



# CERTIFICATION PROPOSAL

## WASTEWATER COLLECTION SYSTEM EXPANSION TO SULGER SUBDIVISION IN SIERRA VISTA, ARIZONA

*Submitted: April 8, 2013*

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## EXECUTIVE SUMMARY

### WASTEWATER COLLECTION SYSTEM EXPANSION TO SULGER SUBDIVISION IN SIERRA VISTA, ARIZONA

**Project:** The Project consists of the construction of a wastewater collection system in the Sulger Subdivision in the city of Sierra Vista, Arizona (the “Project”).

**Project Objective:** The purpose of the Project is to eliminate exposure to untreated or inadequately treated wastewater discharges by expanding the wastewater collection system to this unserved area, contributing to the reduction of pollution and the risk of waterborne diseases.

**Expected Project Outcomes:** The Project is expected to generate environmental and human health outcomes related to the following:

- Wastewater collection system expansion to support adequate collection and conveyance for 154 new residential service connections.
- Eliminate untreated wastewater discharges of approximately 0.029 <sup>1</sup>million gallons per day (mgd).

**Population Benefited:** 374 residents

**Sponsor:** City of Sierra Vista, Public Works Department

**Project Cost:** US\$3,964,700

**Uses & Sources of funds:**  
(Millions of dollars)

| Uses                                    | Amount        | %            |
|-----------------------------------------|---------------|--------------|
| Construction*                           | \$3.96        | 100.0        |
| <b>TOTAL</b>                            | <b>\$3.96</b> | <b>100.0</b> |
| Sources                                 | Amount        | %            |
| NADB-BEIF Construction Assistance Grant | \$3.96        | 100.0        |
| <b>TOTAL</b>                            | <b>\$3.96</b> | <b>100.0</b> |

\* Includes costs related to construction, supervision, and contingencies.

<sup>1</sup> Source: Final Design Wastewater Collection System in the Sulger Subdivision, elaborated by the City of Sierra Vista Department of Public Works, October 2012.

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### 1. ELIGIBILITY

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**Project Type**

The Project falls within the eligible category of wastewater.

**Project Location**

The Project is located in the city of Sierra Vista in Cochise County, Arizona, approximately 14 miles north of the U.S.-Mexico Border. The project area is known as Sulger Subdivision, a 38 acre subdivision located within the city's boundaries on the west side. Approximately half of the subdivision was annexed into the City of Sierra Vista and the southern half of the subdivision chose to remain as an unincorporated area in Cochise County.

**Project Sponsor and Legal Authority**

The public-sector project sponsor is the City of Sierra Vista. Pursuant to the Arizona Administrative Code, Title 18, Chapter 9, Article 3, Part E; and the Delegation Agreement #11-004, Sierra Vista has legal authority to operate and maintain the wastewater infrastructure within the city limits. On October 28<sup>th</sup>, 2011, the City of Sierra Vista and Cochise County signed and intergovernmental agreement for the purpose of extending and maintaining the City sewer system into the unincorporated section of the Sulger Subdivision.

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### 2. CERTIFICATION CRITERIA

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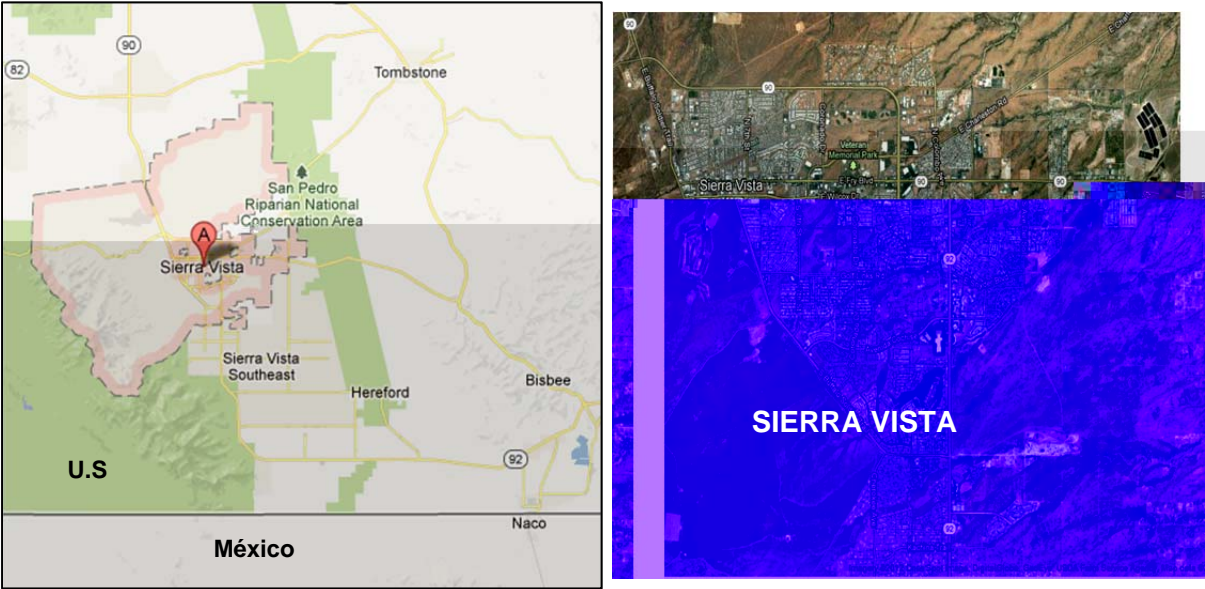
#### 2.1 TECHNICAL CRITERIA

##### 2.1.1. Project Description

**Geographic Location**

The Project is located in the city of Sierra Vista in Cochise County, Arizona, about 70 miles (110 km) southeast of Tucson. The project area is located within the 18,

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



**General Community Profile**

According to U.S. Census Bureau, the city of Sierra Vista has a population of 46,109 residents or an estimated 17,033 households. Sierra Vista is the largest city in Cochise County accounting for nearly one-third of the County's estimated population of 139,434<sup>2</sup>. The city has a substantial employment base due to Fort Huachuca — the community's major employer and primary driving economic force. As a result the professional, scientific and technical services sector is unusually large and nearly half of all jobs in Sierra Vista are in the government sector. The city also serves as a hub for retail business for the region.

The status of public services in Sierra Vista is described in Table 1.

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<sup>2</sup> Source: Sierra Vista Economic Outlook 2012, Cochise College Center for Economic Research.

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

| <b>Water System</b>                                          |                                 |
|--------------------------------------------------------------|---------------------------------|
| Service coverage:                                            | 100%                            |
| Water supply source:                                         | Groundwater (private supplier)  |
| Number of hookups:                                           | 17,033                          |
| <b>Wastewater Collection System</b>                          |                                 |
| Service coverage:                                            | 92%                             |
| Number of connections*:                                      | 12,898                          |
| <b>Wastewater Treatment</b>                                  |                                 |
| Service coverage:                                            | 100%                            |
| Treatment facilities:                                        | 4 MGD WWTP MLE Treatment System |
| <b>Solid Waste</b>                                           |                                 |
| Solid waste collection :                                     | 100%                            |
| Final disposal:                                              | Landfill                        |
| <b>Street Paving</b>                                         |                                 |
| Coverage:                                                    | 100%                            |
| * The remaining 8% of the residents have septic tank systems |                                 |

Source: City of Sierra Vista, Oct 2012

**Project Scope**

The Project consists of providing wastewater collection service for the unserved area called Sulger Subdivision within the boundaries of the city of Sierra Vista. The Sulger area is a 38-acre subdivision on the west side of the City. The area was subdivided in the 1950's into approximately 154 lots. Approximately half of the subdivision (about 93 lots) was annexed into the City of Sierra Vista. The southern half of the subdivision (61 lots) chose to remain as unincorporated area of Cochise County. The Project will provide services to the City and County portions.

Currently residents from the project area utilize on-site septic tanks with leach fields for wastewater disposal; however the lots located in the Sulger subdivision have aged septic tanks with insufficient property/setbacks for leach fields and experience surface pooling requiring frequent pumping or the replacement of entire system. The Cochise County Health Department has tried to work with the residents to install acceptable leach fields in the amount of space available, but options available to the residents are diminishing over time. New leach fields may be close to property lines, which may impact the hydraulic performance of leach fields on adjacent lots. Non-compliant, failing on-site treatment systems cause an immediate threat to the environment and potential for human contact/exposure, making the Project compatible with the Category 2 definition for the project prioritization methodology used to select projects for funding from the US-Mexico Border Water Infrastructure Program funded by the US Environmental Protection Agency and administered by BECC and NADB.

This Project includes the installation of approximately 9,700 linear feet of 8-inch gravity sewer pipe, the construction of approximately 20 precast concrete manholes, connecting approximately 154 existing homes to the sewer system and decommissioning of the existing septic tanks compliant with Arizona Department of Environmental Quality (ADEQ) regulations.

Flows from the proposed sewer system will discharge into the main interceptor at 7th street and will be treated at the City of Sierra Vista’s Environmental Operation Park (EOP). The EOP is a wastewater treatment plant (WWTP), owned and operated by the City, with capacity to treat 4 MGD using lagoons and wetlands treatment processes. The effluent meets the City’s Aquifer Protection Permit APP10149. Current flows into the plant are 3.2 MGD and there is sufficient capacity to accept 0.029 MGD of additional wastewater flows generated by the proposed Project.

**Figure 2**  
**LOCATION SULGER SUBDIVISION**



**Figure 3**  
**SULGER SUBDIVISION WASTEWATER COLLECTION SYSTEM**



The final design has been completed, therefore, it is estimated that once the Project receives the notice to proceed, it will take approximately 8 months to complete its construction. The main construction milestones include earthworks, installation of wastewater gravity mains and manholes, laterals and house connections, as well as decommissioning of septic systems.

**Table 2**  
**PROJECT SCHEDULE**

| Key Milestones      | Status                             |
|---------------------|------------------------------------|
| Procurement         | Anticipated: Quarter 2 and 3, 2013 |
| Construction period | 8 months from NTP                  |

### 2.1.2. Technical Feasibility

#### Design Criteria

The wastewater collection system final design was completed in accordance with Arizona Department of Environmental Quality (ADEQ) standards as outlined in the Arizona Administrative Code Title 18, Article 9 (ACC R18-9).

As a conclusion of the design review, the proposed system has received a Construction Authorization from ADEQ dated November, 2012.



### **Selected Technology**

As part of the development for the Sulger Subdivision wastewater collection system, a Preliminary Engineering Report was completed during the planning phase. In the report, different alternatives were evaluated based on the following attributes:

- Constructability
- Capital cost
- O&M
- Environmental impacts
- Social/community acceptance
- Best Management Practices
- System reliability

The alternatives included: no construction, building new centralized facilities, on-site waste disposable system and interconnection with existing sewer system. After evaluating the attributes and each of the alternatives capital and O&M (operation & maintenance) costs, it was determined that the best fit solution was the interconnection with the existing system through the installation of new PVC sewer pipeline to serve the project area.

The work performed and materials used in this Project shall be in accordance with the 2012 Uniform Standard Specifications and Details for Public Works Construction (Standard Construction Specifications), sponsored and distributed by the Maricopa Association of Governments (MAG), the City of Sierra Vista special provisions and the Arizona Administrative Code R18-9-E301.

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

The proposed Project is being developed within the urban area of the city of Sierra Vista and sewer lines and interceptors will be installed within existing municipal and county rights of way and easements, in the Intergovernmental Agreement the County authorized the City to use the designated rights of way and other property belonging to the County in connection with this Project. The Contractor will coordinate with the City and the County to request the corresponding permits to construct in the right of ways and for street closures at the startup of the construction process. No land acquisition is required.

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

The Public Works Department is one of the largest departments in the City's organization, it provides services to Sierra Vista residents, other public agencies and City departments utilizing 119 full time and 34 part-time qualified workers. The department has a municipal services division and an engineering division that provides several services including operation and maintenance of wastewater collection systems, wastewater treatment plants and treated water infiltration wells.

The City has operation and maintenance procedures in place that include the essential tasks necessary to ensure the proper operation and maintenance of the system. The procedures include information and instructions applicable to system operation, preventive tasks and repairs for the proposed infrastructure. Public Works provides sewer line cleaning and inspection at a maximum interval of approximately two years and the manholes are inspected in conjunction with the gravity sewer mains. The city is well equipped and knowledgeable in operation and maintenance of collection systems and treatment plants. Public Works has a vactor truck and video inspection equipment for trouble-shooting and assistance with scheduled maintenance to identify system issues.

## **2.2 ENVIRONMENTAL CRITERIA**

Wastewater produced in the project area is currently disposed of in private on-site septic system. The septic systems in the Sulger subdivision are approximately 50 years old and experience several deficiencies. Non-compliant, failing on-site treatment systems cause an immediate threat to the environment and potential for human contact/exposure. The existing septic systems in the Sulger Subdivision fall under the authority of the Cochise County Health Department. ADEQ has delegated this authority to the County.

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

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

The Project and associated infrastructure meet the following applicable environmental laws and regulations:

- Aquifer Protection Permit (A.A.C. R18-9-A2).
- 4.0 General Permit: Sewage Collection Systems (A.A.C. R18-9-d11rj21T91.1c3stems

**Pending Environmental Tasks and Authorizations**

There are no formal environmental authorizations pending.

**Compliance Documentation**

The following formal authorizations have been obtained for the Project:

- CatEx Authorization signed December 9, 2011.
- ADEQ Construction Approval signed on November 12, 2012

**2.2.2. Environmental Effects/Impacts**

**Existing Conditions and Project Impact-Environmental**

The existing on-site systems used for residential wastewater disposal typically consist of a buried tank to retain effluent and leach lines that allows the anaerobically broken-down effluent to percolate into the surrounding soil. The Sulger subdivision have aged septic tanks approximately 50 years old with insufficient property/setbacks for leach fields and experience surface pooling requiring frequent pumping or replacement of the entire system.

The Cochise County Health Department has tried to work with the residents to install acceptable leach fields in the amount of space available, but options available to the residents are diminishing over time. New leach fields may be close to property lines, which may impact the hydraulic performance of leach fields on adjacent lots.

There are health concerns related to the density of the septic systems located within the Sulger subdivision, which causes excessive nitrogen loading. Nitrogen loading limits have been established by ADEQ, requiring a minimum lot size of 1 acre with one single family dwelling to meet acceptable nitrogen loading levels. The Sulger area has 0.17-acre lots with approximately four houses per acre (including streets and alleys). The nitrogen loading rate is approximately 400 percent of the allowable regulatory rate.<sup>3</sup>

Another concern in this area is the small lot size and the difficulty of replacing leach fields. Current Cochise County and ADEQ regulations require a 50-foot setback from any component of a septic system to the lot lines. Most of the lots in the Sulger subdivision are only 75 feet wide. This makes it impossible to meet the standard setback requirement. A waiver to this requirement is available, but the adjacent landowner must agree to the encroachment. The setback limit can be reduced to 5 feet through the waiver process. In addition, ADEQ requires a 5-foot setback from driveways and water lines and a 10-foot setback from buildings. Given these restrictions, it is quite difficult to replace leach fields in Sulger while meeting the setback requirements<sup>4</sup>

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<sup>3</sup> Source: City of Sierra Vista Sulger Septic System Replacement Preliminary Engineering Report, City of Sierra Vista. March 2011.

<sup>4</sup> Idem.

By eliminating the use of failing septic tanks, the proposed Project will reduce the potential for groundwater and surface water contamination resulting from the inappropriate disposal of untreated wastewater and will reduce health concerns related to nitrogen loading rates as well as the potential for human contact with raw wastewater which can be caused by surface pooling.

The following are the expected Project environmental benefits:

- Wastewater connections with collection and treatment: 154 new sewer connections
- Capacity to collect and treat wastewater: 0.029 mgd.

#### Mitigation of Risks

Although the Project anticipates some minor direct or indirect adverse impacts in the long and the short term these are not considered to be significant in regards to the construction and operation of the Project. Potential impacts include the following:

- The local air basin will be temporarily impacted by emissions of carbon monoxide, nitrous oxide and sulfur dioxide emissions due to vehicles and equipment used during construction.
- Groundwater and the subsurface will be positively impacted by reducing the potential infiltration of contaminants to reach the water table.
- Noise levels may be elevated during construction activities. This impact is short in duration and concentrated to the work area and will include temporary roadway blockages; as well as presence of workers in the area.

Minor environmental impacts are anticipated from implementation of the Project, some of the mitigation measures consist of:

- Best Management Practices (BMP) to control storm water spillage.
- All work related to excavation would be stopped if previously unidentified or hazardous material is encountered. ADEQ will be contacted to further investigate and implement proper actions.
- Construction and related noise will be mitigated by imposing standard procedures such as specific days and hours of operation and the use of mufflers on construction equipment.
- A traffic control plan will be developed and followed by the building contractor firm, including placement of warning signs preventing potentially hazardous situations.

#### Natural Resources Conservation

The Project contributes to natural resource conservation by reducing environmental deterioration and risks of groundwater and surface waters contamination by expanding the wastewater collection infrastructure providing the necessary means to collect and convey wastewater flows to adequate treatment.

All sewer collection lines in the project area will be located within existing roadways to minimize landscape disturbance.

**Existing Conditions and Project Impact – Health**

According to the “World Health Organization Water, Sanitation and Hygiene Links to Health FACTS AND FIGURES – November 2004 edition”, sanitation projects can have the following benefits to human health:

- 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%.

The construction of a new wastewater collection system in the Sulger Subdivision in Sierra Vista will reduce the health risks associated with inadequate on-site wastewater treatment or lack of proper wastewater treatment. The Project will reduce the possibility of human contact with improperly disposed and partially treated or raw wastewater; as a result, it will reduce the transmission of water borne diseases.

Waterborne diseases are caused by pathogenic microorganisms that are directly transmitted as a result of inadequate wastewater disposal practices and unsafe 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 through poor 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. Projects that provide wastewater collection, such as the Sulger Subdivision Wastewater Collection System, contribute to improving the community’s wellbeing. Table 3 shows waterborne statistics for Cochise County in Arizona.

**Table 3  
 WATERBORNE DISEASE STATISTICS**

| Disease            | Number of Cases per year |      |      |      |      |
|--------------------|--------------------------|------|------|------|------|
|                    | 2012                     | 2011 | 2010 | 2009 | 2008 |
| Amebiasis          | 0                        | 0    | 0    | 0    | 0    |
| Campylobacteriosis | 32                       | 18   | 32   | 22   | 11   |
| Cryptosporidiosis  | 0                        | 0    | 0    | 0    | 0    |
| Giardiasis         | 1                        | 2    | 2    | 1    | 0    |
| Shigellosis        | 18                       | 11   | 8    | 10   | 15   |

Source: Arizona Department of Health Services, Office of Infectious Disease Services  
<http://www.azdhs.gov/phs/oids/data/current.htm>

**Transboundary Effects**

No transboundary impacts are anticipated within or around the region. The environmental impacts resulting from the implementation of the Project will be positive overall, since the

Project will increase the wastewater collection to a currently unserved area, reducing the water resource contamination and improving the quality of life of the residents by reducing potential health risks.

## 2.3 FINANCIAL CRITERIA

The total estimated cost of the Project is US\$3,964,700 which includes the funding for construction, supervision, and contingencies. The Project meets all BEIF program criteria and has been approved by EPA for a BEIF grant for up to US\$3,964,700 to complete the financing of the Project. Table 4 presents a breakdown of total Project costs, as well as the source of funds.

**Table 4**  
**USES AND SOURCES OF FUNDS**  
**(US\$)**

| <b>Uses</b>                                  | <b>Amount</b>      | <b>%</b>   |
|----------------------------------------------|--------------------|------------|
| Construction, contingencies, and supervision | \$3,964,700        | 100        |
| <b>TOTAL</b>                                 | <b>\$3,964,700</b> | <b>100</b> |
| <b>Sources</b>                               | <b>Amount</b>      | <b>%</b>   |
| NADB-BEIF Construction Assistance Grant      | \$3,964,700        | 100        |
| <b>TOTAL</b>                                 | <b>\$3,964,700</b> | <b>100</b> |

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## 3 PUBLIC ACCESS TO INFORMATION

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### 3.1 PUBLIC CONSULTATION

BECC released the Project proposal for a 30-day public comment period beginning February 28, 2013. No comments were received. Additionally the following list of Project documents is available for public access:

- Final Design Report, Wastewater Collection System for the Sulger Subdivision, Sierra Vista, AZ. Public Works Department City of Sierra Vista, October 2012
- Categorical Exclusion for the WWCS in Sulger Subdivision in Sierra Vista, AZ.
- City of Sierra Vista Sulger Septic System Replacement Preliminary Engineering Report, City of Sierra Vista. March 2011
- Tierra Services, Environment Report, Sulger Sewer Project, City of Sierra Vista, Arizona, October 2010.
- Public Meeting Minutes, pictures, articles and materials.
- Arizona Administrative Code. Title 18, Chapter 9.
- Title 40 Code of Federal Regulations Parts §1500-1508 (40 C.F.R. Parts 1500-1508).

### **3.2 OUTREACH ACTIVITIES**

The city of Sierra Vista conducted extensive outreach efforts to communicate the project characteristics, including cost and fees and to obtain the support of the residents of the project area. In accordance with the public outreach requirements of the BEIF program, activities such as the use of a local steering committee, public meetings, and appropriate project information access were conducted as described in the Public Participation Plan (PPP). The following information provides a summary of the outreach activities carried out for the Project.

The Local Steering Committee was formally installed on January 19, 2012 at a meeting held at the Public Works Office. The steering committee included residents and members of the community, and was formed by individuals from the local Environmental Affairs Commission, a Sierra Vista Councilman, Cochise College and residents from the project area.

The steering committee developed a public participation plan and periodically met with the project team throughout the development period to help the project sponsor to disseminate information regarding the Project. The Project's technical and financial information was made available to the public for review. The Local Steering Committee, with assistance from the project sponsor, prepared a fact sheet and a presentation for the Project. Project information was presented to the community during two public meetings.

The first Public Meeting notice was published February 3, 2012 in various places such as the Sierra Vista Herald, the Public Works Board and via handouts in the project area. The meeting was held on March 8, 2012 at the Sierra Vista Area Chamber. The meeting was attended by more than 50 residents from the Sulger Subdivision. This meeting informed the residents of the Project's characteristics, potential funding sources, impact fees and future household connections monthly costs related to the new wastewater collections system.

A second public meeting was held on September 11, 2012. During the meeting the community was informed of the Project's funding structure, impact fees, and future household connection monthly costs related to the new wastewater collection system. The meeting was attended by more than 60 people showing their support and interest towards project implementation. The meeting served as a discussion forum for the residents who also signed an acceptance letter to support the Project.