

## VI. WATER RESOURCES

*“ ... existing supplies, name of water district/company with number of accounts served and areas served; number of individual wells within Community Area with records from ADWR on well depths and range of gallons per minute capacities; proposed or planned water resources for projected growth”* (Yavapai County General Plan, p. 77)

### A. Existing Conditions

Residents of the Cornville Planning Area are served by private wells and septic tanks, with the exception of those served by a privately-owned water company in Lower Oak Creek Estates and water and sewer companies in two planned area developments—Oak Creek Valley and Verde Santa Fe South. Agriculture is the predominant water user in the area. There is one golf course that uses reclaimed water, and there are no industrial facilities. Water use at Page Springs Fish Hatchery is considered non-consumptive, because it is discharged back into the river system.

Water resources in Arizona are governed by State Water Law, and management is primarily the responsibility of the Arizona Department of Water Resources (ADWR). The Yavapai County Water Advisory Committee (WAC) reviews water issues and water management strategies for the Yavapai County Board of Supervisors. State legislative proposals that would allow Counties to tie water availability to development and require water management planning could become valuable tools for managing rural growth.

**1. Watersheds.** Arizona lies in the Lower Colorado River Basin Regional Watershed. The watershed is further divided into tributary watersheds. For example, the Oak Creek Watershed is part of the Verde River Watershed, which is part of the Salt River Watershed. The Verde River drains an area of approximately 6,188 square miles and traverses a distance of about 140 miles from Sullivan Lake Dam (located north of Chino Valley) to the Salt River. The Planning Area is in the middle of the Verde River Watershed where Oak Creek meanders 23.5 miles on a southwesterly course from Deer Pass to the Verde River.

**2. Aquifers.** Subsurface channels known as aquifers supply much of Arizona’s fresh water supply. Yavapai County, including the Cornville community, relies on this aquifer system as its main potable water source. Average annual precipitation in the area is 14.3 inches, although drought conditions have persisted for the past several years. The temperatures in Cornville range from an average high of 98.8 to an average low of 28.7 degrees (F). Because the climate is characterized by high summer temperatures and large rates of evaporation and transpiration, only about 5 percent of the precipitation that falls recharges the aquifers.

In developed areas, aquifer recharge is increased as the result of “human intervention in the hydrologic cycle” (USGS). A portion of the water used for irrigation of commercial crops, golf courses, and other uses percolates into the basin and ultimately helps recharge the aquifers. Water in ponds, ditches and sewage treatment plants can also percolate downward and recharge the aquifer. Although the quantities of water recharged are not well documented, some data indicate

that about one-half of the irrigation water applied to fields ultimately recharges the aquifers. “In the Verde Valley and other watersheds, however, there is insufficient available data to indicate whether adequate water supplies exist to sustain current or future growth demands” (*Yavapai County General Plan*, p. 53).

**3. Riparian Values.** Riparian areas are sometimes called “ribbons of green”. They can be a stream bank, a marsh, or an area where there is seasonal water. Some riparian areas look dry, but the presence of cottonwood trees is evidence of water near the surface. Flooding is important to the health of riparian areas, as flood waters move nutrients, plants, animals and seeds through ecosystems. Fertile new floodplains, sand bars and exposed soil provide opportunities for growth of riparian plant species. Healthy riparian areas reduce the frequency and extremes of flooding and improve water quality. As more plants grow, more animals are attracted by food and nesting sites. People are also attracted to riparian settings, because they are ideal places to live and to play, especially in an arid region. Cornville is identified with two perennial streams, Oak Creek and Spring Creek, and their riparian values. Oak Creek, a perennial tributary to the Verde River, is approximately 47 miles long, from where it begins at Sterling Springs high in Oak Creek Canyon to its confluence with the Verde River south of Cornville. The upper two-thirds of Oak Creek is vegetated by canyon hardwoods, such as ash, oak, alder and sycamore. The lower third, all within the Cornville Planning Area, is primarily cottonwoods and mesquite.

**4. Floodplains.** The size of the Oak Creek floodplain within the Planning Area varies and is about 1,000 feet wide when it meets the Verde River. There are 954 acres in the 100-year flood plain in the Planning Area, of which 223 acres are irrigated agricultural lands. Records for the flow of Oak Creek near Cornville are available for periods July 1940 to September 1945 and April 1948 to the present. Extreme flows for the period of records have been 26,400 cubic feet per second (cfs) February 19, 1980 and 6 cfs on July 27, 1940. In 1993, 1995 and December 2004, major flooding of Oak Creek occurred. The Yavapai County Flood Control District administers regulations that govern land use and construction in or adjacent to floodplains for all unincorporated areas. The booklet, “*Floodplains Yavapai County—Information Package*”, explains floodplain management, definitions, hazard determination, map availability and other Flood Control services. The District also allows residents to participate in the National Flood Insurance Program and maintain eligibility for disaster relief.

**5. Water Supply.** The Planning Area has three sources of water supply: surface water (rivers and streams), groundwater (aquifers/wells), and reclaimed water (effluent).

**a. Surface Water.**

**(1) Quantity.** Due to the area’s semi-arid climate, the amount of available surface water can vary dramatically from year to year, season to season, and place to place. Evapo-transpiration of Oak Creek is estimated to be 4,700 acre-feet per year. Water shortages along streams occur with some frequency from June to September. Often entire surface flow is diverted for irrigation, and underground flow may or may not adequately replenish the flow before the next downstream diversion. The U.S. Geological Survey has operated stream-gauging stations in the Verde River watershed since the early 1900s. The mean annual flow at the gauging station on Oak Creek near Cornville (Station 9504500) is 63,690 acre-feet. The minimum annual flow recorded at the gauge was 21,710 acre-feet and the peak flow was 173,710 acre-feet. The data is based on

records from 1940 to 1945 and 1949 to 1990 (USGS). Winter stream gauging records indicate that the base flow of Oak Creek ranges between 30 and 40 cubic feet per second (cfs) (USGS). Base flow is the component of stream flow that is influenced by groundwater discharge and does not include runoff from precipitation or snowmelt. Utilizing the records for winter removes the uncertainty of influence from agricultural diversions.

**(2) Quality.** Surface water from Oak Creek is used for irrigation purposes within the Planning Area. In Oak Creek, turbidity, ammonia and high levels of boron have been measured below the West Fork. Excessive amounts of turbidity, ammonia, nutrients and fecal coliform have been recorded in Dry Creek and lower Oak Creek. These water-quality problems are attributed to land development, on-site wastewater systems, and recreation in the area (ADWR; ADEQ). In addition, animals, such as raccoons, skunks and deer, have been found to negatively impact water quality in Oak Creek (DNA Study by Northern Arizona University, *Sedona Red Rock News*, October 10, 2001). The Arizona Department of Environmental Quality (ADEQ) requires or encourages the use of “best management practices” (BMP’s) relating to agriculture, construction, recreation and other activities in order to meet water quality standards; and it has enforcement authority when BMP’s are ignored and standards are violated.

Oak Creek is designated by ADEQ as an *unique water*, which is defined as “a water of exceptional recreational or ecological significance or which constitutes an outstanding public resource”. The creek was the first to be named under a policy adopted by the Arizona Water Quality Control Council on April 8, 1981. Oak Creek is not to be changed by human activities. It is subject to specific water quality standards and requirements for construction activity and roadway operation.

#### **b. Groundwater.**

**(1) Quantity.** Natural underground aquifers supply Arizona with about 40 percent of its water needs. Aquifers have stored water for millions of years; but there is growing concern about overdraft of the current supply of groundwater. According to the USGS National Water Information System (NWIS), the groundwater database, depths to water are less than 200 ft. in approximately 80 percent of the wells located within the Verde Watershed and about 50 percent of these have depths to water of less than 55 ft. In some areas of the Middle Verde watershed, the water table is above land surface and wells flow naturally. However, water table declines in recent years have reduced the number of such wells.

Currently, ten wells in the Upper and Middle Verde River Watersheds are equipped with real-time depth-to-water monitoring instruments. The wells are widely distributed, represent major aquifers in specific study areas, and are selected based on condition, access, known aquifer conditions, proximity to other wells, and other factors. The depth to water in each well is measured every hour and transmitted to the computer database by satellite every 4 hours (USGS). One well is located near Cornville.

**(2) Quality.** There are indications of groundwater quality problems in the Verde Valley, including the Cornville Planning Area. “Arsenic, salt, sulfate, selenium, iron, manganese, mercury, fluoride, and chloride at levels exceeding Environmental Protection Agency (EPA) standards have been found in waters throughout the Verde Valley” (USGS). On January 22, 2001, the EPA changed the arsenic standards allowed in drinking water from the current 50 parts per billion (ppb) to 10 ppb to

be effective January 23, 2006. “This will tremendously increase the amount of Verde Valley groundwater that will not meet the new standard” (USGS). ADEQ is currently developing a water quality improvement plan. Each public water supply must comply with the new standard.

Most Cornville residences have private wells and septic tanks. Individual wells are supplied by common aquifers; and contamination is possible because, collectively, these individual wells and septic tanks are discharging back into the aquifers. “Septic tanks in communities are the largest source of waste discharged back into the ground and are the second largest source of groundwater contamination within the United States” (Schwartz et al 1998). However, properly designed and maintained septic systems do not contribute to groundwater pollution.

**c. Reclaimed Water.** Reclaimed water or effluent is wastewater treated to a quality that can be used for irrigation purposes. Effluent is being used at the Verde Santa Fe golf course to partially meet water needs and conserve groundwater. (Use of effluent will gradually increase until Verde Santa Fe South is fully developed; then all golf course irrigation water will be effluent.) Use of 100% effluent for any future golf course developments is recommended; and use of gray water systems is also encouraged. Table 14 shows projected effluent production and return flows within the Planning Area for the next twenty years.

**Table 14. Cornville Planning Area  
Projected Effluent Production & Return Flows (acre-feet per year)**

	2003	Projected 2005	Projected 2010	Projected 2015	Projected 2020	Projected 2025
<b>Effluent Production</b>						
New Water Companies	0	0	16	49	81	163
Septic Systems	348	381	487	612	799	999
Verde Santa Fe	19	78	105	141	188	252
<b>Return Flows - Totals</b>	6,897	6,649	6,144	5,822	5,610	5,531
Water Co. Effluent	0	0	16	49	81	163
Septic Systems (1)	80	88	112	141	184	230
Industrial-Page Springs Hatchery (100% return to GW)	4,336	4,336	4,336	4,336	4,336	4,336
Agriculture (50% return to GW)	2,364	2,111	1,575	1,197	914	709
Reservoirs (20% return to GW)	29	26	17	11	7	5
Verde SF Golf (Effluent & GW—20% of total water demand of 441 acre feet/year)	88	88	88	88	88	88

(1) Septic system returns are estimated to be 50% if located in Holocene alluvium, 65% of supplied water is estimated to be treated by septic systems. There are 559 out of 1,204 occupied parcels of land (46%) located in the Holocene in Cornville.

**Source: Yavapai County**

**6. Ditches.** Most irrigation ditches in the Verde Valley were built in the late nineteenth or early twentieth century. They were built for irrigation of the floodplains to grow fresh vegetables, fruits and nuts. Orchards are still found in the valley, along with fields of forage alfalfa and grass pastures. There are over 30 ditch diversions on Oak Creek, Beaver Creek and the Verde River; six are located within the Planning Area.

**a. Point Willow Ditch** is located near the Page Springs Bridge. Ten users irrigate 21 acres from the 1.7 mile ditch. The area was first irrigated in 1904 with 5.5 cfs entering at its head.

**b. Jack's Ditch** is located on the west side of Spring Creek near its confluence with Oak Creek. The original filing for water rights dates back to 1876 with 76 acres under irrigation by 1898. The heading takes in 4 cfs.

**c. Sheepshead Ditch** is located in Sheepshead Canyon with a length of .95 mile. Original use of Sheepshead Spring goes back to 1898. The spring area is closed to grazing and is managed as a Wildlife Habitat Area by the Forest Service. The heading produces .2 to .5 cfs.

**d. Mason-Lane Ditch**, also referred to as the Oak Creek Ditch, is about 5 miles long, with original filings for water rights dating back to 1876. The ditch flow is about 20 cfs.

**e. Dickerson Ditch** is on Oak Creek and irrigates 56 acres of land for four users. Water filings go back to 1897. Water diversion is 4 cfs at the head.

**f. Cornville Ditch.** The head of Cornville Ditch, with an intake of 9 cfs, is located on the west side of Oak Creek. It was cultivated in 1876 with 165 acres and by 1914 was 190 acres. The ditch is almost 4 miles long, serving 55 users and 168 acres to the north and south of Cornville.

**7. Wells.** The Planning Area is primarily served by individual private wells. Exceptions are Lower Oak Creek Estates (250 customers) served by Oak Creek Public Service; Oak Creek Valley Property Owners Association (up to 185 customers); and Verde Santa Fe South (up to 950 customers), whose water system was recently purchased by the City of Cottonwood. Map 6 shows the distribution of all wells in the Planning Area, based on Yavapai County Records. (Wells are recorded to the nearest quarter section and depicted by dots. One dot could indicate more than one well.)

As of 2003, an estimated 1,204 private wells in the Planning Area account for about 397 acre feet per year of potable water demand, based on .33 acre feet usage per well (Tables 15 and 16). Agriculture and other uses account for 9,632 acre feet per year (Yavapai County). These are only estimates because some wells are "exempt" (those using less than 35 gallons per minute) and not monitored or regulated (Yavapai County General Plan, p. 54).

**8. Water Systems.** Water systems in the Planning Area use groundwater as their main water source. The systems are described as follows: "*Community water systems*" serve the same people year-round. According to EPA records (*NAU Report*, page 66), there are 101 community water systems (e.g., homes or businesses) within the Cornville zip code area. In addition, there are 117 "*Transient Non-Community Water Systems*", which do not consistently serve the same people (e.g. rest stops, campgrounds, gas stations). There are 34 "*Non-Transient, Non-Community Water Systems*" that serve the same people, but not year-round (e.g. schools that have their own water system). There is only one facility issued a permit to discharge water back into the river system, which is the Page Springs State Fish Hatchery. The Arizona Corporation Commission is responsible for the records of water companies' uses, but its records may not be accurate or inclusive because some data are not reported. "Data on water supplies in Yavapai County vary greatly." (*Yavapai County General Plan*, p. 49).

**9. Water Rights.** In general, the State of Arizona owns the water resources within its boundaries and issues rights to appropriate and use that water to individuals and organizations. Within the Planning Area, groundwater and surface water rights are administered by ADWR under two separate forms. Groundwater rights are administered under the 1980 Groundwater Code, which for areas outside of Active Management Areas (AMA) means that wells need only to conform to specified construction standards and be registered with the state. No right to the use of groundwater is implied by the well registration documents. Cornville has 1,559 production wells that have been registered with ADWR.

Surface water rights are administered under the 1919 State Water Code on the basis of prior appropriation, meaning that the most senior appropriators of the water enjoy the best water right in times of shortage. Within Cornville, there are an estimated 820 acres of irrigated or historically irrigated land that may have senior water rights. However, the final disposition of these surface water rights has not been resolved as to their extent (amount of water right) and priority. These rights are currently the subject of a massive court case known as the Gila River Adjudication. This adjudication proceeding is attempting to resolve the disposition of surface water rights within other watersheds in the State and will someday move into the Verde Valley. In current litigation, the Court has declared that wells located within a geologic formation known as the Holocene alluvium, generally within a ¼ mile away from a stream, are pumping surface water. One outcome of this determination may be that owners of wells located in the Holocene alluvium will be required to obtain a surface water right to continue pumping. There are an estimated 411 wells in Cornville that are located in the Holocene alluvium. Fortunately, Cornville does have senior surface water rights within its boundary that may one day be needed to resolve this issue at the community level. Keeping track of the existing senior water rights within Cornville and ensuring that these water rights are not extinguished may benefit the community as the adjudication proceeding moves forward.

As stated earlier, effluent is another water source available within the Planning Area. Although the ADEQ administers the quality of effluent treatment and what it can be used for, the actual ownership of effluent water rights is not administered by ADWR and is privately owned. Effluent is currently being used to offset groundwater pumping at the Verde Santa Fe Golf Course and may prove to be a valuable water supply for similar uses as the community grows.

**10. Current & Future Demands.** Based on current and projected population estimates and available water resource data, Table 16 displays population projections and types of water users through the year 2025. If the population projections hold true, Table 17 shows that increased demand for potable water will be offset by a decrease in water demand for agriculture and other uses. This is due to the likelihood that agricultural lands will be developed. If that happens, it is projected that total water demand in the Planning Area could gradually decrease over the next fifteen years, but it would begin to increase between 2020 and 2025.

**Table 15. Cornville Planning Area  
Current and Projected Population & Number of Water Users by Type**

	2003	Projected 2005	Projected 2010	Projected 2015	Projected 2020	Projected 2025
<b>Population Projection (6% per year)</b>						
Planning area projected Population - total	4,504	5,060	6,772	9,062	12,127	16,230
Served by New Water Companies	0	0	247	741	1,235	2,470
Oak Creek Pub Svc - Service area build out <b>(1)</b>	603	677	906	1,112	1,112	1,112
Verde Santa Fe Water – Est. Population <b>(2)</b>	618	694	928	1,242	1,663	2,225
Oak Creek Valley - Service area build out <b>(3)</b>	383	395	457	457	457	457
Remainder (Assumed to be Supplied by Private Wells)	2,900	3,294	4,234	5,510	7,660	9,966
<b>Number of Water Users by Type (4)</b>						
Water Company Customers (Total # of hookups)	649	715	1,028	1,438	1,808	2,536
New Water Companies (# of hookups)	0	0	100	300	500	1,000
Oak Creek Public Service (# of hookups) <b>(1)(5)</b>	244	274	367	450	450	450
Verde Santa Fe Water (# of hookups) <b>(5)</b>	250	281	376	503	673	901
Oak Creek Valley Water Co. (# of hookups) <b>(3)</b>	155	160	185	185	185	185
Homes or Businesses served by Private Wells <b>(6)</b>	1,204	1,334	1,714	2,231	3,101	4,035
Fish Hatchery	1	1	1	1	1	1
Agriculture (acres irrigated) <b>(7)</b>	750	670	500	380	290	225
Ponds - Golf and Ag related (surface acres)	24	21	14	9	6	4
Golf Courses - Verde Santa Fe (acres of turf)	85	85	85	85	85	85

- (1) The area served by Oak Creek Public Service has space for approx 200 additional hookups, 250 existing + 200 = 450 max hookups
- (2) Based on number of service connections and available lots times 2.47 persons per household (*Census 2000*).
- (3) Oak Creek Valley Water has 155 customers current, with a build out of 185 customers. Water use includes club house and park.
- (4) 2.47 persons per household, *Census 2000*.
- (5) From 2001 Arizona Corporation Commission annual reports
- (6) Based on ADWR Well database and Department of Revenue Tax Records for 2003. In following years, the number of water users served by a well is based on assumption that the population not served by a water company is served by a well
- (7) There are currently 4,182 acres (estimated) of private vacant land in Cornville available to meet needs of new population. It is assumed that the irrigated agricultural lands not located in the 100-year floodplain will be used to meet needs of growth. This assumption leaves approximately 225 acres of irrigated land remaining in the floodplain

**Source: Yavapai County**

**Table 16. Cornville Planning Area  
Current and Projected Water Demands (acre-feet per year)**

	2003	Projected 2005	Projected 2010	Projected 2015	Projected 2020	Projected 2025
<b>Water Companies:</b>						
New Water Companies	0	0	25	75	125	250
Oak Creek Public Service	71	80	107	131	131	131
Verde Santa Fe Water	171	192	257	344	460	616
Oak Creek Valley Water Co. (1)	67	69	80	80	80	80
Private Wells (2)	397	440	566	736	1,023	1,331
<b>Total potable water demand</b>	<b>706</b>	<b>781</b>	<b>1,035</b>	<b>1,366</b>	<b>1,819</b>	<b>2,408</b>
Fish Hatchery	4,336	4,336	4,336	4,336	4,336	4,336
Agriculture (3)	4,728	4,222	3,150	2,394	1,827	1,418
Ponds - Golf and Ag related (3)	146	128	85	56	37	25
Verde Santa Fe Golf Course - Groundwater (4)	422	316	274	217	142	41
<b>Total Demand (Ag, Hatchery, Golf, Reservoirs)</b>	<b>9,632</b>	<b>9,002</b>	<b>7,845</b>	<b>7,003</b>	<b>6,342</b>	<b>5,820</b>
<b>Total Water Demand - All Uses (acre-feet/yr)</b>	<b>10,338</b>	<b>9,783</b>	<b>8,880</b>	<b>8,369</b>	<b>8,161</b>	<b>8,228</b>
Water use per person (gallons/day)	140	138	136	135	134	132

(1) Water deliveries from March to October, 2004 total 52 acre-feet, estimated Nov-Feb use based on March (minimum) values of 3.78 acre-feet. Data from Jim Vanlieu, OCV Water Co.

(2) Based on 0.33 acre-feet usage per well.

(3) Ag water use is based on weighted average water use from ADWR 2000 (3.15 ft/acre), divided by an average estimated irrigation efficiency of 50%. Reservoir water consumption is assumed to be 6.0 acre-feet/acre

(4) Water usage based on estimates for turf in the Verde Valley of 5.2 acre-feet per acre. Verde Santa Fe effluent is used on the golf course. The value listed here is the estimated remaining demand that will be met by groundwater pumping. See Table 15 for quantity of demand supplied by effluent. **Source: Yavapai County**

**11. Water Conservation.** Currently, there is not a specific program that promotes water conservation in the Cornville area; although citizens have expressed the desire and need for conservation. Generally speaking, there are two categories of water conservation practices (excerpted from "How to Use Water Effectively, EPA).

**a. Engineering practices** (modifications in plumbing, fixtures, or water supply operating procedures). Low-flush toilets, toilet displacement devices, low flow showerheads, faucet aerators are common plumbing fixture adjustments that can be used by individuals for little or no extra cost. Homes served by wells might reduce water pressure to save both water and energy, reduce the likelihood of leaky pipes and reduce appliance breakdowns. Gray water (domestic wastewater composed of wash water from kitchen sinks, bathtubs, and clothes washers) can be reclaimed with dual distribution systems and used for home gardening, lawn maintenance, and landscaping. Cycle irrigation to provide water at the right time and place, bubbler soaker and drip systems, along with careful selection of plants, can save landscape irrigation water. Innovative xeriscaping is a comprehensive approach that can result in water and energy savings, reduced heating and cooling costs, less runoff, fewer yard wastes, increased habitat, and lower maintenance costs.



**b. Behavioral practices** (changing water use habits). Habits like running the dishwasher when its full, turning off the water while brushing teeth, taking short showers, adjusting washing machine water levels, watering lawns early or late, planting only indigenous plants, sweeping the sidewalks, rather than hosing with water, and covering swimming pools when not in use – all are familiar examples of conservation practices. Little things can add up! A faucet lets out 5 gallons of water flow in two minutes; a hose uses about 50 gallons of water in five minutes.

Public Education is an essential component of water conservation. The Community Association often provides information at community meetings, with assistance from Yavapai County officials, about water studies, legal issues, well testing, arsenic control measures, conservation, and drought management. Yavapai County has also passed ordinances requiring use of effluent on golf courses and to encourage re-use of gray water, increasing possibilities for more water conservation.

## **B. Issues**

- Obtaining data about water availability and use
- Developing a water budget and planning for growth
- Identifying sources of water pollution
- Preventing groundwater contamination from septic systems
- Protecting surface water quality in Oak Creek
- Using reclaimed water—effluent, gray water
- Meeting new federal arsenic standards
- Protecting riparian areas
- Managing growth in floodplains
- Conserving water

## **C. Goals & Objectives**

**As stated in the *Yavapai County General Plan, April 2003* (p. 41-42),** health, safety and progress in Yavapai County is dependent on a reliable water supply. The availability of high quality water operates as a prerequisite for any and all future development and is essential to sustain the natural environment. The first three water goals are from the *Yavapai County General Plan* and prerequisites for all future development in the County. The subsequent goals and objectives are specific to the Cornville Planning Area.

### **Goal 1: Steward the water supply carefully.**

- a. Establish extent of available groundwater, coordinate growth in accord with defined water resources.
- b. Engage in long-range planning for water rights acquisition, storage; encourage active recharge and water recycling programs, designate drainage and floodwater retention for recharge potential.
- c. Apply water allocation/budgeting as a growth management tool County-wide (e.g. discourage unregulated lot-splitting, encourage well monitoring).
- d. Undertake proactive conservation programs; offer incentives for reducing water consumption by homes, farms and industry.

**Goal 2: Maintain high water quality standards.**

- a. Establish baseline for water quality, monitor and publish results.
- b. Enforce against groundwater pollution; assist local water treatment, storage expansion projects; discourage proliferation of septic systems.
- c. Consider wetlands alternatives for sewer treatment; favor biological purification systems (e.g. aerobic techniques).

**Goal 3: Secure and protect natural water resources.**

- a. Assure that all developments (not only subdivision) are engineered to protect natural watersheds.
- b. Monitor upland runoff, riparian and base flows for all County waterways.
- c. Seek easements along drainage ways to prevent incursions, protect the beneficial function of floodplains and provide recreational opportunities.
- d. Maintain water flow and ecosystems, wildlife corridors on the Verde River and other waterways.

**Goal 4: Work with Yavapai County to prepare an accurate water budget and manage water.**

- a. Support efforts to tie water availability to development.
- b. Participate in regional water management planning.

**Goal 5: Encourage residents to legally secure their water rights.**

**Goal 6: Provide information and assistance for residents about:**

- a. Water availability (study results, use, rights)
- b. Water quality standards (e.g. well testing, meeting new arsenic standards).
- c. Water conservation measures.
- d. Use of reclaimed water (e.g. gray water systems) to conserve ground water.
- e. Proper care of wastewater systems.

**Goal 7: Protect riparian area resources**

- a. Manage growth in floodplains—limit development, encourage use as open space for parks or recreational purposes; discourage new construction in 100-year floodplains.
- b. Encourage private property owner involvement.
- c. Teach riparian values.
- d. Protect Oak Creek’s status as a “unique water”.

**D. Implementation Policies & Strategies**

Leadership and policies for implementing these goals and objectives can come from the Community Association, working in cooperation with Yavapai County, public agencies, water groups and private landowners, to provide current information and assistance to achieve Plan goals and objectives. The Association is a participant in the Northern Arizona Water Consortium; works cooperatively with the Verde Water Users Association; and regularly provides educational presentations on water resources, including hydrology, studies, legal issues, water quantity and quality concerns, management of wells and septic systems, and water conservation. The primary County contact on water-related issues is the Yavapai County Water Coordinator.