falls within the BECC's priority sectors and complies with General Criteria.

Pendent issues:

None.

2. Health and Environment

2.a Compliance with Applicable Environmental Laws and Regulations

The proposed works will be constructed according to the National Water Commission (CONAGUA) regulations and guidelines. Additionally, conservation areas are not anticipated to be affected by the project, the CESPTe and CONAGUA will supervise the project implementation according to the established guidelines and best management practices.

Due to the Project will be constructed along existing right-of-ways and urban areas, it will not be necessary to consult the National Institute of Anthropology and History (INAH for its initials in Spanish) regarding impacts to cultural resources, archeological sites and historical monuments.

2.b Human Health and Environmental Impacts

Human Health Impacts

The city of Tecate is located in the northwest region of Baja California, bounded by the United States to the north. Subdivisions such as Rincón Tecate VI and El Escorial, lack running potable water, whereas subdivisions such as El Mirador, La Sierrita, Villas del Yaqui, Jardines Del Río and San José Sur have, have not had sanitary sewer service for years. This has constituted a human health and environment risk. The population that is not hooked-up to the wastewater collection system, disposes of their wastewater by discharging it into latrines and cesspools. The rest of the wastewater flows is being discharged onto streets, arroyos or washes, putting the population at health risk.

The lack of running water at the aforementioned subdivisions represents a human health risk because the population without the service receives its water in drums and other receptacles. The lack of hygiene when handling this type of receptacles, favors the proliferation of diseases and pathogens among the inhabitants of these subdivisions.

The public health because of an improved water system will be impacted positively, mainly because water of sound quality will be safely delivered to the residents, thereby avoiding health risks, and ensuring that the population has the water quality and quantity for their wellbeing.

The project unserved areas' wastewater is currently disposed untreated to latrines and cesspools. The lack of wastewater collection for half of the population has resulted in sewer overflows and runoffs creating a risk for the transmission of diseases due to the residents' contact with wastewater. The purpose of this project is to address contamination risks to existing public health and groundwater and to prevent risks inherent to inappropriate wastewater management.

The development of this project will help address these issues and improve public health conditions as follows:

- (1) By improving the water distribution system, the risks of transmitting infectious diseases by the inadequate handling of potable water will be reduced.
- (2) Human health conditions will be improved by reducing or eliminating wastewater overflows and the risk of human contact with sewage as a result of an improved wastewater collection system.
- (3) Reduced potential for soil and aquifer contamination that may result from the inadequate use of latrines and septic tanks in areas that lack wastewater collection service, as well as from the use of poorly maintained lines and the discharge of raw wastewater onto arroyos or washes

Human Health Information

Infections and gastrointestinal diseases constitute the most frequent cases of human disease in the zone, after the respiratory infections, according to Tecate's illnesses control data base. Human health statistics in the Tecate zone reveal that there is a relationship between the inadequate handling and disposal of wastewater and the incidence of gastrointestinal diseases in the study zone. Table 2 shows the high incidence of gastrointestinal diseases in the study zone.

The gastrointestinal diseases are associated with the inadequate disposal of wastewater and the supply of contaminated water. The helmitiasis, Amebiasis, and salmonella are frequently caused by poor wastewater management, lack of infrastructure, and contaminated water and food, and are conditions common to underprivileged areas.

Table 1. Number of cases associated with poor handling of contaminated water in the City of Tecate B.C.

Cause	Year			
	2003	2004	2005	2006
Intestinal illnesses (Other organisms)	2,573	3,404	4,276	3,311
Helmintiasis			216	148
Amebiasis		144	180	95

Source: SUIVE Department of Epidemiology of Baja California

The most common organisms or parasites found in untreated wastewater include: *E. coli* (*Escherichia coli*), cholera (*Vibrio cholerae*), hepatitis A (*Enterovirus ssp*), *Giardia* (*Giardia lamblia*), *Cryptosporidium* (*Cryptosporidium parvum*), and helminth eggs. An individual may become ill after drinking water that has been contaminated with these organisms; eating uncooked foods that have been in contact with contaminated water; or having bad hygiene habits that contribute to the dissemination of diseases by direct or indirect human contact.

Environmental Impacts

The environmental impact caused by the Project will be in general positive, for it will provide potable water and sewer to subdivisions that lack these services, reducing the health risks associated with the inadequate handling of water and infiltration of raw wastewater due to the use of latrines and cesspools. Further, the improvements will be constructed in areas previously affected by human activities.

The project implementation will reduce the disposal of untreated discharges and infiltration, produce by the existing unregulated systems from the project area, into the Tecate River.

Minor impacts to the environment will be generated during the construction phase produced by the installation of water and sewer lines. These impacts include particulate matter emissions, gases generated by the construction equipment, temporary obstruction of streets, and potential hazardous conditions for workers, residents and vehicles.

To reduce the environmental impacts during the construction phase, mitigation measures will be taken such as watering roads to reduce dust, maintaining vehicles to reduce emissions, setting up precautionary signs, installing portable restrooms, etc.

Regarding the operational phase, negative impacts are not anticipated as long as the proposed activities are carried out as specified in the final design and stipulated in the environmental clearance process as specified in the ruling of the Environmental Impact Assessment.

Transboundary Impacts

No negative Transboundary impacts are expected by the implementation of the water distribution and wastewater collection project; on the contrary, a positive effect is expected on the US side mainly because untreated wastewater that is discharged to the Tecate river will now be sent to the wastewater treatment plant in Tecate. Additionally, the risk of wastewater flow infiltration into the shared aquifer will be reduced and the risk for the US border people of contracting or spreading waterborne diseases will be reduced as well.

Formal Environmental Authorization

On February 21, 2007, CESPTe presented the Environmental Impact Statement for the Constriction of Water and Wastewater Improvements Projects for the City of Tecate, B.C. to the Baja California Secretariat of Environment. This agency issued its resolution on May 17, 2007, as annotated in an official document identified as SPA-TIJ 821-07, only after it was verified that all requisites of the Mexican environmental process had been fulfilled.

Important issues for Certification:

The project solves a significant human health and environmental problem.
The project has the required environmental clearance.

Pendent issues:

None.

3. Technical Feasibility

3.a Technical Aspects

Project Development Requirements

The sanitary sewer and water designs were performed in accordance with the technical specifications of the Drinking Water, Sewer and Wastewater Treatment Manual of CONAGUA Technical Division, the Mexican Official Norms NOM-001-CONAGUA-1995 titled “Sanitary Sewer System – Tightness Specifications” and NOM-013-CONAGUA-2000 “Drinking Water Distribution System – Tightness Specifications and Testing Methods” and the “Technical Norms for Sanitary Sewer System Projects”, of the State Water Commission of the state of Baja California.

Potable Water

The drinking water project was designed in strict compliance with CONAGUA regulations and in accordance with the preferred alternative from alternative analysis performed. The water distribution project will be comprised of 4.70 Km of pipe. The following projects, need it to supply drinking water to the proposed network, are considered infrastructure works; they will be build by the CESPTe and are not eligible for certification: for the a booster station (average flow of 27.7 l/s), a transmission line with a length of 2.2 Km, and a storage tank with a capacity of 1,000 m³.

Within the drinking water supply project for the El Escorial subdivision, 2,148 people will benefit, with a supply of about 250 l/capita/day; the subdivision is located in a 24-hectare tract of land, where 5,400 lineal meters of PVC pipe ranging diameters from 100 to 152 mm (4 in. to 6 in.) will be installed. For the Rincón Tecate VI subdivision, 845 people will benefit, with a supply of 250 l/capita/d; the subdivision is located within a 7-hectare tract of land, where 2,973 lineal meters of PVC pipe with a diameter of 100 mm (4-in.) will include. The length and diameters for the distribution network are noted in Table 3.

Table 3. Pipe Dimensions for the Tecate Water Network.

Water Distribution System Expansion in Tecate					
Component	Length (ml) Diameter (mm)		Sectorization Valves	Avg. Flow (lps)	Connections
	Fracc. El Escorial	3659 ml			
	1741 ml	152 mm			
Fracc. Rincón Tecate IV	2973 ml	100 mm	4	2.45	206
TOTALS	6632 ml	100 mm	17	8.67	730
	1741 ml	150 mm			

For the west zone, wherein the Rincón Tecate VI and El Escorial subdivisions are located, a 1000 m³ storage and regulation tank will be constructed in the highest elevation of the Vista Hermosa subdivision. This tank will be pump-fed and by gravity it will supply water to the aforementioned subdivisions. The aforementioned structures are not considered to be part of this project. The tank will draw its water from the Cuchuma-Carrizo water transmission line, which comes from the Cuchuma Water Treatment Plant. The tank will also serve the Acosta (Ecochuma), Vista Hermosa and La Joya distribution systems, which are also located in the western part of the city.

Sewer

Similarly to the previous designs, the sewer project was developed in strict compliance with the norms of CONAGUA. The design of the sewer system was developed in accordance with the alternative analysis and following the preferred option. The per capita sewage flow will be 200 l/day. Although the site topography of the project area is irregular and undulating it provided some chance to configure a collection system by gravity; but for the best part it was not possible to configure the entire system by gravity. For San José del Sur and Fraccionamiento La Sierra subdivisions, located at the east section of the city, due to the topography, the installation of two lift stations and pressure lines will be required to eliminate the flow, which will be discharged into the Descanso collector. For the Mirador subdivision, also located on the east, the construction of a lift station and pressurized line will be necessary to convey the sewage flows to a manhole, and subsequently to be sent by gravity to the East collector. The Rincon Tecate IV, locate on the west side, will not require ancillary structures to convey its sewage flows before those flows reach the West Collector. The lengths, diameters, manholes and capacities are presented in Table 4.

Table 4. Design data for the proposed sewer improvements for Tecate

Sewer Network for Tecate B.C.					
Component	Length (ml) Diameter (mm)		Manholes	Avg. flow(lps)	Connections
	Col. San José Sur	1745 ml			
	836 ml	254 mm			
Fracc. La Sierra	3678 ml	200 mm	60	4.7	493
Fracc. Rincón Tecate	2289 ml	200 mm	35	1.7	206
Fracc. El Mirador	4019 ml	200 mm	74	6.92	729
Totals	11731 ml	200 mm	205	13.56	1,453
	836 ml	254 mm			

Collectors

The proposed Tecate sewer improvements for the west sector, requires the construction of a collector that will convey all the residential flows. The West Collector will benefit a population of 9,557 people, and was designed to collect sewage flows from the subdivisions located at the west end of the city. The discharges will be emptied to this 300-mm diameter, 261-m long collector and by gravity it will send the flows to a lift station and then conveyed to the WWTP.

For the subdivisions located on the east side of town, the main infrastructure components are already in place. But, it will require that some ancillary structures be constructed, these include pump stations, lift stations, and force mains to elevate sewage flows located below the minimum piezometric elevation. The length, diameter, manholes and capacity are presented in Table 5.

Table 5. Design data for the West Collector pipe

Collectors for Tecate					
Component	Length (ml) Diameter (mm)		Manholes	Avg. Flow (lps)	Connections
West Collector	261 ml	300 mm	8	22.1	2,331

Lift Stations and Force Mains

The site topography makes it necessary to include lift stations and force mains to elevate the sewage flows and increase head. The lift station wet wells, designed for a residence time of less than 25 minutes to avoid septic conditions, will provide the necessary head to lift the maximum peak wastewater flows and will have an emergency (backup) system to protect the infrastructure for whenever there are power outages. The ancillary structures include pretreatment, influent grit removal and screen to eliminate medium and large solids, as well as grit present in the wastewater flows, control room, power plant, dry and wet wells, and backup pump station equipment (1+1 in case of power outage or failure). The pumps operate in sequence, and will work depending

Table 6. Lift Stations and Force Main General Data

Lift Stations and Force Mains of Tecate				
Component	Avg. Flow (l/s)	Length (ml) Diameter (mm)	Connections	Benefited Population
Lift Station Poniente	80 l/s	N/A	2,331	9,557
Línea Poniente		1989 ml 300mm		
Lift Station El Mirador	18 l/s	N/A	445	1,825
Sewer Line El Mirador		1404 ml 254 mm		
Lift Station San José Sur	880 l/s	N/A	84,550	338,200
Sewer Line San José Sur		18470 ml 900 mm		
Lift Station La Sierra	880 l/s	N/A	84,550	338,200
Sewer Line La Sierra		450 ml 760 mm		

Appropriate Technology

Water System

In order to have a sound and efficient water distribution system, several options were evaluated to come up with the best alternative. The analyzed alternatives consisted of the following:

- a) **No Action.** Under this alternative, the aforementioned subdivisions would continue to receive water via water trucks, running the risk of distributing contaminated water due to poor handling practices and consequently increasing the likelihood of gastrointestinal diseases. Thus, this alternative was deemed not viable.
- b) **Expand the drinking water system of the subdivisions.** This alternative was analyzed and deemed to be the best alternative with the least annualized cost, including the O&M costs, in addition to the fact that the lines will be constructed on already affected areas. In this case, water will be supplied via a 2.2-Km line that will run from the Carrizo-Cuchumá aqueduct to the west zone. The alternative contemplates the construction of a pump station with a flow of 40 l/s and a storage tank with a capacity of 1000 m³, for distribution throughout the west side.
- c) **Expand the water distribution system with a different type of pipe arrangement.** This alternative was analyzed because it has the same features than the previous one but was considered not viable because of its initial cost and a larger O&M expense. It was also not selected because it required the acquisition of land and therefore the acquisition of right-of-way and easements, as well as affecting undisturbed lands without public access. this alternative will require; that raw water is supply from a diversion point at the San Luis Río Colorado-Tijuana aqueduct, the construction of a water treatment plant, a 7-Km transmission line, a pump station and a storage tank.

Sewer and Wastewater Treatment System

In order to have an adequate sanitary sewer system that operates in an efficient manner, a concept was developed to evaluate multiple technical alternatives. The analyzed alternatives consisted basically of studying the following:

- d) **No Action.** Because of implications with the environment, human health and social issues, this alternative was discarded from the beginning, given that the current population would continue to discharge raw sewage into latrines and poorly designed cesspools, which tend to create human health risks due to surface runoff of sewage or potential contamination of the shallow aquifer.
- e) **Construct the system such that it discharges onto two treatment locations.** This alternative was analyzed and discarded, mainly because it implies the construction of a new plant, even though most of the sewer system would operate by gravity, it would require that some new lift stations, force mains and collectors be constructed to convey the flows to the new WWTP. Additionally, the higher O&M costs associated with the new plant, coupled with the need to acquire land for the construction of lift stations and force mains for those areas where gravity would not work, proved the alternative unfeasible. Moreover, the acquisition of land, right-of-way and easements would involve undisturbed areas more sensitive to impacts from the construction and operation activities.
- f) **Construct the sewer system such that it will discharge at the existing wastewater treatment plant.** This option was analyzed and was considered to be the most adequate because, even though it includes the construction of several lift stations and force mains, its operation and capital costs are less than the cost associated with building, maintaining and operating a new plant as proposed by the previous alternative. Additionally, all construction will take place in an urban setting on previously disturbed areas.

Treatment

The existing WWTP has enough treatment capacity to handle and treat the additional discharges from the proposed project area. The effluent will meet the discharge quality requirements as established by the Mexican Official Norm NOM-001-SEMARNAT-1996. Concerning the handling and disposal of the sludge produced by the WWTP operation it meets the requirements of the Mexican Official Norm NOM-004-SEMARNAT-2002.

R-O-W and Land Acquisition Requirements

Since the sewer and water lines, as well as lift stations will be constructed within the urban area and there are ROW there will be no need to acquire ROW or land. The land for lift stations and the pump station was previously acquired by the municipality. The land for the storage tank was acquired by CESPTe. BECC has documentation as proof of the land ownership.

Tasks and Schedule

The Project certification comprises all of the previously described elements. The sanitary sewer and water distribution system construction process is anticipated to commence initiated in November 2007. The Water and Sewer system construction is expected to last 14 months and will take place during the 2007-2008 periods. CESPTe has initiated the development of the sewer project and the pressurized transmission line. Figure 4 shows the project schedule.

Table 7.Project Construction Schedule

Water and Sewer System Expansion Project for Tecate																																										
Construction Schedule																																										
Concept	2007						2008												2009																							
	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December												
El Escorial (AP)																																										
Rincon Tecate (AP)																																										
Colector/Emisor Poniente																																										
El Mirador (AR)																																										
Rincon Tecate (AR)																																										
La Sierra (AR)																																										
San Jose Sur (AR)																																										

Technical Process

The Project construction will be performed accordingly and based on the approved final designs. All pipes and appurtenances associated with the project shall guarantee compliance with existing standards and testing certifications at the minimum. These components shall have the approval or certification from the appropriate institutions. The approval shall specified concurrence with the customary specifications and testing methods as established by the corresponding Official Mexican Standards. Based on the previous, one of the main properties a water and sewer shall meet is airtightness to prevent leakage and cross-contamination. Both projects will meet the following Official Mexican Standards: NOM-001-CONAGUA-1995 “ Sewer System-Airtightness Specifications” and NOM-013-CONAGUA-2000 “ Water Distribution System-Airtightness Specifications and Testing Methods”.

3.b Management and Operation

Project Management

The Project will be manager and administrated by CESPTe.

Operation and Maintenance

Organization

CESPTe, as a decentralized agency of the state of Baja California, is governed by a Board of Directors headed by the state’s executive power and is composed of various government and public-at-large members, which has the mission to providing potable water and sewer to the city of Tecate. The CESPTe has the technical capacity and skilled personnel to operate and maintain the water and sewer infrastructure. The Water and Wastewater Treatment Department includes the sewage division that handles the operation of the sewer and wastewater treatment plant. Furthermore, the division has a section that specializes in maintaining the sewer network, pump station and force mains. CESPTe also has skilled personnel that operate and maintain the WWTP.

Operation and Maintenance

The O&M plan that is included in the project design, addresses the main activities for conducting preventive maintenance on the sewer and water distribution systems. CESPTe will be responsible for the

O&M program. The water and sewer infrastructure preventive maintenance has the primary objective of providing a useful tool to carry out the activities associated with controlling effluent quality, sound O&M practices and to prevent failures of the system. By performing the proper maintenance as a scheduled task to the pumps, gates, screens, valves and all other system structures, the operator will ensure the proper operation and performance of the system will be achieved.

Pre-Treatment Program

CESPTe has expressed that they will comply with the Mexican Official Norm NOM-002-ECOL-1996, which establishes the maximum allowable limits for wastewater discharges into the municipal sewer system. CESPTe, with support from the Municipal Ecology Department, will be in charge of monitoring compliance of this norm. In light that the project will be located within residential developments, no additional pre-treatment is anticipated beyond the one proposed for the efficient operation of the system in accordance with the O&M Plan.

Permits, Licensees, and other Regulatory Licenses

CESPTe has the appropriate permits and water rights from CONAGUA to discharge wastewater and supply the necessary allotment to the proposed project areas, similarly it has the proper environmental authorizations for the development of the projects. The water and sewer system expansion final designs have been reviewed by BECC, CESPTe and the North American Development Bank (NADB), and have been validated by CONAGUA.

Important Issues for Certification:

The project has been reviewed by BECC, CESPTe and the NADB, and has been validated by CONAGUA

Pending Issues:

None.

4. Financial Feasibility

4.a Financial Feasibility

The North American Development Bank (NADB) reviewed the financial information presented by the project's sponsor, Comisión Estatal de Servicios Públicos de Tecate, Baja California (CESPTE), and based on it determined that the financial and structural capacity proposed is adequate. The information presented and the financial analysis include, among other items:

- i) Historic and pro forma financial statements;
- ii) Financial structure of the project;
- iii) Investment budget;
- iv) Historic and pro forma operation and maintenance budget; and
- v) Economic and demographic information from the project area.

A detailed analysis of the project's financial information is included as a proposal for credit that will be submitted to the NADB Board for its authorization. The following is a summary of the financial analysis.

The total cost of the project is estimated at MX\$30.82 million, including costs for supervision and value-added-tax.

Item	Amount (Pesos)
Collector, Force Main, Sewer Network, and Water Distribution Network.	30,824,926
TOTAL	30,824,926

The CESPTE y the NADB agreed that the financial structure will allow the implementation of the project, as further indicated:

Financial Source	Type	Amount (Pesos)	%
CESPTE-State-Federal	NR ⁴ /Grant	20,654,926	67.00
NADB	Loan	10,170,000	33.00
TOTAL		30,824,926	100.00

⁴ Net Revenue

The CESPTE has a professional financial and technical administration; a solid financial situation is reflected, in general, by its level of revenue and control for the last four fiscal years. Additionally, the NADB credit will not affect its financial situation.

4.b Fee/Rate Model

Due to the characteristics of the project, the CESPTE will not require the implementation of a fee model for the project. Currently, the CESPTE has an adequate rate scheme that provides sufficient income to cover its operation and maintenance costs and the debt service.

4.c Project Administration

The project will be managed by the CESPTE, who has the adequate staff to manage the proposed infrastructure and address any potential emergency related to the operation and maintenance of the project, once it starts operating.

Important Issues for Certification:

The project has been reviewed and was determined that is financial feasible.

Pending Issues:

None.

5. Community Participation

5.a Local Steering Committee

The Comprehensive Community Participation Plan developed by the Local Steering Committee was approved by the BECC on August 11, 2006. The Local Steering Committee was responsible for preparing an outreach program, including informing the resident of the benefits resulting from the project, as well as the associated costs and economic impacts for the community.

The Local Steering Committee was formally established on June 7, 2006 at a meeting held at the CESPTe Facilities at which, representatives of the community assisted. A Board of Directors was elected, and is integrated by the following individuals:

Chairman of the Steering Committee: C. Guillermo Romero Ibarrola, resident of the community

Vice-President Steering Committee: C. Alejandro Pérez Garcia, resident of the community

Public Meeting Official: Gloria Adriana Cervantes Moreno, Commercial sub director CESPTE.

Outreach Officials:

- C. Lourdes Garcia Rocha
- C. Joel A. Villalobos
- C. Mayela Ramírez Gómez
- C. Carlos A. Legi Domínguez

Technical Advisors:

- Ing. Raúl Vázquez Prieto
- Lic. Pedro Camarena Rodríguez

5.b Public Access to Project Information

Public Notice

An invitation to the First Public Meeting, scheduled to be held on October 5, 2007, was published on September 5, 2007 in the “El Mexicano” newspaper. A notice for the second public meeting scheduled for September 20, 2007 was also published on September 12, 2007 in the “El Mexicano” newspaper.

Additional Outreach Activities

The Local Steering committee in coordination with the CESPTe prepared written information about the project. Informative Brochures were sent to the consumers attached to the periodical water bill. Additionally documents were distributed in a variety of community centers such parks and shopping centers. Public notices were also installed in different areas of the city in order to inform about the project and invite the public to the meetings. Project information was available with the local steering committee and through the utility’s web page. Twenty two Information meetings were held with local residents in anticipation of BECC public meetings.

Public Meetings

First Public Meeting

The meeting took place on October 5 2006 at the Tecate's auditorium COBAH. The meeting started at 6:00 PM and was attended by the mayor of Tecate, Joaquin Sandoval Millan, the former mayor Constantino Leon, municipal government board members Miguel Carpio, Oscar Pulido, Felipe de Jesús Villalobos and Serafín Ferreira, the CESPTe Director Patricia Ramirez, state delegates Lucina Rodriguez and members of the Local Steering Committee. Approximately 300 residents assisted to the meeting. During the meeting 277 surveys were applied from which 99% confirmed that they understood the project and supported it.

Second Public Meeting

This meeting is programmed to be held on September 20, 2007.

5.c Final Public Participation Report

The Local Steering Committee and the project sponsor will prepare the "Final Public Participation Report" to demonstrate that the proposed objectives were fully met according to BECC's criteria. This document will be submitted once the second public meeting is held.

Important Aspects for Certification:

There is overwhelming community support for the project, and the corresponding information to demonstrate public support is available.

Pending Issues:

- Second public meeting.
- Final Public Participation Report

6. Sustainable Development

6.a Institutional and Human Capacity Building

Actions within the scope of the project that contribute to institutional and human capacity building at the State Commission of Public Services for Tecate (CESPTe) are the following:

- Improving the utility's necessary wastewater collection and treatment infrastructure (wastewater collection lines).
- Operating a wastewater collection system that meets applicable state and federal regulations.
- Provide training to operating staff.
- Optimize the use of water resources and create environmental stewardship in the community

CESPTe will provide basic technical training to the staff for the operation and maintenance of the new infrastructure that will be built as a result of the project's implementation.

6.b Conformance with Applicable Local, State, and Regional Laws and Regulations and Conservation and Development Plans

As referenced in Chapter 2, the project complied with all laws and regulations applicable to the subject. In addition, the project supplements the actions set forth in the Master Plan for Improvements to Water, Wastewater and Collection Services in Tecate B.C., which include the need to develop basic sanitary infrastructure works for unserved areas in Tecate. The proposed project complements the actions considered in the 2005-2007 Municipal Development Plan, which proposes to improve wastewater collection coverage and create new infrastructure.

At the state level, the project meets the objectives and lines of actions set forth by the 2003-2009 Development Plan for the State of Sonora, which proposes to develop appropriate wastewater treatment facilities and infrastructure, and a more efficient enforcement of environmental rules and regulations to address water management issues with a long-term vision and financially viable, community endorsed, and environmentally sustainable alternatives.

At the federal level, the project meets all applicable rules and regulations regarding wastewater collection, treatment, and disposal., it also includes action lines and works contained in the National Hydraulic Plan (PNH), which intends to promote actions to reduce pollution in binational watersheds.

The project adheres to the US-Mexico Border 2012 Environmental Program by meeting Goal 1 (Reducing water contamination) and Objectives 1 (Promoting an increase in the number of household connections to wastewater collection and treatment services) and 4 (Promoting improved water utility efficiency). One of the program's guiding principles is reducing major risks to public health and conserving and restoring the natural environment.

6.c Natural Resource Conservation

The project contributes to reduce environmental deterioration by expanding existing wastewater collection lines and providing hookups to households that currently lack this service. Wastewater will be collected and conveyed to the WWTP to improve its quality, thus reducing aquifer contamination and human health risks resulting from raw wastewater discharges to streams or agricultural drains. The utility also proposes to reuse the treated effluent for irrigation in parks and fields.

The project also includes the implementation of sustainable building practices that will be part of the specifications of the construction process.

6.d Community Development

The completion of this project is crucial to the development of the community, as it will promote a harmonious development in areas that currently lack wastewater collection and treatment services. The expansion of the wastewater collection system will promote the development of the local community by reducing contamination caused by untreated wastewater runoff, thus improving the quality of life.

Important Aspects for Certification:

The project meets all applicable Sustainable Development principles.

Pending Issues:

None.

- "Estrategia de Gran Visión para el Abastecimiento y Manejo del Agua en las ciudades y Cuencas de la Frontera Norte en el Período 1999-2025", CONAGUA, December 1999.
- "Anteproyecto de Alcantarillado y Saneamiento Zona Oeste de Tecate, Baja California", Comisión Estatal de Servicios Públicos de Tecate, March 2006.
- "Proyecto Ejecutivo de Alcantarillado y Saneamiento Zona Oeste de Tecate, Baja California" Comisión Estatal de Servicios Públicos de Tecate, April 2007.