

Thoughts on Water by a Late Arrival

By Ron Hurlbut

I was hired by the City of Fairfield in 1983 to supervise the Public Works Department, which operated the city's water system, street system, city parks, city landscape, engineering and code inspection of new development.

When I started work I quickly found the City was using a single source of water delivered by a single canal that ran through an unstable area on Cement Hill and the city had less than 1 days water use in available water storage. To make matters worse the water system was operating at a deficit and was supported by the City General Fund.

City Water between the 1860's and the 1930's

In 1866 the Suisun and Fairfield Water Company completed a new system for Suisun and Fairfield. In the late 1800's the Company completed a new system for Suisun and sold the Fairfield system for \$350 to H. K. Hoyt, Superintendent of the joint company since its founding.

On December 24, 1901, sparks from the Fairfield waterworks smokestack, blown by a heavy north wind, started a fire and burned the plant to the ground. Henry Goosen, was working on the plant when it caught fire; Henry purchased the rights to the water system and rebuilt the plant.

July 10th, 1913 was a dry year. A Notice appeared in the Solano Republican urging residents, some 850 in number, to conserve water.

June 24, 1926, by a vote of 121 to 44, citizens approved purchase of the waterworks from Henry Goosen. For \$27,000 the City acquired the pipelines, 20 flowing wells, the waterworks, and a \$2,000 maintenance and improvement fund. The system had 268 connections that consumed 12 million gallons of water per day.

In late 1929 the City hired Ray Venning to run the water operation for \$125 a month. Ray carried out that job until his death in 1953. His wife Edith ran the billing system from her kitchen table while raising their children. After Ray's death, Edith was hire by the City and worked full time as water billing clerk until she retired in 1966.

Ray Venning Water Treatment Plant

I found it interesting that no one talks about why the Ray Venning Water Treatment Plant was originally built. In 1932 the citizens of Fairfield approved a \$100,000 bond to drill a deep water well hoping to get fresh water which was below the brackish salt water which was near the surface. The bond would also pay for the construction of an elevated steel water reservoir. Well, the deep water well casing collapsed during the drilling; they tried to fill the well with concrete to seal off the brackish salt water and drill through the concrete to sweet water. In the end the well only produced salty foul smelling water.

Because of the water shortage at the time the City of Fairfield contracted with the City of Vallejo to use some of their water from the new Cache Slough line. The water from Cache

Slough comes from the Sacramento River and needed a high level of treatment. The Ray Venning Water Treatment Plant (3MGD) started operation in 1953. In 1954 as the City of Fairfield is urging the Federal Government to build Monticello Dam creating Lake Berryessa, the Fairfield Mayor was complaining about the high cost Vallejo was asking for the water they got free from the river. Vallejo wanted \$32.60 per acre-foot of water; Lake Berryessa water would cost \$15 per acre-foot. Water became available from Lake Berryessa in 1959/60. In 1960 untreated water was pumped into the new Dickson Hill reservoir with only chlorine being added to the water. In 1969 the Dickson Hill Water Treatment Plant (10 MGD) was built and started treating more water the Ray Venning Water Treatment Plant.

In 1976 the Waterman Water Treatment Plant (28 MGD) was constructed and went into operation to accommodate the construction and operation of the Anheuser-Busch Brewery; at that point the Ray Venning Water Treatment Plant was literally abandoned.

A Vision of What the Future Could Be

A vision came in 1916 when William Pierce made the chance comment that Richmond was looking for water and was eyeing Monticello on Putah Creek as the perfect place for a dam. “He thought it would be awful if the Bay Area got the water we could use”, said his son Lewis Pierce, in the history “The Solano Water Story.” The elder Pierce, who had a ranch in Suisun Valley, campaigned for three long, frustrating decades, slowly gathering support to form the Solano Water Council, which eventually became the Solano Irrigation District. A decade after that, the dam Pierce envisioned in Devil’s Gate was built. Lake Berryessa was born and Solano County got a water source that changed its future. “It changed the agriculture from just dry farming and allowed the cities to grow” Vacaville Mayor David Fleming said.

Solano County sets Key Water Policies

It is interesting to note that in the 1950’s the Solano County Water Conservation and Flood Control District was the main water agency in the County. Under the leadership of Dave Balmer, County Administrator, a number of key water policies were created. Traditionally, water is priced to pay for construction of the pumping facilities, the delivery system, and maintenance; the further the water travels to get to a user – the higher the cost (railroad ticket). In order to get everyone to support the construction of the Solano Water Project, the County needed the support of the Cities and Farmers. The cities at the end of the proposed water delivery system, Benicia and Vallejo, did not want to pay more for water than those close to the source, like Vacaville and Fairfield. Dave Balmer proposed a single cost for all users (postage stamp); that is a principle still in use in Solano County. The other thing Dave did was subsidizing the cost of water to farmers; the County implemented a countywide tax to reduce the cost of Ag water from \$2.65 to \$1.50 per AF. The Bureau of Reclamation would not contract with the County on water service contracts for the farmers, this, the Solano Irrigation District (SID) was born. SID holds the water service contract for the farmers; SID also inspected construction of the Putah South Canal.

Solano Water Project is Built

After World War II, there was an interest in creating employment for the soldiers as they returned home. In 1948 the Bureau of Reclamation looked at building water supply projects

through out the United States. Local farmers were very interested in a cheap highly reliable water source. Ground water was only available in the northern part of the county, well drilling was expensive, and the cost of pumping high. The farmers hired a used car salesman to be their spokesperson and started pestering Congress and the County Board of Supervisors.

Before construction of the Solano Water Project could begin water service contracts were required. The contracts were 'take or pay' IE: water was paid for even if it was not used. SID and the cities of Benicia, Fairfield, Suisun City, Vacaville, and Vallejo signed contracts. Suisun City operated their Water Treatment Plant on Waterman Blvd. until the 1980's when SID started operating the city plant.

The Solano Water Project eliminated the town of Monticello in Napa County, constructed Monticello Dam, Lake Solano Dam, the Putah South Canal, and the terminal reservoir in Cordelia. SID agreed to inspect construction of the Putah South Canal. A young engineer - Brice Bledsoe was hired to inspect the construction and he became the first General Manager for SID. SID regulates water releases from Monticello Dan, Lake Solano Dam, and water releases into the Putah Creek Canal; they also maintain the canal and terminal reservoir.

In the 1950's and 60's it was hard for all parties to pay for their water service contracts with the Bureau. Benicia traded their service contract to the City of Fairfield in exchange for future water service from the cheaper North Bay Aqueduct. Cities were charged \$15 per acre-foot (AF), of water; farmers were supposed to pay \$2.65 per AF but the County brought that cost down to \$1.50 per AF with a county wide tax.

Originally 80% of the water from Lake Berryessa was contracted to Ag; they were supposed to pay 80% of the cost of the Federal water project. As we approached contract renewal with the Feds in the late 1990's, we found the cities had paid close to 80% of the project cost. At contract renewal time with the Bureau of Reclamation the water allocations and pricing were left unchanged to the advantage of the farmers. In exchange, SID agreed to help the cities during an extreme draught, as was the case in the mid 1990's.

The Race to Keep Up with Water Demand

Keeping up with residential and industrial demand for potable water has always been difficult due to the availability of water and the high cost of treatment facilities. With little groundwater being available in Southern Solano County the cities have had to rely on water stored in lakes or river water. By way of example the city of Fairfield a population of less than 300 people in 1927; by 1976 the population was 41,000 and in the late 1990's the population exceeded 100,000 people.

To keep up with water demand the City of Fairfield built the Ray Venning Water Treatment Plant (3MGD) in 1953, Dickson Hill Plant (10MGD) in 1969, Waterman Water Treatment Plant (28MGD) in 1976, Waterman is expanded in 1982 to [] MGD capacity, August 1990 the North Bay Regional Water Treatment Plant ([] MGD) went into operation, and Waterman is refurbished and expanded in 2009 to ([] MGD). The last Waterman expansion cost \$53 million. Now you can appreciate why city water service costs so much.

I was told an interesting story by Ken Britz, (retired Water Treatment Plant Manager), about a hot spell in the early 1970's. Ken was working as a water plant operator and the Fairfield water reservoir at Dickson Hill was about to go dry - no water for the citizens. Ken's boss

wanted to pump untreated water from the Putah South Canal directly into the water reservoir serving the public – Ken said that was not a good idea and promised to keep both Dickson Hill and Ray Venning operating through the night and prevent any backwashing of the filters from occurring as that would slow down the treatment of water. During the night Vacaville ran out of water and was trucking water from Fairfield to Vacaville and Suisun City opened a valve between Fairfield and Suisun City as Suisun City was also running out of water. They made it through the night maintaining water service and the weather cooled down – end of crisis.

City of Fairfield Water Treatment in 1980's

In the winter, water from Lake Berryessa was treated at the Waterman Water Treatment Plant, which had been built to supply high quality water to the Anheuser-Busch Brewery. In the summer because of higher water demand, the Dickson Hill Water Treatment Plant was operated, the water plant operators did not like working at Dickson because of the high noise level within the building that contained the pressure pots that filtered the water. The Ray Venning Water Treatment plant was no longer in use and most of its instrumentation and operating controls had been salvaged. Within 5 years we no longer stored treated water at the Venning plant.

Cities and Ag Districts Cooperate

In the early 1980's water rights, level of water use, and responding to emergencies was like a game of poker, no one showed their hands. When Ron Hurlbut (city) and Brice Bledsoe (SID) started to work together, they invited their counterparts to join the conversation about water rights, water needs, and how to support each other in an emergency. These meetings proved key to a number of projects: 1) Construction of the North Bay Aqueduct, 2) Contract renewal with the Bureau of Reclamation on Lake Berryessa water contracts, 3) An unsuccessful effort to purchase Monticello Dam from the Bureau of Reclamation, 4) 10 years of litigation on water for Putah Creek, 5) Creation of the Solano County Water Agency, 6) Joint effort to perfect water rights from the Sacramento River. That group of professionals continues to meet and coordinate water issues to this day.

North Bay Aqueduct

Why and where was the North Bay Aqueduct built? In 1959 as the Federal Government was building several large fresh water reservoirs in California, water interests mainly in Southern California got the Porter Burns Act enacted by the voters of the state creating and funding the \$1.75 Billion dollar State Water Project. One of many projects approved by the Porter Burns Act was the North Bay Aqueduct which pumps water from Cache Sough all the way to Calistoga in Napa County. The North Bay Aqueduct supplies water to 5 of the 7 cities in Solano County and a number of cities in Napa County. Working together the cities and Ag districts in Solano County supported passage of a county wide tax to lower the cost of North Bay Aqueduct water from an anticipated \$180 per acre foot of water down to \$45 per acre foot of water. This was all part of a number of agreements between the cities and the Ag districts, chief of which was the Solano Irrigation District, SID. Today the North Bay Aqueduct is the primary source of

water for the City of Benicia, and is an important water supply for the cities of Fairfield, Vacaville, Vallejo, and Cities in Napa County as far north as Calistoga.

Water from the North Bay Aqueduct was going to be expensive (\$180 vs. \$10 from initial studies) and the project was constructed after passage of Prop 13, any tax would require a 2/3 positive vote for enactment. There was an exception, the Goodman Decision allowed the implementation of a tax to cover a contractual agreement that was signed before the passage of Prop 13. The cities gained support from the County Board of Supervisors and worked with the Ag districts to gain the support of the farmers; we got a majority of the voters to approve.. Fortunately the tax was approved and North Bay Aqueduct water cost in Solano County was reduced from \$180 per AF to \$45; Napa County chose to leave the water cost much higher than \$180 due to the added facilities and additional pumping to get the water to the cities in Napa County that use water from the North Bay Aqueduct

North Bay Regional Water Treatment Plant

With all the work and discussions associated with getting the North Bay Aqueduct funded and built there was an awareness of the benefits of working together. The cities of Fairfield and Vacaville agreed to jointly design, fund, construct, and operate a state of the art water treatment plant, NBR. Benicia, Suisun City and Vallejo were invited to participate; all declined. The participating cities were concerned about the quality of water from Cache Slough and the probable presence of some salt in the water. To avoid possible health issues associated with bromides, ozone is generated on site and used as the primary disinfectant; deep charcoal filter beds are used to control taste and odor. The two cities provide administrative direction to the Fairfield staff that operates the plant. It was during this time frame that the City of Fairfield built additional underground reservoirs with 60 or 70 million gallons of treated water storage. We had thoughts of raw water storage in a small lake adjacent to NBR, however time and money ran out and we did not do it.

Contract Renewal with Bureau of Reclamation

The initial 1956 water service contracts the Bureau of Reclamation executed with the Cities and Solano Irrigation District, SID, were for 50 years. In the early 1990's Brice Bledsoe, General Manager for SID, was very concerned about a number of issues and how they would affect SID. Among his concerns: 1) Loss of water rights to another County, 2) Loss of water to maintaining a full flowing Putah Creek, 3) Reallocation of water rights from Ag to the Cities, 4) Water would be sold at a uniform price to Ag and municipal agencies, raising the cost of water for farmers. Contract renewal needed to be completed several years before 2006.

Unsuccessful Effort to Purchase Monticello Dam

Well, what is the best way to avoid all the concerns about contract renewal? ? Purchase the federal dam, which was almost paid for, as required in the original water service contracts. For four years we pursued this concept with Federal staff people and congressional elected officials. This created quite a mess. The Mayor of the City of Benicia decided Benicia had been swindled out of their water rights from Lake Berryessa by the City of Fairfield. The truth was Benicia did not want to pay the cost of Berryessa water, \$15 per acre-foot use it or not in the late 1950's. Fairfield agreed to trade 2 acre feet of water from the future North Bay Aqueduct

for each acre foot of water from Lake Berryessa; at that time water was forecast to cost \$10 per acre-foot from the North Bay Aqueduct. Benicia's Mayor still pursued the issue back in Washington anyway. Napa County wanted water rights from Lake Berryessa because the lake is in Napa County, never mind Napa County declined water rights initially and botched up the recreational contracts around the lake and the feds took over operation of the recreational facilities. The University of California, Davis showed up wanting water rights for the school and fishery issues. Yolo County showed up wanting both water rights and additional water in Putah Creek for a new park the city of Davis wanted to build along the creek. The Feds were so keen on the idea of selling the dam they wanted us to pay the original construction cost inflated to 1990's cost. (\$500 Million original cost raised to \$5 billion dollars the project would cost today.) Needless to say, we dropped the idea of purchasing Monticello Dam.

10 Years Litigation on Water for Putah Creek

In preparation for Solano Project contract renewal, the folks in Solano County sued all surface water users in Napa and Yolo Counties that are in the Lake Berryessa watershed. That process of adjudication took several years; while in that process, the University of California, Davis County and Yolo County sued Solano Water Agencies for additional water in the creek. It was only after using a helicopter that we discovered the University was pumping water from the creek for an adjacent farm. Davis University pumped so much water, that the creek dried up from that location down to the Yolo Bypass. I think it was a process of warring us down, and the continual pressure from the Bureau and Fish & Game that we eventually capitulated. So now there is year round flow in Putah Creek and flushing flows are released into the creek in December in the hope Salmon will come up the creek. That additional water into the creek and the realization that water agencies in Solano County did not reduce their water rights resulted in a less reliable water supply for Solano County during a draught that lasted multiple years.

Creation of the Solano County Water Agency

As the Cities and Ag districts continued to work together on water issues there was talk of forming a Joint Power Authority to work on contracts and fund water projects. The Solano County Board of Supervisors became concerned and asked how they could help. Those discussions lead to the creation of the Solano County Water Agency where the 5 supervisors, 7 mayors and Board members from 3 Ag Agencies constitute the Board of Directors. The professional staff members from those agencies serve an advisory role to the Board of Directors.

Cities Perfect Water Rights on Sacramento River

As the above activities started to wind down, Rick Wood, Deputy Director of Public Works/Water for the City of Fairfield lead an effort with the cities of Vacaville and Benicia to establish water rights from the Sacramento River. The Porter Burns Act protected the water rights of people in Northern California in the watershed of origin where State Water Projects were built. After establishing the amount of water needed by the participating agencies and completion of the Environmental Reviews the request proceeded to court. The State of California wanting to avoid creating a precedent by allowing this issue to be settled in court and creating first class riparian water rights to the suing cities agreed to provide water rights equivalent to State Water Project water rights. The cities received additional water rights that

are subject to reduction during a draught. The cities agreed to the offer in order to avoid the cost of a long trial.

Suisun City Water System

I will share the little I know about Suisun City's water service. We know from Edith Venning's writings that an initial water facility was built in 1866 to serve the towns of Fairfield and Suisun. In the late 1800's Suisun built a new system separate from Fairfield. In the early 1900's civic leaders from Fairfield requested permission to install fire hydrants on a new water service line Suisun City had installed.

I know Suisun City had a 12 acre pond on Twin Sisters that was used for water service. There were also wells in Gordon Valley that were used to serve the city. There was an old concrete reservoir on Spy Glass Hill (Oliver Road/Waterman Road) that connected the pond, the Gordon Valley pumps. Eventually a new Water Treatment Plant that treated water from the Putah Canal (water from Lake Berryessa) was built below the reservoir. The concrete reservoir has been replaced by a steel tank that is connected to Suisun City by a concrete pipeline in Oliver Road.

As the Hoffman Construction Company started building a large number of homes in Suisun City and discussions were going on about the North Bay Regional Water Treatment Plant, SID entered into a joint powers agreement with Suisun City for additional water treatment. After creation of the JPA, a new water treatment plant and storage reservoir was built by SID to serve Suisun City, the plant is located on Cement Hill near Clay Bank Road. Upon completion of the Cement Hill plant SID stopped operating Suisun City's water treatment plant on Waterman Blvd. The City of Fairfield has tried several times to purchase the reservoir on Spy Glass Hill, but to no avail.

In the mid 1990's Robert Bounds, Director of Public Works for Suisun City called to say they had just dug up an old redwood pipeline used for water service. They were doing some pipeline work in preparation for improvements to Main Street. The old redwood pipe was not in service at the time. The pipe was two pieces of redwood that were hollowed out in the center, banded together and the seams sealed with tar or pitch.

Vallejo Water System

The City of Vallejo has always been well positioned on water since the early 1930's. Although Vallejo could not use ground water wells in town and both the Sacramento and Napa Rivers were too salty for municipal use, the city did well on water supply. The city created 3 lakes in upper Green Valley: Madigan, Fry, and Curry. In addition to using water from the lakes they used ground water wells in Gordon and Suisun Valleys.

They were the first to go upstream on the Sacramento River and pump water from Cache Slough. Because of their population and the Mare Island Naval Ship Yard they received a generous water entitlement from the Solano Water Project. The city was providing water to Green Valley and the City of Fairfield between the 1940's and construction of the Solano Water Project; they were quite comfortable on water issues.

When the North Bay Aqueduct was about to start construction Vallejo did not want anything to do with that expensive water. Vallejo's support was needed to get a county tax to subsidize the cost of that water; it took a number of meetings between the Vallejo and Fairfield Directors of Public Works to gain Vallejo's support. It was pointed out that Vallejo was depending on a steel pipeline built 50 years earlier; I also pointed out that the state water project would pay less for electricity to pump water from Cache Slough to Vallejo, and the State would maintain the new concrete pipeline.

Vacaville Water System

Unlike the cities to the south, Vacaville is blessed with a large underground aquifer that carries lots of water. The aquifer (known as the Tehama formation) originates at the base of the Tehama Mountains to the North fed by substantial rain every year. At the south end of town the aquifer is about 2,000 feet deep. It is very expensive to dig those 6 to 12 inch diameter deep wells. The PG&E bill for pumping is substantial, and there is a need to add chlorine and fluoride to the water as it is pumped from the ground.

With the construction of Monticello Dam, Vacaville built a water treatment plant near the Putah Creek Canal. The city has several above ground steel reservoirs they use to store potable water and pressurize the city water mains. Vacaville's participation in the North Bay Regional Water Treatment plant adds to their daily supply of water and they benefit from the 10 million gallon buried concrete water reservoir.

Dixon Water System

Dixon is much like Vacaville; they are blessed by the ground water aquifer the Tehama Formation. The city was served by the California Water Company; in the late 1990's SID agreed to provide water to about ½ the city. The initial service was ground water; I would not be surprised to find SID is supplying Solano Water Project to the city.

Benicia Water System

Benicia has had water service issues for years. In the late 1800's the city used water from the Sacramento River and Lake Herman. During dry years, the lake was not sufficient. The river water was salty and unusable, so water was brought in by barge. I am sure in later years Benicia received some help from Vallejo, but at a substantial price.

The Solano Water Project is built and Benicia constructs a 24 inch water line from the terminal reservoir in Cordelia, along what is now Interstate 680 to their water treatment plant adjacent to Lake Herman. The Solano Water Project water is too expensive and Benicia trades their water entitlement from that source to Fairfield. Fairfield agrees to pay the \$15 per AF and agrees to give Benicia twice the Berryessa entitlements. Benicia continues to use Lake Berryessa water, but only pays for what they use.

Along comes the North Bay Aqueduct and Benicia is forced to switch from Berryessa water to Sacramento River water. What a surprise, initial project studies forecast a water cost of \$10 per AF; current construction design priced water at \$180 per AF. Not only did the price increase dramatically, but Benicia has to upgrade its water treatment plant in order to treat the river water, it was not an ideal situation for them.

Rio Vista Water

In the early days, water from the adjacent Sacramento River was probably free of salt and could be used by city. As more and more water was removed from the river, ocean salt water started intruding more northward, which forced the city to rely on ground water. Today the city has difficult with arsenic levels in the ground water. The regulatory standards keep going lower so now the city has an unresolved problem. Rio Vista is so distant from all the cities and SID that none of the agencies can help. Rio Vista can not afford to build 13 miles of pipeline to Fairfield to serve their limited population.

End of thoughts

I have found the history of water in Solano County interesting and would hate to see some of the concerns and actions not preserved for future generations; I just happen to come along at the right time.