Border Environment Cooperation Commission Expansion and Rehabilitation of the Water Distribution System in Praxedis G. Guerrero, Chihuahua

1. General Criteria

1.a Project Type

Project Name: Expansion and Rehabilitation of the Water Distribution System in Praxedis G. Guerrero, Chih.

Project Sector: Water pollution.

1.b Project Category

Category: Community Environmental Infrastructure Project – Community-wide impact.

1.c Project Location and Community Profile

Community: Praxedis G. Guerrero, Municipality of Praxedis G. Guerrero.

Location: The State of Chihuahua is located in the northern part of the Republic of Mexico. Praxedis G. Guerrero is located in the northeastern end of the State of Chihuahua, within the Municipality of Praxedis G. Guerrero. It is one of the 23 communities found in the area known as the Juarez Valley, and it is a traditionally agricultural community.

Location within the Border: Within the 100 km area adjacent to the U.S.-Mexico border.

Figure: Figure 1 shows the location of Praxedis G. Guerrero, Municipality of de Praxedis G. Guerrero, in northeastern Chihuahua.

Figure 1. Location of Praxedis G. Guerrero, within the municipality of Praxedis G. Guerrero

Demographics

Current Population:	3,641 residents
Growth Rate:	1.00 %
Reference:	Final Design by Chihuahua State Water Utility (*Junta Central de Agua y Saneamiento de Chihuahua*, JCAS) Year: 2009
Median per Capita Income:	
	$ 3,288 Mexican Pesos
Reference:	Based on statistics by INEGI and the National Commission on Minimum Wages.
Primary Economic Activity:	
	Agriculture and cattle-raising
Marginalization Rate:	-1.31841, Very Low
Reference:	CONAPO 2008

Services

Community:	Praxedis G. Guerrero, Municipality of Praxedis G. Guerrero.
Water System	
Water Coverage:	48.5 %
Water Source:	Water Well # 1 and Water Well # 2
Domestic Hookups:	565
Wastewater Collection System	
Wastewater Coverage:	98 %
Sewer Connections:	1,165
Wastewater Treatment	
Treatment Coverage:	100 %
Solid Waste	
Collection Coverage :	100%
Road Paving	
Coverage:	10%

1.d Legal Authority

Project Sponsor:	Chihuahua State Water Utility (*Junta Central de Agua y Saneamiento de Chihuahua*, JCAS) in coordination with the local water utility (*Junta Municipal de Agua y Saneamiento de Praxedis G. Guerrero*, JMAS)
Legal Representative:	Mr. Luis Raul Aragon Sanchez

Legal Instrument to Demonstrate Authority: The legal authority of JCAS and JMAS has been established in Article 1564 of the Administrative Code for the State of Chihuahua. JMAS is authorized to provide water and wastewater collection services to the community, whereas JCAS is the regulatory agency and the entity responsible for developing infrastructure improvement projects in Praxedis G. Guerrero.

Date of Instrument: May 1, 1950.

Compliance with Agreements:

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

1.e Project Summary

Project Description and Scope: The project includes the expansion and rehabilitation of the existing water distribution system in Praxedis G. Guerrero, Chihuahua, including the construction of new domestic water hookups and the rehabilitation of existing hookups; deep well equipment for two new wells and two existing wells; four new disinfection units, a steel elevated water storage tank, conveyance and distribution lines, and a telemetry system.

Components:
Potable Water

Water system expansion for Praxedis G. Guerrero

- Electro-mechanical and inter-connection equipment for 4 deep water wells.
- Construction of 3 system housing units.
- Supply, installment and construction of 108 linear meters of protective fence for two elevated tanks.
- Supply, installment and construction of 2,120 linear meters of 6" and 8" PVC and HDPE pipelines.
- Supply, installment and construction of 7,168 linear meters of 8" PVC and HDPE pipelines.
- Supply, installment and construction of 23,528 linear meters of 3", 4", and 6" PVC pipelines for the distribution network.
- Supply, installment and construction of 600 new domestic service hookups (150- 2" diameter hookups, and 450- 3" diameter hookups) including flow meters.

- Supply, installment and construction of 270 meter loops (to rehabilitate).
- Supply, installment and construction of 4 chlorine gas-based disinfection units.
- Supply, installment and construction of a 15-meter high elevated water tank with capacity for 450 m3.
- Supply, installment and construction of a telemetry system to automate the Water Well-Tank system.

Population Served: 3,641 residents

Project Cost: US$1,831,625

Project Map: Figure 2 shows the proposed potable water system.

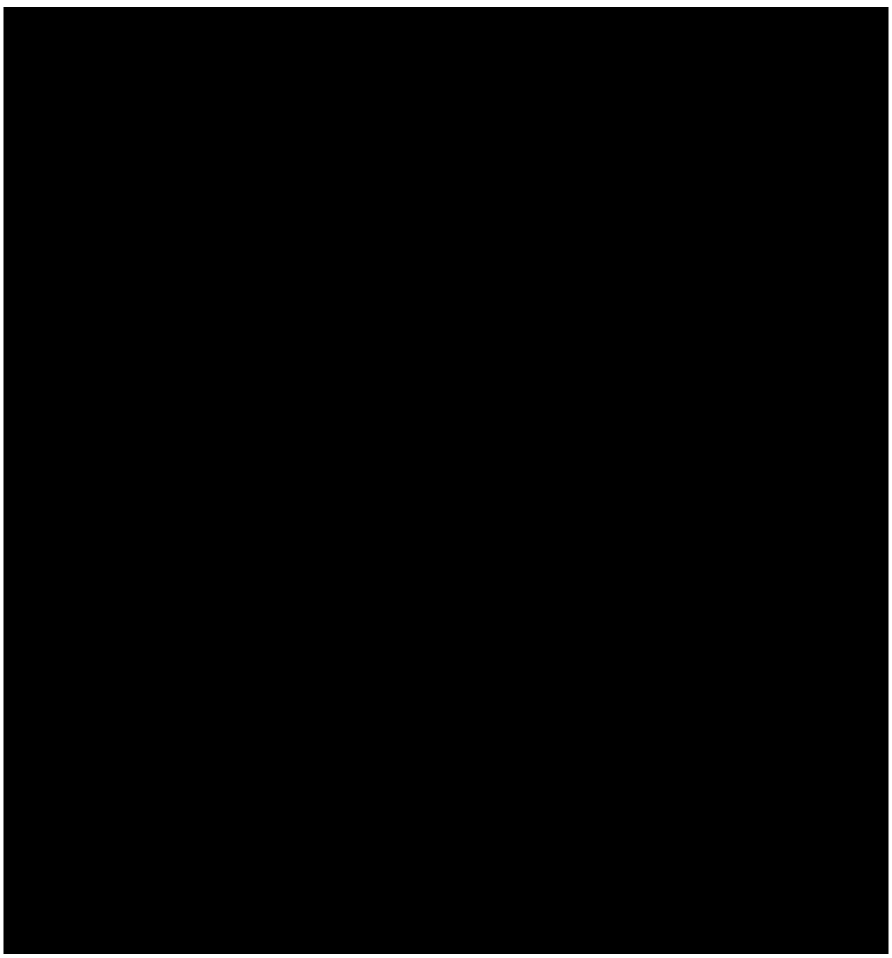

Figure 2. Map of the proposed water distribution system

1.f Project Justification

Project Justification:	• The proposed components of the project will help provide potable water to residents of the project area that currently lack this service. • Residents of the project area have a shortage of potable water service and resort to hauled water from tank trucks, or inadequate and substandard plastic water hoses for their service. • The implementation of the proposed project will provide adequate water service to approximately 3,641 residents, reducing the risk of infections associated to low water quality. • The project will help increase the water service coverage rate to up to 100% with the installation of approximately 600 new, and rehabilitation of 270 service lines and meters.
Urgency of the project or consequences of no action:	The lack of water distribution service jeopardizes the health of the project area residents, as it exposes them to an increased rate of gastrointestinal diseases associated to the use of non-potable water.
Prioritization Process category:	Category 1

Pending Issues:

None.

Criterion Summary:

The project meets BECC's General Criteria.

2. Human Health and Environment

2.a Compliance with Applicable Environmental Laws and Regulations.

Environmental and Public Health Needs Addressed by the Proposed Project:

More than half of the local residents lack potable water service and obtain water for personal consumption from haul water or inadequate connections.

The lack of potable water service results in a number of health issues related to the unavailability of quality water for human consumption including the high incidence rate of water-borne gastrointestinal diseases.

Project Meets the Following Applicable Environmental Laws and Regulations:

Official Mexican Standard NOM-127-SSA1-1994, "Environmental health, water for human use and consumption – permissible quality levels, and treatments required to render water potable."

The project will follow the guidelines established by CONAGUA for the construction of this type of water structures. Additionally, the tasks are not expected to impact protected areas or ecological reserves, since they will be developed within previously impacted urban and rural areas. During the implementation of the project, the JCAS and CONAGUA will oversee the construction activities for conformance with the above mentioned law.

2.b Human Health and Environmental Impacts.

Human Health Impacts

Direct and Indirect Benefits to Human Health:

The project will provide the reliable distribution of potable water which meets Mexican drinking water standards in order to prevent health hazards.

The quality of life of the project area residents will improve by providing them access to public potable water services.

Health Statistics:

Water borne diseases are caused by pathogenic microorganisms that are directly transmitted as a result of inadequate wastewater disposal practices and unhealthy water supplies. 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. Water borne diseases may be caused by protozoans, viruses, bacteria, and intestinal parasites.

Supporting Figures:

HEALTH SERVICES OF CHIHUAHUA
SANITARY JURISDICTION, JUAREZ
EPIDEMIOLOGY DEPARTMENT

GASTROINTESTINAL DISEASES PER TYPE AND YEAR
IN THE JUAREZ AREA
YEARS 2003 TO 2007

	YEAR				
DISEASE	2003	2004	2005	2006	2007
AMEBIASIS	1012	914	863	934	863
INTESTINAL ILLNESESS	48721	49666	41123	42806	41526
PARATYPHOID AND OTHER	488	656	1075	1367	1087
OTHER HELMITIASIS	3259	3087	1407	1247	1555
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: VEEKLY REPORT OF DISEASES NEV CASES

Table 1. Gastrointestinal Diseases in the Juarez, Chihuahua area

Environmental Impacts

Direct and Indirect Benefits:

Environmental Impacts:

Only minor environmental impacts are anticipated during the construction of the different project phases.
Potential impacts include the following:

Construction Phase

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

Operation Phase

No impacts are anticipated during the operation of the proposed water system.

Mitigation Measures:

Mitigation measures will include the following:

- Application of water to reduce fugitive dust emissions.

- Routine maintenance for vehicles to reduce emissions.
- Placement of warning/traffic control signage to prevent potentially hazardous situations

Impacts: The environmental impact resulting from the project's implementation will be positive overall, since the project will permit the provision of potable water to the community, improving the quality of life of local residents by reducing risks associated with deficient water management.

Transboundary Impacts

Due to the proximity of Praxedis G. Guerrero with several communities in Hudspeth County, in the U.S., residents frequently cross the border, constantly interacting in between communities in the region. With the expansion of the existing water system, there will be a positive impact on the health of residents of communities such as Fort Hancock and Alcala, Texas, as well as the entire region, since the project will permit the reduction of the risk of waterborne diseases caused by the lack of potable water.

Wastewater generated by this project will not have a negative impact on the region's surface water. The wastewater will be treated at the existing wastewater treatment plant, which has sufficient treatment capacity.

Formal Environmental Clearance

Environmental Clearance: Pursuant to the provisions of the General Law on Ecological Balance and Environmental Protection regarding Environmental Impact Statements, Mexico's Secretariat of the Environment and Natural Resources (SEMARNAT) issued Official Communication DOEIA.IA. 3066/2010 on September 30, 2010, in which the agency determined that the project does not require a Environmental Impact Statement (MIA), as long as the proposed activities will be developed in an area already impacted by human activities.

Pursuant to the U.S. National Environmental Policy Act (NEPA), a transboundary impact study is required for the project proposed for certification. However, the U.S. Environmental Protection Agency (EPA) decided to grant an exemption to the Praxedis G. Guerrero water project upon determining that the project area is included in a previously completed Finding of No Significant Impact (FONSI) issued in 2007 for the construction of the local wastewater collection and treatment system. The exemption letter was issued on November 30, 2010.

This exemption establishes that the project will not result in significant environmental impacts that may affect the U.S. border area.

Project Results Matrix Summary

Results Measuring

1. Provide access to quality water service	**Indicators and Objectives** Improve drinking water service. (Target: 600 new connections) **Improve drinking water service (rehabilitation)** (Target: 270 rehabilitated connections) **Baseline Value: 565 connections**

Pending Issues:

None.

Criterion Summary:

The project complies with BECC's Human Health and Environment criteria.

3. Technical Feasibility

3.a Technical Aspects

Technical Aspects

Design Criteria:

The project was developed in accordance with the technical specifications contained in the Water, Wastewater Collection, and Treatment Manual prepared by CONAGUA's Technical Directorate.

The project includes the following components:

- Electro-mechanical and interconnection equipment for 4 deep water wells.
- Construction of 3 system housing units.
- Supply, installment and construction of 108 linear meters of protective fence for two elevated tanks.
- Supply, installment and construction of 2,120 linear meters of 6" and 8" PVC and HDPE pipelines.
- Supply, installment and construction of 7,168 linear meters of 8" PVC and HDPE pipelines.
- Supply, installment and construction of 23,528 linear meters of 3", 4", and 6" PVC pipelines for the distribution network.
- Supply, installment and construction of 600 new domestic service hookups (150- 2" meter, and 450- 3" hookups) including flow meters.
- Supply, installment and construction of 270 meter loops (to rehabilitate).
- Supply, installment and construction of 4 chlorine gas-based disinfection units.

The final design includes the implementation of Green Building practices as part of the technical construction specifications. The project will minimize the requirements for pavement replacement, landscape disturbance, and intrusive construction practices, and will maximize energy efficiency. Only small sections of pavement will be replaced, and no demolition of existing structures will take place. Small areas will require paving for the movement of equipment and these roads will use local soils as road base.

The design proposes the use of materials that meets the properties and characteristics suitable to the project requirements, and minimizes the use of concrete with replacement and combination of other less energy intensive materials, preferably of on-site and unprocessed origin.

Appropriate Technology

Assessment of Alternatives:

Potable Water.

- Alternative 1. No Action. The no action alternative will be to continue to operate under the current water distribution conditions, failing to meet a water quality, quantity, or appropriate operation according to the CONAGUA regulations. In addition, the no action alternative will not address inefficient energy use of existing equipment and may create increased risks of inoperable conditions.

- Alternative 2 (Recommended Alternative). Expanding the water distribution system to achieve a 100% service. Additionally, this alternative proposes supplying required equipment for more efficient operation of the water wells, along with new disinfection units, pressure regulation, looping of the water distribution system, and Water Well-Storage Tank automation.

The proposed drinking water system will operate following a typical water distribution system with water supply, storage, and distribution.

The wastewater generated for the project implementation (approximately 0.11 mgd) will be collected and conveyed by the existing wastewater collection system and treated in the existing wastewater treatment plant that consists in a lagoons system with 0.34 mgd capacity, both constructed in 2009.

Property and Right-of-Way Requirements

Requirement:

The water distribution lines will be placed on municipal rights of way and thoroughfares, no additional land is to be purchased for the project.

Project Tasks and Timelines

Project Timeline

The construction of the different project components is estimated to be completed in approximately 2 years. Construction tasks were started in July 2010.

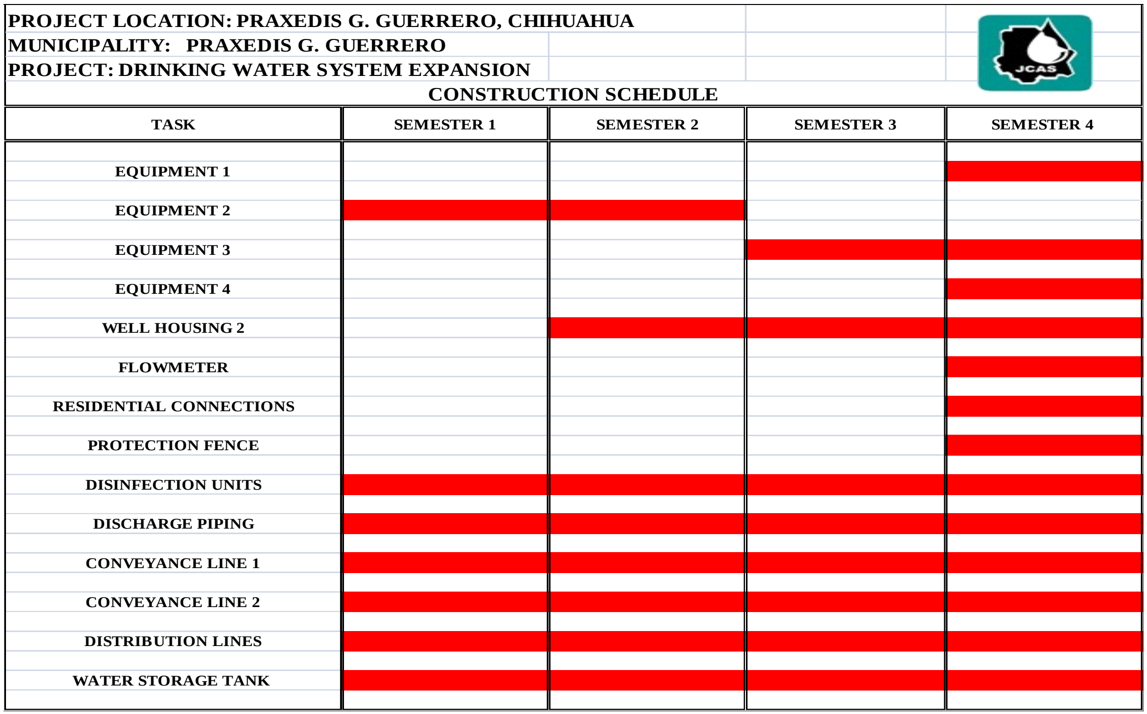

Figure 4. Activity Timeline

3.b Management and Operations

Project Management

Resources:

The management, construction, and operation of the proposed project will be the responsibility of the project sponsor. The sponsor has sufficient resources and staff for this purpose.

Junta Central de Agua y Saneamiento del Estado de Chihuahua will provide technical assistance and oversight to the *Junta Municipal de Agua y Saneamiento de Praxedis G. Guerrero* (JMAS) for the operation of the proposed system.

Operation and Maintenance

Organization:

JMAS has a President, a Secretary, a Treasurer, three alternates, and staff to operate and maintain the water system. Additionally, the local utility will receive assistance from JCAS, the state utility, which has available personnel for water systems operation and maintenance.

Operation Plan:

Within the Final Design, an Operation and Maintenance manual was developed to include the primary tasks for a proper operation of the system and to prevent breakdowns in the proposed infrastructure.

Permits, Licenses, and Other Regulatory Requirements:	The project sponsor has the following documentation available: - Water withdrawal permit (CONAGUA) - Finding of No Impact to historical or cultural properties (INAH) - Technical File validation by CONAGUA
Reviewing Agencies:	• EPA • BECC • NADB • CONAGUA (Official Communication No. BOO.E.22.2.-224. October 27, 2010) • *Junta Central de Agua y Saneamiento de Chihuahua* (JCAS)

Pending Issues:

None.

Criterion Summary:

The project complies with BECC's Technical Feasibility criteria

4. Financial Feasibility

4.a Verification of Financial Feasibility

Financial Conditions

Information Submitted: JMAS 2006-2010 financial statements.

Financial Analysis Results: Project to be fully funded through a combination of Mexican and BEIF grants. The water and wastewater services are under the operational jurisdiction of JMAS of Praxedis G. Guerrero and will receive support from JCAS, the State Water Authority.

Project Scope, Project Cost and Financial Structure

Item: The scope of the project is the Expansion and Rehabilitation of the Water Distribution System in Praxedis G. Guerrero, Chihuahua.

Final cost: **US $ 1,831,625**

Financial Structure:

Source	Type	Amount US	%
Mexico	Grant	$1,282,137	70.0
NADB-BEIF Construction Assistance	Grant	$549,488	30.0
Total:		**$1,831,625**	**100%**

Dedicated Revenue Source

Source of Income: JMAS/JCAS to operate and maintain system and maintain reserve requirements.

4.b Legal Considerations

Project Management: The project will be managed both by the JMAS of Praxedis G. Guerrero and the JCAS who have legal and technical capacity to implement the project.

Pending Issues:

None.

Criterion Summary:

The project complies with NadBank's Financial Feasibility criteria.

5. Public Participation

5.a Community Environmental Infrastructure Projects – Community-wide impact

Steering Committee

Date of Establishment: The Steering Committee was formally installed on October 6, 2010 at a meeting held in the Salon Ejidal of Praxedis G. Guerrero. During this meeting, a Board of Directors was elected.

Steering Committee Members: The Steering Committee consist of the following members:

Chair:	Pablo Guzmán García
Secretary:	Ricardo Lozoya Buzo
Alternates:	Mario Alberto Herrera de la Cruz
	Verónica Lozoya Buzo
	Jesús Alan Enríquez Méndez
	José Luis Maldonado Apodaca

Date of approval of Public Participation Plan: The Comprehensive Community Participation Plan developed by the Steering Committee was approved by the BECC on November 5, 2010.

Public access to project information

Public Access to Project Information: The project's technical and financial information was made available to the public for review.

The Steering Committee, with assistance from the project sponsor, prepared the following:

- Flyers
- Brochures
- Megaphone advertising
- Radio announcements

The above media outlets were used to inform the community about the project.

Additional Outreach Activities: Development and distribution of a project fact sheet.

Public Input: Due security reasons public meetings to promote the proposed project were cancelled.

The process to request public comment for the project proposed for certification was as follows:

The Steering Committee made available project information 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. No comments of opposition were received.
Final Public Participation Report	
Final Public Participation Report:	The Steering Committee and the project sponsor will prepare the Final Public Participation Report to demonstrate that the proposed objectives were fully met to BECC's satisfaction.
Post-Certification Public Participation Activities	
Post-Certification Activities:	The project sponsor, in coordination with the Steering Committee, will provide a general description of public participation activities that may be carried out after the project's certification in support of its implementation and long-term feasibility.

Pending Issues:

None.

Criterion Summary:

The project complies with BECC's Public Participation criteria.

6. Sustainable Development

6.a Human and Institutional Capacity Building

Project Operation and Maintenance:	The project sponsor will be the agency responsible for operating and maintaining the water distribution system. The project sponsor has the basic institutional and human capacity to operate and maintain the proposed water distribution system.
Human and Institutional Capacity Building:	Actions within the scope of the project that contribute to strengthen the *Junta Central de Agua y Saneamiento de Chihuahua's* institutional and human capacity include: • Improve water services in a continuous, efficient, and cost-effective manner. • Training and education for the utility's operating staff throughout its different areas, to provide essential services that meet the needs of the community. • Water use optimization and community awareness of the importance of water resources. • Basic technical training to the operations and maintenance staff responsible for the new infrastructure.

6.b Conformance to applicable Local, State, and Regional Regulations and Conservation and Development Plans.

Local and Regional Plans addressed by the project:	The proposed project conforms to applicable plans and actions described in the following documents: • Master Plan for Improvements to Water, Wastewater and Collection Services in Riparian Communities in the Upper Rio Grande, Juarez Valley. • The project conforms to the U.S.-Mexico Border 2012 Environmental Program by meeting Goal 1 (Promote an increase in the number of homes connected to a potable water supply) and 4 (Promote improvements to water utility efficiency).

6.c Natural Resource Conservation

	• The proposed improvements to the local water distribution system will help increase its physical efficiency and consequently, will reduce withdrawal rates in the local aquifer that supplies water to this community and the Juarez Valley in general.

- The final design includes the implementation of Green Building practices as part of the technical construction specifications. The project will minimize the requirements for pavement replacement, landscape disturbance, and intrusive construction practices, and will maximize energy efficiency. Only small sections of pavement will be replaced, and no demolition of existing structures will take place. Small areas will require paving for the movement of equipment and these roads will use local soils as road base. The design proposes the use of materials that meets the properties and characteristics suitable to the project requirements, and minimizes the use of concrete with replacement and combination of other less energy intensive materials, preferably of on-site and unprocessed origin.

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 incidence of water-borne and arboviral diseases resulting from the use of non-potable water.

The implementation of a new potable water system will promote the development of the local community, since it will help reduce the incidence of water-borne diseases and improve the quality of life of Praxedis G. Guerrero residents.

Pending Issues:

None.

Criterion Summary:

The project complies with BECC’s Sustainable Development criteria.

Available Project Information:

- Final Design for the Praxedis G. Guerrero Potable Water System. Junta Central de Agua y Saneamiento de Chihuahua. 2009.

- Official Communication No. BOO.E.22.2.-224. October 27, 2010 in which CONAGUA validated technically Final Design of the proposed project.

- Official Communication No. E/117-D/2006, in which INAH finds no objection for the development of this project in the Praxedis G. Guerrero area, inasmuch as no historical monuments of archeological settlements exist in the area.

- EPA's Categorical Exclusion (CATEX) Finding regarding the Praxedis G. Guerrero water system project. November 30, 2010.

- Consultation with the State Directorate of Ecology to determine jurisdiction and environmental assessment modality." Official Communication SDEP-241/2010, Junta Central de Agua y Saneamiento del Estado de Chihuahua. June 22, 2010.

- Response from the State Directorate of Ecology pursuant to the Environmental Impact Assessment modality." Official Communication No. DOEIA.IA. 3066/2010. Direccion de Ecologia del Estado de Chihuahua. September 30, 2010.

- 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 Juaez)*, developed by ICISA (BECC, December 2000).

- Final Public Participation Report for the Project for Expansion of the Potable Water System in Praxedis G. Guerrero. Junta Central de Agua y Saneamiento and Steering Committee. 2011.