

## **ATTACHMENT 9**

**(Supplemental Documentation to the: Mogollon Rim Water Resource  
Management Study Report of Findings)**

**A review of Water Resource Investigations  
and Other related Information for the  
Mogollon Rim Water Resource  
Management study**



# MOGOLLON RIM WATER SUPPLY STUDY

## Introduction

While the recorded and evidential history for the study area goes back to the 16<sup>th</sup> century, the focus of this report will be upon the history of water resource development within the study area since the beginning of the 20<sup>th</sup> century. There is an extensive history of water supply development in the study area of the Mogollon Rim Water Supply Study. The water resource development history starts near the beginning of the twentieth century with the development of the Salt River Project.

Once the planning for the project was completed, the U.S. Congress authorized the Project and appropriated funds for its construction. In terms of water resource development this action by the Congress was an important decision to support a water project for the Salt River Valley, which includes Phoenix and surrounding communities.

When this project was constructed and placed into operation, the capture and delivery of this water into the Salt River Valley created a major impact upon the total water resources of the entire study area. The first impact on the watershed was the construction of the facilities required to support the Project. The second impact was the assignment of water rights to the Project; and thirdly, the associated establishment of the Tonto National Forest to preserve and protect the watershed, as well as for other purposes, to sustain the development of the watershed's water resources for the Project.

The Town of Payson and the unincorporated communities of Pine and Strawberry were founded in 1884 with the establishment of local post offices. Payson was incorporated as a Town in 1973. Pine and Strawberry do not intend to become incorporated communities at any time in the foreseeable future (2004).

Offered below is a review of the water resource development studies completed by Payson, Pine and Strawberry for the time period 1971 to the present. Other portions of the historic review reflect early time periods associated with the establishment of the Salt River Project, Tonto National Forest, and the Central Arizona Project.

### **A. History of Water Supply Development and Management in the Study Area**

It is important to start with some relationship to the timing of events that have led to the planning efforts associated with the Mogollon Rim Water Supply Study. The first event will be a brief review of the establishment of the Salt River Project and the Tonto National Forest. The rest of the historical review will focus upon the water resource development efforts of the Town of Payson, the Pine and Strawberry Water Improvement District, and other water resource studies prepared by Gila County, in association with the Arizona Department of Water Resources.

### **B. Salt River Project**

The Salt River Project (SRP) includes a water service area of about 250,000 acres in Maricopa County. The member lands within SRP are provided water annually for irrigation, municipal and industrial uses. Surface water is derived from the 13,000 square mile watersheds of the Salt and Verde Rivers. Supplemental water is provided from 250 groundwater wells within the water service area. SRP also provides power within a 2,900 square mile service area spanning Maricopa, Gila and Pinal counties in Central Arizona.

SRP was created in 1903 when landowners in the Salt River Valley (Phoenix area) formed the Salt River Valley Water Users' Association, in accordance with the National Reclamation Act (Act). Individual property owners within the water service area pledged their land as collateral for a federal government loan to build Theodore Roosevelt Dam, the cornerstone of SRP's water operations. SRP was the nation's first multipurpose reclamation project authorized under the Act.

In its early days, the Salt River Valley Water User's Association was an uneasy alliance. Disputes about water rights were common. The Articles of Incorporation of the Salt River Valley Water User's Association (Association) did not determine the prior water rights of individual landowner's nor were these rights defined in the contract between the Association and the federal government.

Before the federal government would invest money to build storage facilities to capture flood flows on the Salt River as contemplated by the Act, a system would have to be in place to distribute the natural or normal flow, of the Salt River and its tributaries. Washington officials wanted shareholders to settle these water rights claims to the use of the normal flow of the Salt River and its tributaries to avoid future conflicts between the users of stored water and the owners of prior vested water rights.

In 1905, Judge Kibbey filed an action to quiet title the water rights of Patrick T. Hurley against Charles Abbott and other Salt River Valley landowners. As one of the prime movers of the Association, Hurley volunteered to file the friendly suit to force a decision on water rights issues. On March 1, 1910, after five years of gathering and studying evidence, Judge Edward Kent sitting as the district judge, handed down a decision that endures even today.

The Kent Decree established the relative rights of the Association lands to the normal flow of water of the Salt River and its tributaries. The decree formally stated the principle of normal-flow rights and prior appropriation, and reaffirmed the principle of appurtenancy, thus tying water to the land. Kent's ruling concerns lands that used water from the Salt River from 1869 through 1909 diverted at or above the Joint Head Dam (on the Salt River near what is now 48<sup>th</sup> Street.)

With the issuance of the Kent Decree that recognized the water rights within the Salt River Project, and the creation of several national Forests, the regional surface water rights were established and protected. The remaining funding was released from the federal government for the construction of Roosevelt Dam and the dam was completed in 1911. While creating a water storage facility for SRP, the communities that lie within the

Salt and Verde watersheds were either not in existence or so small those available resources were sufficient to meet their water demands. Over the past few decades water demand in smaller watershed communities has boomed, requiring the importation of new water supplies or significant capital expenditures in search of alternative water supplies.

### **C. Tonto National Forest**

The Tonto National Forest owes its existence to a singular historic event that took place shortly after the turn of the (20<sup>th</sup>) century -- the building of Roosevelt Dam to control the Salt River and ensure the water supply of what was then the heavily agricultural cities of Phoenix, Mesa, and Tempe in the Salt River Valley.

The National Forest was created in 1905 to protect the watersheds of the Salt and Verde rivers. This continues to be a central focus of the Tonto National Forest; however all of the mandates for managing the Forest for all resource values and uses are still applicable to the Tonto (National Forest). In response to the growing need for water to support community needs while still protecting the forest environment, the Southwestern Region of the Forest Service adopted a policy, on September 5, 2001, that gives specific direction for consideration of consumptive use of water uses and development from National Forest lands.

The major focus for the current management direction of the Forest is the improvement of Forest health and fuels reduction. The ongoing drought situation has exacerbated the mortality from insect infestation as well as presented nearly unprecedented fire hazards to western Forests and communities. Efforts are now underway to use prescribed fire and mechanical treatments to thin the Forests to pre-settlement era levels to mimic conditions when natural fire played the predominant role in the ecosystem. The thinned forest is reasonably expected to have the added benefit of increasing watershed shed runoff.

### **D. Town of Payson**

There are numerous water resource studies which have been performed regarding Payson's portion of the Study Area between 1972 and 2004. A summary presentation of all of the reports is offered immediately below:

### **E, Background**

The Town of Payson is dependent on a water supply produced from groundwater wells located within the Town's boundaries. These wells produce water from the underlying geology or aquifer, which is composed of fractured bedrock. The water storage capacity of this type of aquifer is dependent upon fractures and weathered zones located within the bedrock. The Town has invested in many water studies in an effort to affectively and responsibly manage its water supplies. These efforts have afforded the Town's ability to grow to its current size while also resulting in the adoption of a Safe Yield ground water supply management objective. As such, it has been identified that little to no additional growth can be supported with the existing ground water supply. Moreover, the development of a groundwater reserve for drought mitigation is clearly needed.

Efforts to explore for and develop additional supplies of both ground water and surface water for use conjunctively are on-going and directly relate to the study at hand. A surface water source has always been a desire for the Town of Payson. The realization of such supplies via exchange, purchase, or other means, has been complicated by environmental issues, limited water rights, and monetary infeasibility.

Making Payson's 1984 CAP water allocation "wet", in Payson, in time to meet increasing demands was simply not possible. Particularly when considered in light of the State's on-going adjudication process and lengthy Federal Indian water rights settlements.

Faced with this reality, the Town of Payson elected to sell its original CAP water allocation of 4,995 ac/ft and set aside the funds in trust for the future development of yet undetermined alternative surface water sources and/or ground water development and management actions. These funds have essentially financed the majority of the ground water development and exploration actions described below in addition to ongoing surface water negotiations such as Blue Ridge Reservoir.

#### **F. Previous Studies**

Offered immediately below is a summary of the water resource related investigations that the Town has pursued since 1971.

Manera and Associates, Inc., 1975 (3), prepared a report concerning the water available to Payson North. They concluded that a sufficient groundwater supply was available to supply the project growth of Payson North for a minimum period of 35 years (2010) with an acceptable rate of decline in the static water level. It was further noted that the Town of Payson was studying methods of purchasing United Utilities Company. In addition, the Town of Payson had applied for an allocation of Central Arizona Project (CAP) water. The delivery of CAP water would require an exchange with either SRP or others prior to it being available to Payson. Delivery of the exchanged water would probably be by capturing and diverting from the East Verde River. Further, it was expected that when these transactions were completed Payson North as well as the Town of Payson would be supplied with CAP water, the remaining groundwater acting as a supplement supply.

The Payson's Master Water Plan, 1981 (4), prepared by the engineering firm (Dashney, Steele & Jensen, Inc.) was primarily a report discussing the infrastructure needs of Payson. However, there were two items that related to Payson's water resource development program. The two items were as follows: (1) "Payson should continue with the use of underground water. Central Arizona Project water will be expensive and should not be used as the main source of water supply unless the ground water supply is found to be inadequate or insufficient to meet future needs..."; and (2) "The top priority in a program for improving the Payson waterworks is to conduct a systematic investigation of the groundwater resources in the study area (Payson). Present sources must be modified and new sources found and integrated with the distribution system as soon as possible. This proposed Master Water Plan was entirely dependent on the assumption that the underground water supply would be sufficient to meet the ultimate needs of the study area."

W. S. Gookin & Associates in cooperation with Dashney & Associates (Gookin), 1984 (5), concluded in their CAP feasibility study for Payson that “it is apparent that the cost of CAP water will significantly exceed the cost of ground water for the Town of Payson. Therefore, CAP water should only be utilized as an alternative to ground water and not as the replacement. If sufficient ground water supplies can be located, it probably will not be desirable for Payson to pursue CAP supplies. Given the uncertain nature of water supplies in the area and the restrictive nature of the ground water code, substantial evidence of a dependable ground water supply should be obtained prior to abandoning the CAP option. If additional ground water supplies cannot be economically developed, then it will be necessary to proceed with the CAP diversion project.”

In the section entitled “Future Activities”, the Gookin Report notes the following: “The Town of Payson is facing a limitation under the subcontract (CAP water service subcontract) of “Take and/or Pay for Water” in 1990. If the Town of Payson has not taken (CAP) water by 1990, the Town will have to pay capacity, advalorem, and nonpumping Operation and Maintenance charges anyway.”

The Gookin Report recommended that the Town of Payson continue all activities that were being undertaken at that time to contract for CAP waters by 1990. These activities included infrastructure plans, a Notice of Intent, Loan Application, an Environmental Assessment, Exchange Contract, Bonding, M&I Water Service Subcontract, Repayment Contract, Design and Survey, and Construction Program.

Further, Gookin recommended that the CAP diversion from the East Verde River be made at a Beaver Valley site because it is economically and probably environmentally superior. Gookin also noted that the diversions should be done pursuant to a tripartite exchange agreement between the Town of Payson and Salt River Project and Phelps Dodge Corporation.

Additionally, Gookin identified several alternatives for additional water sources. Payson could purchase valid water rights along the East Verde River and divert the water; groundwater development; Blue Ridge Reservoir diversions and a CAP exchange.

In Payson’s Master Water Plan update for the waterworks system serving the Town of Payson, 1989 (7), the Engineers (Burgess & Niple Engineers and Architects) noted that Payson should continue with the use of underground water unless the groundwater supply is found to be inadequate or insufficient to meet future needs. Continuing the existing systematic investigation, including test drilling and pumping is recommended for exploration and evaluation of higher yielding groundwater resources in the Payson area and surrounding areas. Recharging of the groundwater resources via the proposed Green Valley Lake project by the Town of Payson is a viable method of insuring an adequate groundwater supply.

The Town of Payson performed a water exploration project from 1984 – 1987 (6). The work was done under the direction of hydrologist, E. L. Gillespie. Mr. Gillespie

observed, in early 1985, that the exploratory drilling program conducted during 1984 produced fair results. The estimated total new water discovered was 960 g.p.m. In the following years exploratory program, Mr. Gillespie noted that the 1985 Exploration Project appeared to be quite discouraging as so many sites proved to be unsuccessful (less than 100 g.p.m.) but overall we arrived at a total new water slightly less than last year (1984, 960 g.p.m.) compared to this year of 880 g.p.m. with a (combined) total for both years (1984 and 1985) of 1,840 g.p.m.

Mr. Gillespie encouraged Payson to explore additional areas within the Payson Town site, Land Developer's project lands, USFS Trades, Star Valley and Granite Dells area, as well as some sites within Payson proper. He felt that investigating some of the outlying areas would be wise—not only to spread the well fields further apart, but also for future Payson water services to areas now being served (1986).

In Mr. Gillespie's final report (1987), he notes the 1986 exploration project completed with a good success—after appearing so “bleak” during most of the project.

The pumping test on the four (4) successful exploration wells resulted in 1,065 g.p.m. of “new water” for the Town of Payson's growth.

He further notes that it now appears that the exploratory program would be limited in test sites within the town, unless some exploration could be obtained in the lower Country Club area and along the edge of the valley south of Main Street.

Gookin's Report, 1992 (9), reiterates a recommendation from their 1984 report (see above). (1) Payson should not rely solely on groundwater to meet its future requirements. In the 1992 Report, Gookin recommends two alternatives to meet their future demand. These are the CAP exchange and a recharge project. Their final recommendation was that when faced with the decision of accepting CAP water; it should be contracted for unless the recharge program has produced positive results.

Town of Payson Recharge Studies: Green Valley, Rumsey Park, and Other

Sargent, Hauskins & Beckwith—Consulting Geotechnical Engineers (SHB) prepared a hydrogeologic evaluation of the proposed groundwater recharge project, Green Valley Park May 1992 (11). Their report included the results of their geologic and hydrogeologic investigations, evaluations and analyses for the proposed recharge project and they included a recommended preliminary design for a pilot recharge project.

The Green Valley Park Governing Board commissioned a study (November 1992—Study results were developed from 1991 data.) to evaluate the water pumping facilities which would be needed to serve the Green Valley Park Lake system. In the study, it was reported that the original design of the American Gulch Wastewater Treatment Plant (WWTP) was capable of treating the average daily flows of the Town of Payson up 1.7 mgd. The original land area and hydraulic provisions for the subsequent expansion of facilities was sufficient in size to ultimately treat average daily flows of 2.55 mgd.



During the period of the study, the WWTP was treating an average daily flow of 1.0193 mgd. Northern Gila County Sanitary District (Sanitary District) was operating these facilities in 1991. The Sanitary District has been the operating agency for these from the initial operations until the present (2004).

During 1991 the Sanitary District provided 56.32 million gallons of treated effluent to five users for irrigation (approximately 15% of the total flow). The total effluent production for the year 1991 was 372.0625 million gallons. The five effluent users were the Payson Golf Course, Jones, Llama Ranch, Payson West, and Payson High School.

In a late 1992 report (10), Gookin notes the following water supply alternatives for Payson:

1. Rely on existing groundwater supplies and future, local groundwater wells.
2. CAP water via Roosevelt Dam.
3. CAP water via the East Verde.
4. Develop waters from the Tonto National Forest.
5. Groundwater recharge using wastewater effluent.
6. CAP exchange/funds with the City of Scottsdale.

In and around 1993, Errol L. Montgomery & Associates (Montgomery) (13) was commissioned by the Town of Payson to perform a hydrogeologic investigation to identify and evaluate potential groundwater development areas in the vicinity of the Town of Payson. Their study area in east central Arizona was approximately 700 square miles in size. They were to study three areas within the project area. The three areas were Hardscrabble Mesa, Star Valley/Mogollon Rim, and Rye Creek basin. The principal water-bearing units in the study area are: floodplain alluvium, basin-fill deposits, basalt and related volcanic rocks, consolidated sedimentary rocks, and igneous and metamorphic complex.

Montgomery's findings were as follows: Hardscrabble Mesa – The quantity of groundwater data for Hardscrabble Mesa is small, and because the probability is small that a substantial volume of groundwater is stored in or recharged to the basalt and related volcanic rocks in the area, Hardscrabble Mesa was considered to be favorable for groundwater exploration and development. Star Valley/Mogollon Rim—the principal aquifers in the Star Valley/Mogollon Rim area are the igneous and metamorphic basement complex and consolidated sedimentary rocks. The principal source of groundwater in the Star Valley/Mogollon Rim area is recharge from precipitation on the Mogollon Plateau. The Star Valley/Mogollon Rim area was considered a favorable area for potential groundwater development. Rye Creek Basin (outside of the study area) – The principal aquifers in the Rye Creek basin are floodplain alluvium and basin –fill deposits. The floodplain alluvium is generally more transmissive and has larger specific yield than the basin-fill deposits, but areal extent and thickness of the floodplain alluvium are small. Basin-fill deposits in Rye Creek basin store a large volume of groundwater relative to other aquifer units in the study area. Rye Creek basin was considered the most favorable area, of the three area studied, for groundwater development. The chemical quality of groundwater in the project area was observed to be generally good.

In 1994, Errol L. Montgomery & Associates, Inc. (Montgomery) (14) were engaged by Payson to prepare a report regarding the hydrogeologic conditions in the Jacks Canyon, Clear Creek, and Chevelon Creek watersheds located in Coconino and Navajo counties, Arizona. The purpose of this study was to provide background information relative to the adjudication of water rights in the Little Colorado watershed. As part of the proposed adjudication settlement, it had been proposed that watersheds of Jacks Canyon, Clear Creek, and Chevelon Creek on the Colorado Plateau be closed to all further surface water and groundwater development. This area was being considered by the Payson for possible future development of groundwater for a supplemental supply to serve the growing population of Payson. The purpose of this report was to document groundwater conditions in the aquifers that underlie the three watersheds.

Montgomery also provided the following assessment of the groundwater development and use in these three watersheds:

“Withdrawals of groundwater from the Coconino Aquifer consist of pumping for livestock, domestic, and public-supply uses. Amounts of groundwater that have been developed in the Jacks Canyon, Clear Creek, and Chevelon Creek watersheds have been small except for the Winslow public-supply wells. The major withdrawal occurs in the vicinity of Winslow for public-supply wells and probably does not exceed 2,000 acre-feet per year at present (1994). Withdrawals for other uses in the three watersheds are probably are less than 200 acre-feet per year....”

Because withdrawal of groundwater in the area is small and does not exceed recharge, water levels generally show no decline. Altitude of groundwater levels in the Coconino aquifer has not changed except in the vicinity of the Winslow well-field.

George V. Sabol Consulting Engineers (Sabol), December 1994 (15), prepared the Rumsey Park Addition – Stormwater Drainage and Aquifer Recharge Facilities report. In the Conclusions and Summary section of the report, Sabol noted that aquifer recharge in the Rumsey Park addition may be feasible. Sabol noted that this was due to the favorable soil and aquifer properties in the area and because there is significant groundwater withdrawal that provides opportunity for aquifer recharge.

Sabol also noted that aquifer recharge can be achieved with reuse water that is generated by the North Gila County Sanitation District’s Wastewater Treatment Plant. Quality aspects must also be considered, including the quality of the WWTP reuse water and the expected quality improvements obtained when the reuse water infiltrates into the sand fill of the seepage trench and moves through the alluvium and decomposed granite. Once the reuse water has moved into the fractures of the granite, additional quality improvements should not be expected. Early discussions with ADEQ and ADWR are needed to make sure that the proposed recharge with reuse water meets regulatory requirements and that

the necessary permits can be obtained. Other water quality concerns were address with respect to the reuse water's impact upon on groundwater quality for potable use.

Sabol indicated that two aquifer recharge facilities could be constructed: either an aquifer recharge pond or an aquifer recharge channel. Sabol further noted that both recharge facilities can be developed to enhance recreational and environmental consideration for Rumsey Park.

In 1997 (18), the Town of Payson prepared a groundwater exploration report concerning, the Snowstorm Mountain Exploration Area. The results of that effort were that the groundwater potential in the Gibson Creek Batholith is marginal and likely limited in extent due to abundant secondary mineralization. In recently faulted areas a higher potential for groundwater may exist and especially in areas where more felsic rocks are present. The erosion of both the Mazatzal Mountains and the Snowstorm-Oxbow Range has deposited a substantial thickness of alluvial fan and freshwater limestone deposits from Simonton Flat towards Cypress Thicket and Rye. These deposits may offer a potential for productive deep sand and gravel aquifers. The land area over which this study was conducted was Federal lands administered by the U.S. Forest Service.

ASL Consulting Engineers, in their 1998 reconnaissance hydraulic evaluation report of the Hancock/Winslow irrigation system and McHood Reservoir (19), Winslow, Arizona, noted that the existing irrigation delivery system appears to be hydraulically capable of delivering 5,456 acre-feet of water per year. However, the system has probably been delivering a maximum of approximately 4,000 acre-feet per year. The report further stated that the actual average annual amount delivered is probably less than 2,000 acre-feet per year.

Southwest Ground-water Consultants, Inc. (SWC), 1998 (17), prepared a long-term management program of the Town of Payson's water resources. They noted that the potential future water resources available to the Town of Payson consist of:

- Effluent (direct use and recharge);
- Ground water within a 5-mile radius of the Town;
- Ground water outside a 5-mile radius of the Town; and,
- Water Conservation.

The SWC report included the following Long-Term Management Recommendations to help insure the long-term water supply for the Town of Payson:

1. "Develop and implement an in-depth water conservation plan that will reduce the summer peak month and peak day demands, as well as the overall year-round Town water use. This plan should include the development of water rates that will discourage waste and/or overuse.
2. Re-use directly or indirectly all available effluent from the North Gila County Sanitary District (NGCSD) wastewater treatment plant.

3. Explore for potential ground-water resources north and east of Town in particular and other areas outside of Town in general.
4. Continue the periodic monitoring of all Town production, observation, and exploratory wells for depth to water, water production, and water quality.
5. Continue the periodic monitoring of water users, and develop a better understanding of water use by customer classification.
6. Continue the monthly monitoring and evaluation of the effects of precipitation on ground-water levels on a seasonal and annual basis.
7. Continue the policy of requiring all new developments to “bring” water with them in order to obtain project approval and building permits, and provide options to developers to co-develop/cost share with the Town for ground-water exploration and development. This policy should remain in effect until such time as the Town has located and proven additional long-term water supplies. At that time, adjust water development fees to reflect the cost of development of these supplies.”

In a May 1999 report, Rumsey Park Recharge (20), the Town of Payson proposed to recharge treated effluent into the northern part of American Gulch as part of a potential aquifer storage and aquifer project.

In September 2000 (24), the Town of Payson continued its groundwater exploration program. A study of the North Payson Area was prepared with the following results: In November 1999 the Town of Payson initiated Phase II of its Federal lands groundwater exploration program in an area referred to as the North Payson area. The study area is located just North and East of the Town of Payson, in the Tonto National Forest. A total of 15 exploratory well sites were selected following the completion of initial geological investigations. The land area over which this study was conducted was Federal lands administered by the U.S. Forest Service.

An estimated total of 316 gallons per minute (g.p.m.) of potential well yield was identified by the project. No “dry holes were drilled. The Northeast portion of the North Payson study area can be described as an area of moderate to low groundwater production potential. Unless, new information warrants, the development of water supplies in this area is not feasible for municipal supplies. While the estimated total of 316 gpm would make a positive increase in the Town’s water supplies, there was still a need for the Town to continue its investigations for additional groundwater supplies.

In the Town’s 2001 Ground-Water Management Status Report (29), the following was noted: Ground-water well development and rehabilitation efforts since late 1997 have increased production capabilities by 1,313 or 1.9 mgd. A significant proportion of this increase was gained in 2001 with ongoing well rehabilitation and deepening efforts. In addition, the total above does not include a well located in the Tonto National Forest which is expected to produce  $\approx$  150 gpm (NP-2). At the time of the writing of this Report, the USDA Forest Service was requiring further testing and permitting before the NP-2 well could be utilized as a public water supply. It had been estimated by others (Southwest Ground-Water Consultants) that the safe yield of the useable groundwater supply is 1,826 afy and 89 gpcd if the Town were to supply a population of 18,600,

including commercial uses. At the time of the writing of this Report the author (M. Ploughe) notes the Town was rapidly approaching its safe yield estimate.

The Town of Payson continued its exploration and development work in the North Payson Area by performing NP-2 Aquifer Testing and Analysis, March, 2002 (31). A special use permit was obtained from USDA Forest Service in January 2001. The obtaining of this permit was necessary to facilitate the testing of the NP-2 well. In order to estimate the true long-term capacity of the NP-2 well, the natural flux or flow of groundwater available to the well was considered. The natural flux available to sustain pumping from NP-2 is estimated to be 107 gpm. Approximately two thirds of this existing natural flux is however, currently being captured or will be captured with existing Town of Payson and private wells. As a result, no more than approximately 35 gpm can be considered “new water” to Payson. Water quality samples collected from NP-2 met all drinking water quality standards. In concluding the recommendations of the Report it was recommended that using the NP-2 well at a pumping rate of 150 gpm was proposed. Under normal circumstances the actual well use would not be continuous, but would likely be less than a twelve-hour per day overall annual pumping average. As a result, the potential impacts to existing Town wells and nearby private wells are minimized and the natural flux is not exceeded. Most importantly, utilizing this pumping rate will help maintain the Town’s abilities to meet future peak summer demands while improving overall well field efficiency.

The Forest Service, however still has reservations about issuing a production well permit for NP2 due to indications from the initial pump tests that nearby private wells could be affected. Additional analysis will be required before a final determination would be made (2004).

The 2002 Status Report (32) on the Town’s groundwater management noted the efforts to investigate potential water supplies on private lands and the national forest public lands will continue. The deepening of existing wells and installation of new wells in areas that can increase well field efficiency will continue to be pursued. The current production (2002) capabilities were sufficient to meet the demands for the 2002 summer season even when amidst the worst winter drought recorded. As such, the need for drought emergency plan to aid in managing the water supply via conservation requirements in times of drought has been identified and would be addressed. With annual demand approaching safe yield, planned depletion projection results indicate that the aquifer could conservatively sustain overdraft until the year 2021. However, the Town’s abilities to meet peak demands will become increasingly difficult as aquifer storage declines.

In addition, the results of test drilling on private lands in the Rye area were presented. The purpose was to explore the potential for sand and gravel aquifers within the Rye Creek Basin, as theorized in the 1993 Montgomery Report. Upper alluvial sediments were found to be less than 20 feet thick and were unsaturated. The lower Tertiary sediments were found to be of variable thickness not exceeding 600 feet and were comprised of clay and silt rich sediments. Ground water yields, though, were very low at less than 20 gpm while the quality was found to be quite poor.

The Town's 2003 Water Resources Management Status Report (34) notes that Payson, and the southwestern United States, is in the midst of a prolonged and severe drought period. The Town is rapidly converging upon its safe yield target, as previously expressed above. Without additional water supply developed outside of the Town's limits, Payson is limited to producing water from existing wells located in the local aquifer. It is the policy of the Town that the Town will make attempts to manage its water supply and take efforts relating to water development and water conservation to achieve "Safe Yield" water supply goals each year. Additionally, the Town conducted drilling exploration for additional groundwater supplies on private lands in and near the Town's limits and in areas remote to the Town's limits. The Town has also conducted drilling exploration on public lands near the Town's limits. These efforts have revealed only limited potential for new water supplies and have not been pursued for water supply development. Special use permits were requested and pending at the time of the Report's preparation. Efforts to secure a surface water source from Blue Ridge Reservoir were also ongoing as were efforts to develop a local groundwater recharge project utilizing reclaimed (see Rumsey Park Recharge Project). Until additional water supplies are developed for use within the Town, Payson will utilize strategies to reduce the consumption of local water supplies by conservation methods.

Black & Veatch prepared an Aquifer Recharge Feasibility Study, in July 2003 (36). The essence of the Report was to outline the design details for effluent treatment pilot plant to study the best operations and processes to apply to effluent for it to be recharged into the local aquifer. The report also identifies that only limited reclaimed water is available for a pilot study at this time. The operation of a pilot treatment and injection facility with current effluent availability would require numerous shut down and restarts of the facility which is not feasible. Reclaimed water availability is most desired to be consistently available in excess of 100 gpm. No action regarding the final development of this pilot project has been reported at this time (November 2003).

The Town had G&AORAMA prepare a report concerning the Structural Geology and Groundwater Potential, Diamond Rim Study Area, August 2003 (36). The consultant notes that the Town has been successfully producing water in the Payson Granite for a number of decades. In recent years it has been determined that the best wells are along Tertiary faults. Recent groundwater exploration efforts leading to drilling on Tertiary faults in Payson Granite have been successful. Moreover, recent drilling has produced appreciable water at depths approaching 1,000 feet, much deeper than was previously thought possible in the Payson Granite. Geologic mapping for the Diamond Rim Study Area has successfully delineated and carefully located numerous Tertiary faults involving 'basement' crystalline rocks (Payson Granite and gneissic granitoids) and overlying sedimentary rocks of Tertiary and Paleozoic age. These faults have high potential for rapid transmittal of groundwater to wells that are sited to drill into the fault zones beneath the groundwater table and at depths from 500 to 1,000 feet. Thirty-six potential drill sites, largely along faults and at intersection of faults, have been located by this study. The Town is awaiting approval from the Forest Service before moving on into this exploratory drilling program.

During three different short periods in October, November, and December of 2003 (39), HydroSystems, Inc. incorporation with Zonge Engineering & Research Organization, Inc. performed a geophysical survey of the Diamond Rim project area. The geophysical survey was performed using a process known as Natural Source Audio-frequency magnetotellurics (NSAMT).

The Diamond Rim project area is very complex topographically and geologically, containing steep topography and numerous mapped faults. In general, background resistivities are very high, as is normally the case in areas dominated by the presence of granitic rock. In addition, many of the geologically mapped faults and contacts are clearly evident in the survey results. The geophysical data also show several faults that are not evident in surface geologic mapping.

The geophysical data gathered during the study appears to be consistent with the surface geologic mapping and hydrologic of previous studies. The data also appear to have provided additional new subsurface information. Some well sites that were proposed prior to the geophysical survey have been modified or re-prioritized by the Town of Payson and HydroSystems, Inc. These modifications were not made simply on the basis of the geophysics, but also on the basis of background geological and hydrological data, as well as on drilling concerns and access. Based on the data and other considerations, the Diamond Rim Fault is considered to be an attractive drilling target for future ground water exploration.

Payson's 2004 Water Resources Management Status Report (41) discussed several water resource management issues that were causing impacts upon the "Safe Yield" policy of the Town. Those water resource management issues are discussed in the following paragraphs.

First, the Town of Payson is dependent on a water supply produced from groundwater wells located solely within the town limits. These wells produce water from the underlying aquifer, which is composed of fractured bedrock. The water storage capacity of this type of aquifer is dependent upon fractures and weathered zones located within the bedrock. As a practical matter, it is desirable that water withdrawn from the aquifer for public use is replaced on a yearly basis by rain and snowfall that falls within the town limits and seeps through the overlying soils into the aquifer. This ideal situation is referred to as "Safe Yield" wherein the amount of water that seeps into the local aquifer on a yearly basis is equal to, or great than, the amount that is withdrawn for local water supply. Safe Yield for Payson has been estimated to be 1,826 ac-ft/yr (not including artificial recharge).

The southwestern United States, in which Payson is located, is generally considered to be in the midst of a prolonged and severe drought period. Payson has endured significant deficits in precipitation since 1989 and has observed consecutive declines in the local aquifer water levels since the El Nino weather cycle of 1997-1998. A yearly decline in

aquifer water levels indicates that Payson is not in the ideal situation of “Safe Yield” but is using water stored within the aquifer that may or may not be replaced in future years.

Without additional water supplies developed outside of the town limits, Payson is limited to producing water from existing wells located in the local aquifer that is currently in a state of reduced water storage. It is the policy of the Town of Payson local government that the town will make attempts to manage its water supply and take efforts relating to water development and water conservation to achieve “Safe Yield” water supply goals each year. In 2003, Payson residents consume local groundwater resources in an amount equal to 92% of “Safe Yield”. The fact that water consumption for 2003 was reduced by 7%, from a 2002 annual consumption of 99% of safe yield, is a sign that the Town’s award winning water conservation programs are working successfully.

Until additional water supplies are developed for use within the town, Payson will continue to utilize strategies to reduce the consumption of local water supplies by conservation methods. Since March 2003, the Town’s most recent conservation ordinance has been utilized to mandate water conservation methods for new and existing businesses and homes. A key component of this ordinance is the possible institution of water use restrictions each spring in order to achieve reduced water consumption. These efforts in combination with increased water conservation education, special conservation programs, and the assistance provided to the public water system homes and businesses are a meaningful attempt by the town government to achieve the town’s goals of “Safe Yield” in the management of its public water supply.

Defining the viable water resources options for the Town continue to be a priority for the Water Department. Within this context, the potential for a surface water source from Blue Ridge Reservoir continues to be a priority for the Town of Payson along side exploration on public lands as well as effort to develop a local ground water recharge project utilizing reclaimed wastewater and/or future surplus surface water sources.

In recent years, the Town of Payson has conducted drilling exploration for additional ground water supplies on private lands in and near the town limits and in areas remote to the town limits. In addition, the Town has also conducted exploration projects on public lands near the town limits. These past efforts revealed only limited potential for new water supplies and have not been pursued for water supply development. More recently, investigations conducted at Doll Baby Ranch have been concluded with similar results, while a new well installed on property of the Northern Gila Sanitary District shows some promise. In addition, permit applications for additional ground water exploration in much more promising areas of the public lands northeast of Payson are pending at this time (April 2004).

Efforts to investigate potential water supplies on private lands and the national forest public lands will continue. However, private lands close to the Town and available for exploration are few. The 2003—2004 recharge season was another below average period of precipitation for Payson. No significant recharge was observed over the 2003-2004 water year and ground water levels continue to decline. Longer periods of wet weather



are clearly needed to ease the impact of drought in the region. The Town's water conservation programs appear to be addressing the lack of precipitation by successfully limiting annual water consumption to less than the long-term safe yield of the aquifer. In addition, production capabilities are expected to be sufficient to meet demands for the 2004 summer season even amidst the likelihood of continued drought.

#### **H. Town of Payson's Recharge Projects**

Payson has either studied or studied and constructed two recharge facilities within the Town's boundaries. The Green Valley Park Reuse Facilities have been constructed and are being operated by the Town.

##### ***Green Valley Park Lakes Groundwater Recharge Project***

Green Valley Park is a cooperative water reclamation project between the Northern Gila County Sanitary District and the Town of Payson. This award-winning park has been designed to recharge the town's water table through passive percolation of treated effluent and excess storm-water runoff through the bottom of the lakes into the groundwater aquifer. The lakes also provide storage of the effluent for reuse customers throughout town and for watering of landscaping in the park. Monitoring of water levels in wells located around the edges of the Park allow the town to assess the effectiveness of the recharge process.

The town is partners with the Arizona Game and Fish Department in providing an urban fishing program. In October, 1996, the lakes were stocked initially with 1,250 pounds of rainbow trout. The Town continues to work with the Game and Fish Department to stock the lakes with rainbow trout from October through May each year. The lake is currently stocked at a rate of approximately 450 pounds of trout every three weeks. Approximately 300,000 gal/day is passively recharged to the Payson granite aquifer via the Green Valley Recharge project.

The second recharge facility that has been studied is the Rumsey Park Recharge Project. Observation wells have installed within the area in which the recharge could occur. A study of surface drainage and other pertinent items was completed by George V. Sabol Consulting Engineers, Inc. in 1994 (15). To date (January 2004) this project has not been built. See Black and Veatch study, 2003 (35), above.

#### **I. Town of Payson's Infrastructure Studies and Associated Projects**

Currently Payson's water supply and delivery system is located within the Town itself. Master Water Plans were prepared in both 1981 (4) and 1989 (7) concerning Payson's water system infrastructure. Since both reports were concerned with the water supply

and distribution system within the Town's boundaries, no additional reporting will be provided concerning the adequacy of the Town's interior infrastructure in this Report.

In 1999 (21), both Reclamation and Payson computed preliminary estimates for an infrastructure system to bring Blue Ridge Reservoir waters into Payson. No copy of the work done by Payson's consultant, Burgess and Niple, has been made available to Reclamation for summarization in this study.

In March 1999, there was a Payson Road Reconnaissance Geology Study (22) with respect to potential pipeline locations for bringing surface from the Phelps Dodge's power generation stations located, near Rim Trail and Washington Park, on the East Verde River. The purpose of the reconnaissance was to investigate the feasibility of the routes for placement of a pipeline in the roadbed from the power generating plant to the Town of Payson. The Study provides field reconnaissance of several pipeline routes and the routes associated geology

Reclamation's prepared a preliminary engineering study concerning the same project. Reclamation's report was prepared in draft form only. A summary of the draft results are offered below:

The Town of Payson, November 1998 (??), had prepared, by ASL Consulting Engineers, a preliminary estimate of construction and operation costs for an East Verde River Water Transfer System (Transfer System). The Transfer System included two different water treatment options to treat 6,100 acre-feet per year. The two treatment options considered were (1) conventional treatment and (2) membrane treatment. The Transfer System includes 18" transmission pipeline with needed appurtenances, treatment plant system and land acquisition costs. The preliminary estimates for the Transfer System was \$13,792,710.

A draft report, prepared by the Bureau of Reclamation, February 1999, entitled "Blue Ridge Dam and Reservoir, Water Supply Alternative—Pipeline Options for Payson, Strawberry & Pine, Preliminary Cost Estimates" (21). The report presented a preliminary look at several options to move water from the Blue Ridge Reservoir to the communities of Payson, Pine and Strawberry. Included in the report were several options to transport 3,000 acre-feet/yr of water to the communities of Payson, Pine and Strawberry. There were several cost items that were not included in the probable opinion of construction costs. The list of cost items that were not included are land purchase, rights-of-ways, safety, reliability, geology, utility relocations, pump selection and configuration, and associated social problems. In addition, the study addressed the initial costs for an Environmental Impact Statement. Unforeseen (unpredictable) costs of environmental problems, mitigation or litigation were not calculated. The report provided only a level or magnitude of the construction costs for various piping options under the Blue Ridge Dam and Reservoir Water Supply Alternative.

There were four (4) options for pipeline locations developed in the draft report. Those options were as follows: Control Road, Instream Diversion, Rim Road and Highway 87.

The Control Road option takes water directly from Phelps Dodge's power plant pipeline and follows Control Road west along the base of the Mogollon Rim. A 3,000 acre-foot reservoir would be located near Buckhead Mesa, along with 2.5 million gallons a day (mg/d) water treatment facility and a 10 million gallon (mg) clear well. Water would then be pumped north to Pine and Strawberry to 0.5 mg storage tanks and use gravity flow south to Payson to storage. The probable opinion of cost for this option is \$73,100,000.

The Instream Diversion option puts the water in the East Verde River at Phelps Dodge's power plant. The water is then taken out of the river near the Houston Mesa Road crossing. A small ogee dam would be built to get the depth required for the infiltration diversion system. Water would be pumped up a pipeline aligned along Houston Mesa Road into a 3,000 acre-foot reservoir located at Sunflower Mesa. The water would then be pumped through an 18 inch pipeline aligned along the Houston Mesa Road to near Highway 87 where a 2.5 mg/d water treatment facility and a 10 mg clear well would be located for Payson's needs. The water would then be pumped through an 8 inch PVC line aligned along Highway 87 to holding tanks for Strawberry and Pine. . The probable opinion of cost for this option is \$53,500,000.

The Rim Road option splits the supply of water to Payson and to Strawberry and Pine in two separate pipelines. The water to Payson is taken directly from the Phelps Dodge power plant and follows Houston Mesa Road via an 18 inch steel pipeline to a reservoir located at Sunflower Mesa. A pump station would then pump the water to a 2.5 mg/d water treatment plant and 10 mg clear well located near Payson. The water for Strawberry and Pine would be diverted from the Phelps Dodge pipeline on top of the Mogollon Rim. It would be pumped through an 8 inch PVC pipeline along the Rim Road to Highway 87. The pipeline would then follow Highway 87 down to a small water treatment plant located near Pine and then be gravity feed to final storage near Strawberry. . The probable opinion of cost for this option is \$72,000,000.

The Highway 87 option pumps water out of Blue Ridge Reservoir along a forest road directly to Highway 87 via an 18 inch steel pipeline. The pipeline then follows Highway 87 south, down the Mogollon, past Strawberry, through Pine to a 3,000 acre-foot reservoir located northwest of the Highway 87 and Control Road intersection. The water would then be treated at a 2.5 mg water treatment plant and stored in a 10 mg clear well before being pumped south to Payson and back north to Strawberry and Pine. The probable opinion of cost for this option is \$91,100,000.

**J. Northern Gila County Watershed Alliance**

The Northern Gila County Watershed Alliance’s Technical Committee prepared (1998) a Report entitled Northern Gila County Water Plan (16). It was observed in this Report that the current water usage in the Northern Gila Country area (includes Payson, Pine, Strawberry, and Star Valley) is estimated to be less than 2,000 afy. This usage is probably low, however, considering the water shortages and conservation efforts that have been on going for several years. The majority of residents in the area take great care in utilizing this precious resource. The study area’s primary source of water is groundwater drawn from public and private wells. Overdraft of groundwater in the Payson area has produced declining water levels in the Town’s network of supply wells. Water quality, in some wells, has also has an impact. In the Pine/Strawberry area, a lack of high producing water wells and under-developed infrastructure combine to create frequent inadequate or unavailable water supply for residents. Recreational use by tourist and seasonal visitors also severely impact the study area’s water supplies. Population projections developed for this report, indicate between 38,000 and 48,000 residents by the 2050. Serving this population will require an additional 4,500 to 5,500 afy of water (based on 150 gallons per day, per capita). With adequate storage capability these quantities should be able to serve the recreational users as well. Several potential water sources were discussed as possible solutions to future water needs. Among the most discussed were Blue Ridge Reservoir, new water wells, greater and more effective use of reclaimed water and miscellaneous area water rights. Additional hydrogeological, legal and cost/benefit information will be required before final informed decisions could be made.

The Northern Gila County Water Plan offers a list of possible sources for additional water. The list contains the following surface and groundwater sources:

Table J.1. Potential Water Supply Sources That Require Additional Investigation (16).

<b><u>Below the (Mogollon) Rim</u></b>	<b><u>Above the (Mogollon) Rim</u></b>
Tonto Creek Water Rights	Blue Ridge Reservoir
Gisela Area Water Rights	Long Valley—Clints Well Area
C-Aquifer (Portion below the Rim)	Hay Lake Ranch
Rye Creek Water Rights	
Indian Springs at Kohl’s Ranch Water Rights	
Pine Creek Water Rights	<b><u>Other Options</u></b>
Fossil Springs Water Rights	Better Utilization of Currently Reclaimed Water
Verde Valley Water Rights	Stronger Conservation Measures
Existing CAP Allocations/Trades	Development of Ordinances and Building Code to Regulate Water Usage
Recycled and Reclaimed Water	
Surface Water Impoundment(s)	
Ground Water Exploration	
Horizontal Drilling (at Rim)	
Flowing Springs Water Rights	

### **K. Pine and Strawberry Water Resources Study Information**

During the time period, May 18 – June 2, 2000 (23), an exploratory borehole was drilled near Strawberry, Arizona. The borehole was drilled to a total depth of 1,872 feet below land surface. Although the total depth of the hole was 1,872 feet, “lost” circulation problems combined with unstable borehole conditions the onsite geologist was not able to gather and collect drill samples from depths below 970 feet, and limited the depth of geophysical logs to 1,773 feet.

The major geologic units penetrated by the borehole include the lower member of the Supai Formation, the Naco Formation, the Redwall Limestone, and possibly the Martin Formation and/or the Tapeats Sandstone. A shallow groundwater zone that produced a small, unquantified amount of water into the borehole was encountered in the lower member of the Supai Formation at a depth of about 170 feet. The water level of the regional aquifer system was encountered in the Redwall Limestone at a depth of about 1,380 feet (about 4,400 feet in elevation above mean sea level). Based on interpretation of the geophysical logs it does not appear that basement rock (such as, granite or quartzite) was penetrated by the borehole.

### **L. Pine and Strawberry Water Improvement District**

The Consultant’s report, (2003) – Morrison Maierle, Inc (38), concerns the investigation of groundwater availability for the Pine/Strawberry Water Improvement District notes the following:

The communities of Pine and Strawberry have historically experienced severe water shortages in the summer months. Recent investigations conducted by the Pine/Strawberry Water Improvement District (PSWID) reveal that the water supply shortages caused by seasonal decreases in well yields are the result of limitations inherent in the hydraulic properties of the fractured rock aquifers that supply water to wells in the PSWID area. The limitations of groundwater flow through the fractured rocks to pumped wells will cause predictable decreases in well yields as pumping time increase. Although drought or below average precipitation conditions exacerbate the seasonal groundwater shortages, they are not the fundamental cause of the shortages, a conclusion supported by the fact that water shortages have historically occurred at the end of as many as 12 consecutive years of above average precipitation. The investigations show the currently utilized groundwater sources, in the Schnebly Hill and Supai strata, are inadequate to support existing demands let alone future growth.

The report continues to state: Investigation of the PSWID area of alternative sources of groundwater supplies has identified a deep aquifer in the Redwall Limestone and associated strata as the most favorable groundwater resource from which to develop additional sustainable water supplies for the area.

### **M. Pine and Strawberry Water Improvement District**

The District was formed and approved to function during the mid-1990s. The purpose of the District was to perform those studies and related activities that would lead to the identification of additional water supplies to supplement the existing water resources of

both Pine and Strawberry. Further, the purpose of this effort was to find water supplies that were both reliable and sustainable since the existing water supply was prone to have shortages during the summer months of each year.

The District joined the North Gila County Watershed Alliance to work on the solution to their water supply needs from a regional context. That Alliance has been integrated in to the current Study. The District has returned its power to the County. The County now represents not only the Pine and Strawberry Water Improvement District in the study; but several other districts and unincorporated communities/subdivisions as well.

Prior to the District dissolution they had established a water plan to use in the development of a strategy for accomplishing their goal of finding additional waters to firm up their existing but tentative water supply. A presentation and current status of each element is reviewed below.

## **N. The Pine and Strawberry Water Improvement District's 2002 Long Range Water Plan**

***Purpose:*** The Development Of A Water Resources Plan With The Goal Of Assuring An Adequate Long Term Groundwater Supply Is Available To Meet The Reasonable Needs Of Both The Area Residents And Property Owners (current and future)

### ***The Plan***

- Northern Gila County Water Plan Alliance. Continue as members of the NGCWPA Steering and Technical committees in its efforts to provide studies of the Northern Gila County water issues and assist the community, county, state and federal decision-makers in pursuing solutions. The Northern Gila County Water Plan Alliance no longer exists. This Alliance has been reorganized by Gila County into a study partner in the Mogollon Rim Water Supply Study.
- Water supply and demand model. Define a water consumption factor that can be used to estimate quantity of water that will be required to provide the Pine/Strawberry area with an adequate long-term supply of water. This effort was completed during the current study. A report entitled "Demand Analysis", Mogollon Rim Water Resources Management Study has been prepared and it is incorporated as part of the general report for the study.
- Maintain an outreach program. Communicate efficient recycling and water conservation programs. This work has been transferred back to the County
- Expand web sites. Prepare handouts for distribution. Have a booth at the Crafts Fair to share information with general public. Sponsor a contest with school children for ideas to communicate information on water conservation. Never end the process to communicate effectively. The web site for the District is no longer available for public viewing.
- USGS study. Participate with USGS and other participants in a study of the geology, surface and sub-surface hydrology of the greater Northern Gila County area. All USGS studies in the area have either been completed or terminated.

- Explore costs and feasibility of a deep production well. If this proves to be appropriate and ultimately successful, request that Gila County transfer the well site(s) to PSWID. There was an exploratory borehole drilled in the Strawberry area in the early part the first decade of the new century. See Strawberry test hole for additional comments.
- Strawberry test hole. Continue monitoring to determine feasibility of sub-surface water source development in the Strawberry area. A preliminary report regarding the data developed during the borehole drilling, limited geophysical testing, and other borehole studies has been prepared. No additional monitoring is being performed.
- Solicit participation from other local water districts/suppliers to work on common goals and objectives. PSWID, Portal 4, Solitude Trails, and others, may benefit by meeting frequently to share thoughts, current positions/status, and direction. This effort is no longer being pursued by the District.
- Investigate feasibility of developing a Mogollon Rim Well Field and pipeline. This effort is a part of the Mogollon Rim water supply study.
- Investigate feasibility to transfer local CAP allocations to PSWID and research methods and agreements to allow collection of surface water. A winter storage lake could be a wetlands or habitat; basins could be built to capture rainfall; and other water harvesting concepts should be investigated. Explore the feasibility of utilizing the Blue Ridge Reservoir and proposed back up Well Field to supply water to the Pine/Strawberry area. This alternative will consider during the alternative formulation phase of the study.
- Investigate feasibility of becoming the water supplier/company to the communities of Pine and Strawberry. The District, when it existed made efforts toward formalizing this concept. No action or final decisions have made toward confirming and formalizing this concept.

## **O. Central Arizona Project**

During the early 1900's, the seven states of the Colorado River Basin: Arizona, California, Nevada, New Mexico, Wyoming, Colorado, and Utah negotiated for shares of Colorado River water. In 1922, representatives from the seven states and the United States government created the Colorado River Compact, which divided the states into lower and upper basins and gave each basin 7.5 million acre-feet of water to apportion. Arizona, California, and Nevada were sectioned into the lower basin, and were instructed to divide their 7.5 million acre-foot allotment among themselves.

Arizona was in dispute over its share of the river, however, and was the last state to approve the Compact in 1944. Today in the Lower Basin, Arizona has rights to 2.8 million acre feet of Colorado River water per year, California is entitled to 4.4 million acre feet per year and Nevada has annual allocation of 300,000 acre feet.

In 1946, the Central Arizona Project Association was formed to educate Arizonans about the need for CAP and to lobby Congress to authorize its construction. It took the next 22 years to do so, and in 1968, President Lyndon B. Johnson signed a bill approving construction of CAP. The bill provided for the Bureau of Reclamation of the Department

of the Interior to fund and construct CAP and for another entity to repay the federal government for certain costs of construction when the system was complete.

In 1971, the Central Arizona Water Conservation District was created to provide a means for Arizona to repay the federal government for the reimbursable costs of construction and to manage and operate CAP. Construction began at Lake Havasu in 1973 and was completed over twenty years later south of Tucson.

The Town of Payson, Pine Water Company, and the Tonto Apache Tribe have either had or have a CAP water allocation. In 1983, the Secretary of the Interior (Secretary) allocated CAP municipal and industrial (M&I) to Payson (4,995 acre-feet per year water per year), E&R Water Company (161 acre-feet per year), and the Tonto Apache Tribe (128 acre feet per year). In the early 1990s, Payson entered into a transfer agreement with the City of Scottsdale for the severance of Payson's water allocation to the City of Scottsdale, Arizona.

In August of 1999, E&R Water Company transferred its CAP water allocation to the Pine Water Company/Brooke Utilities. The Pine Water Company still retains its CAP water allocation to date (2004). No action has been taken by either the Pine Water Company or the Secretary, acting through the Bureau of Reclamation, to deliver "wet" water to the Pine Water Company's defined service area.

The Secretary (of Interior), 1983, acting upon his trust authority to Indian tribes allocated 128 acre-feet per year to the Tonto-Apache Tribe (Tribe) for use on their Tribal Reservation (29). The Tribe still retains its CAP water allocation to date (2004). No action has been taken by either the Tribe or the Secretary, acting through the Bureau of Reclamation, to deliver "wet" water to the Tribe's Tribal Homelands. The Tribe has proposed a land exchange with the Forest Service for the purpose of expanding the boundaries of their current 85 acre Reservation by an additional 278 acres. The actual size of the final land exchange acreage will be determined by an appraisal of all the lands involved in the exchange. That appraisal is expected to be completed by late summer 2004 and a decision on the exchange likely by the end of the calendar year (2004).

The Regional Director, Lower Colorado Region, U. S. Bureau of Reclamation, in a memorandum to the Assistant Commissioner – Program, Budget, and Liaison (Bureau of Reclamation), June 11, 1993 (12), shared the following background information concerning the Town of Payson Central Arizona Project Water Exchange with the City of Scottsdale:

"In 1968, the Arizona congressional delegation provided a means for the water-short communities located in the upstream portions of the Salt and Verde Rivers watersheds to participate in and benefit from CAP through indirect access to water from the construction of CAP...

In 1983, the Secretary of the Interior allocated to Payson 4,995 acre-feet of CAP municipal and industrial (M&I) water per year...



In 1992, Payson, the United States, and the Central Arizona Water Conservation District (CAWCD) entered into a water service subcontract for delivery of 4,995 acre-feet of CAP water. The subcontract contains language which allows for assignment of the subcontract to another entity.

The East Verde River is the only surface water source available to Payson for direct exchange of its CAP water. Significant environmental obstacles have arisen concerning Payson's use, through exchange, of the waters of the East Verde River. Studies continuing since 1984 have resulted in the conclusion that an exchange involving East Verde River water is not legally, physically, or economically feasible.

Since the passage of the Basin Act in 1968, Payson has grown rapidly to a 1993 population of over 8,000 residents. Payson's present water supply, developed from multiple wells tapping shallow ground water in fractured granite beneath Payson, is no longer adequate to meet the increasing needs of the residents.

Payson has concluded that the development of an alternative water source, such as effluent reuse system and a new well field, is preferable to attempting a direct exchange of its CAP water."

Payson's CAP water allocation was subsequently transferred to the City of Scottsdale. Funds received from the transfer process of the CAP water allocation have been used by Payson to fund both groundwater exploration programs and other development projects to increase local water supplies.

In the U. S. Fish and Wildlife Coordination Act Substantiating Report, Central Arizona Project, Verde and East Verde River water diversions, 1989 (8), the Fish and Wildlife Service (Service) identified both issues and recommendations concerning proposed CAP exchange diversions from the East Verde River. Presented immediately below are some of the more significant observations and recommendations noted by the USFWS:

(Note: The Substantiating Report was written to cover eight holders of CAP water allocations to exchange their allocations with water right holders on the Verde and East Verde Rivers and withdraw water directly from the rivers.)

"The Verde and East Verde Rivers support 165 miles of high quality aquatic and riparian resources... These rivers support an important remnant native fish community. Populations of three species [spikedace (*Meda fulgida*), bald eagle (*Haliaeetus leucocephalus*), and peregrine falcon (*Falco peregrinus*)] that are federally and State listed as threatened or endangered are found with the Verde and East Verde River area, as well as nine other State listed species. Recreational use is high along portions of the two rivers."

The Report further states "Flow reductions from the diversions (see Table ?? below), as originally proposed, would be significant in some reaches and would result in a loss of

about one-half the normal flow in the headwater reaches of the Verde River and about two-thirds in the East Verde River. Proposed flow changes would have adverse effects on riparian and aquatic species, particularly native fishes. Quantity and quality of the aquatic resources would be directly reduced for native fish species and increased for some undesirable non-native species such as red shiner. Long-term effects from changes in riparian zone width, stream channel morphology, water temperature and chemistry, flow patterns, and nutrient cycles would accrue to fish, wildlife, and riparian resources. Impacts would be greatest in the headwaters of the Verde River and in the East Verde Rivers and lowest in the Verde River downstream from Camp Verde. Indirect impacts would occur from residential, recreational, and commercial growth due to increased water availability.”

The Service made several recommendations, the pertinent ones recommendations 3 through 6 concerning the water supply study are listed below:

- “3) Minimum flows presented in Table 9 (see???) should be maintained in respective Reaches of the East Verde River. During periods of non-trans-basin water diversion, when natural stream flow is less than the indicated amount, the natural stream flow should be provided.
- 4) Maximum allowable diversion rates for the proposed diversions on the East Verde River should not exceed 1 cubic feet per second (cfs) for Tonto Apache Indian Reservation and the E & R Water Company (now Pine Water Company) and 4 cfs for the City (Town) of Payson. (Note: The flow restriction of a maximum diversion flow of 4 cfs for the Town of Payson, to preserve minimum stream flow in the East Verde River, would not allow them to receive their full CAP allocation of 4,995 AF/YR, i.e., 6.9 cfs.)
- 5) Long-term monitoring of riparian and aquatic resources should be conducted on the East Verde River. Monitoring procedures should be developed in cooperation with the Forest Service, AGFD (Arizona Game and Fish Department), and Service. Monitoring should begin prior to initiation of any diversions or construction of diversion facilities and be continued throughout the life of the project.
- 6) Changes in proposed/conceptual diversion plans or any additional proposed diversions or impoundments should be re-analyzed by the Service as appropriate.”

Exchange diversions, as originally proposed are as follows:

Table O.1 Central Arizona Project Probable Exchange Diversions (8).

Entity	E & R Water Company (Pine Water Company) Pine and Strawberry	Tonto Apache Tribe	City (Town) of Payson
CAP Allocation	161 AF/YR	128 AF/YR	2,606 AF/YR (4,995

Month							AF/YR?)		
	AF	CFS	Peak	AF	CFS	Peak	AF	CFS	Peak
January	8	0.14	0.21	0	0	0	217	3.6	N/A
February	11	0.19	0.29	0	0	0	217	3.6	N/A
March	10	0.16	0.24	4	0.07	0.14	217	3.6	N/A
April	13	0.22	0.33	14	0.24	0.48	217	3.6	N/A
May	14	0.25	.038	20	0.35	0.7	217	3.6	N/A
June	31	.52	0.78	24	0.41	0.82	217	3.6	N/A
July	21	0.35	0.53	26	0.43	0.86	217	3.6	N/A
August	16	0.27	0.41	23	0.39	0.78	217	3.6	N/A
September	11	0.19	0.29	14	0.24	0.48	217	3.6	N/A
October	10	0.16	0.24	3	0.04	0.08	217	3.6	N/A
November	8	0.14	0.21	0	0	0	217	3.6	N/A
December	8	0.14	0.21	0	0	0	217	3.6	N/A

Table ???. Recommended minimum instream flows (cfs) for the East Verde River (8).

Month	Reach 8*	Reach 9 and 10**
Jan	9	11
Feb	8	15
Mar	14	28
Apr	19	27
May	20	21
June	16	16
July	16	16
Aug	15	16
Sept	15	16
Oct	12	12
Nov	11	12
Dec	9	10

\* Measured at Highway 87 crossing.

\*\* Measured at Childs gage.

#### P. Water Conservation Programs—Brooke Utilities

The Arizona Corporation Commission's (ACC) decision No.'s 61076 and 61072 ordered water conservation staging levels for Pine Water Company in 1998 and remain these orders remain applicable to date, September 2004. During periods of low water supply periods all customers are encouraged to strictly observe the water conservation measures in effect at all times. The following five (5) stages of water conservation have been adopted by Brooke's Utilities, Inc., in concurrence with ACC, for the Pine Water Company

**Stage 1** – No water conservation measures are in effect.

**Stage 2** – Voluntary customer water conservation measures should be employed to reduce daily consumption by ten percent (10%). Outside watering on weekends and

holidays should be curtailed. Outside vegetation watering may occur during weekday periods on even days of the month for even-numbered lots and odd numbered days for odd numbered lots.

**Stage 3** -- Voluntary water conservation should be employed to reduce daily consumption by approximately twenty-five percent (25%). Outside watering should be completely curtailed except for permitted livestock. Indoor water conservation techniques should be employed wherever possible. Restaurant patrons should be served water only upon request

**Stage 4** -- Voluntary water conservation measures should be employed to reduce daily consumption by approximately forty percent (40%). Outside watering should be completely curtailed and livestock should be watered only when necessary. Mandatory indoor water conservation techniques should be employed throughout customer residences. Restaurant patrons should be served water only upon request.

**Stage 5** -- Mandatory water conservation restrictions are currently in effect pursuant to regulatory enforcement proceedings. Such regulatory restrictions may be in the forms of moratoriums, curtailment orders, meter disconnection without notice or the like. Customers should confine themselves to not more than one-half of their usual indoor daily water consumption except for permitted livestock. No outside watering should be conducted. Restaurant patrons should be served water only upon request.

#### **Q. Water Conservation Programs—Town of Payson**

Town of Payson Code of Ordinances (25) provides a clear expression of the Town's Water Conservation Guidelines as follows:

##### **Q.1 DECLARATION OF POLICY for Water Conservation.**

- A) The Town of Payson has a limited water supply.
- B) It is necessary for the town to protect its limited water supply to allocate and monitor water use to existing, pending and future development within its jurisdictional boundaries to ensure the continuing economic development and stability of the town.
- C) It is necessary to require that the town implement conservation measures and to require that water is utilized in the maximum beneficial way and that waste, unreasonable use, or unreasonable methods of use of water be prevented.
- D) This subchapter is a fair and reasonable means of achieving, and substantially advances, the public purposes set forth in this subchapter, and has been drafted to provide the controls necessary to accomplish the stated public purposes.
- E) Conservation of water is in the interests of the town and its citizens and promotes the public welfare.
- F) This subchapter is adopted pursuant to the authority vested in the Town of Payson by the Arizona Revised Statutes to maintain and operate a water system and provide the town with water.

- G) This subchapter shall apply to all water whether potable or effluent and all citizens, businesses and governmental entities within the corporate limits of the town and all customers of the Water Department wherever situated. All provisions of this subchapter related to water surcharges shall apply to all persons, customers, and property served by the Water Department wherever situated.

## **Q.2. RESTRICTIONS DURING WATER SHORTAGE.**

- A) The Town Manager, upon the recommendation of the Public Works Director, is hereby authorized to declare or rescind Water Conservation Levels in conformity with and based upon the Resource Status Levels set forth herein below which assess the relationship between water demand and municipal safe production capability. Safe production capability is 90% of the total available water resources, based upon distribution components, storage reserves, weather conditions and historic data.
- B) The following Resource Status Levels are hereby prescribed:
1. *Resource Status I:* When water demand is equal to or less than safe production capability. Resource Status I shall correspond with Water Conservation Level I. When Resource Status I is reached, Water Conservation Level I shall be declared.
  2. *Resource Status II:* When demand is greater than safe production capability for three consecutive days. Resource Status II shall correspond with Water Conservation Level II. When Resource Status II is reached, Water Conservation Level II shall be declared.
  3. *Resource Status III:* When demand is greater than safe production capability for two consecutive weeks. Resource Status III shall correspond with Water Conservation Level III. When Resource Status III is reached, Water Conservation Level III shall be declared.
  4. *Resource Status IV:* When water demand exceeds total production capability. Resource Status IV shall correspond with Water Conservation Level IV. When Resource Status IV is reached, Water Conservation Level IV shall be declared.
- C) The following Water Conservation Levels shall govern the use of water by customers of the Payson Water Department, as prescribed below:
1. *Water Conservation Level I:* Water awareness. Water users are specifically encouraged to minimize waste in water used for irrigation, vehicle and pavement washing, construction and other water consuming activities. No person shall wash paved areas such as drives, sidewalks, or tennis courts, except for health or safety.
  2. *Water Conservation Level II:* Water restrictions. The following water uses are restricted or prohibited. In addition to the restrictions set forth in subsection (1) above, no person shall:
    - a) Irrigate, wash vehicles, fill or refill pools, spas, or wading pools except as provided in this subchapter and subject to the restrictions contained in [§ 50.83](#).

- b) Wash vehicles on the allowed days unless a bucket and hose with a positive cutoff nozzle is used. No restrictions apply to vehicles that must be washed for public health, safety or welfare purposes, or to commercial car washes.
  - c) Irrigate golf courses except before 9:00 a.m. and after 6:00 p.m. No restrictions apply if treated effluent is used.
  - d) Use ornamental fountains except if equipped with a recycling pump.
  - e) Use water from a fire hydrant except for emergencies or upon the written approval of the Public Works Director and Fire Chief; and except for such use associated with firefighting activities, public health, safety or welfare.
3. *Water Conservation Level III: Water reductions.* In addition to the restrictions set forth in subsections (1) and (2) above, the following water uses are further restricted or prohibited. No person shall:
- a) Fill or refill swimming pools, spas or wading pools.
  - b) Irrigate golf courses. No restrictions apply if treated effluent is used.
  - c) Wash vehicles, paved areas, or use fire hydrants on a non-emergency basis without written approval of the Public Works Director and Fire Chief. No restrictions apply to vehicles that must be washed for public health, safety or welfare, or to commercial car washes.
  - d) Irrigate outdoors except as permitted pursuant to [§ 50.83](#).
4. *Water Conservation Level IV: Water curtailments.* The following water uses are restricted or prohibited. No person shall:
- a) Do any of the acts prescribed in subsections (1) through (3) above.
  - b) Use any potable water for irrigation.
  - c) Use fire hydrants, wash pavements, fill or refill pools or spas or fountains unless for public health, safety or welfare.
  - d) Use potable water for dust control on public or private streets or capital improvement projects.
  - e) Use potable water in violation of any other restriction deemed necessary by the Town Council for the purpose of protecting the welfare of the citizens of the town.
5. *Reduction in anticipated water use.* The foregoing water conservation levels shall be utilized to achieve the following respective reductions in anticipated water use:
- a) Water Conservation Level I: 0% reduction in anticipated water use
  - b) Water Conservation Level II: 5% reduction in anticipated water use
  - c) Water Conservation Level III: 10% reduction in anticipated water use
  - d) Water Conservation Level IV: 30% reduction in anticipated water use
- D) The Town Council may, from time to time, change the established water conservation level or enact additional water conservation or water use reduction

measures as may be necessary or appropriate to achieve a desired reduction in water use.

- E) In addition to the restrictions set forth above, the town shall establish yearly water conservation goals and implement such water conservation measures as may be appropriate for any year in which precipitation levels for the previous year fall below 22 inches of precipitation as measured by the National Weather Service. On or before May 1 of each year, the Water Department shall report to the Town Council the amount of precipitation, as measured by the National Weather Service, for the immediately previous 12 month period. The Water Department shall report the amount of precipitation for such period, whether it is above or below 22 inches for the period, and the percentage variation from 22 inches of precipitation for each such 12 month period. In the event that the precipitation level for any such yearly period is less than 22 inches, the water restrictions provided for in this section, or so many of such restrictions as may be necessary, shall be implemented immediately to reduce water demand, defined as a percentage, in an amount equal to the reported percentage shortfall of precipitation.
- F) In addition to the provisions set forth in divisions (A) through (D) above, the Water Department shall report on a quarterly basis to the Town Council and shall furnish to the Town Council, as part of such report, the amount of precipitation and water usage for such quarterly period, and shall make such recommendations as may be appropriate regarding water restrictions based upon the information presented. The Town Council shall review quarterly precipitation and water usage and such other information as is presented by the Water Department and may take such action as is necessary or appropriate to implement water restrictions or modify water restrictions then in effect at such time.

In addition to the Town's water conservation policy, the staff of Payson's Water Department has proposed new water conservation measures for increasing residential on-site recharge and reuse. The new measures are on-site rainwater harvesting for recharge and reuse of gray water. It is expected that potential implementation of these measure would be helpful in augmenting the Towns' water supplies. In anticipation of employing these two technologies to augment local water supplies, the Town's water department staff is preparing a rainwater harvesting brochure to assist community residents in applying this technology at their residential home sites. By applying rainwater harvesting it is expected that the average (Mogollon) Rim resident can double the amount of rainwater that percolates into the ground on their property.

#### **R. The Tonto Apache Tribe of Payson**

The Tonto Apache Tribe of Payson (Tribe) were recognized in 1972 by the Federal Government and given 85 acres which comprises the current reservation. Tribal leaders reasoned that there were 85 members and each member should have one acre. Tribal population has grown since that time to 110 (January 2002).

The Tribe is, currently (2004), seeking the expansion of their reservation. At present, the Tribe has approximately one half the housing needed for current tribal members because of the Reservation's limited size. Many houses on the Reservation are crowded and contain two families. Some contain three. The Tribal Chairperson estimates a need for 25 additional houses to accommodate the present needs. At the time the 85-acre reservation was created, tribal membership comprised 85 people. Present tribal membership comprises 110 people and there are an additional 20 non-tribal living on the Reservation.

In the Environmental Assessment Proposed Tonto Apache Land Exchange (EA) (29) the following was noted concerning water availability to the Tribe's Reservation: "Surface waters such as springs, seeps, and streams, are limited in the immediate vicinity of Payson. There is no surface water available on the Payson parcel. (Payson parcel is approximately 278 acres located adjacent to the existing Reservation. T.10N., R. 10E., and sections 9 & 10, Tonto National Forest, Payson Ranger District) As a result, water needed for future development of this tract will in all probability be derived from groundwater located underneath the parcel itself or in the immediate vicinity of the parcel. The Payson aquifer is the primary source of water for the entire area. It consists primarily of Payson granite and to a lesser extent the Gibson Creek batholith, gneissic granitoids (granite-like), and basaltic dikes. Water is found throughout the upper 300 to 800 feet of this aquifer, primarily in joints, fractures and faults. Payson estimates that the aquifer underlying the Town can provide 1,826 acre-feet annually on a sustained basis.

Water needed for potential development of the Tonto Apache's Payson parcel would fall into two categories: residential and commercial.

Residential water needs: the amount of additional water needed for residential purposes would not be significant. The Reservation population has increased from 85 to 130 individuals over the past 29 years, or an average growth rate of about one and half people per year. The Tribe currently estimates that 25 additional new houses are needed in order to accommodate the existing population. There are very few lawns at the existing Reservation homes. The Tribe has stated that members might like to have gardens and some ornamental plantings. The Town's daily per capita water use of 95 gallons per capita per day reflects an increase in water usage that the Town attributes to an increase in outdoor watering. The Town uses an average 2.4 capita per service connection (2.4 people per household) which would be consistent with the number of people per household with 25 homes added on the Reservation.

Commercial water needs: of the 278-acre Federal parcel being proposed for exchange to the Tribe, there are approximate 28 acres suitable for commercial development. That acreage includes 19 acres that lie west of Highway 87 and south of the Town of Payson's Event Center and in a narrow (241 feet wide) strip along the south edge of the existing Reservation boundary. There are five acres within the easement for the highway that are not useable. In addition, if the Tribe does acquire the Payson, the opportunity would exist for the Tribe to replace the existing 34 homes on the Reservation by moving or rebuilding them on the acquired Federal parcel. That would make an additional 35 acres



of the existing Reservation, where homes now sit, potentially available for commercial development.

The exact nature of any future commercial development on the Reservation is currently unknown. In order to estimate the potential water demand of any such development, the water use for existing commercial development in the Town of Payson can be utilized.

Payson reports a current average use of 95 gallons of water per person per day from the Town's water system. The Town has a current population of 13,620 people. For usage projections the Town has converted the commercial use into equivalent gallons per capita per day (gpcd) of an additional 1,850 people. Using the Town's formula, the existing commercial water usage in Payson is 175,750 gallons/day. There 447 acres of developed commercial and industrial properties in Payson (number derived from the 1997 Payson Land Use Plan, pages 25 & 27). Using the Payson water usage formula, the average water use per acre of developed commercial lands is 393 gallons/day. The same average number applied to the potential commercial properties on the Reservation, that could be available as a result of a land exchange (63 acres), would be 24,760 gallons/day or 27.7 acre feet per year. For comparison purposes, water use on the Reservation in the year 2000, for both residential and commercial use (casino, store and service station), was 25,113 gallons per day.

In November 1998 (Brad Prudhom, Geologist, personal communication) the Bureau of Reclamation made a preliminary field hydrogeologic investigation to locate well sites for exploratory drilling. The purpose for these exploratory drill holes was to establish if there was a potential to develop an independent groundwater supply for the Tribe if their Tribal lands were expanded. An application to drill these exploratory wells was submitted in February 1999. To date, the application to drill has not been approved. No further action to implement this proposed drilling program is expected at this time.

If new lawns and/or gardens become part of the landscape of new homes to be built on land acquired through a land exchange, water demand could increase by one acre-foot per annum for a total increase of 29 acre-feet per annum.

In order to identify a water supply to meet any commercial development that may occur, the Tonto Apache Tribe's attorney has identified the following potential sources:

- A Tribal well in the Southeast quarter of Section 9 with a historic capacity of 50 gallons per minute.
- A well on property owned by or on behalf of the Tribe located within the Northwest quarter of Section 9 with an undocumented capacity.
- A potential well site located within the Northwest quarter of Section 9 with an unknown capacity.

The Tonto Apache Tribe has also filed claims for various surface water rights and has a contract for 128 acre feet of Central Arizona Project water. Those surface water rights may have value to trade for more available ground water or be developed to bring surface

water into Payson. These prospects are vague at the present and are not considered, for the purpose of this analysis, to have potential in the foreseeable future.”

**S. Private Water Companies and Other Water Service Areas**

About 30 water companies deliver almost 3,500 acre-feet per year to commercial and domestic customers in the study area. Presented below is a partial listing of Gila County water providers that are believed to be located with the Study area (as provided by ADWR 2001). (Note there may be included in this list water companies which lie outside of the study area. Additionally, there may water companies not listed because of the uncertainty as to where their Certificate of Convenience and Necessity service areas are located.)

Table S.1. Gila County Water Providers Located Within the Study Area (circa 2000).

Company Name	Service Connections	Amount of Water Delivered (gallons pumped per year)
Beaver Valley	154	?5,611,700,000?
Bonita Creek Land & Homeowners Association	37	572,468
J.N.J. Enterprises, L.L.C.	249	5,704,350
Kohl’s Ranch Water Company	123	5,338,918
Payson Water Company		
Deer Creek	116	8,094,920
East Verde Estates	139	5,152,860
Flowing Springs	25	1,951,610
Geronimo	68	1,777,400
Gisela	178	1,417,867
Mead’s Ranch	64	873,160
Mesa del Caballo	346	21,323,070
Star Valley	266	21,451,950
Whispering Pines	151	5,655,020
Pine Water Company, Inc.	1,887	43,711,000
E&R Water Company		
United		
Williamson Waterworks		
Strawberry Water Co., Inc.	1,016	50,151,790
Strawberry Water Co.	49	Flat rate unmetered

The Arizona Corporation Commission maintains regulatory authority over private water companies and private sewer companies throughout Arizona.

Several other agencies also have jurisdiction over aspects of running a reliable water system. Two divisions within the Arizona Department of Environmental Quality have regulatory authority. ADEQ's Waste Programs Division deals with solid waste treatment and disposal, and therefore is concerned with sewer systems. ADEQ's Water Quality Division has the responsibility of ensuring the safety of drinking water from public water systems.

County health authorities also oversee public health issues associated with water and sewer systems.

Private water companies and water cooperatives are regulated by the ACC. Raising or restructuring rates requires ACC approval in a rate hearing. Private companies generally are not allowed to raise rates to recover future costs. For example, if ADWR requires conservation programs, the ACC may refuse a rate increase to cover the costs until after the money has been spent and the program proven to be effective. Similarly, a small water company cannot increase rates to build a new well or a treatment system. Instead, it must build the well or the treatment system, then recover the costs. Also ACC does not allow water companies to recover CAP holding costs. These are costs for CAP water rights not presently being used.

As a result, private water companies and water cooperatives may find themselves in a regulatory bind. ACC's goal is to keep rates low to benefit consumers; the ADWR goal is to conserve water within AMAs; and an ADEQ goal is to ensure safe drinking water quality. A private water company confronting these varied regulatory goals may have problems initiating conservation programs. Without the power to borrow money or float bonds, a small water company's very survival may be threatened when major capital improvements are needed.

## **T. Water Rights**

Arizona has separate water rights systems for groundwater and surface water. Groundwater rights are based on the reasonable use doctrine and are not quantified outside AMAs. Within AMAs, grandfathered rights are quantified on the basis of use prior to the designation and establishment of the AMA.

Surface water rights are based on the doctrine of prior appropriation. Predominant in the West, the doctrine protects early appropriators and is summarized by the tenet "first in time, first in right." In other words, the first person to put the water to beneficial use acquires a right superior to later appropriators.

In addition to rights for typical beneficial uses (e.g., irrigation, domestic, stock watering, etc.), surface water rights can be issued for instream-flow. Instream rights maintain a flow at specified levels, times, and reaches along a river for environmental or wildlife benefits. The specifications of the right depend on the needs of the particular use, along with water availability, and other appropriations.

## **U. Privately Owned Wells**

Ground water is the source of almost all water for human uses except recreation in the study area. A recent review of the USGS's National Water Information System (NWIS) (27) ground water data base shows approximately 1,200 wells in the study area. Most of the wells in the study area are in bedrock aquifers.

Most of the 1,200 wells, excluding production wells for the Town of Payson and Private Water Companies are assumed to be considered to be under private ownership and are described as exempt wells under Arizona's water law. (An exempt well, per Arizona Department of Water Resources' definition, is a well that has a maximum pump capacity of 35 gallons per minute (50,400 gpd). Typical exempt well uses include non-irrigation purposes, noncommercial irrigation of less than 2 acres of land and watering stock. Most exempt well are used for residences and are more than adequate for household use.

A coalition of private well owners, Diamond Star Citizen's Action Coalition (Coalition), was formed, 2001, to challenge the efforts of the Town of Payson to develop ground water sites on Forest Service lands in and near both Star Valley and Diamond Point communities (??). The Coalition was formed to focus on the following issue: (1) encourage wise growth within the Study Area guided by staying within the limits of a specified annual water budget; and (2) monitor and comment on any project to promote the exploration and drilling of new wells to develop new ground water supplies in or near Star Valley and Diamond Point Shadows and adjacent areas; and (3) discourage any "encroachment" upon previously developed private groundwater supplies

## **V. Private Surface Water Rights**

In Gookin's Feasibility Study regarding the Central Arizona Project (5), they incorporated a table (Table 10 -- not included in this Report) entitled Surface Water Rights on the East Verde River. Gookin states in the text preceding Table 10 the following: "The Town of Payson has two water sources available to it: surface water and ground water. If the CAP allocation is not taken via an exchange agreement, the Town of Payson probably could not get a new surface water right to the East Verde River. Salt River Project protests all new applications for new water rights in the Salt and Verde water sheds. It is likely that Salt River Project would be successful in preventing a new water right certificate from being issued due to the legal and financial resources of the Project.

Even if Payson did get a surface water right, it would be junior to all other surface water rights along the East Verde River, the shareholders of the Salt River Project, the City of Phoenix and the Salt River Pima Maricopa and Fort McDowell Indian Communities. These senior water right holders would have priority to surface water and the remaining flow would not provide sufficient water for Payson's demands at any time during the year.

The Town of Payson could purchase water rights along the East Verde River as other cities in Arizona have done for surface and ground water supplies, but there are no large volume water rights along the East Verde to purchase. The data in Table 10 shows that

the Doll Baby Ranch has the largest water right claim but that only amounts to 310 acre feet per year. (The surface water rights holders are not listed since it is generally unlikely that Payson will pursue the small amounts of surface water rights that may be available for Payson's acquisition.)

The total surface water rights on file at the Arizona Department of Water Resources for the East Verde River are 580.1 acre feet per year, per Gookin Study 1984. The water rights associated with the Doll Baby Ranch represent nearly 54 % of the water rights existing in the Payson area.

#### **W. Surface Water**

Surface water sources in or near the Study Area include East Clear Creek, in the Little Colorado River watershed; East Verde River and Fossil Creek, Gila River watershed; and Tonto Creek, Salt River watershed. Each of these surface water sources will be briefly described below.

#### **X. East Clear Creek -- Blue Ridge Dam and Reservoir**

In 1963 (1), the Phelps-Dodge Mining Company completed the construction of the Blue Ridge Reservoir dam, on East Clear Creek, along the Mogollon Rim approximately 50 miles southeast of Flagstaff (Arizona) and 90 miles northeast of Phoenix. The dam site and reservoir are located within the Coconino National Forest, Arizona. The dam, a concrete monolith, stands 160 feet high and 14 feet thick at its base. East Clear Creek is an intermittent stream that drains northeastward into the Little Colorado River.

Blue Ridge Reservoir has a storage capacity of about 15,000 acre-feet and receives seasonal and other runoff from 71 square miles of contributing watershed. The Blue Ridge system consists of a dam to store water on East Clear Creek, a pumping station, a two-million gallon priming reservoir, a 10-mile steel-reinforced concrete cylinder pipeline, an 11-mile electrical transmission line within the pipeline right-of-way, and a 3mW hydropower generator which is used only to provide electricity for the pumping station. The water from the Reservoir is pumped from the Reservoir through the pipeline across the Mogollon Rim to the East Verde River, which is a tributary to the Verde River. First exports were made in October 1965.

The purpose of the Reservoir and associated facilities has been to deliver water to SRP in exchange for diversions of water from Black River on the Salt River Watershed by Phelps Dodge for use for mining purposes at its Morenci, Arizona copper mine.

In 1962, Phelps Dodge and the SRP entered into an Exchange Agreement which provided that Phelps Dodge must provide SRP with water from Blue Ridge equivalent in quantity and quality to the water diverted from the Black River by Phelps Dodge for use in Morenci. Historical deliveries of Blue Ridge water to the East Verde from 1996 through 1990 were about 9,630 A.F. and average annual credits to Phelps Dodge were approximately 5,775 .A.F. net of evaporation and other losses.

In 1997, a settlement agreement between Phelps Dodge and the San Carlos Apache Tribe, which was ratified by Congress, required Phelps Dodge to discontinue the use of Blue Ridge water for the Black River Exchange. Instead, Phelps Dodge is now leasing CAP water from the Tribe for delivery to SRP in the exchange.

Historical withdrawals from the Reservoir have been approximately 9,300 acre-feet annually to balance withdrawals on the Black River (on the Salt River watershed) by Phelps Dodge for mining operations at their Morenci Copper Mine. Since the implementation of the Black River/CAP Exchange Agreement in early 2002, the pumping and power generation components of Blue Ridge reservoir have not been operated.

The water rights for Blue Ridge reservoir are currently unadjudicated and are the subject of the Little Colorado River Basin Water Rights Adjudication and Negotiations. Blue Ridge water has also been identified as a water supply source in the Arizona Water Rights Settlement legislation (which includes the Gila River Indian Community Settlement), and have been considered in the Payson Area Water Supply Study.

#### **Y. East Verde River**

The East Verde River flows in a generally westerly direction from the Mogollon Rim in central Arizona. The East Verde River is located in both Gila and Yavapai Counties, Arizona. The East Verde River is tributary to the Verde River which is tributary to the Salt River and is part of the Colorado River System.

The headwaters of the East Verde are of high gradient and flow through steep rocky canyons with some small broad valleys. Moving downstream, the river alternately flows in narrow boulder-filled channels with steep gradient, and lower gradient areas with sand and gravel substrate.

Groundwater discharge maintains perennial flow in the East Verde River. The East Verde River enters the main stem Verde River from the east, about 25 miles upstream from Horseshoe Reservoir, and has a perennial length of about 40 miles.

Flows within the East Verde River may be affected if groundwater pumping increases substantially in the vicinity of the river. Since 1966, water has been added to the East Verde River about 50 percent of the year at the rate of approximately 30 cfs. This water is imported by pipeline from East Clear Creek in the Little Colorado River basin a result of a water exchange agreement between the Phelps-Dodge Corporation (Phelps-Dodge) and the Salt River Project. Phelps-Dodge pumps water from the Black River (in the Gila River drainage) in eastern Arizona on a when-needed basis for use in its Morenci operations. They then transfer a similar amount of water from East Clear Creek (Little Colorado River drainage) to the East Verde River (Gila River drainage) to replace the Black River water. As a result of the river diversions being placed on a when-needed basis, flows in the East Verde River fluctuate widely and occasionally little or no flow is recorded. This was the type of exchange and diversion operation that existed between the years of 1966 and 1999.

In 1999, Phelps-Dodge ceased to divert waters from the Blue Ridge reservoir to meet its exchange agreement regarding diversions from the Black River. Instead Phelps-Dodge began using Central Arizona Project waters to meet its exchange conditions with Salt River Project.

The East Verde River, in the past, has received intermittent trans-basin diversions of water from the Blue Ridge Reservoir, located on East Clear Creek, in the Little Colorado River basin, as part of a water exchange agreement between Phelps Dodge Corporation and the Salt River Project. The average annual flow diverted by Phelps Dodge Corporation, 1965 – 1990, was 9,990 acre-feet. The recorded annual low flow for this same period was 3,110 acre-feet. Again, since 1999, diversion flows from Blue Ridge reservoir have gone to zero. This major reduction in diversion flows has created a significant reduction in the in stream flow volumes of the East Verde River.

Currently, the water stored in Blue Ridge Reservoir is being considered as part of the Navajo Nations' and the Gila River Indian Community's water settlements. There is also some consideration being given by the U.S. Congress to sit aside a portion of the average annual water supply to communities of northwest Gila County.

## **Z. Tonto Creek**

Tonto Creek originates in the Mogollon Rim country northeast of Payson, Arizona, and flows southward into Roosevelt. The 955 square-mile Tonto Creek basin is in the Central highlands water province of central Arizona and is entirely in Gila County. The Tonto Creek basin can be separated into two parts, the upper and lower basin. The upper basin is within the Study Area. The watershed area of the upper portion of the Tonto Creek basin is 675 square miles. The average annual flow from the upper basin is 80,000 acre-feet. (2)

The basin is drained by Tonto Creek, which flows southward and discharges into Roosevelt Lake. The mountains that border the basin are composed chiefly of igneous and metamorphic rocks, and the basin is underlain by more than 2,000 feet of unconsolidated to semiconsolidated sedimentary deposits.

The tributaries to Tonto Creek flow only for short periods mainly in response to runoff from precipitation.

## **AA. Fossil Springs/Creek**

Fossil Springs/Creek (Creek) is located just below the edge of the Mogollon Rim, in the Mazatal Mountains of central Arizona, at the southern margin of the Colorado Plateau, in Fossil Creek Canyon. Fossil Creek forms the boundary between Yavapai and Gila counties, as well as Tonto and Coconino National Forests over most its course. The headwaters of the Creek and its extension to just south of Irving consist entirely of National Forest System lands, and include the northern portion of the Mazatal Wilderness. No State, tribal, or other lands are included in this segment of the Creek.

Fossil Creek is one of Arizona's rare warm water perennial streams, flowing from a complex of springs, known as Fossil Springs, 14.3 miles through rugged and isolated terrain before entering the Verde River. Fossil Springs produces a constant water temperature of approximately 70 degrees Fahrenheit and a flow of 43 cfs (slightly more than 320 gallons per second), most of which is captured by Arizona Public Service (APS) at the 25-foot high Fossil Springs diversion dam located 0.3 mile downstream of the springs. Base flow below the diversion dam varies between 2 and 5 cfs, although episodic flows of much higher magnitude are possible from rainfall and snowmelt. At this flow rate, Fossil Springs produces approximately 31,000 acre-feet of water each year and represents a significant component of the base flow of the lower Verde River, particularly during the low flow season.

Fossil Creek is a major perennial tributary to the Verde River, draining southwest off the Mogollon Rim between the major sub-basins of East Verde River to the south and West Clear Creek to the north. Elevations in the watershed range from 7,260 feet along the Rim to 2,550 feet at the Verde River confluence. Rainfall and snowmelt contribute to intermittent stream flow between the upper basin and Fossil Springs. Perennial flow arises from Fossil Springs at an elevation of 4,280 feet, approximately 14.3 miles upstream from the Verde River. Virtually the entire Fossil Creek drainage area is on land administered by the U.S. Forest Service.

The water quality of Fossil Springs has a high calcium carbonate concentration. It has been estimated that approximately 12 metric tons per day of calcium carbonate is precipitated from full base flows in the 6.7 km stretch below Fossil Springs.

APS owns and operates the Childs and Irving hydroelectric facilities on Fossil Creek. Built in the early 1900s, these facilities utilize stream flow diverted from Fossil Creek to generate hydroelectric power.

In December 1992, APS filed an application with the Federal Energy Regulatory Commission (FERC) to relicense the Childs-Irving Hydroelectric Project for 30 years. On August 14, 1997, FERC issued a draft Environmental Assessment (EA) on the relicensing proposal and invited public comment. After a period of negotiation with a coalition of groups including American Rivers, The Nature Conservancy, the Yavapai-Apache Tribe, the Northern Arizona Audubon Society, the Sierra Club, and the Center for Biological Diversity, APS signed an Agreement in Principle in 1999 to decommission the facilities and return full flows to Fossil Creek. FERC is currently analyzing the effects related to decommissioning and facility removal in the stream corridor and watershed. If decommissioning occurs according to the terms of the Agreement in Principle, APS will return base flows of approximately 43 cfs to Fossil Creek no later than December 31, 2004.

When the FERC decision is issued, APS has until 2009 to dismantle and remove most of their facilities and restore the sites. Some of the facilities will be retained for interpretive purposes, but all facilities at Irving (hydropower plant), Stehr Lake and the flumes, siphons and penstocks will be removed.



## **BB. Wilderness and Scenic Rivers—Fossil Creek**

In 1993, the Forest Service conducted a preliminary analysis of Fossil Creek (Grant Loomis, Hydrologist, Tonto National Forest, personal communication). The study was for the purpose of determining if Fossil Creek could be considered for eligibility of its inclusion in the nation's Wild and Scenic Rivers system. The study was performed at the request of the state's congressional delegation. The study concluded that Fossil Creek was potentially eligible for inclusion because it was considered to be free flowing and possessed one or more "outstandingly remarkable" values (ORV). The segment of Fossil Creek between the Fossil Springs diversion dam and the Mazatzal Wilderness Boundary received a preliminary classification of "recreational," and the segment from the Mazatzal Wilderness boundary to the Verde Wild and Scenic River boundary was classified as "wild". Outstandingly remarkable values were listed as: Geologic, Fish, wildlife, Historic, and Riparian/Ecological. Free-flowing is defined in the Wild and Scenic Rivers Act , in part, as "...existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway."

In an associated study by the Forest Service, their policy requires that the Forest Service manage eligible river segments in a manner that does not impair their eligibility. The Forest Service has determined that a diversion from Fossil Creek is the type of activity that could impair eligibility for further consideration of Fossil Creek being established as a wild and scenic river.

## CC. U.S. Fish and Wildlife Service/Arizona Game and Fish

Threatened and Endanger Species in Gila County.

### County Species Lists – Gila County: Threatened and Endanger Species—2004 (26)

Common Name	Scientific Name	Status
Apache (Arizona) trout	<i>Oncorhynchus apache</i>	Threatened
Arizona agave	<i>Agave arizonica</i>	Endangered
Arizona hedgehog	<i>Echinocereus triglochidiatus var. arizonicus</i>	Endangered
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Cactus ferruginous pygmy-owl	<i>Glaucidium brasilianum cactorum</i>	Endangered
California Brown pelican	<i>Plecanus occidentalis californicus</i>	Endangered
Chiricahua leopard frog	<i>Rana chiricahuensis</i>	Threatened
Colorado white salmon (pikeminnow)	<i>Ptychocheilus lucius</i>	Endangered
Gila topminnow	<i>Poeciliopsis occidentalis</i>	Endangered
Gila trout	<i>Oncorhynchus gilae</i>	Endangered
Lesser long-nosed bat	<i>Leptonycteris curasoae yerbabuenae</i>	Endangered
Loach minnow	<i>Tiaroga cobitis</i>	Threatened
Mexican spotted owl	<i>Stix occidentalis lucida</i>	Threatened
Razorback sucker	<i>Xyrauchen texanus</i>	Endangered
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered
Spikedace	<i>Meda fulgida</i>	Threatened
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	Endangered
<b>Proposed</b>		
Gila chub	<i>Gil intermedia</i>	Proposed Endangered
<b>Candidate</b>		
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Candidate
<b>Conservation Agreement</b>		
Arizona bugbane	<i>Cimicifuga arizonica</i>	Conservation Agreement

## DD. Effluent

One of the potential sources for additional water supply in the study area is effluent. At the time of the preparation of this Report (2004) most if not all of the wastewater generated by the Town of Payson was being treated into an effluent. All of that water was under contract for either irrigation purposes or aquifer recharge. It is expected that over the years of projected water demand, up to 2040, that there will be an increase in the available effluent available for supporting specific areas of reuse, e.g. public irrigation and recharge projects.

**EE. North Gila County Sanitation District**

The Northern Gila County Sanitary District (District) is the agency responsible for providing wastewater treatment for the Town of Payson service area. Wastewater collected within the District’s boundaries is transported to the American Gulch Water Reclamation Facility (WRF). The reclamation facility is a biological nutrient removal process, which utilizes the following components: Primary Treatment, Bardenpho Process, Clarification, Tertiary Treatment, Disinfection, and Final Effluent Distribution and Disposal.

Reclaimed water is distributed to six customers (2003) for irrigation, dust control, construction activities and reused at the WRF. In addition to effluent distributed for reuse purposes, it is assumed that approximately 250,000 gallons per day (gpd) infiltrates through the bottoms of the lakes. Based on limited historical data, Table EE.1 American Gulch Water Reclamation Facility Effluent Water balance, presents a current water balance for reclaimed water produced at the WRF.

Table EE.1 American Gulch Water Reclamation Facility Water Balance

Month	Total Amount of Effluent Available (mgpm) <sup>1</sup>	Total Amount of Effluent Distributed to Reuse Customers (mgpm)	Assume Lake Infiltration (gpd) <sup>2</sup>	Excess Effluent Available for Recharge
Jul – 01	36.62	23.25	250,000	181,000
Aug – 01	39.56	31.78	250,000	1,000
Sept – 01	34.39	21.79	250,000	470,000
Oct – 01	33.55	25.93	250,000	0
Nov – 01	39.26	31.78	250,000	85,000
Dec – 01	37.00	14.29	250,000	483,000
Jan – 02	35.51	3.38	250,000	786,000
Feb – 02	32.14	16.10	250,000	323,000
Mar – 02	35.08	18.69	250,000	279,000
Apr – 02	34.23	24.38	250,000	78,000
May – 02	35.03	21.35	250,000	191,000
Jun—02	33.52	21.99	250,000	134,000

Notes:

- (1) Million gallons per month
- (2) Gallons per day

The excess effluent available for aquifer recharge varies from zero to over 700,000 gpd. The average annual volume of effluent available for recharge is 251,000 gpd, or nearly 280 acre-feet per year. The effluent from the WRF currently (2003) meets Class A+ reclaimed water standards.

## FF. Non-Municipal Water Providers

Listed in Table FF.1 are the non-municipal water service providers for the study area. The water providers may be segregated into the groupings: Domestic Water Improvement Districts that have been established by Gila County, Private Water Companies who are licensed by the Arizona Corporation Commission, those water suppliers who do not qualify as a public water system but who have recognized as a water supplier to a limited service area (see definitions for “community”; “non-transient, non-community”; and “transient, non-community” water systems); and unregulated private wells. More details are given in the text presented below.

Table FF.1. Water Service Providers – Mogollon Rim Water Supply Study

Water Service Provider	Name	Public Water System Type
Public – Domestic Water Improvement Districts	Pine: Solitude Trails	Community
“	Pine: Strawberry Hollow	Transient/Non-Community
“	Pine: Pine Water Association	Community
“	Pine: Pine Creek Canyon/Portals IV	Community
“	Rim Trail (Washington Park/Shadow Rim)	Community
Private – Unregulated (Cooperatives/Homeowner Associations, and Others)	Bear Flat	
“	Beaver Valley	Community
“	Bonita Creek	Transient/Non-Community
“	Christopher Creek/Hunter Creek/Zane Grey/Brooks	Community
“	Collins Ranch	Non-Transient/Non-Community
“	Diamond Point Recreation	Semipublic (non-regulated)
“	Diamond Point Shadows	Community
“	Ellison Creek Estates	Semipublic (non-regulated)
“	Ellison Creek Recreation	Semipublic (non-regulated)
“	Kohl’s Ranch	Non-Transient/Non-Community
“	Oxbow Estates	Semipublic (non-regulated)
“	Pine Meadows	Semipublic (non-regulated)
“	Round Valley	Semipublic (non-regulated)
“	Summit Springs	Semipublic (non-regulated)
“	Thompson I & II	Semipublic (non-regulated)
“	Tonto Creek Estates	Community
“	Tonto Village	Community
“	Verde Glen/Cowan Ranch	Non-Transient/Non-Community
“	Wonder Valley/Freedom Acres	Transient/Non-Community

Private – Regulated Utility Firms	<b>Brooke Utilities</b>	
“	East Verde Park	Community
“	Flowing Springs	Community
“	Geronimo Estates	Community
“	Mead Ranch	Community
“	Mesa Del Caballo	Community
“	Pine	Community
“	Star Valley A & B	Community
“	Strawberry	Community
“	Whispering Pines	Community
“	Strawberry – Lufkin Hunt	Community

The following definitions are those of the Arizona Department Environmental Quality regarding safe drinking water system.

A “community water system” is one that serves 15 or more service connections used by year-round residents or that serves 25 or more year-round residents who use water for drinking, cooking, bathing, and cleaning. Community water systems may also serve all the businesses and other water users within their boundaries.

A “non-transient, non-community water system” is one that serves 15 or more service connections that are used by the same persons for at least six months per year, or serves the same 25 or more persons for at least six months per year. These water systems supply businesses where people may spend a large percentage of time, but these typically aren’t a consumer’s primary water source.

A “transient, non-community water system” is one that serves 15 or more service connections, but does not serve 15 or more service connections that are used that are used by the same persons for more than six months per year; or one that serves an average of at least 25 persons per day for at least 60 days per year, but does not serve the same 25 persons for more than six months per year.

The following Arizona Department of Water Resources definition for an exempt well is as follows: A well with a maximum pumping capacity of not more than 35 gallons per minute, which is used to withdraw groundwater for non-irrigation purposes.

**GG. Domestic Water Improvement Districts -- Gila County**

There are five public domestic water improvement districts (DWID) located within the study area boundaries: Solitude Trails, Strawberry Hollow, Pine Water Association, Pine Creek Canyon Portals IV and Rim Trail. All of the established DWIDs are located within the Pine community. In Arizona, a domestic water improvement district is a county improvement district which is either formed for the purpose of constructing or improving a domestic water delivery system or purchasing an existing domestic water delivery system and, if necessary, improvements to the system or a district that is converted from a county improvement district to a domestic water improvement district.

## **HH. Gila County Unregulated Cooperatives and Homeowners Associations**

There are 18 unregulated cooperatives and homeowner associations providing water service within the study area.

## **II. Multijurisdictional Water Facilities Districts**

During the late 1990s, Arizona Revised Statutes: Title 48, Chapter 34 was passed into law, Multijurisdictional Water Facilities Districts. The purpose of the law was to allow two or more municipal water systems to consider the formation of a multijurisdictional water facilities district for the purpose of mutual benefit in the construction, operation and maintenance of water related facilities. A Municipal water provider is defined as a city, town, domestic water improvement district, private water company or irrigation districts that supplies water for nonirrigation use. If there were a desire for some or all study parties to enter into a multijurisdictional water facilities district, State law would allow for the establishment of such an institutional arrangement.

## **JJ. Indian Water Rights/Settlements**

Currently (2004) there are several Indian water settlements, associated with Tribe in Arizona, that are in some state of the settlement process. The Arizona Water Rights Settlement--Gila River Indian Community is awaiting Congressional approval of its settlement agreement. Water Settlement negotiations are still underway for the Indian communities of the Little Colorado River Basin. The tribes and nation that are included in the Little Colorado River Basin Water Settlement include the Navajo Nation, Hopi Tribe, Zuni Pueblo, and the San Juan Piate Tribe.

The waters collected and stored in Blue Ridge Reservoir have been part of the water budget discussions for water settlements associated with the Navajo Nation, Hopi Tribe, and the Gila River Indian Community. December 10, 2004, President Bush signed the Arizona Water Settlement Act thus enacting an Indian community water settlement that had been decades in negotiations. This settlement act resolves long-held issues held by the federal government, the states of Arizona and New Mexico, local governments, the Gila River Indian Community, the Tohono O'odham Nation and other Native American communities in the region. The Navajo Nation and the Hopi Tribe's water settlement issues were not resolved by the Arizona Settlement Act.

The Settlement Agreement is entered into among: the United States of America; the Gila River Indian Community; the State of Arizona; the Salt River Project Agricultural Improvement and Power District; the Salt River Valley Water Users' Association; Phelps Dodge Corporation and several other settling parties.

Offered immediately below are pertinent sections of the Arizona Settle Act (P.L. 108-451) that are expected to impact the water supplies being consider in the Mogollon Rim Water Supply Study:

Sec. 213 – Miscellaneous Provisions -- Arizona Water Settlement Act ratifies the agreement between the United States and the Salt River Valley Water Users' Association

dated September 6, 1917, and the rights of the Salt River Project to store water from the Salt River and Verde River at specified locations and to deliver the stored water to shareholders of the Project and others for recognized purposes, subject to specified requirements. Directs the United States, acting through the Secretary, to accept from the Salt River Project Agricultural Improvement and Power District the transfer of title to the Blue Ridge Project in Arizona.

#### BLUE RIDGE PROJECT TRANSFER AUTHORIZATION-

##### (1) DEFINITIONS- In this subsection:

(A) BLUE RIDGE PROJECT- The term `Blue Ridge Project' means the water storage reservoir known as `Blue Ridge Reservoir' situated in Coconino and Gila Counties, Arizona, consisting generally of--

(i) Blue Ridge Dam and all pipelines, tunnels, buildings, hydroelectric generating facilities, and other structures of every kind, transmission, telephone and fiber optic lines, pumps, machinery, tools, and appliances; and

(ii) all real or personal property, appurtenant to or used, or constructed or otherwise acquired to be used, in connection with Blue Ridge Reservoir.

(B) SALT RIVER PROJECT AGRICULTURAL IMPROVEMENT AND POWER DISTRICT- The term `Salt River Project Agricultural Improvement and Power District' means the Salt River Project Agricultural Improvement and Power District, a political subdivision of the State of Arizona.

(2) TRANSFER OF TITLE- The United States, acting through the Secretary of the Interior, shall accept from the Salt River Project Agricultural Improvement and Power District the transfer of title to the Blue Ridge Project. The transfer of title to the Blue Ridge Project from the Salt River Project Agricultural Improvement and Power District to the United States shall be without cost to the United States. The transfer, change of use or change of place of use of any water rights associated with the Blue Ridge Project shall be made in accordance with Arizona law.

##### (3) USE AND BENEFIT OF SALT RIVER FEDERAL RECLAMATION PROJECT-

(A) IN GENERAL- Subject to subparagraph (B), the United States shall hold title to the Blue Ridge Project for the exclusive use and benefit of the Salt River Federal Reclamation Project.

(B) AVAILABILITY OF WATER- Up to 3,500 acre-feet of water per year may be made available from Blue Ridge Reservoir for municipal and domestic uses in Northern Gila County, Arizona, without cost to the Salt River Federal Reclamation Project.

(4) CARE, OPERATION, AND MAINTENANCE- Upon the transfer of title of the Blue Ridge Project to the United States under paragraph (2), the Salt River Valley Water Users' Association and the Salt River Project Agricultural Improvement and Power District shall be responsible for the care, operation, and maintenance of the project pursuant to the contract between the United States and the Salt River Valley Water Users' Association, dated September 6, 1917, as amended.

(5) C.C. CRAGIN DAM & RESERVOIR- Upon the transfer of title of the Blue Ridge Project to the United States under paragraph (2), Blue Ridge Dam and Reservoir shall thereafter be known as the 'C.C. Cragin Dam and Reservoir'.



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