5.0 Water Resources Element

The Water Resources Element of the Goodyear General Plan 2003-2013 identifies the supply and demand of potable and non-potable water to serve the future municipal and industrial needs within the City. In association with the 1997 adopted Water Plan, the Water Resources Element will assist the City provide an adequate supply of water to existing and future residential, commercial, and industrial activities in the Goodyear Planning Area.

The Water Resources Element is organized into the four sections identified below to communicate the City's desire for a long-term, dependable supply:

- Background
- Water Resources Goals, Objectives, and Policies
- Water Resources Plan
- Water Resources Element Implementation Activities

5.1 Background

In the arid climate of the Arizona desert, the availability of potable water is a critical resource to achieve community sustainability and growth. In the past, the City and its surrounding area were predominately comprised of agricultural uses north of the Gila River. The fields were irrigated with groundwater and surface water conveyed through the Buckeye and Roosevelt Irrigation District Canals. The significant development that has occurred in the Goodyear Planning Area over the past 15 years and its significant potential in the future will be guided by both water quantity and potable availability considerations.

The entire planning area is located within the Phoenix Active Management Area (AMA), which was identified through the passage of the Groundwater Management Act (GMA) by the State of Arizona in 1980. The intent of the GMA for the Phoenix AMA is to require the direct use of renewable resources; require that groundwater pumping be offset by groundwater recharge of CAP water or effluent; and/or withdraw groundwater credits or acquire additional water rights and credits. While significant reductions in groundwater mining have occurred over the last 23 years, the Phoenix AMA may not reach its goal of safe-yield (i.e., balancing groundwater extraction and recharge) by 2025. A

key provision of the Code is the Assured Water Supply (AWS) rules, which require both private and municipal entities to utilize renewable supplies or replenish groundwater use in new development. The AWS criteria for new development includes the following:

- Physical (to a depth of 1,000 feet), legal and continuous availability of the water supplies for 100 years.
- Sufficient quality of the water supplies.
- Water use must be consistent with the management goal of the Phoenix AMA.
- Water use must be consistent with the management plan of the Phoenix AMA.
- Financial capability to construct any necessary water storage, treatment, and delivery systems.

Groundwater is the only potable water supply source currently being used for the City of Goodyear. The majority of Goodyear's groundwater is supplied by the City's ten wells, most of which are located in the West Salt River Valley Subbasin. A second subbasin, Rainbow Valley, is located in the southern region of the planning area, approximately south of the Ray/Narramore Road alignment. Historically, groundwater elevations have receded; recent records indicate that levels have either stabilized or are slightly improving. While the depth to groundwater can average several hundred feet within the planning area, the region around the Gila River experiences waterlogging, with groundwater that may be only several feet beneath the surface. According to the 1997 City of Goodyear Water Plan, "There is sufficient groundwater available within the MPA (Metropolitan Planning Area) boundaries to meet the City's needs for the foreseeable future, if the City possessed the legal rights and administrative authority to withdraw this groundwater." Through its actions over the past six years, the City now has secured both the legal and administrative authority to withdraw groundwater (in compliance with the GMA) indefinitely through its membership in the Central Arizona Groundwater Replenishment District (CAGRD).

The City of Goodyear does not supply any surface water to its residents at the present time. Within the planning area, there are three irrigation districts that currently hold surface water rights and distribute irrigation water throughout the area to their agricultural-based clients. The Buckeye Irrigation Company (BIC) supplies water to approximately 1,070 acres, or 1 percent of the

planning area. These lands are located adjacent to the Gila River and have been declared waterlogged by the Arizona Department of Water Resources (ADWR), removing the strict conservation measures typically imposed on agricultural users. In the future, groundwater withdrawal may not be considered as mined groundwater, but rather a renewable resource in areas designated as "waterlogged" by the ADWR. However, this resource could require substantial treatment for potable uses. The Maricopa County Municipal Water Conservation District No. 1 (MWD) supplies irrigation water to approximately 3,840 acres within the Goodyear Planning Area. The Roosevelt Irrigation District (RID) supplies irrigation water to approximately 13,000 acres of land, comprising 15 percent of the planning area. In1990, the average annual potable water deliveries for the supplied area were 0.75 acre-feet per acre.

Even though the City only provides its customers with groundwater, it also has an available source of imported surface water through the Central Arizona Project (CAP). However, the City does not have the facilities necessary to convey it for potable use. The CAP is operated and managed by the Central Arizona Water Conservation District who sells the water (by the acre foot) based on energy, operation, maintenance and capital repayment costs. The CAP canal transports approximately 1.4 million acre-feet (af) of the 2.8 million acre-feet of Arizona's Colorado River water allocation approximately 337 miles from its extraction point at Lake Havasu to its termination point south of Tucson. The City uses a standard of a half acre foot of water (162,926 gallons) as the amount that typically can support a family of four for one year. The remaining half acre foot of water is allocated for non-residential uses. CAP water is considered a renewable supply, based on the fact that precipitation replenishes the Colorado River each year.

At the present time, the CAP provides an allocated amount of water to four sources that supply water to the planning area. The City of Goodyear signed a CAP subcontract in 1985 for an annual allocation of 2,374 acre-feet. In 1996, the City purchased an additional allocation of 1,007 acre-feet from the McMicken Irrigation District. The total amount of the CAP allocation could serve a population of approximately 30,000 residents. The Arizona-American Water Company (AAWC) (formerly Citizens Utility Company) is allotted 1,439 acre-feet a year. Alquaquin is allotted 5,580 acre-feet of CAP water annually. Alquaquin provides water to the surrounding communities of Avondale, Litchfield Park, and unincorporated areas within Maricopa County. Within

the City of Goodyear, Alquaquin supplies water to both Palm Valley and PebbleCreek planned communities north of I-10. Arizona Water Company (White Tanks) is currently evaluating the purchase of an allocation of 968 acre-feet for their system. However, a conveyance system does not exist to physically deliver CAP water for municipal and industrial uses. Excess CAP water that cannot be used is typically reintroduced to the aquifer through recharge programs implemented by the CAGRD, the Arizona Water Banking Authority, and other entities.

The City is also working diligently to obtain additional supplies of imported surface water. Approximately 7,100 acre-feet of CAP water has been allotted to the City as a result of the Gila River Adjudication process and can be utilized in 2005-2006. The City is also pursuing an additional 7,100 acre-feet of CAP water from an Arizona tribal community. The purchase of these additional supplies is also anticipated to occur in 2005 or 2006.

Currently, the City of Goodyear operates two of the three water reclamation facilities (WRF), (City of Goodyear WRF and the Corgett Basin WRF) that serve its wastewater treatment needs. Together, the facilities have a capacity of 3.80 million gallons per day (mgd). The Palm Valley WRF, which is owned and operated by Alquaquin, has a capacity of 4.1 mgd. In addition, the City has programmed the conceptual location of three WRF sites to service future growth south of the Gila River. The first phase of the Rainbow Valley WRF is projected to be operational by 2004 and will be located north of Pecos Road and east of Rainbow Valley Road. Projected to be operational by 2013, the Waterman WRF will be located south of Queen Creek Road and west of Rainbow Valley Road, on the west side of Waterman Wash. The third facility is planned to be located in the area where the Cotton Lane alignment intersects with the Gila River.

Today, the existing discharge from the City of Goodyear and Corgett WRF is recharged into the ground. However, the City has the ability to recover its recharged flows through existing City wells. Depending on the level of treatment, the effluent water could also be used to irrigate non-edible crops and landscaping, and will non-human contact bodies of water in the future.

5.2 Water Resources Goals, Objectives, and Policies

The goals, objectives, and policies presented in the Water Resources Element serve as the City's guide to meet the needs for high quality water in the future. The presented goals are the culmination of revalidated issues from the 1998 General Plan, the 1997 Water Plan, membership requirements by CAGRD, input from the General Plan Advisory Committee (GPAC) and the residents of the City, Community Development Department staff, City Department staff involvement, and URS's professional assessment. The Water Resources goals respond to the following issues:

- To provide additional resources to accommodate future growth
- To maintain water quality for municipal use
- To value the resource as a limited commodity
- To determine the cost benefit and affordability of water resources

Goal A: A Committed Potable Water Supply to Serve Existing and Future Growth.

Objective A-1: Evaluate new resource acquisition and existing resource use.

Policy A-1a: The City shall attempt to locate and develop additional sources of groundwater for its potable and non-potable needs.

Policy A-1b: The City shall explore a cost effective groundwater treatment alternative that reduces all parameters (i.e., arsenic, nitrates, Total Dissolved Solids (TDS)) to acceptable levels for potable use.

Policy A-1c: The City shall acquire external (e.g., outside of the City's defined Certificate of Convenience & Necessity (CCN) boundary) groundwater credits to the extent they are determined to be reasonably priced.

Policy A-1d: The City shall continue to partner with WESTCAPS to evaluate the potential and cost effectiveness of obtaining

treated, imported surface water through additional Central Arizona Project allotments or other entities.

Policy A-1e: The City shall prepare a comparative cost evaluation of the City's water source alternatives including its existing Central Arizona Project water purchase agreements.

Policy A-1f: The City shall consider requiring developers to retire their agricultural irrigation grandfathered rights (IGFR's) and obtain a credit for the City to provide potable water supplies to serve future development.

Objective A-2: Continue to transition to renewable resources over time.

Policy A-2a: The City shall endeavor to implement the strategies identified in the Arizona Department of Water Resources Third Management Plan to assure proper use and conservation of area water resources.

Policy A-2b: The City shall analyze their support for recommendations proposed by the 2001Governor's Water Management Commission.

Goal B: A High Quality Supply of Potable and Non-Potable Resources.

Objective B-1: Link new resources to existing supplies to increase water quality.

Policy B-1a: The City shall continue to strive to provide an interconnected water treatment and blending distribution system throughout the City.

Policy B-1b: The City shall evaluate the cost/benefits of enhanced treatment capabilities throughout all City water facilities.

Policy B-1c: The City shall develop a policy for a 100-year committed water supply secured in a partnership between the City and development community.

Policy B-1d: The City may secure/commit real 100-year supplies (recharge, etc.) within the City municipal planning area by 2013 for up to 97,200 in population.

Objective B-2: Evaluate the beneficial use of stormwater flows within the community.

Policy B-2a: The City shall consider the capture of stormwater for treatment and reuse or incidental recharge within joint use active and passive open space facilities.

Objective B-3: Leverage the use of tertiary treated effluent.

Policy B-3a: The City shall evaluate the cost benefits of recharging or direct use of treated effluent.

Policy B-3b: The City shall implement the use and strongly support the conveyance of treated effluent or other non-potable water resource for large turf area (i.e., golf course) and roadway right-of-way irrigation needs.

Policy B-3c: The City shall aggressively pursue 100 percent reuse or recharge of all effluent produced within its service area.

Policy B-3d: The City shall explore the economic benefits and feasibility of acquiring treated effluent for direct or indirect use from other sources outside the planning area.

Policy B-3e: The City shall evaluate the use of water pumped from water logged areas and treated for potable uses.

Goal C: A Community Dedicated to Water Conservation.

Objective C-1: Continue the use and retrofitting of low flow fixtures in structures.

Policy C-1a: The City shall implement a voluntary program to use or retrofit commercial and residential structures with low flow fixtures and recirculating hot water systems.

Policy C-1b: The City shall continue to inspect new construction to ensure that it meets the City's adopted State Plumbing Code.

Objective C-2: Promote increased public awareness for reduced water use.

Policy C-2a: The City shall continue to use and update its Water Conservation Plan.

Policy C-2b: The City shall develop a traveling display or demonstration area within City Hall and the City Center that provides strategies to reduce personal water usage.

Policy C-2c: The City shall continue to work with its public and private school districts to incorporate creative educational programs for water conservation.

Policy C-2d: The City shall continue to work with other valley communities and agencies to enhance awareness through advertising campaigns (i.e., Water: Use It Wisely).

Policy C-2e: The City will conduct water audits for its residential and non-residential customers (who request and pay for) to evaluate the amount and type of existing use and strategies for water reduction.

Policy C-2f: The City shall associate a website linkage from the City's homepage to direct residents to sites that demonstrate water conservation strategies and techniques.

Objective C-3: Utilize appropriate plant material and irrigation technology for the Sonoran desert.

Policy C-3a: The City shall strongly encourage residential and employment projects to adhere to its drought tolerant vegetation list on their private property.

Policy C-3b: The City shall promote the use of low flow/drip/best practices systems for common area landscaping for all public spaces.

Policy C-3c: The City shall require all landscaping planted in a publicly owned right-of-way (served by groundwater) may only include plants from the Department's Low Water Use/Drought Tolerant Plant List for the Phoenix AMA.

Objective C-4: Prepare the City for future drought or low potable supply conditions.

Policy C-4a: The City shall prepare a drought management plan (that is coordinated with other communities in the region) to acknowledge thresholds of deteriorating supply conditions and a staged response system.

Policy C-4b: The City shall periodically review its conservation based rate structure to promote wise water use.

5.3 Water Resources Plan

The City of Goodyear completed its Water Plan in 1997, which specifically identified a strategic plan to accommodate future water demand. The plan is anticipated to be updated in 2003 based on changing conditions within the City as well as the external regulatory environment.

The City of Goodyear may face water challenges in the future that include providing an assured supply, conveying imported surface water to its demand point, and responding to external and internal drought conditions. It is imperative for the City to update its resource planning efforts, including reuse/ recharge opportunities and conservation measures, to provide a reliable and high quality supply for future generations. The 1997 Water Plan outlines a three-step process to implement its recommendations as illustrated on Figure 5-1, *Water Resources*. Each step serves as a building block in developing a safe and efficient water system in Goodyear.

Step One: Groundwater

By definition, high quality groundwater is the groundwater that does not require treatment to make it acceptable for potable uses. It is estimated that 5,000 acre-feet of high quality groundwater is available in the foreseeable future. However, the City is in the process of acquiring 10,000 acre-feet of water from the Maricopa Water District and Tonopah Irrigation District. While it may be possible to increase this amount by identifying other additional high quality groundwater fields within the City, the placement of additional wells may cause the supply at existing wells to decrease.

Except in waterlogged areas, the Arizona Department of Water Resources (ADWR) considers groundwater a "renewable" source only if it is replenished through groundwater recharge or the expenditure of existing City groundwater credits. The City of Goodyear groundwater recharge facility (located northwest of the City Center location) returns the tertiary treated effluent to the aquifer. Approximately 40 percent of the groundwater pumped, according to the 1997 Water Plan, is recharged. Conversely, this procedure requires 60 percent of the water be recharged through CAP or purchased groundwater credits from the CAGRD or other groundwater credits. Although the Water Plan indicates that CAP recharge is occurring, credits may be purchased, expended, or other options may be considered if the option is

Figure 5-1
Water Resources

more cost efficient. When considering the City's existing population, the maximum potential use of groundwater is 5,900 acre-feet a year.

Step Two: Recharge/Recover CAP Allotment

The City is currently recharging approximately 10,000 acre-feet in the Agua Fria Recharge Facility. The City's increasing demands for high quality groundwater will require the City to secure an additional potable source. The City could either use CAP water through recharge and recovery or treat groundwater and replenish it through recharge or the expenditure of credits. The existing Water Plan identifies that recharge and recovery of CAP water is the most cost efficient option. However, the updated Water Plan may indicate that the proposed water treatment plant is the most cost effective solution. The capture and treatment of water from waterlogged areas adjacent to the Gila River may also pose a viable option. To improve its options, the City may purchase the additional CAP allotment identified previously to augment the City's existing 3,951 acre-foot allotment noted above.

Step Three: CAP Water Treatment and Regional Conveyance

As identified previously, the City has a CAP allocation that is being recharged to accommodate future potable needs. The organization of the Western Maricopa County Central Arizona Project Subcontractors (WESTCAPS) was intended to develop solutions to put CAP water to potable use within the west Salt River Valley. WESTCAPS completed a regional planning study which identified the need for West Valley water providers to utilize their CAP water allocations to mitigate the effects of long-term groundwater level declines, land subsidence, and groundwater quality issues. The White Tank Regional Water Treatment Plant is the result of recommendations contained in the (WESTCAPS) regional planning study. The project is being led by the Arizona-American Water Company (AAWC), which purchased a 45-acre site at the northwest corner of Cactus and Perryville Roads. Ultimately, the site is capable of supporting a treatment plant with a minimum capacity of 80 million gallons per day (mgd). The site is located adjacent to the Beardsley Canal, which will act as a conduit to convey water from the CAP canal. The Beardsley Canal is capable of delivering 80 mgd of CAP water to the treatment plant. Once treated, the water will be conveyed in a looped distribution system. The City will be able to connect into the system along Camelback Road, between Sarival Avenue and Perryville Road. The City is in the process

of negotiating with the AAWC to secure a prorata share of the treatment facility capacity in order to utilize its CAP allocation for future potable use.

Potable Water Demand

A general determination of potable water demand serves as a guide for the City to understand its future supply needs, thus providing residents and businesses with an assured resource. The total average day water demand is determined to be 200 gallons per capita per day (gpcd). This factor is based on the following assumptions:

- Residential demand is 140 gpcd and comprises 70 percent of total demand.
- Commercial and industrial demand is 50 gpcd and comprises 25 percent of total demand.
- Lost and unaccounted water is 10 gpcd and comprises 5 percent of total demand.

Table 5.1
Planning Area Potable Water Demand

Year	Service Area Population*	Average Day Demand (mgd)	Annual Demand (ac-ft)
2003	12,600	2.8	2,500
2013	52,700	10.5	10,600
Buildout	343,700	68.7	69,300

Notes:
* Represents City served areas
Source: City of Goodyear Water Plan; 1997 and URS December, 2002

As shown above in Table 5.1, *Planning Area Potable Water Demand*, the year 2002 population served by the City requires approximately 2,500 acre-feet per year of potable water. The annual need translates to an average need of nearly 2.5 mgd. By the year 2013, if the service area reaches its forecast population of 52,700, the City will need 10.5 mgd and an annual potable supply of nearly 11,000 af. The need for additional potable resources produces an annualized rate of 13 percent to keep pace with expected growth. At full buildout, or when the service area achieves a population of

343,700, daily water demands will range from nearly 69 mgd, creating an annual potable demand of more than 69,000 af.

In the year 2003, the City was able to utilize a portion of its existing bank of groundwater credits to achieve the replenishment requirement for its extracted groundwater. By the year 2013, the City is expected to have utilized the majority of its existing groundwater credits and may purchase additional credits in the future, based on cost and timing considerations. As shown on Table 5.2, *City Service Area Water Supply* at full buildout, the City anticipates using the majority of its existing and potential CAP allotment to serve the needs of its large population base. It should be understood that the long-term supply of the City is dependent on many factors including, but not limited to, the addition of future CAP allocations, enhanced recharge supplies, and the provision of additional groundwater credits.

Table 5.2
City Service Area Water Supply

Year	Water Demand (ac-ft)	Groundwater Pumped (ac-ft/year)	CAP Allocation Utilized	Incidental Recharge (ac-ft/year)	Effluent Recharge (ac-ft/year)	Replenishment Requirement (ac-ft/year)
2003	2,500	2,500	0	125	1,500	875
2013	10,600	6,100	4,500	530	3,660	1,910
Build-out	69,300	54,800	14,500	3,465	41,580	9,755*

Source: City of Goodyear Water Plan; 1997 and URS December; 2002

* May be less if water is extracted and treated from water logged areas.

5.4 Water Resources Element Implementation Activities

The Water Resources Element Implementation Activities identify both short and long-term projects that will achieve the goals and objectives identified previously. A listing of these activities is provided below and organized into both near (1-5 year) and long-term (5-10 year) timeframes to support the 10-year update timeframe mandated by Arizona Revised Statutes (ARS). The activities identified for near-term implementation are further defined in Chapter 12.0, *Implementation Program*.

Near-Term Implementation Activities	Long-Term Implementation Activities
Update/Prepare Water/Wastewater Facilities Master Plan	
Enhance Water Conservation Display	
Voluntary Plumbing Conservation Program	
Public School Water Conservation Program	
City Water Audit Program	
Conservation/Drought Management Plan Update	
White Tank Regional Water Treatment Plant Project	