



# **CERTIFICATION PROPOSAL**

## **ARSENIC TREATMENT AND WASTEWATER COLLECTION PROJECT TORNILLO, TEXAS**

*Submitted: July 31, 2014*

## CERTIFICATION PROPOSAL

### ARSENIC TREATMENT AND WASTEWATER COLLECTION PROJECT TORNILLO, TEXAS

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## EXECUTIVE SUMMARY

### ARSENIC TREATMENT AND WASTEWATER COLLECTION PROJECT TORNILLO, TEXAS

- Project:** The proposed project consists of the construction of an arsenic treatment facility (ATF), and the addition of 19 new wastewater connections to the ATF waste line. The completed ATF and sanitary sewer line will be owned and operated by El Paso County Tornillo Water Improvement District (EPCTWID), which serves the unincorporated community of Tornillo (the “Project”).
- Project Objective:** The purpose of the Project is to provide improved access to sustainable potable water service by reducing Arsenic concentrations to comply with regulatory requirements. The related ATF waste line will provide infrastructure to support first-time wastewater connections eliminating risks of exposure to untreated or inadequately treated wastewater discharges.
- Expected Project Outcome:** The Project is expected to generate environment and human health benefits related to the following Project outcomes:
- Provide improved drinking water quality;
  - Full compliance with regulatory standards -- arsenic concentrations will be reduced to < 10 µg/L.<sup>1</sup>
  - Provide access to wastewater collection and treatment services for 19 new sewer connections.
  - Eliminate untreated or inadequately treated wastewater discharges of approximately 6,000 GPD.
- Population Benefited:** 3,500 residents of the unincorporated community of Tornillo, Texas.<sup>2</sup>
- Project Sponsor:** El Paso County Tornillo Water Improvement District (EPCTWID)
- Project Cost:** US\$3,251,460
- BEIF Grant:** US\$3,251,460

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<sup>1</sup> 10 µg/L = 10 ppb = 0.01 mg/L.

<sup>2</sup> Based upon 2012 EPCTWID connection data with 3.92 residents per household.

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

<b>Uses</b>	<b>Amount</b>	<b>%</b>
Construction, contingencies, and supervision	\$3.25M	100
<b>TOTAL</b>	<b>\$3.25M</b>	<b>100</b>
<b>Sources</b>	<b>Amount</b>	<b>%</b>
NADB-BEIF (Grant)	\$3.25M	100
<b>TOTAL</b>	<b>\$3.25M</b>	<b>100</b>

# CERTIFICATION PROPOSAL

## ARSENIC TREATMENT & WASTEWATER COLLECTION PROJECT TORNILLO, TX

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### 1. ELIGIBILITY

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#### **Project Type**

The Project falls within the eligible sectors of drinking water and wastewater collection.

#### **Project Location**

The Project is located in the unincorporated community of Tornillo, El Paso County, Texas, adjacent to the U.S.-Mexico border. The project is in the border region defined as within 100 kilometers (62.5 miles) of the U.S.-Mexico International Border.

#### **Project Sponsor and Local Authority**

The project sponsor, the El Paso County Tornillo Water Improvement District (EPCTWID), is a public sector utility created in August 2001. EPCTWID was granted a Certificate of Convenience and Necessity (CCN No. 11416) on February 23, 2006 by the Texas Commission on Environmental Quality (TCEQ), to provide service to the community.

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### 2. CERTIFICATION CRITERIA

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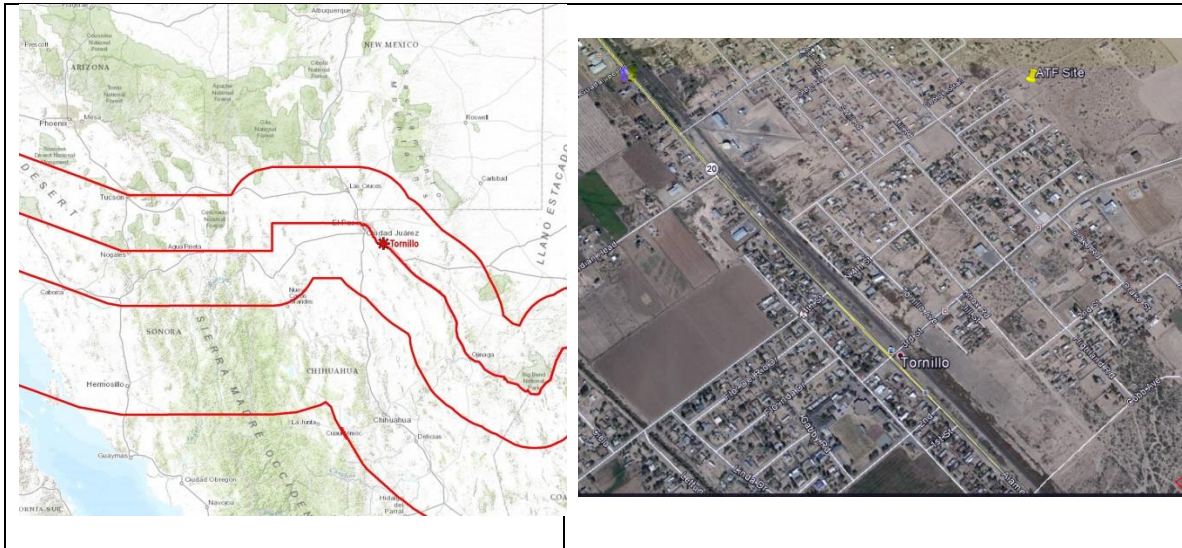
#### 2.1. TECHNICAL CRITERIA

##### 2.1.1. Project Description

#### **Geographic Location**

The unincorporated community of Tornillo is located in El Paso County, approximately 30 miles southeast of El Paso, in the Rio Grande Valley. The ATF will be constructed on the north side of Tornillo, approximately 3 miles from the US Mexico border. The new sanitary sewer line (waste line) will begin at the ATF site, and be routed along Hadley, Drake and Fourth Streets before connecting to EPCTWID's existing wastewater collection system (WWCS).

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



**General Community Profile**

According to the 2010 US Census Data, the Census Designated Place (CDP) for Tornillo had a population of 1,568.<sup>3</sup> However, the boundaries of the CDP do not coincide well with the Tornillo Service area. The CDP boundaries are limited primarily to areas south of Highway 20, while the Tornillo service area straddles the highway, and includes more outlying areas. The community's population has been estimated using the average household size in the CDP (3.92), and EPTWCID's total number of residential water connections (892), for an estimated population of 3,500 persons.<sup>4</sup> This estimate is also consistent with other population indicators such as Tornillo Independent School District student population of 1,366 students.<sup>5</sup>

The estimated Median Household Income (MHI) in Tornillo is \$28,295, which is significantly lower than the Texas MHI of \$50,920. Tornillo's population living below the poverty level is 38%, compared to 17.0% for statewide.<sup>6</sup>

The status of public services in the EPCTWID service area is described in Table 1 below.

<sup>3</sup> <http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkml>.

<sup>4</sup> Brown and Caldwell 2013 Population Projection Analysis.

<sup>5</sup> <http://tisd.schoolfusion.us/>.

<sup>6</sup> <http://quickfacts.census.gov/qfd/states/48000.html>.

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

<b>Water System</b>			
Water coverage*	100%		
Supply source	EPCTWID operates two active wells in the Hueco Bolson Aquifer, and has a third well for contingencies.		
Number of hookups	892 residential and 74 commercial		
<b>Wastewater Collection</b>			
Coverage	62%		
Number of connections	572 residential and 29 commercial		
<b>Wastewater Treatment</b>			
Coverage	100%		
Treatment facilities	<b>Plant</b>	<b>Type</b>	<b>Capacity</b>
	Tornillo WWTP	Activated Sludge	0.73 MGD
<b>Solid Waste</b>			
Collection coverage	~95%		
Final disposal	Landfill		
<b>Street Paving</b>			
Street paving coverage	70%		

\* Information provided by EPCTWID.

**Project Scope**

Naturally occurring arsenic in the aquifer serving this community regularly tests at levels ranging from 0.010 mg/l to 0.015 mg/l, which exceeds regulatory limits of 0.010 mg/l for potable water allowed by the Clean Water Act (CWA). EPCTWID was notified of non-compliance with CWA Arsenic Standards in 2005 by the TCEQ. In July 2011, EPCTWID was notified by the EPA that it must come into compliance or it will be liable for fines of up to \$37,000/day of non

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- Modification to the 6



**Figure 3**  
**ARSENIC TREATMENT FACILITY SCHEMATIC**



Table 2 shows the proposed schedule for project implementation milestones.

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

Key Milestones	Status
Procurement	Anticipated: 3 <sup>rd</sup> quarter 2014
Installation Period	Complete within six months from notice to proceed.

### **2.1.2. Technical Feasibility**

#### **Design Criteria**

The ATF design conforms to the process developed through pilot testing and approved by TCEQ. In general, all design modifications to the Tornillo water system conform to TCEQ design standards. Additionally, all media and additives must conform to standards for drinking water set by American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61.

### Selected Technology

The following considerations were taken into account for the ATF selection criteria:

- Reliable Arsenic Removal. In order to meeting regulatory requirements the treatment technology must reduce the arsenic concentration to  $\leq 0.010$  mg/l.
- Treatment Capacity. The system must meet the current demand (600 gpm) and be expandable to provide additional service to meet future demand.
- Capital Cost. The utility's capacity to fund the construction of the ATF is extremely limited therefore the selection of a low cost option was targeted.
- Operations and Maintenance (O&M) Costs. O&M costs have an ongoing impact on the utilities financial viability therefore O&M considerations were included in the evaluation process.

The recommended system uses a Greensand Plus™ filtration process. This system was chosen for the following reasons:

- high removal efficiency -- 85% to 95% for arsenic;
- the media can be continuously reused;
- the technology is highly reliable and scalable;
- the process provides the additional benefit of iron and manganese ions removal; and
- Greensand™ technology is well established leading to competitive capital and O&M costs.

The primary disadvantage of all arsenic treatment processes are water losses associated with waste effluent and backwashing. The plant will require approximately 17,000 gallons per day for backwashing when operating at full capacity. The backwash requirement represents a loss of approximately 2% of the daily production.

The facility, as approved by TCEQ, will have the capacity to treat 600 gpm meeting the required production rate of 580 gpm (utilities are required to supply 0.6 gpm/connection). Currently average demand is nearly 200 gpm (based on the utility's average demand of 290 gpd per connection). Although the EPCTWID's capacity exceeds current demands, the combined production rate from supply Wells No. 2 and No. 3 is 560 gpm, does not meet TCEQ requirements. To meet TCEQ requirements the community has drilled Well No. 4 increasing its capacity by 300 gpm.

The ATF is expandable allowing it to meet future demands, and EPCTWID has applied to allow water from Well No. 4 to be treated using the Greensand™ Process. In the interim water can be blended with untreated sources to further enhance the utility's capacity.

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

The ATF will be installed entirely within the site of the Well No. 3; the site is partially owned by Tornillo and partially leased from University Land. The Project improvements will straddle the leased and owned portions of the site. In February 2006, EPCTWID renewed a 10-yr lease for the site, for \$500 per year. All of the modifications to the water system will occur within Well Site No. 2. The waste effluent line will be installed entirely along existing ROW before connecting to Tornillo's existing wastewater collection system. No new land acquisitions will be required for this Project.

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

The operations and management of the proposed Project will be the responsibility of EPCTWID. The utility will ensure that sufficient resources, training, and staff are available for the proper operation of the new ATF.

EPCTWID provides both water and wastewater services, and has established procedures for operations and maintenance of both services. EPCTWID has two licensed operators, one with level C water/wastewater certifications, and one with a level A wastewater certification. The ATF manufacturer will provide the operators with O&M manuals and training for the correct operation of the new ATF. TCEQ requires water operators with a level "C" certification to operate and maintain the system. The utility is committed to developing additional certified operators.

The Utility was established in 2001; the utility has been providing water services since that time and Wastewater service since 2009. The utility has 957 water connections and 599 wastewater connections. The utility has the capacity to produce 560 gpm from wells nos. 2, and 3, well no. 4 is currently used as auxiliary supply only.

## **2.2. ENVIRONMENTAL CRITERIA**

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

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

The Project is subject to the environmental clearance process included in the National Environmental Policy Act (NEPA). In considering funding from the US-Mexico Border Water Infrastructure Program, the Project was reviewed in accordance with the U.S. National Environmental Policy Act (NEPA), 42 USC §§4321-4370f. In accordance with NEPA, Council on Environmental Quality (CEQ) regulations found at Title 40 CFR §§1500.1-1508.28, and EPA NEPA regulations at 40 C.F.R. Part 6, EPA Region 6 completed the environmental review and clearance process.

In 2001, the EPA adopted a new standard, under the Safe Drinking Water Act (Section 1414), for arsenic contamination in drinking water, limiting its concentration to 0.010 mg/L. The new

Arsenic Rules required all community water supplies to be with in compliance by 2006. The rules are enforced by both the TCEQ and the EPA. Currently EPCTWID is not in compliance with the arsenic rules, but has shown steady progress in working toward a solution.

**Environmental Studies and Compliance Actions**

Tornillo has received two enforcement letters (Dated July 14, 2011 and April 10, 2013) from the EPA advising the community that they will be subject to fines of up to \$37,500 per day if the system is not brought into compliance. The utility has not been fined to date, since it has been able to demonstrate that it is continuously advancing towards meeting the regulatory requirements.

An Environmental Information Document (EID) was developed for this project by Brown and Caldwell and submitted for environment review to the TWDB in November 2011, and received a Finding of No Significant Impact (FONSI) through the TWDB in November 2012. Since the Project is also expected to receive federal funds from EPA US-Mexico Border Water Infrastructure Program, it is also subject to a NEPA process overseen by EPA; therefore the EID prepared for TWDB was updated to meet EPA requirements, and submitted to the EPA for NEPA clearance.

The EID evaluates the potential environmental impacts that would result from the implementation of alternatives considered, including the proposed action. To obtain a FONSI the proposed project is evaluated for potential environmental consequences and methods for mitigating the effects are made. If the project's environmental impacts are determined to be immaterial then a FONSI is issued. The EID addresses each of to the following environmental areas:

- Air quality, odors, and greenhouse gas emissions
- Noise impacts
- Water quality, hydrology and floodplain impacts
- Biological resources and wetland impacts
- Cultural and historic resource impacts
- Geology and soils impacts
- Municipal and public service impacts
- Public health, hazards and waste management
- Socioeconomic conditions
- Land use and planning
- Transportation and circulation
- Utilities and service systems, and
- Environmental justice

Based on the findings and conclusions of the EID, EPA Region 6 prepared an Environmental Assessment (EA) and a Finding of No Significant Impact (FONSI), which was issued on February 19, 2014.

### **Pending Environmental Tasks and Clearances**

There are no pending environmental tasks or authorizations.

### **Compliance Document**

- TWDB Finding of No Significant Impact (FONSI) issued November 6, 2012
- EPA Finding of No Significant Impact (FONSI) issued February 19, 2014
- TCEQ conditional project approval in compliance with Chapter §290 Rules and Regulations for Public Water Systems (Rules)

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

Tornillo residents currently do not have access to water that meets regulatory requirements for Arsenic contamination. The utility's water quality is further impaired by high concentrations of iron and magnesium ions, which are a secondary concern due to unpleasant taste and aesthetic characteristics that they impart to the water. The ATF will bring EPCTWID water supply into compliance with existing environmental regulations and improve the community's satisfaction with the available drinking water service.

Residents along the new sanitary sewer lines currently lack access to wastewater collection services, and rely on on-site treatment such as septic systems. In general on-site treatment leads to risks of groundwater contamination and waterborne diseases associated with human contact with raw sewage.

The 19 new connections will eliminate discharges of approximately 5,600 gallons per day of inadequately treated and untreated wastewater. The operation of the ATF will create a waste stream of approximately 17,000 gallons per day. The Tornillo wastewater plant has capacity for 0.73 MGD, and currently operates at approximately 0.078 MGD; the new connections will help improve the operation of the WWTP.

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

EPCTWID water supply contains naturally occurring Arsenic which has tested at concentrations between 0.010 and 0.015 mg/L exceeding the EPA's allowable limit. Some problems associated with regular low doses of arsenic include: nausea, vomiting, effects to the cardiovascular, reproductive, endocrine, and immunological systems, and cancers in the lungs, liver, kidney and prostate. The ATF will reduce the arsenic concentration to acceptable levels, to minimize health risks related to arsenic consumption.

There have not been any environmental issues documented with the on-site wastewater collection systems to be decommissioned as part of this project. Extending services is still anticipated to provide several environmental benefits:

- Provide access to wastewater collection and wastewater treatment services for 19 new sewer connections;

- Eliminate untreated wastewater discharges of approximately 6,000 gpd.

#### Mitigation of Risks

The environmental studies associated with this Project have identified two potential environmental risks associated with this project: an existing flood plain traverses the project site and that the site has been identified as potential habitat for the mountain short-horned lizard and the Texas horned toad lizard. Both are state listed as threatened species.

Impacts to the horned toad lizard are anticipated only during the construction phase, when hibernating lizards could be killed due to construction activities. The lizards hibernate when temperatures are below 75° F (24° C) so construction activities will be limited to periods with average temperatures are above 75° F. This should minimize the risks of accidentally killing a hibernating lizard. Activities that will not be allowed during cooler times include trenching, grading, and construction of the ATF pad. Other construction activities such as installation of the ATF unit may still be allowed during cooler periods, which should not disturb the lizards. After construction accommodating the lizard's habitat is not anticipated to impact the plant's normal operations.

A flood plain as identified by FEMA mapping also traverses a portion of the well site. It was determined that the entire site is not within the plain therefore the ATF will be located outside of the floodplain.

The environmental impacts resulting from the Project's implementation will be positive overall.

#### Natural Resource Conservation

The extension of wastewater collection system to 19 new connections contributes to the conservation of groundwater by reducing the risk of contamination from failing septic systems.

#### No Action Alternative

The no-action alternative was not considered viable. Failing to implement actions will result in continued arsenic exposure for the residents of Tornillo and the enforcement of regulatory fines to EPCTWID.

#### **Existing Conditions and Project Impact – Human Health**

Arsenic primarily enters the body through inhalation of contaminated dusts or through ingestion of contaminated food, and water. It can also enter through the skin, but dermal absorption is not as common. At low concentrations arsenic can be processed in the liver where it is biomethylated then excreted primarily in the urine. Typically a single low-level dose can be excreted within a few days. However, as Arsenic concentrations rise and with chronic exposures the body becomes less efficient at processing and excreting it.<sup>7</sup>

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<sup>7</sup> Agency for Toxic Substances and Disease Registry (ATSDR), Case Studies in Environmental Medicine, Course WBCBDV1576, October 2009.

The health effects from Arsenic can be the result of a single large dose, or from repeated low doses, such as is found in Tornillo's drinking water. Chronic exposure to arsenic is associated with lung, skin, and bladder cancers, but the mode of carcinogenesis is unknown<sup>8</sup>. Other cancer risks may exist, but linkages are not as clearly established. The Tornillo ATF project will remove  $As^{3+}$  and  $As^{5+}$  cations, which are particularly pernicious and can cause acute toxicity at high doses.  $As^{3+}$  can inhibit the pyruvate oxidation pathway and  $As^{5+}$  can disrupt mitochondrial respiration through the rapid hydrolysis of high energy bonds in compounds such as ATP (Adenosine Triphosphate).

The ATF facility will reduce the concentrations of arsenic contaminants in Tornillo's water supply to less than 0.010 mg/L which is deemed safe for human consumption.

Extending sewer connections as part of this project will provide additional human health benefits. According to the "World Health Organization Water, Sanitation and Hygiene Links to Health FACTS AND FIGURES – \*updated November 2004", sanitation projects can have the following benefits to human health:

- Improved sanitation reduces diarrhea morbidity by 32%.
- One gram of feces may contain 10M viruses, 1M bacteria, 1000 parasitic cysts, and 100 worm eggs.
- 4% of global disease burden can be prevented through improved water supplies, sanitation, and hygiene.

Project implementation is expected to reduce the health risks associated with uncontrolled discharges and inadequate on-site 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 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. Table 3 shows waterborne disease statistics for El Paso County Texas.

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<sup>8</sup> WHO, Water, Sanitation and Hygiene Links to Health, <http://www.who.int/mediacentre/factsheets/fs372/en/>.

**Table 3**  
**WATERBORNE DISEASE STATISTICS FOR EI PASO COUNTY, TX**

Disease	Number or Annual Cases			
	2008	2009	2010	2011



- TCEQ letter approving proposed arsenic removal process, August 19, 2009.
- Environmental Information Document (EID), El Paso County Tornillo Water Improvement District's Proposed Arsenic Treatment Facility, Tornillo, El Paso County, Texas, Raba-Kistner Consultants, Inc., November 2011.
- TWDB Finding of No Significant Impact for the Proposed Wastewater collection and Treatment Systems for El Paso County Tornillo Water Improvement District's Arsenic Treatment Facility, November 2012.
- EPA Finding of No Significant Impact for the Proposed Wastewater collection and Treatment Systems for El Paso County Tornillo Water Improvement District's Arsenic Treatment Facility, February 2014.
- Final Design for El Paso County Tornillo Water Improvement District Arsenic Treatment Facility and Wastewater Collection System Project BID NO. 01-13, January 2014

The public comment period ended on July 18, 2014, with no comments received.

### **3.2 OUTREACH ACTIVITIES**

EPCTWID has conducted outreach efforts to communicate the Project goals, benefits, costs, and impacts. In accordance with the public outreach requirements of the U.S.-Mexico Border Water Infrastructure Program, activities such as the use of a local steering committee, public meetings, and appropriate project information access where conducted as described in the Public Participation Plan (PPP). The following information provides a summary of the outreach activities carried out for the Projects. The following information provides a summary of the outreach activities carried out to support this Project.

The Local Steering Committee was formed on April 18, 2013. The steering committee developed a public participation plan and periodically met to help the Utility to disseminate information regarding the Project. The Project's technical and financial information has been made available to the public for review. Information on the Project was presented to the community during public meetings held on April 5, 2012, May 16, 2013, and May 12, 2014.

The April 5, 2012 public meeting was held in support of the TWDB Environmental Review process; notice was posted at the utility and published March 1, 2012 in the West Texas County Courier. The May 16, 2013 meeting was conducted as part of the regular board meeting, the Agenda for the meeting was published on 05/13/2013. The final public meeting was advertised on 05/06/2014 and held on 05/12/2014 respectively.

Links to news articles related to the Project are provided below:

- <http://www.watertechonline.com/articles/stimulus-funds-slated-for-arsenic-removal> (Published July 14, 2009, the article focused on potential stimulus funding for the project)

- [http://www.elpasotimes.com/ci\\_23896947/arsenic-levels-tornillos-drinking-water-raise-concerns](http://www.elpasotimes.com/ci_23896947/arsenic-levels-tornillos-drinking-water-raise-concerns)  
(Published Aug 20, 2013 the article discusses EPCTWID is seeking approval for a \$2.3 million improvement project from NADB)
- <http://www.ktsm.com/news/worried-tornillo-residents-seek-answers-about-arsenic-water>  
(Published Aug 20, 2013 Tornillo's resident's concerns about water quality are discussed)
- <http://www.kdbc.com/news/tornillo-residents-worried-about-arsenic-water>  
(Published Aug 20, 2013 Tornillo's resident's concerns about water quality are discussed)
- [http://diario.mx/El\\_Paso/2013-08-20\\_02c98cf2/faltan-fondos-para-resolver-problema-de-agua-contaminada-en-tornillo/](http://diario.mx/El_Paso/2013-08-20_02c98cf2/faltan-fondos-para-resolver-problema-de-agua-contaminada-en-tornillo/)  
(Published Aug 20, 2013 Tornillo's resident's concerns about water quality are discussed)

All public outreach efforts received very positive responses from Tornillo residents in support of the project, and no opposition was documented in public meetings or by local media coverage.