

PCWA Urban Water Management Plan, December 2000

The following notes and observations are derived from the Placer County Water Agency's 2000 Urban Water Management Plan (UWMP). It provides an overview of the Agency's water supply and hydroelectric system, current water use demands, projected water demands, and an ambitious set of water conservation best management practices. (Projected demands have been revised upward as of July 22, 2003; see workshop notes at bottom below, and see [regional water agencies](#) worksheet for additional summary data.) The Plan is meant to comply with the requirements of the CA Urban Water Management Planning Act, and to serve as a long-term water supply plan for PCWA.

PCWA was established in 1957 and serves about 150,000 people in Placer County through 35,000 agricultural, municipal and industrial connections in unincorporated areas and in the cities of Auburn, Colfax, Loomis, Newcastle, Rocklin and many other small communities. The San Juan Water District, the City of Roseville, and the City of Lincoln receive wholesale deliveries of water and are required to prepare their own UWMPs. The 1997 UWMP projected that in 2015 untreated water demand would be 126,706 AF/year and that treated water demand would be 34,179 AF/year with sufficient water supplies in average precipitation years. The Plan predicted that water shortages could occur during single or multiple dry years. (Chapter 1)

The PCWA Power System was established in 1963 with the construction of the Middle Fork American River Project. The Project consists of five hydroelectric power plants, two large reservoirs (French Meadows and Hell Hole) and twenty-one miles of tunnels. Approximately 200 MW of hydropower output is wholesaled to PG&E each year. (2.3)

The Water System was created in 1968 and provides water through various contracts and five Water Service Zones.

Zone 1, the largest, extends from Auburn south to the northern boundary of Roseville. The sources of water for Zone 1 are PG&E's Wise/South Canal, PCWA's Boardman Canal, and the American River. American River water is pumped to the Auburn Tunnel, a three mile long tunnel which connects the American River Canyon with Auburn Ravine near Ophir. Water is also supplied to PG&E's South Canal by pumps that intercept the Auburn Tunnel and pump water to the surface and into the South Canal. (2.4.1)

Zone 2 is south of Roseville and provides water to 47 residences on two-acre lots. The water supply comes from two wells that pump from the North American River sub-basin. (2.4.2)

Zone 3, the second largest, serves Applegate, Weimar, Meadow Vista, Colfax, Gold Run, Dutch Flat and Alta. The water supply comes from PG&E and is delivered via the Boardman Canal. The Canal, which begins near Alta and follows I-80 to Zone 1 near Lake Theodore, provides water to the four treatment plants in Zone 3, other community water districts and raw water customers. (2.4.3)

Zone 4 was established in 1998 and serves 479 residential customers in the Lahontan Subdivision of Martis Valley. The Zone has two wells and a 500,000 gallon storage tank. (2.4.4)

Zone 5 was established in 2000 to provide water to commercial agriculture in west Placer County. In 2000, raw water totaling 17,000 AF was delivered to commercial agricultural customers near the Auburn Ravine. (2.4.5)

The Historical Number of Connections (Table 3-1) shows 2,401 raw water customers and 11,285 treated water customers for a total of 13,686 in 1985. The numbers for 1999 are: 5,681 raw water customers and 28,920 treated water customers for a total of 34,601, a growth rate of 4.0 per cent per year. By far, most of the connections, 32,105 in 1999, are in Zone 1. (Table 3-2)

Unaccounted-for water is “unmetered water use such as for fire protection and training, system and street flushing, sewer cleaning, construction, system leaks, water use at the treatment plants, and unauthorized connections.” (3.3). Zone 1 had unaccounted losses of 4,630AF in 1999, representing 18.1% of annual water production (Table 3-4). Zone 3 had unaccounted losses of 232 AF or 32.1% of production in 1999. In 1991, Zone 3 had losses equal to 49.3% of water production (Table 3-6).

Water use per year by the average customer dropped from 1.13 AF/yr/connection in 1985 to 0.91AF/yr/connection in 1999 (Table 3-7).

Projected Water Demands are based on mid-range estimates of probable growth rates as compiled from the Placer County General Plan, Sacramento Area Council of Governments population projections for Placer County and General Plans from communities throughout the County. “The Agency anticipates that build-out of its service areas will occur in approximately 2035. By 2020, water demands are expected to increase by 50 percent, from 114,047 AF in 1999 to 171,572 AF in 2020. The projected annual water demand increase between 1999 and 2020 is 2.0 percent per year....These water demand projections include the water savings due to conservation measures currently being implemented. Impacts to water demands resulting from additional conservation measures that are currently not in use are not reflected in the projected water demands. Future conservation planning by the Agency will quantify the expected water savings from the additional conservation measures planned to be implemented.” (3.5) Of the projected use for 2020, treated water will comprise 72,622AF and raw water use will be 98,400AF (Table 3-8).

Water Supply Quantity identifies four sources of water supply. Presently, the main source of water is from the Yuba and Bear Rivers via the Bear River Canal and is purchased from PG&E. The other sources are the American River, the CVP and ground water.

- **PG&E (Yuba/Bear River System).** “The Agency has two water supply contracts with Pacific Gas and Electric Company (PG&E) providing options to purchase up to

125,400 acre-feet annually from PG&E's rights to water for consumptive purposes from the Yuba and Bear River systems. This water source is used to supply Zones 1 and 3. Zone 1 is supplied up to 100,400 ac-ft/yr and Zone 3 is supplied up to 25,000 ac-ft/yr. The rights to this water were developed by PG&E and its predecessors by appropriation prior to 1914....One of these contracts has no term limit and the other, for 100,400 acre-feet annually, terminates in 2013, at which time it will come up for renewal for an adjustment in the price to be paid for the water." (4.1.1)

- **Middle Fork American River System.** "The Agency has permits obtained from the California State Water Resources Control Board allowing it to divert from the American River between [the City of] Auburn and Folsom Reservoir up to 120,000 acre-feet annually for consumptive use. This water is available from releases from the Agency's Middle Fork American River Project, which was completed in 1967, and from direct diversions from the American River system. The place of use under those permits is western Placer County and a portion of northeastern Sacramento County. The Agency has entered into wholesale contracts to provide portions of the Middle Fork water to the San Juan Water District, the City of Roseville, and the Northridge Water District. These contracts give the Agency the right to reduce supply in the event of water shortages." (4.1.2) The San Juan contract is for 25,000 AF annually and the water is diverted at Folsom. The Roseville contract is for a maximum of 30,000 AF annually and is also diverted at Folsom. The Northridge contract provides annual increases to a maximum of 29,000 AF/year in 2013. The water is diverted at Folsom and wheeled through San Juan's facilities. (4.1.2)
- **Central Valley Project.** PCWA has a contract with the Bureau of Reclamation for a maximum of 117,000 AF annually by the year 2007. However, absent Auburn Dam, it is doubtful that the Bureau is obligated to deliver more than 35,000 AF annually. The American River Water Forum Agreement addresses this issue in the following water supply provisions: 1) Water that the Agency sells to Roseville, San Juan Water District, and Northridge Water District are not addressed in the Agency's specific agreement. 2) In most years, when the projected March through November unimpaired inflow to Folsom Reservoir is greater than 950,000 AF, the Agency will divert and use 35,500 ac-ft from the American River and 35,000 AF from the Sacramento and/or Feather Rivers with certain conditions. The 35,000 AF limitation applies to the Agency's Middle Fork water supply. 3) In the drier years and driest years, when the Folsom Reservoir inflow is less than 950,000 AF, the Agency will divert 35,500 AF plus replace up to 27,000 AF of water in the American River from re-operation of the Middle Fork Project reservoirs. (4.1.3)
- **Ground Water.** PCWA pumps 64 AF/year of water from two wells in Zone 2 and 927 AF/year of water from two wells in Zone 4. "...Placer County has established a policy that all urban and suburban development should rely on public water systems using a surface water supply." (4.3)

Current and Projected Water Supplies show a surplus of 65,100 ac-ft in 2000 and a surplus of 18,900 ac-ft in 2020 for Zones 1 and 5 given a normal climate year. An assumption of 10,000 ac-ft from recycled water is made for 2020 – none for 2000 through 2010 – but has yet to be evaluated (Table 4-2). Zone 2 (ground water) shows a surplus of 1,266 ac-ft for both 2000 and 2020 (Table 4-3). In Zone 3 (PG&E supply), there is a

surplus of 17,660 ac-ft for 2000 and one of 17,100 for 2020 (Table 4-4). Zone 4 (ground water) shows a surplus of 495 ac-ft in 2000 and one of 707 ac-ft in 2020 (Table 4-5). The Tables show a surplus of surface water totaling 82,760 ac-ft in 2000 and 36,000 ac-ft in 2020.

Drought Conditions: “The PG&E supply is subject to shortages due to drought as well as infrastructure problems. PG&E estimates that it can make full deliveries of the 100,400 ac-ft to Zone 1 and 25,000 ac-ft to Zone 3 that it has under contract to the Agency with only 60% of average precipitation. The worst case drought assumption for planning purposes for the PG&E supply would be a repeat of the 1977 event, with a 50% reduction in supply. It is assumed that CVP supplies would be similarly reduced.” (4.5.2) The Middle Fork Project could, based on a recent computer modeling of the 70 years of available hydrological record, have supplied the full 120,000 ac-ft of consumptive water rights in all the years of record, even the worst case three year drought. “No water supply deficit is projected to occur in any zone except in Zones 1 and 5. Within Zones 1 and 5, a deficit is projected at 2020 under year two and three of a multiple dry water year event, which would require supply cutbacks and corresponding demand reductions.” (4.6)

Water Conservation Best Management Practices: PCWA has adopted a general policy of practicing conservation/efficiency with the on-going adoption of additional conservation measures; however, there is no study of the water savings generated by existing conservation measures. Efforts are underway, through a study financed by the Bureau of Reclamation, to define a list of standard agricultural water use efficiency measures.

Agricultural efficiency measures are not addressed in the UWMP. PCWA is not a signatory of the California Department of Water Resources’ Memorandum of Understanding Regarding Urban Water Conservation in California. The Agency is, however, a signatory to the American River Water Forum Agreement. The MOU’s BMPs are similar to those in the Water Forum Agreement. The Water Forum BMP lists sixteen measures that cover the generally recognized standard definitions of water conservation measures (Table 5-1). Additionally, in 1999, PCWA asked DWR to assess water efficiency opportunities in Zone 1. The study (February 2000) made a number of recommendations including addressing the unaccounted-for water of 16% and providing a real time canal flow monitoring system and developing programs to address irrigation water use. “For the years 1994-1998, the April through September irrigation season average canal flows (Zone 1 raw water in – Zone 1 treated water), were approximately 34,500 ac-ft/yr. If the metering and telemetry system could save just 2% of that water, it would be worth \$34,500/yr in avoided American River pumping costs. For three stations on each of four canals at \$10,000 per station, the \$120,000 initial cost would be recovered in four years. Approximately 33,000 ac-ft/yr of PCWA’s Zone 1 water is used for irrigation. Programs should be developed to address this largest use of water in the district.” (DWR Conservation Study, 2000, pp18 & 19.) 660 ac-ft of water per year would be saved as well.

Recycled Water. The UWMP assumes that generated wastewater is equivalent to approximately 40% of treated water use (11,000ac-ft in 2000 and 29,000ac-ft in 2020).

A proposed regional wastewater treatment plant would replace various small county and Auburn facilities and would discharge into Auburn Ravine. It would generate, with Roseville, approximately 10,000 AF/year, probably for use in rice fields in Placer and Sutter counties. Rice requires 4 to 5 ac-ft of water per acre of production. "The Agency is planning to be the coordinator and wholesaler of recycled water within its service area. The Agency will provide coordination between the WWTP owners and the customers of recycled water." (6.5)

Chapter 7, Conclusions and Recommendations, fails to include the adoption of DWR's Conservation Study for Zone 1 as one of its recommendations.

Appendix C discusses water shortage stages and triggering mechanisms. PCWA has established a five stage rationing plan with stages iii-v (equal to a 25%, 35% and 50% shortage) requiring mandatory reductions in use. "During 1995, 74% of all water usage within the Agency's Service Area was untreated water. The majority of untreated water is sold in miner's inches as a continuous flow of water through an orifice. Untreated water usage can be reduced by installing a smaller sized orifice and encouraging customer (sic) to use water over longer periods of time." (Appendix C p 3)

Appendix D lists, by date, established PCWA conservation/efficiency practices. PCWA's established practices, combined with the Water Forum BMPs and DWR's recommendations for Zone 1, should provide significant savings in treated water. Agricultural practices present, by far, the greatest opportunities for increased conservation. PCWA has removed declining tiers of raw water seasonal irrigation, begun a data base of agriculture users and installed raw water meters on the 11 largest agriculture users in Zone 5 (Appendix D pp3 & 4).

Appendix E is a copy of the Water Forum Conservation Agreement.

Appendix F is the Department of Water Resources 2000 Study of Potential Water Efficiency Programs for PCWA (Zone1). The Study looks at current PCWA practices and suggests additional BMPs. An area of concern was the large unaccounted-for water (16%) which should be reduced. Suggested efficiencies include test sampling customer's meters to determine accuracy, hiring a water conservation coordinator, installing real time canal flow monitoring systems (see above re savings) and irrigation efficiency programs (BMPs #5, #1, #9 and CVPIA AG #3) should be adopted.

PCWA has adopted progressive urban demand side measures and water efficiencies over the past thirty years. The recommended urban BMPs as spelled out in the Water Forum Agreement are excellent. The potential problem is to make sure that all the applicable measures are adopted and pursued and that long term funding means are found. Although the Water Forum staff does give progress updates, no subsequent agreements have been signed which would ensure that the BMPs are put in place.

Recycled water may be the greatest potential source of additional environmental water from treated water users. Currently, recycled water is made available to golf courses,

landscapers, parks and rice growers. PCWA's Surface Water Supply Update for Western Placer County (March, 2001) assumes that golf courses account for an increase of close to 500 AF/yr in water deliveries. The Update also assumes that the area will experience build-out in golf courses and predicts future increases of 100 AF/yr for golf courses. Either figure is significant and with the recent growth of the movement toward low maintenance courses represents an opportunity for major reductions in usage.

The UWMP acknowledges the importance of landscape BMPs. It is noted, for example, that older homes tend to use less water largely due to established landscaping. Large landscapes, in particular, offer the opportunity for major savings. Again, the issue is ensuring that the BMPs are adopted and widely used.

Agriculture raw water use represents the bulk of PCWA's present water use but only about one fifth of the revenue (1995, Appendix C p4). As the DWR Study noted, it also represents the best source of significant savings to be applied to the environment. The Bureau of Reclamation funded study should provide recommendations for savings from reductions in canal water losses and for programs that would use telemetry and automation to monitor and help operate the raw water delivery system. It is also extremely important that PCWA adopt the Central Valley Project Improvement Act Critical BMPs for Agricultural Contractors, including the following:

- Measure water deliveries to customers within 6% accuracy.
- Hire a water conservation coordinator (as recommended in the DWR Study).
- Provide services for agricultural water users.
- Implement pricing structure BMP #11 (conservation pricing).
- Evaluate policies of water supplies.
- Improve pump efficiencies.
- Exemptible BMPs for agriculture contractors.
 - 1) Facilitate alternative land use
 - 2) Use recycled water where available
 - 3) Facilitate financing for on-farm irrigation systems
 - 4) Incentive pricing
 - 5) Line or pipe ditches or canals and construct regulatory reservoirs
 - 6) Increase flexibility of water ordering
 - 7) Operate spill and tailwater recovery systems
 - 8) Optimize conjunctive use of surface and ground water
 - 9) Automate canal structures
 - 10) Water use pump testing

Although PCWA has adopted a large number of conservation/efficiency measures, significant savings in water use, especially in agriculture, can still be realized. A recent agreement entered into by PCWA serves as an example of one way of acquiring water for additional instream and environmental use. The proposed development at Sunset Ranchos was not part of an existing General Plan and the amount of water that was requested was greater than the projected surplus available after buildout in 2035. PCWA agreed to sell half of the projected surplus (800 ac-ft) in exchanged for \$600,000 which

