

Border Environment Cooperation Commission
Improvements to the Water and Wastewater Systems for El Paso County Water & Control Improvement District #4
(Fabens, Texas)

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I. General Criteria

1. Type of Project. The project consists of expansion of the wastewater treatment plant, well head water treatment system, rehabilitation of the water distribution system, and rehabilitation of the sewer system.
2. Location of Project. The project is located in the town of Fabens, Texas. Fabens is an unincorporated community in the County of El Paso, Texas located approximately 28 miles southeast of the county seat in the City of El Paso and 4 miles of the Rio Grande. The 2000 population of Fabens is approximately 7,066 people, and is expected to reach 10,916 people by the year 2020. To determine the population a historical growth rate of 2.33% was used and reduced to 2.16% by the end of the planning horizon.

3. Description of Project and Tasks.

The District has been in violation of TNRCC requirements for its wastewater treatment plant and drinking water quality for several years. The existing wastewater treatment plant exceeds the 75/90 percent rule related to capacity mandated by TNRCC. The plant has also exceeded the permit levels for BOD and TSS, and minimum limit of Cl_2 residual. In the area of water, for the last five years the drinking water quality exceeds state standards in total dissolved solids, iron, and manganese. There is also inadequate fire protection and low pressures.

In October 1998, the TNRCC gave the District 6 months to develop a schedule through construction and startup to remedy the situation. Therefore, the District contracted a consulting firm to complete a water and wastewater facility plan and environmental information document.

The facility plan recommends that the wastewater treatment plant be modified and expanded from 0.67 mgd to 1.2 mgd and an interceptor line be constructed. The wastewater treatment plant currently is permitted to discharge and will continue to discharge into the Fabens Waste Drain Channel, which is approximately 6.5 miles from the Rio Grande. This outfall is part of the drainage area of Segment 2307 of the Rio Grande. The quality of the effluent will meet the permitted standard of less than 20 mg/l of chemical oxygen demand (COD), 20 mg/l of total suspended solids, and less than 200 colonies/100 ml of fecal coliform. The sludge is permitted for drying on site and is sent to a local landfill.

In area of water, the facility plan recommends the replacement of the 2-inch water lines, additional pumping capacity, and treatment units at well sites to remove iron and manganese.

A summary of the components are addressed below:

Wastewater Treatment:

- Modification to the existing Oxidation Ditch
 - Addition of aeration equipment for aeration and mixing
- Expansion of Wastewater Treatment Plant
 - Headworks: mechanical bar screen and circular grit tank
 - Aeration Process
 - Secondary Clarifier
 - Disinfection
 - Sludge Drying Beds
 - Mechanical sludge collection

Wastewater Collection:

- 7,000 lf of 15-inch interceptor

Water Distribution System:

- 11,885 lf of existing mains PVC line

Storage Capacity:

- Air Valve

Water Pumping Capacity:

- Mechanical equipment at well #4
- 1000 gpm booster pump at well #4
- 470 gpm booster pump at 10th St Well

Water Treatment System:

- 1,300 gpm Chemical Equipment at well #4 and #5
- 1,350 gpm Chemical unit at 10th St. Well
- 0.5 MG Tank at Well #4

4. Compliance with international Treaties and Agreements.

The implementation of this project will comply with all the current International Treaties and Agreements between the United States of America and Mexico that are related to environmental problems along the international border.

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II. Human Health and the Environment

1. Human Health and Environment.

Water pumped from groundwater supply wells does not meet the Texas Natural Resource Conservation Commission (TNRCC) water quality standards. The water contaminants in the District's water supply are classified as secondary pollutants and primarily affect the aesthetic qualities of water. Although aesthetic problems pose no direct threat to human health, these issues do affect the public acceptance of drinking water, and therefore have indirect health consequences. High sulfate levels at the CC Camp well gave the water a rotten egg odor. The District is also concerned with the high levels of iron and manganese at the three wells that are currently in operation. Iron levels at Well #5 are high enough to affect the taste of the drinking water. Iron and manganese produce ugly rusty brown, yellow, gray or black stains and streaks on clothing during laundering, on plumbing fixtures and anything else they come into contact with, as well as affecting food preparation. In addition, water containing iron and manganese promotes the growth of iron and manganese tolerant bacteria in mains. The bacteria are not harmful to humans but impart an especially foul taste and odor making the water objectionable to drink or bathe in. Of additional concern to the District, bacterial growth can increase friction losses in water mains, leading to more work for the pumps and accompanying higher power consumption.

The offensive taste, odor and appearance of the water give citizens the impression that it is unsafe to drink. In the hot summers, the residents choose to hydrate themselves and their children with soft drinks instead of the far healthier alternative of water. Personal hygiene is impacted when the odor and taste of the water is so objectionable that residents avoid bathing, washing their hands frequently or brushing their teeth. Health professionals working in the local schools and clinics have witnessed and testified to the effects of poor hygiene due to avoidance of good quality tap water.

The water distribution system is not adequate to meet fire protection standards posing a direct threat to the safety of residents in the District. A majority of the water distribution lines are two inches in diameter. A minimum size of 6 inches in diameter is needed for the installation of fire hydrants. The TNRCC requires a maximum spacing of 500 feet between hydrants. Although the new administration in the District has actively been adding fire hydrants to the system, the town only has approximately 50 percent of the fire hydrants required to ensure adequate fire protection according to TNRCC guidelines. Furthermore, system modeling revealed that they system cannot maintain the TNRCC minimum 20 psi pressure in the event of a fire.

2. Environmental Assessment:

An Environmental Information Document was prepared in January 2001 and submitted to the US EPA for review and finding. On the basis of the environmental review and assessment (EA) of the Environmental Information Document and other available information, the Regional Administrator has made a determination that the project is not a major Federal action significantly affecting the quality of the human environment and that preparation of an Environmental Impact Statement (EIS) is not warranted. The project individually, cumulatively, or in conjunction with any other action will not have a significant adverse effect on the quality of the environment.

The EPA issued its preliminary Finding of No Significant Impact (FONSI) on May 16, and after the public comment period, signed the final FONSI on June 18.

3. Compliance with Environmental and Cultural Resources Law and Regulations

The project is in compliance with all applicable environmental and cultural resource laws and regulations, including among others, Significant, Unique or Important Farmlands, National Natural Landmarks, Wilderness Protection, Wild and Scenic Rivers, Wetlands Protection, Floodplain Management, Fish and Wildlife Protection, Endangered Species Protection, Historical, Architectural, Archeological, and Cultural Sites, Air Quality, and Environmental Justice. The project is in conformance with the State Implementation Plan (SIP) for the County of El Paso, and with the Water Quality Management Plan developed by the Texas Department of Water Resources and West Texas Council of Governments.

III. Technical Feasibility

1. Appropriate Technology.

A water and wastewater facility plan was completed in January 2001 for the project through the District's own funds. The facility plan included a planning horizon of 20 years and included modeling of both the existing water system and wastewater system for average demands and peak demands to determine the appropriate phasing of the proposed infrastructure for the immediate needs, 2010 needs, 2020 needs, and buildout. The average per capita residential consumption used was 120 gpcd and for wastewater flow was 80.8 gpcd. The facility plan also contained various alternative analyses whereby the selected alternative was the most cost effective and provided ease of operation. The following summarizes the alternative analyses:

Water Distribution System

- The deficiencies in the water distribution system yielded two alternatives. The do nothing alternative, which would result in periods of low pressure and the system, would thus be out of compliance with TNRCC. The second and recommended alternative is to abandon all existing 2-inch diameter water lines and some 6-inch diameter water mains and install new 8-inch mains. In addition the existing 8-inch main which conveys water to a ground storage reservoir will need to be upgraded to a 16-inch main in order to meet the demands of the system.
- Based on the modeling, the existing pumping facilities also need to be upgraded to meet the minimum pressures required by TNRCC. Four alternatives were analyzed including the (1) do nothing alternative, (2) purchase of a new 1,500 gpm reservoir and pump station, (3) a new 400 gpm booster pump at well site #4 and relocation of CC camp reservoir and booster station to well site #4, and (4) the selected alternative of an additional 470 gpm to the existing 10th street booster.

Water Supply/Treatment System

- A total of five alternatives were considered to address the water quality issue. The goal of each alternative was to provide quality potable water to the rate payer at an affordable cost. The five alternatives include (1) the do nothing alternative, (2) purchase water from an outside source, (3) dissolve the district and become part of another existing district, (4) develop and implement a water exploration program to find and develop one or more wells, and (5) the selected alternative to treat the existing water supply to remove Iron and Manganese
- Three alternatives were considered for treatment which include (1) conventional chlorination and filtration, (2) ion exchange, and (3) the selected alternative of oxidation/precipitation/filtration through an electromedia system.

Wastewater Collection System

- Three alternative routes were considered to divert flow from the River Street interceptor.

Wastewater Treatment System

- Improvements are required for the following units and alternatives were considered for each component: Inlet structure, aeration process, secondary clarifier, disinfection, and sludge handling.
 - A new inlet structure is needed therefore, three alternatives were considered including (1) manual bar screen, (2) inclined bar rake, and (3) the selected alternative, a mechanically-cleaned fine bar screen. For grit removal two alternatives were considered including (1) the hydraulic grit separator and (2) the selected alternative of the circular grit tank.
 - Additional oxidation ditch volume is required to improve plant performance therefore three alternatives were considered (1) replace existing oxidation ditch with an aeration basin, (2) replace existing oxidation ditch with a trickling filter, and (3) modifying the existing oxidation ditch and constructing an additional oxidation ditch.
 - The secondary clarifier does not have adequate side wall depth therefore three alternatives were considered (1) upgrade existing secondary clarifier, (2) add a new single tank, and (3) the selected alternative of a multiple tanks.
 - The existing chlorine contact chamber does not meet TNRCC design criteria. Several alternatives were considered to upgrade the existing chlorine contact chamber including (1) rehabilitate the existing structure to meet TNRCC design criteria and add a second chlorine contact chamber to handle future peak flows (2) substitute a liquid-chlorine feed unit for the gas feed for safety reasons (3) ozone disinfection (4) and ultraviolet disinfection.
 - The sludge drying process must be expanded to handle the existing and future plant loads. The sludge dewatering and drying alternatives considered included (1) belt filter press (2) sludge drying beds with underdrain system (3) and the selected alternative of sludge drying beds with an underdrain system and mechanical sludge handling.
2. Operation and Maintenance Plan. The District is in the process of updating its comprehensive Operation and Maintenance Plan. The contractor for the water treatment component of the project will be required to provide an operations manual and training associated with the equipment.
3. Compliance with applicable design norms and regulations. This project complies with applicable design standards and regulations that are required by the state of Texas and County of El Paso.

IV. Financial Feasibility and Project Management

1. Financial Feasibility.

The project has a total project cost is \$9,101,993. The following table illustrates the details of the estimated project cost.

	District	Not Funded	Other Sources	Totals
Add Rotor/Walls	\$ 114,000			\$114,000
Mod Chlorine Contact Basins		\$ 20,000		\$ 20,000
Expand WWTP		\$ 3,531,450		\$3,531,450
River St. Interceptor (Funded by RD loan)			\$ 1,225,234	\$1,225,234
Altitude valve at I-10	\$ 6,500			\$ 6,500
Install equip at Well #4		\$ 250,000		\$ 250,000
Install chemical equipment at Well #4		\$ 825,000		\$ 825,000
0.5 MG tank at Well #4		\$ 500,000		\$ 500,000
Install chemical equipment at 10th street Well		\$ 894,000		\$ 894,000
New 1000 GPM booster pump at Well #4		\$ 100,700		\$ 100,700
Additional 470 GPM booster at 10th St.		\$ 32,400		\$ 32,400
Install chemical equipment at CC Camp Well		\$ 624,000		\$ 624,000
Rehabilitate Water Lines (Funded by Utility)	\$ 978,709			\$978,709
Totals	\$ 1,099,209	\$6,777,550	\$ 1,225,234	\$9,101,993

The following table summarizes the financial structure of the project.

Source	Amount	%
BEIF (Grant)	\$4,111,274	45.2
District Funds	\$1,099,209	12.1
RUS Loan/District Match	\$1,225,234	13.5
NADB Loan (Value Lending)	\$2,666,276	29.2
Total	\$9,101,993	100

Additionally, Transition Assistance from the BEIF program is included to allow for the gradual increase in the rates. The Transition Assistance is not a project cost and therefore is not listed in the above financial structure.

Source	Amount
Transition Assistance (BEIF Grant)	\$1,356,248

2. Rate Model:

The average monthly combined rate for water and sewer is \$26.05. An increase to \$36.50 over a seven year period will be needed for the project. In order to increase the rate in a gradual manner transition assistance from the BEIF program is needed in the amount of \$1,356,248.

3. Project Management. The existing organizational structure of a General Manager, an Operations Department with 8 operations personnel, and an Administrative Department with office personnel of 3 will be sufficient to continue operating the proposed infrastructure.

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V. Public Participation

1. Comprehensive Public Participation Plan: The El Paso Water Control and Improvement District #4 (EPWCID #4) in Fabens, Texas and the project steering committee submitted a public participation plan on April 24, 2001. The plan was approved two days later. Activities carried out in fulfillment of the plan are summarized below.
2. Steering Committee: The steering committee was formed in February of this year. It includes Homer Russell, President, self employed; Steve Bridgeman, mechanic, Vicepresident; Leon Gonzalez Secretary; Robert Kimpel, local locksmith; Michael Surratt, agriculturalist; Policarpo Porras, local resident; Raul Gutierrez, student; Rafael Ramirez, of the Fabens Independent School District; and Sue Bridgeman, of the Tornillo Independent School District. A support group for this steering committee is composed of Steve Rodriguez and Michael Perez of the EPWCID#4, consulting engineers and Cecilia Rodriguez of the Secretary of State of Texas Colonias Initiative Office.
3. Local Organizations: The list of organizations contacted included local churches such as the First Baptist, Nuestra Señora de Guadalupe, First United Methodist, Templo Elim, Assembly of God, and other organizations such as the Fabens School Board, Parent Teacher Organization and others. A special meeting of the steering committee with local businesses was held in May 2001 to discuss the project's impact on the local community.
4. Public Information: The Water and Wastewater Facility Plan and Step II document were available for steering committee since February and for public review at the District office and public library since April 2001. Fact sheets have been distributed to local organizations and mailed to local residents prior to each public meeting.
5. Public Meetings: The first BECC required public meeting was held on May 15, 2001 with over 160 people attending. The second required meeting was held on December 11, 2001. A survey was mailed to all of the water customers of the District. Returned surveys show over 90% support the need for the project including the rate increase.

VI. Sustainable Development

1. Definition and Principles

- ple 1: The project will improve the quality of life for residents of the Town of Fabens by providing safe, desirable drinking water and ensuring adequate fire protection and wastewater collection and treatment for current and future residents.
- ple 2: The proposed project includes changes to the system that would insure the protection of human health and the environment with population changes projected through the year 2020. Development in the Town of Fabens will be hindered without implementation of the proposed changes to the systems, putting the socioeconomic well-being of the community, already poor, at further risk. The existing water and wastewater infrastructure can not sustain the projected population increase or any new educational, recreational or community services.
- ple 3: An Environmental Information Document was prepared documenting the development of alternatives and which included the consideration and analysis of environmental issues. Environmental protection is integral to the project.
- ple 4: Stakeholders have been involved and have had the opportunity to participate in the decision-making process. This not only includes the local residents, but also local, regional, state, and federal agencies with statutory interest and standing in the issues at hand.

2. Institutional and Human Capacity Building.

The District currently has the basic institutional and human capacity to operate and maintain the existing system and the proposed improvements. Improvements to these capacities have recently been implemented and include:

- The District has plans to upgrade improve its 25 year old operation and maintenance plan, and implement a safety and contingency plan
- The District has also implemented a plan to encourage the current employees to seek the highest level certification possible.
- The District's Board of Directors have set the goal for all operators to obtain a minimum Class "C" license.
- The District's Board of Directors has approved monetary incentives and will pay all expenses for employees to attend seminars and courses out of town to obtain certification.

3. Conformance with Applicable Local/Regional Conservation and Development Plans.

The project is in conformance with the State Implementation Plan (SIP) for the County of El Paso, with Section 208 of the Clean Water Act of 1977, and with the Water Quality Management Plan developed by the Texas Department of Water Resources and West Texas Council of Governments.

The County of El Paso has proposed to expand the existing Fabens Port of Entry as a means of alleviating traffic on the other international bridges as well as stimulating economic development in Fabens and surrounding areas. Without the implementation of the recommended improvements contained in the Facility Plan, the infrastructure does not exist to support additional development.

4. Conservation of Natural Resources.

The proposed water and wastewater system upgrades will result in natural resource protection and conservation through the conservation of energy and water resources.

Energy will be conserved by:

- Currently the growth of iron and manganese bacteria results in higher friction losses in the system. Chemical treatment of the water wells to remove iron and manganese will prevent the build up of iron and manganese bacteria and will result in energy conservation.
- Minimizing the energy necessary to pump water lost due to leakage by replacing the leaking pipes.
- Improving the aesthetic qualities of the water will also result in less pumping energy since the residents of Fabens are in the habit of leaving the faucet or hose running until the color of the water improves.

The water consumption rate for the District is 109.1 gpcd (gallons per capita per day). This is lower than the water consumption for the El Paso Water Utilities system, at 160 gpcd. The implementation of the proposed upgrades will further conserve water resources by:

- Minimizing system leakage
- Minimizing water consumed to purge poor water quality.

5. Community Development.

The implementation of this project is crucial for community development. The water distribution and wastewater collection and treatment systems are not adequate for the needs of the existing population. Therefore, the District is unable to expand service to any additional customers, residential or commercial. A moratorium on residential construction is already in place.

The County of El Paso is planning to expand the existing Fabens International Port of Entry from two lanes to four, more than doubling the width of the bridge from 60 feet to 150 feet. Without the proposed improvements to the water and wastewater systems, the projected economic development from the expansion of the bridge may not occur, because new businesses will be unable to locate within the boundaries of the EPCWCID#4.