



# CERTIFICATION PROPOSAL

## WATER AND WASTEWATER IMPROVEMENTS PROJECT SAN AGUSTIN, CHIHUAHUA

*Revised: November 5, 2012*

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## EXECUTIVE SUMMARY

### WATER AND WASTEWATER IMPROVEMENTS SAN AGUSTIN, CHIHUAHUA

- Project:** The proposed Project consists of the expansion of the drinking water distribution system, construction of the wastewater collection system, and construction of wastewater treatment infrastructure for San Agustin in the municipality of Juarez, Chihuahua.
- Project Objective:** The purpose of the Project is to increase access to basic drinking water and wastewater services in unserved areas and reduce exposure to untreated wastewater discharges by expanding the drinking water system and constructing the wastewater collection and treatment systems, contributing to the reduction of water pollution and the risk of waterborne diseases.
- Expected Project Outcomes:** The environmental and human health outcomes expected for the Project include:
- Increasing access and use of drinking water
    - New service to 50 households
    - Improved service to 661 households
  - Increasing access and use of wastewater collection and treatment services
    - New service to 711 households
    - New treatment capacity of 0.12 million gallons a day
  - Reducing untreated or inadequately treated discharges of 0.11 million gallons a day
- Population Benefitted:** 1,569 residents of San Agustin, Chihuahua.
- Sponsor:** The state water agency, *Junta Central de Agua y Saneamiento de Chihuahua* (JCAS), in coordination with the local utility, *Junta Rural de Agua Potable de San Agustin* (JRAP).
- Project Cost:** \$2, 641,447 USD.

**Uses & Sources:**  
 (USD)

<b>Uses</b>	<b>Amount</b>	<b>%</b>
Construction, contingencies, supervision, and taxes	\$2,641,447	100.0
<b>TOTAL</b>	<b>\$2,641,447</b>	<b>100.0</b>
<b>Sources</b>	<b>Amount</b>	<b>%</b>
Mexico federal and state funds (Grants)	\$1,849,007	70.0
NADB-BEIF construction assistance (Grant)	792,440	30.0
<b>TOTAL</b>	<b>\$2,641,447</b>	<b>100.0</b>

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#### 1. ELIGIBILITY

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##### **Project Type**

The Project falls within the eligible categories of drinking water supply and wastewater treatment.

##### **Project Location**

The Project is located in the community of San Agustin, Chihuahua, Mexico, immediately adjacent to the U.S.-Mexico border. The Project is located within the 100-km border area. San Agustin is located 0.5 miles south of the US-Mexico border.

##### **Project Sponsor and Legal Authority**

The Project sponsors are the state water agency, *Junta Central de Agua y Saneamiento de Chihuahua* (JCAS), in coordination with the local water utility, *Junta Rural de Agua Potable de San Agustin* (JRAP).

The legal authority of JCAS and JRAP is established in Article 1564 of the Administrative Code for the State of Chihuahua. JRAP is authorized to provide water and wastewater collection services to the local community, while JCAS is the regulatory agency and entity responsible for developing infrastructure improvement projects in San Agustin.

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#### 2. CERTIFICATION CRITERIA

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##### 2.1 TECHNICAL CRITERIA

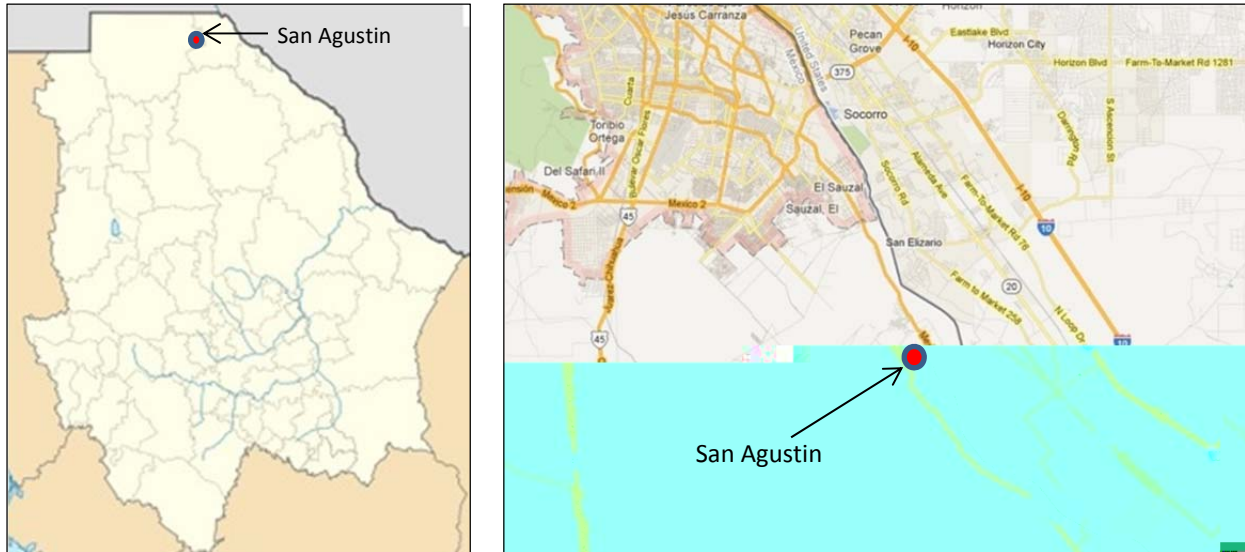
##### 2.1.1. Project Description

##### **Geographic Location**

The Project is located in the community of San Agustin in the northeastern area of the state of Chihuahua, Mexico, within the municipality of Juarez and across the Rio Grande from Fabens,

TX. San Agustin is one of the 23 communities that comprise the area known as the Juarez Valley. Fig. 1 shows the location of the community of San Agustin.

**Figure 1**  
**PROJECT VICINITY MAP**



**General Community Profile**

According to the final design developed by JCAS (2010), San Agustin has a population of 1,569 inhabitants, with an average annual growth rate of 1.0%.

The community's economic activity is largely based on agricultural activities, livestock and industry focused on the export of goods (*maquiladoras* en Cd. Juarez).

The median per capita income is \$3,517 pesos/month, which is a BECC estimation based on statistics from the Mexican national statistics institute, INEGI, and the National Commission on Minimum Wages. According to the Mexican national population council, CONAPO, in 2005, the poverty rate for San Agustin was -1.4953, which is considered very low.

The status of public services in San Agustin is described in the following table.

**Table 1**  
**BASIC PUBLIC SERVICES AND INFRASTRUCTURE**

<b>Water System*</b>	
Service coverage:	93%
Supply source:	Two water wells
Number of connections:	661
<b>Wastewater Collection</b>	
Service coverage:	0%
Number of connections:	0
<b>Wastewater Treatment</b>	
Coverage:	0%
Treatment facilities:	None
<b>Solid Waste**</b>	
Collection coverage:	100%
Final disposal:	Municipal landfill
<b>Street Paving**</b>	
Coverage:	5%

\* Source JCAS, 2012.

\*\* Source: City of Juarez, 2010-2013.

**Project Scope and Design**

The scope of the Project consists of the expansion of the existing water system and construction of a wastewater collection and treatment for the community of San Agustin by the construction of an additional module at the community of El Millon WWTP.

The drinking water project includes the following components:

- Equipment for two deep wells, including: 4- and 6-inch diameter discharge lines, operator booth, and discharge line protection;
- Installation of disinfection systems for two water wells;
- Construction of 2,106 linear feet of 4-inch transmission line, and 2,893 linear feet of 6-inch transmission line;
- Construction of a 49.2 -foot high elevated water tank with 52,834 gallons capacity;
- Construction of 99,686 linear feet of water distribution lines with 3-, 4-, and 6-inch diameters; and
- Installation of 711 residential water hookups (50 new, 661 for rehabilitation);

The wastewater collection project includes the following components:

- Construction of 37,941 linear feet of 8-inch sewer line.

- Construction of 101 new sewer manholes.
- Construction of 711 residential wastewater connections.
- Construction of 11,482 linear feet of 24-inch pipeline and 42 new sewer manholes for the sewer main (San Agustin-Jesus Carranza).

The wastewater treatment project includes the construction of a treatment module with 0.12 million gallons a day (mgd) of capacity at the El Millon Wastewater Treatment Plant (WWTP) (certified in 2010), which will serve the community of San Agustin.

Final designs for the water, wastewater, and wastewater treatment systems include the implementation of green building practices as part of the construction specifications. Materials from the region will be used to stabilize, improve, and protect the levees that form the lagoons and prevent mudslides and wastewater from overflowing out of the ponds. Solar panels will be used to power the reclaimed water irrigation system in the vicinity of the wastewater treatment plant, as well as for the lighting system. Native vegetation from the region will be used for the landscaping included in the Project, which will be irrigated with treated wastewater water.

**Figure 2**  
**GENERAL LAYOUT OF THE ADDITIONAL MODULE AT THE**  
**EL MILLON WASTEWATER TREATMENT PLANT**

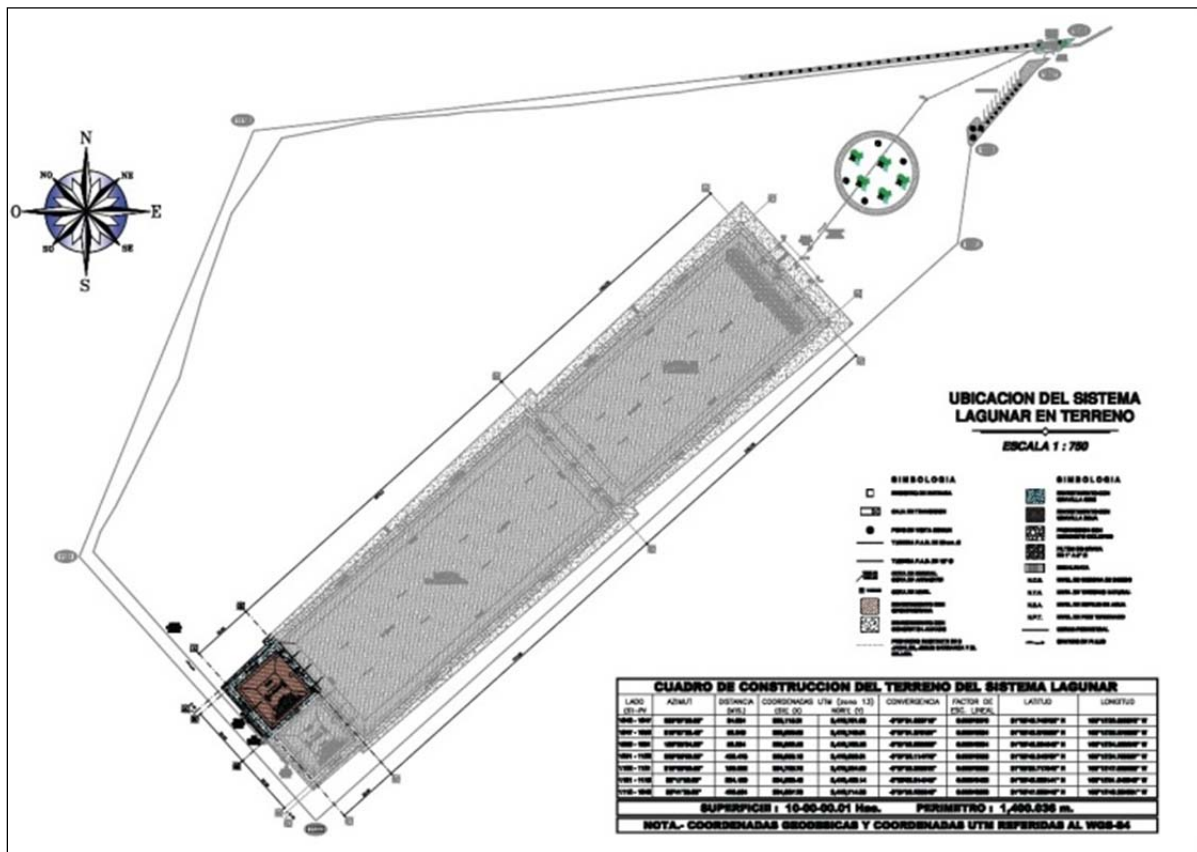
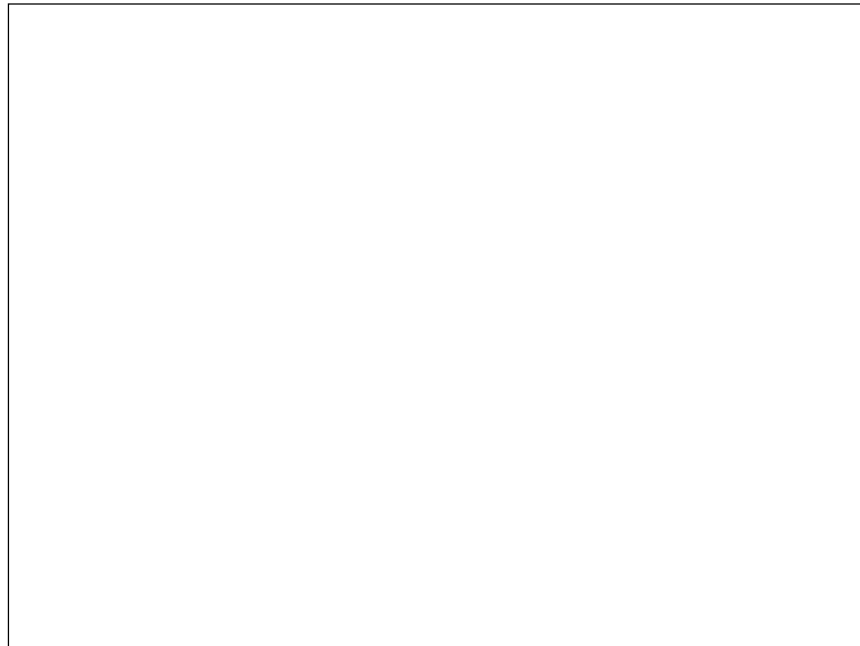




Figure3  
GENERAL LAYOUT OF THE SAN AGUSTIN WATER SYSTEM



Figure4  
GENERAL LAYOUT OF THE SAN AGUSTIN WASTEWATER COLLECTION SYSTEM



The following table shows the proposed schedule for project implementation milestones.

**Table 2**  
**PROJECT MILESTONES**

Key Milestones	Status
Procurement of components financed with federal and state funds (Mexico)	Completed
Construction of components financed with federal and state funds (Mexico)	Completed
Procurement of components financed with NADB-BEIF funds	Anticipated start: December 2012
Construction of components financed with NADB-BEIF funds	Anticipated completion: Feb. 2014

### 2.1.2. Technical Feasibility

#### Design Criteria

Final designs were developed pursuant to the technical specifications contained in the Water, Wastewater Collection, and Treatment Manual prepared by the Mexican national water commission, CONAGUA. Final designs were validated by CONAGUA and reviewed by BECC and NADB.

#### Selected Technology

##### Drinking Water

- Alternative 1. No action alternative. The no action alternative involves the continuation of the current water supply conditions, which fail to meet applicable regulations pursuant to water quality and quantity, without an adequate water distribution system.
- Alternative 2. Expanding the water distribution system to reach 100% coverage. This alternative includes the components mentioned in section 2.1.1., as well as refurbishing water wells, start-up of the new disinfection units, system normalization, looping of the water distribution system, and a well-to-tank automation system.

##### Wastewater Collection

The project scope was developed to include the construction of sewer lines, subcollectors, mains, and residential connections that will collect and convey wastewater from the community of San Agustin to the El Millon WWTP. Alternatives considered during project development included:

- Alternative 1. No action alternative. This alternative was eliminated because pollution of surface water and groundwater, as well as the environment in general, would continue with the disposal of wastewater directly into the ground or agricultural drains, along

with the associated health problems caused by waterborne diseases. The environmental and human health cost is too high.

- Alternative 2. The construction of the wastewater collection system, including sewer lines, subcollectors, and sewer mains to collect wastewater produced by the community and extend the main collector that conveys wastewater from Jesus Carranza, Tres Jacales and El Millon to the El Millon WWTP. This was the preferred alternative, as it entails the lowest operation and maintenance costs and ease of operation.

Alternative 3. The construction of the wastewater collection system, including sewer lines, subcollectors, and sewer mains to collect the wastewater generated by the community and convey it to a lift station and then through a force main to a new treatment facility. This alternative was eliminated because it presented the highest operation and maintenance costs, in addition to a more complex wastewater system operation.

#### Wastewater Treatment

After determining the preference for Alternative 2 above, two treatment technologies were also reviewed and assessed for their technical and financial features:

- Anaerobic and facultative lagoon systems with polishing ponds; and
- Activated sludge system.

The first alternative, an anaerobic and facultative lagoon system with polishing ponds, was the preferred technology, as it involves the lowest operation and maintenance cost and the greatest ease of operation, since skilled operators are not required.

### **2.1.3. Land Acquisition and Right-of-way Requirements**

No additional land requirements are to be purchased for the Project. All of the wastewater pipelines will be laid in municipal right-of-ways and easements.

In the case of the collector main, JCAS has obtained all of the required permits for its construction pursuant to the layout proposed in the final design. The site for the additional module at the wastewater treatment plant is owned by JCAS.

### **2.1.4. Management and Operations**

The management, construction, and operation of the proposed Project will be the responsibility of JRAP with assistance from JCAS. The utility has sufficient resources and staff available for this purpose. JCAS will provide assistance to JRAP for operation and oversight of the proposed Project.

JRAP has a president, secretary, treasurer, three members at large, and assistants for the operation and maintenance of the system. It also has the support of JCAS, which has specialized personnel in operation and maintenance of wastewater collection and treatment systems.

Since the Project area only includes residential users, JRAP has determined that the pretreatment program will consist of ensuring conformance with Official Mexican Standard NOM-002-ECOL-1996, which establishes the maximum permissible levels of contaminants for wastewater discharges to urban or municipal wastewater collection systems. Compliance enforcement will be a responsibility of JRAP with assistance from JCAS.

## **2.2 ENVIRONMENTAL CRITERIA**

Ninety-three percent of the community has access to informal drinking water service. Residents obtain their supply from water trucks or through substandard connections made with plastic hoses inappropriate for this purpose.

Currently, the community of San Agustin does not have a wastewater collection or treatment system. Consequently, there are untreated wastewater discharges from latrines and cesspools that could potentially run off and reach surface bodies of water, such as the Rio Grande and/or groundwater through soil infiltration.

These situations represent health hazards associated with the consumption and use of unsanitary water. Additionally, there is a potential for human contact with raw wastewater and organisms that are vectors for associated diseases. There is also a risk of environmental contamination.

The implementation of this Project will help eliminate 0.11 mgd of untreated wastewater, thereby reducing surface and groundwater contamination from such discharges, as well as give 1,569 San Agustin inhabitants access to adequate drinking water, wastewater collection and treatment services.

The risk of transmission of waterborne diseases and the level of environmental contamination will be reduced as a result of the implementation of the Project.

### **2.2.1. Compliance with Applicable Environmental Laws and Regulations**

#### **Applicable Laws and Regulations**

The Project is subject to domestic environmental clearance authorization in accordance with the Chihuahua state regulations and the General Law on Ecological Balance and Environmental Protection regarding Environmental Impact Assessment, as determined through the Chihuahua Ministry of Urban Development and Ecology. Additionally, the contribution of grant funds from the Border Environment Infrastructure Fund (BEIF), supported by federal appropriations to the U.S.-Mexico Border Water Infrastructure Program of the U.S. Environmental Protection Agency

(EPA), requires that the transboundary impacts of the Project be examined in compliance with the U.S. National Environmental Policy Act (NEPA).

The Project complies with the following environmental laws and regulations:

- The discharges from proposed wastewater treatment plant comply with the Official Mexican Norm NOM-001-SEMARNAT-1996, which establishes the maximum permissible levels of contaminants limits of pollutants for wastewater discharges into national waters.
- The wastewater collection system complies with the Official Mexican Norm NOM-002-SEMARNAT-1996, which establishes the maximum permissible levels of contaminants for wastewater discharges into urban or municipal wastewater collection systems.
- The biosolids from proposed wastewater treatment plant comply with the Official Mexican Norm NOM-004-SEMARNAT-2002, which establishes the maximum permissible levels of contaminants for the utilization and final disposal of biosolids.

#### **Environmental Studies and Compliance Activities**

Pursuant to the provisions of the General Law on Ecological Balance and Environmental Protection regarding Environmental Impact Statements, Mexico's Ministry of Urban Development and Ecology, through their Office of Ecology (State SEDUE) issued Official Communication SG.IR DOEIA.IA.3162/2010 on October 18, 2010, in which the agency determined that the Project does not require an Environmental Impact Statement (MIA), inasmuch as the intended activities are to be developed in an area previously impacted by human activities.

Pursuant to the U.S. National Environmental Policy Act (NEPA), a transboundary environmental impact study was developed and submitted for consideration of the United States Environmental Protection Agency (EPA). A 30-day public review period was opened on June 21, 2010, to receive questions or requests for clarifications. Ultimately, a Finding of No Significant Impact (FONSI) was issued by EPA on July 26, 2010, which establishes that the Project will not result in significant environmental impacts that may affect the United States border area.

The Water Quality Modeling developed in 2009 for Valle de Juarez included the treated wastewater effluent to be generated with the implementation of the San Agustin Project.

#### **Pending Environmental Tasks and Authorizations**

There are no formal environmental authorizations pending.

#### **Compliance Documentation**

The following formal authorizations have been obtained for the Project:

- Official MIA exemption DOEIA.IA.3162/2010;
- FONSI issued by EPA on July 26, 2010;
- CONAGUA's wastewater collection validation (BOO.E.22.2.-519, October 30th, 2009);

- CONAGUA's drinking water validation (BOO.E.22.2.-223, October 26th, 2010); and
- CONAGUA's WWTP validation (BOO.05.06.-303, December 14th, 2009);

## **2.2.2. Environmental Effects/Impacts**

### **Existing Conditions and Project Impact – Environment**

Project implementation will eliminate the use of latrines and discharges to open drains for wastewater disposal, and will help reduce potential surface water and groundwater pollution resulting from an inadequate disposal of untreated wastewater.

The environmental benefits anticipated from the Project include:

- Increased access to wastewater collection services through 711 new sewer connections;
- Elimination of 0.11 mgd of untreated wastewater discharges related to unserved homes.

### **Mitigation of Risks**

Minor environmental impacts are anticipated from implementation of the different phases of the Project, provided that the tasks are implemented in accordance with the requirements indicated in the official letter issued by SEDUE State (DOEIA.IA.3162/2010.) and the mitigation measures established therein. Potential impacts will be present during the construction phase and include the following:

- Fugitive dust emissions;
- Gas emissions from construction machinery; and
- Temporary roadway blockages, presence of workers in the area.

Mitigation measures in the MIA include:

- Application of treated wastewater from existing WWTPs in Cd. Juarez to reduce fugitive dust emissions;
- Vehicle tune ups to reduce emissions; and
- Placement of warning signs to prevent potentially hazardous situations.

The environmental impact resulting from Project implementation will be positive overall, given that it increases drinking water distribution and wastewater collection and treatment coverage, reducing environmental contamination and improving the quality of life of area residents by curtailing potential health hazards.

Natural Resource Conservation

The final design includes the implementation of green building practices as part of the technical construction specifications including:

- Materials from the region will be used to stabilize, improve, and protect the levees that form the lagoons and prevent mudslides and wastewater from overflowing out of the ponds.
- Solar panels will be used to power the reclaimed water irrigation system in the vicinity of the wastewater treatment plant, as well as for the lighting system.
- Native vegetation from the region will be used for the landscaping included in the project, which will be irrigated with treated wastewater water.

The Project helps reduce environmental deterioration by expanding and improving the existing water system and by constructing wastewater collection and treatment systems that will prevent the discharge of raw wastewater into local streams or agricultural drains. The Project helps reduce human health hazards by preventing the use of inadequate water supplies and the potential risk of exposure to raw wastewater.

Existing Conditions and Project Impact – Health

Waterborne diseases are caused by pathogenic microorganisms that are directly transmitted as a result of inadequate wastewater disposal practices and unsafe water supplies. Waterborne diseases may be caused by protozoan, viruses, bacteria, and intestinal parasites. 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 through poor hygiene habits that contribute to the dissemination of diseases by direct or indirect human contact.

The following table shows waterborne disease statistics for the Cd. Juarez area.

**Table 3**  
**GASTROINTESTINAL DISEASES PER TYPE AND YEAR IN THE JUAREZ AREA**

Disease	2003	2004	3005	2006	2007
Amebiasis	1,012	914	863	934	863
Intestinal Illnesses	48,721	49,666	41,123	42,806	41,526
Paratyphoid and Other	488	656	1,075	1,367	1,087
Other Helmitiasis	3,259	3,087	1,407	1,247	1,555
Typhoid Fever	38	54	11	42	60
Shigellosis	6	30	17	14	29
Viral Hepatitis-A	112	181	76	54	*
Giardiasis	202	225	100	83	96
Ascariasis	69	10	9	6	27
Oxiuros	78	34	18	31	18

Source: Health Services of Chihuahua, Sanitary Jurisdiction II Juarez, Epidemiology Department, Weekly Report of New Cases of Disease.

According to the World Health Organization (WHO), sanitation projects can have the following benefits for human health:<sup>1</sup>

- Improved sanitation reduces diarrhea morbidity by 32%.
- Access to safe water and sanitation facilities and better hygiene practice can reduce morbidity from ascariasis by 29%.

Implementation of the proposed Project is expected to reduce the incidence of gastrointestinal diseases associated to the consumption of non-potable water resulting from the use of inadequate water transportation and storage facilities. Additionally, groundwater, surface water, and soil contamination in the region will be reduced, as well as direct contact with raw wastewater by the local population.

### **Transboundary Effects**

Due to the proximity of this community to the city of Fabens, Texas, there are frequent border crossings between cities. The proposed Project will have a positive impact on the health of residents of cities such as El Paso, Clint, Fabens, Tornillo, and the entire region, since the Project will help to reduce the risk of waterborne diseases caused by the lack of a formal water distribution system, in addition to the lack of wastewater treatment or inappropriate wastewater management.

Additionally, the implementation of the proposed Project will reduce the potential for contamination of local and shared water bodies, such as the Rio Grande. According to the transboundary environmental assessment, significant impacts are not expected as a result of the project implementation.

## **2.3. FINANCIAL CRITERIA**

The total cost of the Project is estimated at US\$2,641,447. This figure includes construction, contingencies, and supervision costs. The Project meets all BEIF criteria and has been approved by EPA for a BEIF grant for up to US\$792,440 to complete the financing of the Project. Table 4 presents a breakdown of total Project costs, as well as the sources of funds.

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<sup>1</sup> WHO, Water, Sanitation and Hygiene Links to Health, Facts and figures updated November 2004 ([http://www.who.int/water\\_sanitation\\_health/publications/facts2004/en/](http://www.who.int/water_sanitation_health/publications/facts2004/en/)).



**Table 4**  
**USES AND SOURCES OF FUNDS**  
 (USD)

Uses	Amount	%
Construction, contingencies, supervision and taxes	\$2,641,447	100.0
<b>TOTAL</b>	<b>\$2,641,447</b>	<b>100.0</b>
Sources	Amount	%
Mexico (Grant)	\$1,849,007	70.0
NADB-BEIF Construction assistance (Grant)	792,440	30.0
<b>TOTAL</b>	<b>\$2,641,447</b>	<b>100.0</b>

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### **3. PUBLIC ACCESS TO INFORMATION**

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#### **3.1 PUBLIC CONSULTATION**

BECC published the Project Certification Proposal for a 30-day comment period beginning on October 5, 2012. The following Project documents were made available for public access:

- Final Design, Drinking Water System for San Agustin, 2010.
- Final Design, Wastewater Collection System for San Agustin, 2009.
- Final Design, Wastewater Treatment Plant for San Agustin (El Millon WWTP), 2010.
- Environmental Assessment (Transboundary Impacts Study, EID/EA) AMEC 2010.
- MIA exemption, Letter 3162/2010 Ministry of Urban Development and Ecology, Office of Ecology, 2010.
- CONAGUA's technical validation, 2009-2010.

The 30-day public comment period ended on November 4, 2012 with no comments received.

#### **3.2. OUTREACH ACTIVITIES**

The Project Sponsor, in coordination with the local steering committee, conducted extensive outreach efforts related to the proposed Project. These efforts included activities such as distribution of flyers and brochures, megaphone advertising, and preparation and distribution of a fact sheet of the proposed Project.

The Project's technical and financial information was made available to the public for review. The process to request public input regarding the proposed Project for certification was as follows: the Steering Committee made Project information available at bill collection sites. Additionally, a survey form was distributed to inquire about the public's familiarity with the

Project and their acceptance of it. Survey results indicate that 100% of those surveyed said they were able to fully understand the Project and explicitly expressed their support.

Activities conducted by the Project Sponsor and the steering committee demonstrate their efforts to meet public participation requirements for this funding program. JCAS has a policy for public communication that includes continuous project promotion to obtain/formalize hookup and connection fees, as well as other initiatives such as water conservation.