

Water Resources

Element 8



INTRODUCTION

The ecological health and base flow of the San Pedro River are potentially affected by the use of water within the San Pedro River basin and, as such, the City needs to consider how water use affects water resources. The City’s primary focus is ensuring a long-term water supply for the community while protecting the health of the Sierra Vista Subwatershed of the Upper San Pedro river basin.

A Watershed is a region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or body of water.

It is important to note that the Sierra Vista Subwatershed is comprised of the City of Sierra Vista (including Fort Huachuca), Huachuca City, Tombstone, some of the unincorporated areas of Cochise County, the majority of the San Pedro Riparian National Conservation Area (SPRNCA), and even a small portion of eastern Santa Cruz County. In 2013 approximately one-half of the Subwatershed population resided within the Sierra Vista city limits. The City’s approximate annual growth rate for ten years—between 2003 and 2013—was 1.4 percent, which is also consistent with the growth rate in surrounding areas of Cochise County.



San Pedro River

Growth in Sierra Vista and the surrounding areas has an effect on water resources and a correlative effect on the SPRNCA. In order to support Fort Huachuca in its efforts to mitigate impacts on the SPRNCA, the City has committed to offset its portion of the aquifer’s estimated annual water budget deficit. Numerous mitigation strategies are either currently being implemented or will be implemented. This effort will also require mitigation measures on behalf of future growth.

This Element only focuses on the known available water supply and the anticipated demand. For water conservation related goals and strategies, also refer to Element 9, Conservation Element.

BACKGROUND

The San Pedro River begins in Mexico near Cananea, Sonora, and ends at its confluence with the Gila River near Winkelman, Arizona. The Sierra Vista Subwatershed is located in the southern part of the San Pedro River Watershed. (The Sierra Vista Subwatershed covers the area roughly south of the Babocomari River and ending at the international border, with the eastern border approximately 10 to 20 miles east of the river and the western border consisting of the Huachuca Mountains.)

An aquifer is an underground layer of water-bearing permeable rock or unconsolidated materials from which groundwater can be extracted using a water well.

The Arizona Department of Water Resources (ADWR) Active Management Area (AMA) Review report (2005) cited 19.8 to 26.1 million acre-feet of water in the Upper San Pedro River basin aquifer (which serves a portion of the population in the Sierra Vista Subwatershed).

According to the 2011 *Section 321 Report to Congress*, more water is withdrawn from the Sierra Vista Subwatershed by a variety of uses (agricultural, domestic, municipal) than is being recharged, creating a deficit (see “Estimated Water Use in 2013” below).

An acre-foot of water, equivalent to 325,851 gallons of water, covers 1 acre of land with 1 foot of water

The City of Sierra Vista is not a domestic water provider. The majority of City residents receive their water from one of three private water companies regulated by the Arizona Corporation Commission and Arizona Department of Environmental Quality (ADEQ): Arizona Water, Liberty Utilities, and Pueblo del Sol Water.

Arizona State Law requires “an analysis of how the demand for water that will result from future growth projected in the general plan will be served by the water supplies (the known legally and physically available surface water, groundwater, and effluent supplies).”

Future City Growth Projections

According to the state of Arizona, the estimated City population in 2013 is 45,981. The State further estimates the Sierra Vista population in 2023 will be 50,913. This is a growth rate of slightly over 1 percent per year.

Estimated and Future Projections for City Water Use

Water use data reported to the Arizona Department of Water Resources by the three main water companies operating in Sierra Vista estimates that in 2013 the total water usage in the City, as a whole, is approximately 141 gallons per person, per day—this 141 gallons takes into account the combined water use by residential, commercial, and industrial uses. Using 141 gallons per person, per day, calculates to 0.16 acre-feet of water per person, per day and using the 2023 population estimate of 50,913 persons, and multiplying it by the 0.16 acre-feet of water calculation, water use in the City in 2023 is projected to be 8,041 acre-feet of water per year.

The Cochise Water Project further extrapolated the numbers reported to the Arizona Department of Water Resources and calculated that single-family residential use alone is approximately 90 gallons per person, per day, which is approximately 0.10 acre-feet of water per person, per year. Using the 0.10 acre-feet of water per person calculation, the 2023 estimated population of 50,913, residential water use in the City in 2023 is projected to be 5,091 acre-feet of water per year.

Conservation and Mitigation

As a result of conservation measures, and despite a population increase of nearly 8,000—from 2000 to 2012—City residents reduced usage by more than 5 percent, although the deficit continued to grow. Additionally, while there is evidence that the water table is falling, various studies through the years indicate differing rates.

Sierra Vista enhances the aquifer water supply by recharging effluent water. The Sierra Vista Recharge Project at the City’s Environmental Operations Park is designed to treat and recharge over 4,000 acre-feet of effluent water annually—in 2012, 2,544 acre-feet of effluent water was

recharged and for the period between 2002 and 2013, 19,515 acre-feet of effluent water was recharged. The effluent recharge partially mitigates the water usage in the City.

A water deficit is the difference between water withdrawn compared to water recharged. The 2011 *Section 321 Report* published estimates that the Sierra Vista Subwatershed is in deficit by 4,600 acre-feet of water per year; this is contrasted by the 2003 *Section 321 Report* deficit figure of 13,500 acre-feet of water per year. Groundwater depletion continues, but at a significantly lower rate due to conservation, effluent recharge, and other efforts.

Legally and Physically Available Water Supplies

The City can legally withdraw groundwater (which consists of mountain front recharge, baseflow and underflow into the basin, and artificial and incidental recharge) as long as it is put to beneficial use per the Arizona Groundwater Management Code. The Arizona Department of Water Resources (in 2005) estimated that the mountain front recharge for the Upper San Pedro basin is 28,600 acre-feet per year.

A previously approved agreement with the Tenneco Corporation (prior owner of Castle and Cooke, Arizona, Inc., properties) allows Castle and Cooke to retain effluent water for private use. The 1981 Tenneco agreement committed the City to providing up to 2 million gallons per day of treated effluent for irrigation or other uses in areas under Tenneco ownership. The 1981 agreement was amended in 2006, obligating the current owner, Castle and Cooke Arizona, Inc., to use the available treated effluent to irrigate the existing PDS Country Club golf course, as well as future-parks, rights-of-way, and commercial-area landscaping within the Tribute Specific Plan area. The amount of effluent committed for these purposes remained at 2 million gallons per day, with phasing that begins with 1 million gallons per day, (phasing is triggered by a defined amount of development).

Additionally, the Gila River adjudication has an unknown impact on water users in the community. The adjudication is a judicial proceeding to determine the extent and priority of water rights in the Gila River system. Thousands of claimants and water users are joined in the adjudication that will result in the Arizona Superior Court issuing a comprehensive final decree of water rights for the System. Arizona's definitions regarding surface water, groundwater, and the potential connections between them are subject to these on-going judicial proceedings and may affect access to water supplies in the future. The adjudication has been ongoing for over 30 years.

Lastly, in 2007, Cochise County, pursuant to SB 1575, adopted rules requiring developers of subdivisions, which are defined by the Arizona Department of Real Estates as the creation of six lots or more, to prove 100-year water adequacy prior to a city’s approval of the final plat. It is at the State Department of Water Resources discretion to review and approve or reject the developer’s report. By law, all cities within Cochise County fall under the same requirement.

It should be noted that there are external stresses that can affect the aquifer and the supply of water over which the City has little to no control. Stresses include, but are not limited to:

- Growing population and associated increased competition for water resources
- Poor water quality
- Environmental water allocation issues
- Groundwater overdrafts
- Outmoded water delivery systems
- Drought

(See Element 9, “Conservation” for water conservation-related goals and strategies.)

GOALS AND STRATEGIES

Goal 8-1 Participate in partnerships between local, state, and federal agencies and private water companies

Strategies

1. Obtain and evaluate water usage data from all available sources to determine usage trends.
The City obtains annual water usage information from all local water companies. Based on the trends since 2000, water usage has been trending down despite the increase in home construction and population growth. The water usage in 2000 was 7,633 gallons per acres (gpr). The water consumption in 2020 was 6,814 gprs.
2. Continue cultivating working relationships with all local water companies.
The City coordinates with the local water companies on all site development projects as well as collecting water usage data.
3. Continue the City’s involvement with the Upper San Pedro Partnership (USPP). *The USPP consists of citizens and local water experts that function*

as technical advisors to determine the most effective way to recharge the aquifer. The City continues to be an active member of the Upper San Pedro Partnership.

4. Continue the City's involvement with The Cochise Water Project.

The Cochise Water Project is no longer operating after its primary funding source, The Walton Foundation, ceased payments. Toilet rebate services, once offered by the Cochise Water Project, are now offered directly from the City's Community Development department. Toilet rebates allow homeowners to replace older, inefficient toilets for more sustainable, EPA WaterSense labeled toilets at no cost after the rebate. The City also provides funding to the local University of Arizona Cooperative Extension's WaterWise program. WaterWise provides a variety of public services, including xeriscaping and rainwater harvesting consultation, children's water conservation education, and free workshops and lectures concerning practical water conservation activities.

Goal 8-2 Purchase local, private water companies, when feasible and available

- Strategies*
1. Determine purchase feasibility whenever a local water company is available for purchase. It is not economically feasible to purchase a local water company at this time.

STATE LAW REQUIREMENTS

Arizona Revised Statutes, Section 9-461.05-9 D 5 and F 1 and 2

“A water resources element that addresses:

(a) The known legally and physically available surface water, groundwater and effluent supplies.

(b) The demand for water that will result from future growth projected in the general plan, added to existing uses.

(c) An analysis of how the demand for water that will result from future growth projected in the general plan will be served by the water supplies identified in subsection (a) of this paragraph or a plan to obtain additional necessary water supplies.”

“The water resources element of the general plan does not require:

- 1. New independent hydrogeologic studies.*
- 2. The city or town to be a water service provider.”*

ATTACHMENTS

None

REFERENCES

The following references used in this element are City approved documents.

- Wastewater Management and Sewerage Master Plan, 1986, Amended April 13, 1995, Amended July 22, 1999, Department of Public Works
- 208 Water Quality Management Plan, 1996, Amended 2009, Department of Public Works
- Cochise County Water Resources Inventory, May 2002
- Section 321 of the Defense Authorization Act of 2004, Public Law 108-136, Section 321 Report to Congress, 2011
- Arizona Dept. of Water Resources water use data, 2013
- Arizona State Office of Employment and Population Statistics