

## Border Environment Cooperation Commission

### Wastewater Collection and Treatment Project in Colonia Esperanza, Chihuahua.

#### 1. General Criteria

##### 1.a Project Type

The project consists of the construction of the wastewater collection system (WWCS) and the construction of a wastewater treatment plant based on oxidations lagoons for the community of Colonia Esperanza, Municipality of Praxedis G. Guerrero, Chihuahua.

This project belongs to BECC's *Wastewater Treatment Sector* as well as in the *Domestic Water and Wastewater Hookups Sector*.

##### 1.b Project Categories

The project category corresponds to *Community Environmental Infrastructure Projects – Community-wide Impacts*. The project will improve wastewater collection and treatment quality service of Colonia Esperanza, resulting in a positive impact on the community.

##### 1.c Project Location and Community Profile

The State of Chihuahua is located in the northern part of the Republic of Mexico. It neighbors the United States of America to the north. Colonia Esperanza is located in the northeastern end of the state of Chihuahua in the Municipality of Praxedis G. Guerrero. It is one of the 23 communities found in the area known as the Juarez Valley. It is a traditionally agricultural community, although, due to its proximity with Ciudad Juarez, a significant portion of its residents are currently employed at *maquiladoras* established in the city.

Figure No. 1 shows the location of Colonia Esperanza, Municipality of Praxedis G. Guerrero.



Figure 1. Location of Colonia Esperanza, Municipality of Praxedis G. Guerrero.

## **Demographics**

Population projections prepared for the development of the Final Design for the Improvements to the Wastewater Collection and Treatment Systems in Colonia Esperanza, Municipality of Praxedis G. Guerrero, Chihuahua, were based on *National Institute of Statistics Geography and Informatics* (INEGI, for its initial in Spanish) Census and data from the *National Population Council* (CONAPO, for its initial in Spanish). The current population (2007) has been estimated to be 2,097 inhabitants, with an average 0.69% annual growth rate. The monthly median per-capita income amounts to \$3,252 Mexican pesos<sup>1</sup>.

## **Environmental Services**

### **Existing Drinking Water System**

The drinking water system is supplied by a well 230 ft deep that is located at the hills of the community; the distribution line is 2.8 mi long and 4 in diameter and supplies an elevated tank at the center of the community, to which the distributing system is connected. It was estimated the drinking water service reaches 95% of the community. Neither macro-metering nor micro-metering are in existence. The total number of users in the community is 455 of which 450 are domestic and 5 are commercial.

### **Existing Wastewater Collection and Treatment System**

Colonia Esperanza does not have a wastewater collection. Local residents dispose of wastewater using latrines and septic tanks, with the associated public health and groundwater contamination risks.

The proposed wastewater collection system has been designed so that the residual water can be conducted by gravity to a lift station from which water can be conducted to the proposed treatment plant.

### **Wastewater Treatment**

Wastewater treatment is non-existent.

## **1.d Legal Authority**

The project sponsor is the state utility, *Junta Central de Agua y Saneamiento del Estado de Chihuahua* (JCAS), in coordination with the local utility, *Junta Rural de Agua y Saneamiento* (JRAS) of Colonia Esperanza, Chihuahua. The legal authority of the JRAS is established in the 1564 Administrative Code of Chihuahua<sup>2</sup>. The JRAS has the jurisdiction to provide drinking water and collection services to the municipality, while the JCAS is the regulatory entity in charge of developing projects related to improving the infrastructure of these services for Colonia Esperanza.

The project falls within the scope of agreements targeted at improving the environment and the quality of life of border residents, which have been signed by Mexico and the United States. The United States and Mexico have signed six major bilateral agreements related to air, water, land protection, and pollution control issues. These include:

- 1889 International Boundary Convention
- 1944 Water Treaty

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<sup>1</sup> Fuente: Estimación del NADB basada en estadísticas de INEGI y la Comisión Nacional de Salarios Mínimos.

<sup>2</sup> <http://info4.juridicas.unam.mx/adproju/leg/9/174/default.htm?s=>

- 1983 La Paz Agreement, or Border Environment 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

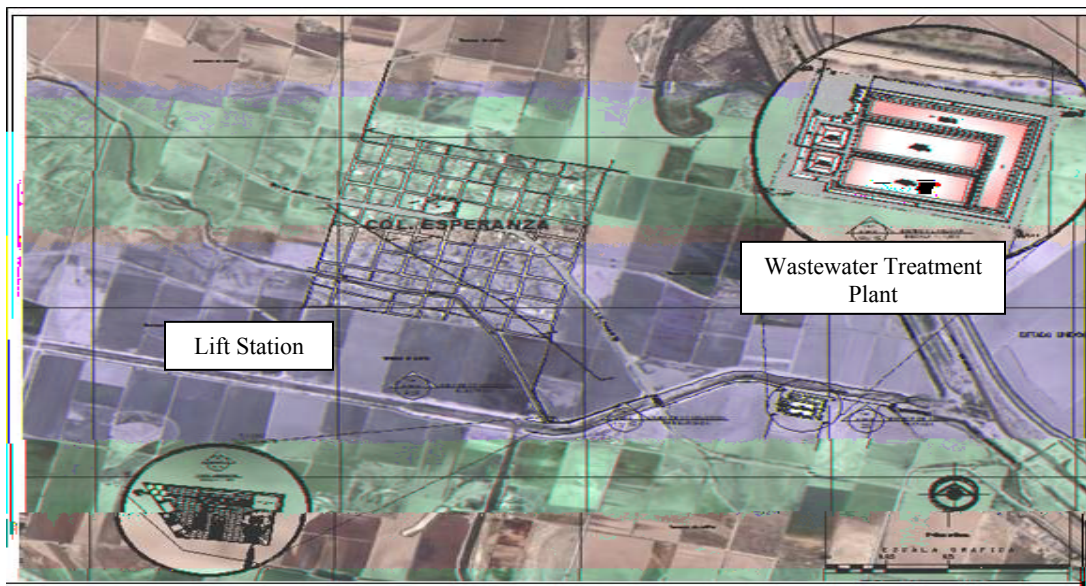
### Project Description

The project consists of the construction of the wastewater collection system and a lagoon-based wastewater treatment plant for the community of Colonia Esperanza.

The project includes the following components:

- Wastewater collection system.
  - 53,927 ft of 8 in diameter wastewater collection lines.
  - 4,321 ft of 10 in diameter wastewater collection lines.
  - 7,848 ft of 15 in diameter wastewater collection lines.
  - 265 manholes
  - 455 household connections
- Construction of a lift station and an force main to convey wastewater to the proposed WWTP construction site.
- Construction of a 0.1 MGD Wastewater Treatment Plant for the community of Colonia Esperanza.

The cost of the wastewater collection and treatment project is US \$2.18 million. Figure 2 shows the location of the wastewater treatment plant and lift station with pretreatment.



**Figure 2.** Location of the wastewater treatment plant and lift station with pretreatment.

**Project Justification**

The lack of wastewater collection in the community forces residents to dispose of wastewater by using latrines and cesspools which, due to the relatively shallow water tables and the type of soil, result in wastewater overflows and cause health and aquifer contamination risks.

The proposed wastewater collection project will help collect wastewater throughout the community, reducing thus the potential for human contact with raw wastewater and organisms that are vectors for diseases. In addition, the project will reduce the potential for groundwater and surface water contamination by eliminating the use of latrines, septic tanks, and wastewater discharges to open-air drains. The effluent from the proposed wastewater treatment plant will be discharged to agricultural drains and eventually to the Rio Grande, creating an environmental and human health benefit for residents of the Juarez Valley and adjacent areas in the United States.

This project has been evaluated as category one during the U.S. Environmental Protection Agency (EPA) funding prioritization process FY 05/06 due to the lack of wastewater collection and treatment infrastructure.

**Important issues for Certification:**

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

**Pending issues:**

None.

## **2. Human Health and Environment**

### **2.a Compliance with Applicable Environmental Laws and Regulations**

The wastewater treatment plant's final design was developed considering the need to generate an effluent that provides sufficient quality for wastewater reuse and eliminates health risks for residents who may have contact with treated water. Final design complied with applicable environmental regulations contained in Official Mexican Standard NOM-001-SEMARNAT-1996, which establishes the maximum permissible levels of contaminants for wastewater discharges to national waters and properties.

The proposed projects will follow the guidelines established by National Water Commission (CONAGUA, for its initials in Spanish) for the construction of this type of infrastructure. Additionally, the project to be developed is not expected to impact protected areas or ecological reserves. During the implementation of the project, the JCAS will oversee the tasks for conformance with the aforesaid guidelines.

The National Institute of Anthropology and History (INAH, for its initials in Spanish) through Official Communication No. E/117-D/2006 dated September 26, 2006, established no objection to the development of this project in Colonia Esperanza, inasmuch as there is no evidence of archeological or historical settlements in the area. Based on the above, no impacts to cultural resources are anticipated as a result of the project's implementation.

### **2.b Human Health and Environmental Impacts**

#### **Human Health Impacts**

The community of Colonia Esperanza is within the area known as the Juarez Valley, southeast of Ciudad Juarez, and adjacent to the Rio Grande. The totality of the population lacks wastewater collection service, and wastewater treatment is nonexistent, a condition that poses human health and environmental risks. Residents dispose of their wastewater using latrines and cesspools.

The lack of wastewater collection, in addition to the existence of clay soil and shallow water tables, has resulted in wastewater overflows and runoffs throughout the community, creating a risk for the transmission of diseases due to the residents' contact with these unhealthy wastewaters. The purpose of this project is to address the existing public health and groundwater contamination risks and to prevent these threats.

The development of this project will help address the aforementioned issues, and will improve public health conditions for local residents as follows:

- (1) Human health conditions will be improved by reducing or eliminating wastewater overflows as a result of an improved sanitary wastewater collection system; the risk of the residents' contact with wastewater will also be reduced.
- (2) Reduced potential for soil and aquifer contamination that may result from the inadequate use of latrines and septic tanks.
- (3) The construction and operation of the proposed WWTP, and the construction of a wastewater collection system will reduce groundwater, surface water, and soil contamination.

## Human Health Information

Human health statistics for Colonia Esperanza are limited, but there is information regarding a high incidence of diseases that include hepatitis A, measles, shigellosis, and tuberculosis.

Table 1 shows information about contagious diseases in the 80 communities in the U.S.-Mexico border and the 44 U.S. border counties.

**Table 1**  
Contagious diseases, Number of cases, and Occurrence Rates in the U.S.-Mexico Border, 2000  
Mexican Border Communities, U.S. Border Counties

Disease	Number of Cases			
	Mexican Border Communities		U.S. Border Counties	
	Cases	Rate*	Cases	Rate*
Dengue	173	2.7	6	0.1
Hepatitis A	1526	24.0	722	11.0
Hepatitis B	71	1.1	410	6.3
Malaria	784***	4.7***	15	0.2
Salmonellosis/Shigellosis	582	9.2	1880	28.7
Tuberculosis	2124	33.4	653	10.0

Source: Mexico: Surveillance Unit, General Directorate of Epidemiology, SSA; United States: State Health Departments of Arizona, California, New Mexico, Texas.

\* Cases for each 100,000 residents.

\*\* Border counties in Arizona, New Mexico, and Texas only.

\*\*\* Includes data only about border states.

The high level of border crossings between the United States and Mexico complicates epidemiological surveillance and the development of strategies to address the spread of infectious diseases. The thousands of border crossings each day underline the potential for the spread of diseases in both directions. Under these circumstances, the United States and Mexico must coordinate their strategies by developing a binational response to the spread of infectious diseases.<sup>3</sup>

## Environmental Impacts

Overall, the environmental impact resulted by the implementation of the project will be positive. Sewer service will be provided to 100% of the population while reducing the risk of wastewater infiltration by the use of latrines and cesspools. In the other hand, all construction tasks will take place in city areas that have been affected previously.

During the construction phases, minor impacts to the environment will be generated produced by the excavation tasks for the installation of drainage and drinking water piping system. These impacts include particulate matter emissions, gases generated by the construction equipment, temporary obstruction of streets, and presence of workers in the areas and risk conditions for people.

<sup>3</sup> Healthy Border 2010: An Agenda for improving Health on the United States-Mexico Border (October, 2003).

To reduce the environmental impacts during the construction phase, mitigation measurements will be taken similar to watering roads to reduce dust, maintaining vehicles to reduce emissions, setting up prevention signs to avoid risk situations, installing portable restrooms, etc.

In relation to the phase of operation activities, negative impacts are not anticipated as long as the activities are accomplished as specified, taking into account planning and exertion within the final design of each task, respectively, and complying with the Environmental Impact Manifest dictate as established.

**Transboundary Impacts**

Negative impacts are not anticipated by the implementation of wastewater collection and treatment system. In addition, a beneficial effect is expected on the U.S. side given that water that enters the Rio Grande via an open channel named “*Interceptor Drain*” will have a better quality now that raw sewage will be treated.

**Formal Environmental Clearance**

Pursuant to the provisions of the General Law on Ecological Balance and Environmental Protection as to Environmental Assessments, the Secretariat of the Environment and Natural Resources (SEMARNAT) determined through official communication SG.IR 08-2007/130 that the project required the development of a private Environmental Impact Statement. An EIS was prepared and submitted to SEMARNAT for review on May 9, 2007, and a finding was issued on June 6, 2007, after determining that the project complied with all requirements for the Mexican process.

As for the U.S. environmental assessment process (NEPA), a transboundary impact study was developed and submitted for consideration to the U.S. Environmental Protection Agency (EPA) and is currently under signatures and authorization and it will be published soon for public comments

As part of the environmental assessment process, the final design was submitted to the International Boundary and Water Commission (IBWC) in the United States and its corresponding commission in Mexico (CILA, for its initials in Spanish). No negative comments were received from neither of the regulatory entities.

**Important issues for Certification:**

The project resolves a significant human health and environmental problem.

**Pending issues:**

None.

## 3. Technical Feasibility

### 3.a Technical Aspects

#### Project Development Requirements

The final designs of the wastewater collection and treatment systems were developed pursuant to technical specifications contained in the Wastewater Collection and Treatment Manual prepared by CONAGUA's Technical Directorate and Official Mexican Standard NOM-001-CNA-1995 "Sanitary Sewerage System – Specifications for Hermeticity."

Wastewater Collection:

The final design for the wastewater collection project was based on gravity flow to a single lift station.

Table 2 shows the lengths and sizes of proposed wastewater collection lines.

**Table 2**  
Sizes of PVC wastewater collection pipes.

PVC Wastewater Collection lines	
Diameter (in.)	Linear feet
8	53,927
10	4,321
15	7,848

Additionally, the system includes 265 manholes and 455 household connections.

#### Wastewater Treatment Plant

In March 2007 the JCAS completed the "Final Design for the Construction of the Colonia Esperanza Wastewater Treatment Plant." The facility will have a 1.05 MGD design flow rate; the system's total wastewater retention time will be 40 days .

In order to prevent potential seepage through the lagoons' fore slopes and to provide slope stability, the project considers the installation of a 1 mm thick high-density (HD) polyethylene geomembrane placed over a 200 gr/m<sup>2</sup> geotextile to prevent potential damage to the geomembrane.

#### Pretreatment

It includes two parallel systems with a 45° manual bar screening, sand trap, and reinforced concrete flow meter with the following dimensions:

- 28.5 x 11.8 ft. primary treatment
- 1.3 x 5 ft. screens with 0.08 ft. separation
- 1.3 x 6.56 ft. and 0.5 ft. deep sand trap will be built for removal of wastewater grit.



### Lift Station

The study area has a flat topography, which calls for a significantly deep wastewater collection system. As such, the project requires the construction of a pumping station to "lift" wastewater and provide it a hydraulic charge before sending it off to the lagoon system for treatment.

The lift station is designed for a maximum 25 minutes residence time in the wet chamber to prevent septic conditions. Additionally, the lift station will have sufficient hydraulic capacity to protect the overall infrastructure, and it will have emergency power generation equipment in case of electrical power outages.

### Discharge Force main

The pressure line that will convey untreated wastewater from the lift station to the treatment system is proposed to be 8" diameter HD RD 41. This force main will first reach a pressure-breaking, flow distribution structure made of reinforced concrete that will equitably distribute the wastewater flow to each of the anaerobic lagoons.

### Primary Treatment

It consists of two anaerobic lagoons that will be built using excavation and quarry materials, with the following dimensions: 47.6 ft. interior side; and 10.7 ft. normal operational depth.

### Secondary Treatment

It includes two facultative lagoons for secondary treatment. Their characteristics will be similar to the anaerobic lagoons, i.e., their berms will be built using excavation and quarry materials, and will have the following dimensions: 295 ft. long interior side; 98 ft. short interior side, and 6.56 ft. normal operational depth. Maturation lagoons will have characteristics similar to the above lagoons, with 9.4 days mean residence time. Figure 3 shows the WWTP's layout.

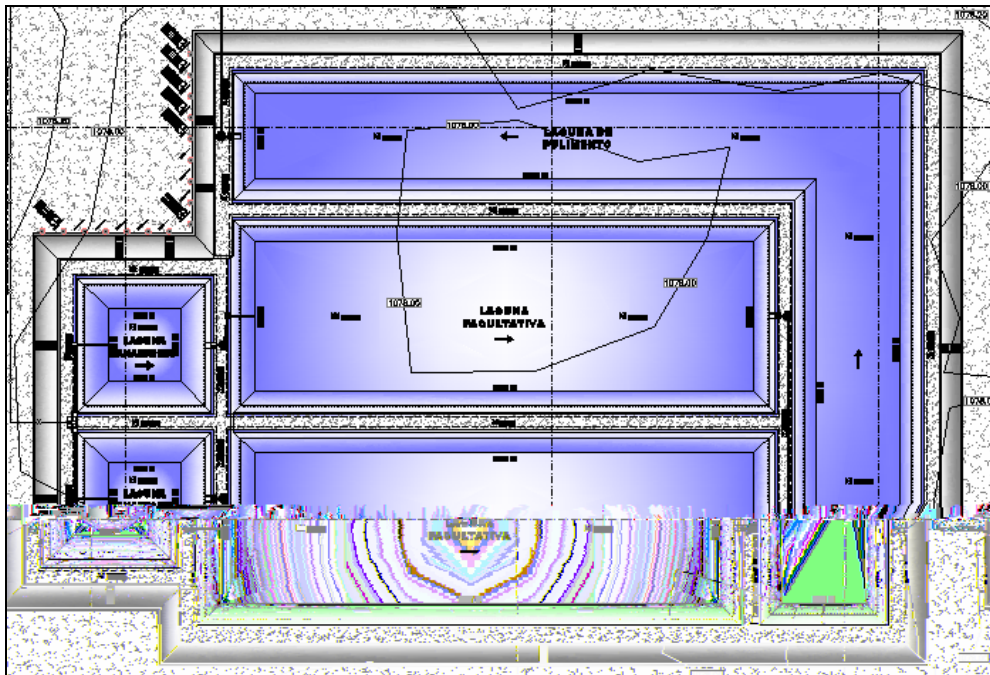


Figure 3. Wastewater Treatment Plant Layout

## **Appropriate Technology**

### **Wastewater Collection System**

In order to count with an adequate and efficient system, a preliminary engineering analysis was developed considering different technical alternatives. The project alternatives reviewed consisted basically of the following scenarios:

- a) **No-action Alternative.** Under this scenario, the community of Colonia Esperanza would not be able to merge its wastewaters into a single location for treatment. Residents would continue discharging their wastewater into latrines and septic tanks, with the resulting risks for aquifer contamination and transmission of water borne diseases. In sum, this alternative presents environmental, human health, social, and political implications that render it unviable
- b) **Expand the wastewater collection system to 100% of the population and make in converge into a single location for pumping to a wastewater treatment plant.** This alternative was reviewed and considered to be the preferred alternative, inasmuch as it allows for the entire population of Colonia Esperanza to have wastewater collection service at a reasonable initial cost, with adequate subsequent operation and maintenance costs.

### **Wastewater Treatment System**

The review of wastewater treatment alternatives included the following options:

- a) **No-Action Alternative.** Colonia Esperanza does not have a wastewater treatment system. Under this scenario, the population would continue discharging raw wastewater to the surface; in addition, there would be a continued risk of human contact with untreated wastewater, which represents a potential risk for the transmission of water borne diseases. After review, this alternative was ruled out, as it results in major human health and environmental risks
- b) **Construction of a wastewater treatment system based on facultative and polishing lagoons.** This option was reviewed, but inasmuch as it requires a larger area for the construction of the system than the preferred alternative, and thus, a higher capital land cost, this alternative was determined not to be the most appropriate one.
- c) **Construction of a wastewater treatment system based on an Imhoff tank, and facultative and polishing lagoons.** Although this is the option that requires the least surface area for its construction, it also requires the highest initial investment. The above makes this option unacceptable.
- d) **Construction of a wastewater treatment plant based on anaerobic, facultative, and maturation lagoons.** This fourth option requires the lowest initial capital investment, least maintenance, and reduced operation costs. Thus, this was considered to be the most appropriate alternative.

The treatment process is sufficient to generate treated wastewater that provides adequate quality for wastewater reuse and eliminates health risks for residents who may have contact with treated water, pursuant to the applicable environmental regulations contained in Official Mexican Standard NOM-001-SEMARNAT-1996, which establishes maximum permissible levels of contaminants for wastewater discharges to national waters and properties. (BOD of 75 mg/l, TSS of 75 mg/l).



The results acquired from the mathematical model indicated that biochemical oxygen demand (BOD) values from the convergence of the Rio Grande and the “*Interception Drain*” range from 20 to 30 mg/l, with dissolved oxygen concentrations (DOC) from 5.6 to 6.4 mg/l. These values comply with quality standards required by the Texas Commission on Environmental Quality (TCEQ).

In order to evaluate the potential impacts on water quality at the discharge point between the “*Interceptor Drain*” and the Rio Grande, the BECC developed a study named “Preliminary Study on Self-Depuration of WWTPs’ Effluent from Ciudad Juarez, Chihuahua and the Merging Flows from Communities at Guadalupe and Praxedis G. Guerrero, Chihuahua.

The sludge generated by the wastewater treatment process will be extracted from the lagoons in periods of approximately every five years and hauled away to the landfill for disposition.

### **3.b Management and Operation**

#### **Project Management**

The treatment system's operation and maintenance will be the responsibility of the JRAS of Colonia Esperanza, under supervision of JCAS technical staff.

#### **Operation and Maintenance**

##### **Organization**

The *Junta Rural de Agua y Saneamiento* (JRAS) of Colonia Esperanza counts with a president, secretary, treasurer, three alternates, operation and maintenance assistants, the support from the JCAS, which counts with the specialized personnel on drinking water and wastewater collection operation and maintenance.

The JRAS is currently developing an institutional development program to standardize the emission of receipts by computer in order to improve the collection of these and be able to count with sufficient income for an adequate operation and maintenance of the drinking water and wastewater collection systems.

##### **Operations and Maintenance**

The Operation and Maintenance Plan presented as part of the project's final design includes the main activities needed to provide preventive maintenance to the proposed wastewater collection and treatment system. The treatment system's operation and maintenance will be the responsibility of the JRAS, under supervision of JCAS technical staff.

The purpose of the infrastructure's Preventive Maintenance Plan is to make available a tool to help carry out the activities related to effluent quality control, facility operation, and prevention of system breakdowns. Ensuring the proper operation of treatment units will generate a good effluent quality. The conservation of treatment unit components, including pumps, screens, gates, valves, as well as structures such as berms, slopes, etc., must be a scheduled and consistent task

##### **Pretreatments Program**

By virtue of the project area only comprises domestic users; the JCAS has dictated that Official Mexican Norm NOM-002-ECOL-1996 needs to be complied as part of the treatment process. The norm establishes the permissible maximum contaminant levels of wastewater discharge to the

urban or local wastewater collection systems. The JRAS will ensure that norm is being followed with the support of the JCAS.

**Permits, Licenses, and Other Regulatory Licenses**

The municipality of Colonia Esperanza counts with permits provided by the CNA for drinking water extraction and wastewater discharge, including environmental authorizations for project development of this kind. The wastewater collection and treatment projects have been reviewed by the EPA and validated by the CONAGUA, the BECC and the North American Development Bank (NADB).

**Important issues for Certification:**

Final Design was reviewed by the EPA, JRAS, BECC and NADB and was validated by the CONAGUA.

**Pending issues:**

None.

## 4. Financial Feasibility and Project Management

### 4. a Financial Feasibility

The North American Development Bank (NADB), after reviewing the financial information submitted by the project sponsor (JRAS) of Colonia Esperanza determined that the financial capacity and structure proposed by the JCAS are adequate. The information submitted and the financial analysis includes but is not limited to:

- i) Historical information
- ii) Project's financial structure
- iii) Investment budget and
- iv) Economic and demographic information on the project area

A detailed analysis of the project's financial information is contained in the loan proposal that will be submitted to the NADB Financial Committee for authorization. Following is a summary of the financial analysis.

The total cost of the project is estimated at US\$2.18 million, including loan closing costs, design, supervision, construction, value-added- tax, and contingencies.

Item	Amount (Dollars)
Wastewater Collection and Treatment System	2,177,756
TOTAL	\$2,177,756

JRA, JCAS, CONAGUA, EPA, and NADB have proposed a financial structure that will allow for the implementation of the project. The table below summarizes the proposed structure:

Funding Source	Type	Amount (Dollars)	%
NADB-BEIF	Grant	430,000	19.75%
Local/State/Federal	Grant	1,747,756	80.25%
NADB	Loan	0	0.00%
TOTAL		\$2,177,756	100.0

JRAS exhibits a solid financial situation as reflected by their level of revenue and expenditure control. JCAS will earmark part of their revenues to service the debt. JCAS has efficient finance management practices. The NADB loan will not affect the utility's financial situation, so JCAS will be able to continue addressing future infrastructure needs.

### 4.b Rate/Fee Model

Due to the Project's characteristics, JRAS will not require the implementation of a rate scheme. Currently, JRAS has an adequate rate scheme which allows the support of operation and maintenance, as well as a service debt.

#### **4.c Project Management**

The project will be managed by JRAS with the support of JCAS. The utility has adequate personnel to manage the proposed infrastructure and address any potential emergency related to the project's operation and maintenance.

**Important issues for Certification:**

The project was analyzed and determined to be viable.

**Pending issues:**

None.

## 5. Public Participation

### **Comprehensive Public Participation Plan**

The Comprehensive Community Participation Plan developed by the Steering Committee was approved by the BECC on March 15, 2007. The Steering Committee set to the task of preparing an outreach program, including the benefits resulting from the project, as well as the associated costs and economic impacts for the community.

### **Local Steering Committee**

The Steering Committee was formally installed on February 2, 2007, at a meeting held at the City Hall in Praxedis G. Guerrero, Chihuahua. The meeting was attended by special guests, including the Mayor of Praxedis G. Guerrero, Juvenal Rodela Campos.



A Board of Directors was elected, comprised of the following individuals:

Steering Committee Chairperson: Mrs. Manuela Hernández G, local resident.

Steering Committee Vice-Chair: Mr. Saúl Rodríguez Barraza, local resident.

#### Alternates:

- Ms. Aurelia Pacheco Ayala, resident
- Mr. Rodolfo Tarín Quiñónez, resident
- Vérulo García García, resident

### **Public Access to Project Information**

The Steering Committee, with assistance from JCAS, prepared written information about the project and designed flyers and brochures that were distributed at public meetings.

### **Additional Outreach Activities**

Information meetings were held with local residents in anticipation of BECC public meetings.



## **Public Meetings**

### **First Public Meeting**

An invitation to the First Public Meeting, scheduled to be held on Sunday, April 29, 2007, was published on April 1<sup>st</sup> in the "Diario de Juarez." The meeting started at 1:30 P.M. at the local Salon Ejidal. The meeting was attended by the Mayor of Praxedis G. Guerrero, **Juvenal Rodela Campos**, and members of the Steering Committee. There were 40 attendees to the meeting. Additionally, 35 surveys were administered during the meeting, and 100% of those surveyed expressed explicit support for the project.

### **Second Public Meeting**

The second public meeting will be held on July 14, 2007.

### **Final Public Participation Report**

The Steering Committee and the sponsor prepared the "Final Public Participation Report" to demonstrate that the proposed objectives were fully met to BECC's satisfaction. This document will be submitted once the second public meeting has been held.

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#### **Important issues for Certification:**

The project is strongly supported by the community; corresponding approval documentation has been received.

#### **Pending issues:**

Hold 2<sup>nd</sup> public meeting and complete 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 Junta Rural de Agua y Saneamiento in Colonia Esperanza include the following:

- Improve the utility's necessary wastewater collection infrastructure (wastewater collection lines)
- Building a wastewater treatment system
- Operating a wastewater collection system that meets applicable state and federal regulations
- Training operating staff

JCAS will provide basic technical training to JRAS staff for the operation and maintenance of the new infrastructure that will be built as a result of the project's implementation. The staff will be provided operation and maintenance training prior to the commencement of WWTP operations. JCAS technical staff will provide guidance to JRAS as needed.

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

This project supplements the actions set forth in the Master Plan for Improvements to Water, Wastewater and Collection Services in Riparian Communities in the Upper Rio Grande, Juarez Valley (*Plan Maestro para el Mejoramiento de los Servicios de Agua Potable, Alcantarillado y Saneamiento en Poblaciones Ribereñas del Alto Bravo, Valle de Juárez*), which include the need to develop basic sanitary infrastructure works for in the Juarez Valley. The implementation of the project will help eliminate risks associated to the inadequate management of wastewater, and will provide treated wastewater for other uses.

The project adheres to the U.S.-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 improve 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 household connections to 100% of residents. Wastewater will be collected and conveyed to the WWTP to improve their quality, thus reducing aquifer contamination and human health risks resulting from raw wastewater discharges to streams or agricultural drains. The project also includes the application 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. The tasks proposed by the project will contribute to reduce the conditions that favor the proliferation of water borne and arboviral diseases related to inadequate wastewater disposal.

The implementation of an appropriate wastewater collection system promotes the development of the community, as it will help reduce contamination in local areas and to improve the quality of life of Colonia Esperanza residents. Treated wastewater will be able to be diverted to other purposes, such as urban and agricultural uses.

**Important issues for Certification:**

The project complies with all sustainable development principles

**Pending issues:**

None.

### Available Project Documentation.

- *"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"* [Global Vision Strategy for Water Supply and Management in Northern Border Cities and Basins during the 1999-2025 Period], CONAGUA, December 1999.
- Official Communication DT-922/2006 requesting a finding by INAH regarding the existence of archeological sites in the Praxedis G. Guerrero, Colonia Esperanza, and Colonia Esperanza areas.
- Official Communication No. E/117-D/2006, in which INAH finds no objection for the development of this project in the Colonia Esperanza area, inasmuch as no archeological settlements exist in the area.
- EPA's "Finding of no significant impact" (FONSI) dated June XXX, 2007.
- Consultation with SEMARNAT to determine jurisdiction and environmental assessment modality, Official Communication DT-374/2006, Junta Central de Agua y Saneamiento del Estado de Chihuahua, April 25, 2007.
- SEMARNAT's response regarding Environmental Impact Statement modality. Official Communication No. SG.IR. 08-2007/130, Chihuahua Federal Delegation, Subdivision of Environmental Protection and Natural Resource Management. May 2, 2007.
- Preliminary Wastewater Collection and Treatment project for Colonia Esperanza and Praxedis G. Guerrero, Municipality of Praxedis G. Guerrero, Chihuahua. Developed by Consultores Mexicanos en Proyectos de Ingeniería, S.C. (BECC, March 2006).
- Final Design for a Wastewater Treatment Plant for Colonia Esperanza, Municipality of Praxedis G. Guerrero, Chihuahua. Developed by Urbanizadora y Edificadora de México, S. A. de C.V. (JCAS, March 2007).
- Final Design for Wastewater Collection Project for Colonia Esperanza, Municipality of Praxedis G. Guerrero, Chihuahua. Developed by Urbanizadora y Edificadora de México, S. A. de C.V. (JCAS, March 2007).
- Project's Environmental Impact Statement, SEMARNAT State Delegation in Chihuahua, oficio No. SG.IR.08-2007/157 del 6 de junio de 2007.
- Master Plan for Improvements to Water, Wastewater and Collection Services in Riparian Communities in the Upper Rio Grande, Juarez Valley. Developed by ICISA, (BECC, December 2000).