

**CITY OF TUCSON, WATER DEPARTMENT
DESIGN STANDARD NO. 8-01
DESIGN STANDARDS MANUAL OVERVIEW**

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These standards are developed to assure that the public water system is reliably capable of supplying adequate quantities of water which consistently meet applicable water quality standards and do not pose a threat to general public health.

8-01.1.0 Introduction

1.1 Purpose of Manual

For public water projects that will become a part of the Tucson Water system, the purpose of this manual is:

- to describe the requirements to obtain approval from Tucson Water for the design of public water project plans and specifications,
- to provide uniform standards to those who are involved in the planning, design, and construction of public water system facilities,
- to ensure the project is designed and approved while complying with, statutes, codes, ordinances and any applicable regulations.
- to ensure that the project is designed and constructed in a manner consistent with established operation and maintenance procedures.

These standards do not waive any applicable City, County, State or Federal regulations or codes.

1.2 Authority for Manual

The establishment of a design standards manual is deemed necessary by Tucson Water in accordance with applicable laws, such as:

- A. A.R.S. 9-499.01, Powers of Charter Cities
“Charter cities ... shall be vested with all the powers of incorporated towns ... in addition to all powers vested in them pursuant to their respective charters, or other provisions of law relating to cities....”

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- B. A.R.S. 9-511, Power To Engage In Business Of Public Nature
1. "A municipal corporation may engage in any ... enterprise ... and may construct, purchase, acquire, own and maintain within or without its corporate limits any such ... enterprise.
 2. A municipal corporation may also purchase, acquire and own real property for sites and rights-of-way for ... the location thereon of waterworks ..., pipelines for the transportation of ... water ...
 3. The municipality may exercise the right of eminent domain either within or without its corporate limits ... and may establish, lay and operate a plant, ... or pipeline upon any land or right-of-way taken thereunder...."
- C. Tucson Code, Chapter 27, Water
Sec. 27-4. Superintendent to control water supply; notice of shutting off pipelines. The superintendent of the water department shall attend to and control the water supply and at all times see to the sufficiency thereof.

8-01.2.0 Basic Requirements Overview

2.1 State of Arizona Requirements

Pursuant to the AAC R18-5-502 (A), recodified 1/30/04, a water system that is designed consistent with the criteria in ADEQ Engineering Bulletin No. 10, "Guidelines for the Construction of Water Systems," May 1978, shall be considered to have been designed using good engineering practices.

ADEQ Engineering Bulletin No. 10 provides guidance and minimum design criteria for the modification and construction of water systems. It is intended for use in the tasks of water system planning, design, plan development, specification writing, review and construction.

2.2 Tucson Water Requirements

This manual will supplement ADEQ Engineering Bulletin No. 10. Where possible, only items that are in addition to, or that exceed, those required in the bulletin will be included. Topics needing clarification or reinforcement will also be covered.

8-01.3.0 Tucson Water Department Overview

3.1 Water Department

For a detailed review of all City codes and ordinances related to the Water Department, please refer to the Tucson Code.

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3.2 Director

The City of Tucson Director of the Utility Services Department includes duties and responsibilities the same as the Director of Tucson Water.

3.3 Organization

A. Mission Statement

Tucson Water's mission is to provide, in partnership with our community, excellence in water services to secure the future and enhance the quality of life. Our commitment is to ensure our customers receive high quality water and excellent service in a cost efficient and environmentally responsible manner.

B. Water Issues Overview

Tucson Water is charged with balancing the issues of water quality and related costs while managing sustainable water sources to meet current and future demand. Tucson Water maintains this balance by developing and operating the water system in a manner that is responsive to its customers, enhances the environment, and meets or exceeds all regulatory requirements.

C. Water Service Provider

As of 2004, Tucson Water provides water service to residents within a 300 square-mile service area that encompasses 78% of the greater Tucson metropolitan area's total population.

A network of wells, reservoirs, pumping stations, and water mains will deliver approximately 110,000 acre-feet of drinking water to city and county residents and businesses during calendar year 2004. In addition, about 12,000 acre-feet of reclaimed water (wastewater effluent treated by filtering and disinfecting) will be delivered for irrigation purposes.

Tucson Water recharges Colorado River water, secondary effluent, and reclaimed water into the aquifer, to "bank" water for future use.

8-01.4.0 Water System Overview

4.1 Current Sources of Water

A. Groundwater

Tucson Water produces groundwater from aquifers located in the Tucson Basin and in Avra/Altar Valley. There are five major well fields from which the water is produced:

- the Central, Santa Cruz and Tucson Airport Remediation Project/Southside well fields, in the Tucson Basin, and
- the South Avra Valley and Central Avra Valley well fields, in Avra/Altar Valley.

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B. Surface Water

Tucson Water receives surface water from the Central Arizona Water Conservation District through the Central Arizona Project.

C. Effluent

Tucson Water receives secondary effluent from Pima County. The secondary effluent is either treated to a higher standard for direct non-potable use in the Reclaimed Water System or recharged for storage credits to be used later.

4.2 Existing Treatment Plants

The Tucson Reclaimed Water Treatment Plant has a designed treatment capacity of 10 million gallons per day.

4.3 Recharge Facilities

A. Central Avra Valley Storage and Recovery Facility

The Central Avra Valley Storage and Recovery Facility is used to recharge Central Arizona Project water into the aquifer. The water is then recovered along with native groundwater for use as a blended water supply for the Tucson potable water system.

B. Sweetwater Recharge and Recovery Facility

The Sweetwater Recharge and Recovery Facility recharges secondary effluent recovered for use in the reclaimed water system.

C. Pima Mine Road Recharge Facility

The Pima Mine Road Recharge Facility is jointly owned by Tucson Water and the Central Arizona Water Conservation District and is used to recharge Central Arizona Project water for future use.

4.4 Water Storage Facilities

The drinking water system has a total combined storage capacity of 273 million gallons as of 2004. The basic objectives of water storage facilities are to help meet peak flow requirements, to equalize system pressures, and to provide emergency water supply, such as fire flow requirements.

Storage in the reclaimed water system helps meet peak flow requirements, and equalizes system pressures.

4.5 Water Pressure Zones

The drinking water system and the reclaimed water system are completely separate systems. Both are composed of multiple pressure levels, or zones, based on topography and defined high water elevations.

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A. Potable Drinking Water System

In the potable drinking water system, there are at present fifteen individual pressure zones. The high water elevations in each of the pressure zones are normally separated by about 105 feet in elevation.

Due to rapid elevation changes over a short distance, there are a few areas that have been designated as dual zones. The high water elevation in a dual pressure zone is about 210 feet above the adjacent lower zone, rather than the normal 105 feet. Water customers in the lower topographic area of a dual zone typically have a pressure-reducing valve in the water service line.

One or more water sources and storage facilities supply peak demand and local fire suppression requirements for each zone.

B. Reclaimed Water System

In the reclaimed water system, the high water elevations in each of the pressure zones are normally separated by about 222 feet in elevation.

4.6 Isolated Water Systems

"Isolated water system" applies to "water service area," or interconnected grouping of water service areas that are not connected to the integrated central water system. An isolated water system has a limited source of potable groundwater usually consisting of one or two wells.