

Wells — The Final Frontier

By Dick Stenzel

Water development within the South Platte River Basin initially occurred in the upstream portions of the basin near Denver and along its Front Range tributaries to meet agricultural and urban development needs. The return flows from irrigation recharged the alluvial aquifers, and caused a rise in base flow conditions in the lower reaches of the South Platte River began to flow year round.

As the flows in the lower river increased and reservoirs were constructed additional development of the basins' water resources occurred. With an estimated storage capacity of nearly nine million acre feet, the South Platte aquifer represents a water resource many times larger than all the surface water storage that have been developed in the basin. This source of water became the next logical place that irrigators looked at to meet their irrigation needs.

The construction of the first high capacity irrigation wells in Colorado date back to over one hundred years ago. The first irrigation well of which there is any record was excavated by E.F. Hurdle, in 1886, in the Lone Tree Creek alluvium, located east of the town of Eaton. Hurdle not only constructed the first well, but also dug two others, at that time, in the same vicinity. Centrifugal pumps were installed which were operated by steam engines. This first irrigation well furnished water to eighty acres of land.

One of the earliest cases concerning tributary groundwater was also associated with the Hurdle well in the case of McClellon v. Hurdle which occurred in 1893. McClellon was the owner of 400 acres of land in Weld County. In 1886 he had filed the necessary papers to secure a water right and constructed diversion works to irrigate his land from Lone Tree Creek. E.F Hurdle dug the well I discussed previously that same year and later McClellon believed he was injured by the well pumping. The court held that Hurdle had not invaded the rights of the prior appropriator but also held that it is an invasion of the rights of a prior appropriator to divert water from a stream—

surface or subterranean—by means of dams, wells, or pumps, whereby the flow of a senior surface water right is diminished and results in injury. However, in this case the court felt that the evidence was vague and indefinite and did not approve the claim for damages.

Between the period of time from Hurdles' first irrigation well and 1930 approximately 300 high capacity irrigation type wells were constructed. With the advent of the electric pump and electric networks which extended power lines into the rural areas of Colorado, additional groundwater development ensued. The groundwater supplies were not subject to drought and thus were more reliable. The increase in the number of high capacity irrigation wells was another 1400 wells.

The drought of the 1950's saw even more development of irrigation wells and by 1960 approximately 1200 new irrigation wells had been constructed. Prior to 1957, a permit was not required to construct a well and ground water was not managed or allocated by the State. The Colorado Ground Water Law of 1957 required a permit from the State Engineer as a prerequisite to drilling a new well and obtaining a new ground water right. The law also made provisions for the registration of existing wells.

Even though there were a few early water court decisions regarding the wells and surface water rights dating back to the Hurdle case in 1893 the connection between ground water and surface water was not well understood. Some of the earliest State Engineers expressed concerns about the impact alluvial wells might have on surface water rights. Many people believed that ground water was separate from surface water and that the pumping of ground water could not affect surface streams. Consequently, ground water was generally considered to be outside the priority system, and wells were not adjudicated or regulated in Colorado for many years.

By the 1960s, thousands of irrigation wells had been drilled along the South Platte, and surface diverters began to assert that ground water pumping affected the surface flow. The legislature responded by passing the Groundwater Management Act of 1965. It

affirmed the prior appropriation system also applied to tributary ground water and directed the State Engineer to administer the distribution of tributary ground water in accordance with the priority system. The 1965 Act also required a well permit be obtained from the State Engineer for the construction of any new well.

Even after passage of the 1965 Act, there remained the problem of bringing wells into the priority system. In some cases, unadjudicated wells had been allowed to operate for many years and the well owners believed that their rights to ground water had been vested.

The General Assembly had given the State Engineer the difficult task of curtailing junior wells for the benefit of senior surface water rights. The problem of administration was aggravated by the fact that there is often a lag time between pumping and the effect on the stream. This meant that the curtailment of a well would not immediately make more water available for a senior surface diverter.

In 1968 the Colorado Legislature authorized a study by consultants to determine the impact of junior wells constructed in the 1940's and later. The study found that wells were reducing stream flows. The Water Right Determination and Administration Act of 1969 was designed to integrate tributary ground water and surface water use and provide maximum utilization of the water resource by allowing for flexible "plans for augmentation". As an incentive for the well owners to adjudicate their wells and join the priority system, the 1969 Act provided that water court applications to adjudicate wells filed before July 1, 1972, would not be subject to the postponement doctrine and the wells would be given a priority relating back to the original appropriation date.

Furthermore the act stated the State Engineer could promulgate rules to assist in the administration of wells. State Engineer Kuiper began rule making in 1970 to curtail wells on graduated basis unless wells were operating in accordance with a court approved augmentation plan or a substitute supply plan approved by the State Engineer under CRS 37-80-120.

The rules were challenged by a well owner organization and a 4 week trial took place in 1974. The trial was recessed and the parties stipulated to a decree incorporating the rules as proposed. The passage of Rules and Regulations of South Platte River, in 1974, required all existing and new high capacity non exempt type wells to replace their depletions to the affected stream systems of the South Platte.

Well owners were encouraged to form associations or conservancy districts to develop plans to replace well depletions that occurred when there was a call on the South Platte River, which in the 1970's up through the 1990's was usually during the months of July and August.

The Groundwater Appropriators of the South Platte (GASP) was established in 1972 to augment 3,000 wells and the Central Colorado Water Conservancy District's Ground Water Management Subdistrict was formed in 1973 to cover 1,000 wells. Some well owners like those under the Fort Morgan and Reservoir Company, Bijou Irrigation Company and the Poudre River Well users sought and obtained water court decreed plans for augmentation.

The GASP and CCWCD organizations operated under annual replacement plans, or substitute water supply plans ("SWSP") approved by the State Engineer. Both plans relied on the fact that the period for senior calls was very limited due to good runoff conditions and the fact that there was a Gentleman's agreement during the winter to not place reservoir calls.

The South Platte Rules and Regulations as approved in 1975 required that a replacement amount equal to 5% of the projected annual volume of ground water diversions be made available to the Division Engineer. The Division Engineer was to use the water at a rate of flow sufficient to compensate for any adverse affect on lawful water requirement as evidenced by a valid senior water right call, but a rate not to exceed 5% of the capacity of the calling diversion structure.

Later on the Division One Office required replacement of out of priority depletions as calculated by using the SDF method. Since most of the irrigation wells did not have meters, the amount pumped was determined by first calculating the potential consumptive use of crops grown by the member wells and then determining how much supplemental ground water was needed after the surface water supplies were utilized.

More detailed accounting of the replacement activities by both GASP and Central of the replacement sources and deliveries was begun in 2000 to assure adequate replacement was being made in a timely manner. Spreadsheets were developed maintained in the Division One Office to track river calls, depletions and replacements. The depletion amounts were based on model runs of well depletions that were provided by GASP and Central. The replacements were from various surface water ditches; reservoirs, augmentation wells and recharge projects, and leased municipal reusable effluent. The detailed accounting assured that replacements were made day to day whenever a river call existed. There was a coordinated effort on the part of both entities to trade any excess augmentation supplies available in a given reach of the river in order to maximize their replacement supplies.

The Empire Lodge decision in 2000 ruled that the legislature did not give the State Engineer authority to approve SWSP's. This decision was upheld in the Supreme Court. The water court decision had a direct impact on the annual approval of SWSP's in the South Platte River basin since the State Engineer no longer had the authority to approve SWSP's.

In 2002, the Legislature passed HB 02-1414 which allowed the State Engineer to approve an SWSP if an application for a plan for augmentation was pending in Water Court. This bill also required notice to interested parties and allowed a plan to be appealed to the Water Court.

The State Engineer filed new well use rules in May of 2002 that were nearly identical to the rules promulgated in the Arkansas River basin in 1996. These rules would have

allowed the State Engineer to annually approve SWSP's that met the much more stringent standards than existed with the 1974 Rules and Regulations.

These rules were challenged as unconstitutional by some objectors in 2002. The Judge Klein ruled and the Colorado Supreme Court later agreed in 2003 that annual approvals of replacement plans were not allowed by statute.

The Legislature approved SB 03-73 in March of 2003 giving well organizations in the South Platte River basin up to three years to file a plan for augmentation with the Water Court and allowed the State Engineer to annually approve a SWSP after conducting a hearing.

River calls in 2003 occurred nearly the entire year. There were several reasons for the extended periods of call occurring. As the need for recharge credits increased the downstream reservoirs could not take a chance that they might not fill. The gentlemen's agreement that had existed for so many was discontinued. Further the pressure on well owners to reduce their depletions to the river resulted in many ditches starting the ditch operations earlier than had occurred when wells were being used to provide the first irrigation water.

Many GASP well owners who had developed augmentation sources prior to 2002 withdrew from GASP and decided to proceed with the development of their augmentation plans or decided to rely upon or improve their decreed plans for augmentations which had been approved in the past.

Excess augmentation credits that historically were shared by those well owners mentioned above had historically been used in the GASP plan for the remaining well owners in GASP who had not developed their own augmentation supplies. GASP also leased additional sources of augmentation water to cover these well owners' depletions who had not developed augmentation sources. The drought saw many of the municipal augmentation sources that were historically leased by GASP were

significantly reduced and the cost of leasing the water increased to the point where GASP could not justify acquiring the water.

In 2003, GASP filed for approval of a SWSP under SB 03-73 and the plan was approved to allow for replacement of ongoing stream depletions that resulted from past pumping, but no pumping was allowed. All of these actions resulted in GASP deciding to go out of business. GASP finished its sale of water assets in 2006.

The South Platte Well Users who were former GASP members filed two augmentation plans with the Water Court in May of 2003 and sought approval of a SWSP for 380 wells. The plan was approved in June of 2003. In 2004, CCWCD established the Well Augmentation Subdistrict (WAS) which included the above 380 wells and 61 additional wells.

In GASP's stead, other groups were formed. These groups were mainly associated either with areas such as a part of a County or ditches. The groups filed augmentation plans in water court. All of the largest ones except the Lower South Platte Water Conservancy District in District 64 and WAS have been decreed.

In Conclusion

Due to the increased demands on the South Platte River over time additional water was imported into the South Platte River Basin through trans-basin diversions, primarily from the Colorado River Basin. The South Platte Rivers annual flow at the Henderson Gage is greater under current conditions when compared to the historic flows. The same is true at the Colorado - Nebraska State Line. The increased flow is partially a result of wastewater discharge, lawn irrigation return flows from trans-basin diversions and not nontributary and nontributary ground water pumping. In addition, urban development in the South Platte River basin has changed the surface runoff characteristics. The increased impervious surfaces and the storm runoff from these surfaces have increased the surface flows.

Today as municipalities seek to capture and reuse their imported water supplies we can expect to see less water being available to farmers. I believe this will result in river calls becoming more frequent and also more senior than we have seen in the last 20 to 30 years.

We are also seeing the length of calls increasing from what occurred in the period from the 1970's to 2000. This is in part due to farmers reducing their use of wells in order to reduce their augmentation requirements and the reduced stream flows that are the result of lower than normal precipitation in the years since 2002. Even when precipitation increases in the future the anticipated reduction in reusable supplies from upstream municipalities and the reduction in the use of wells to meet irrigation needs will continue to increase the period of time that we see river calls in the basin during the summer.

The historic lack of river calls from November through March will probably cease to exist since reservoirs need to place calls to assure that they can fill their reservoirs and not have compete for the water that otherwise will be diverted by junior recharge water rights. The calls may also be necessary due to less reusable water supplies being available during the summer that resulted in return flows during the winter.

When you further take into account the number of center pivot systems that exist today and are still being installed in the South Platte River basin will also further impact future stream flows. This is because the center pivots increase the irrigation efficiencies, while at the same time reducing recharge to the groundwater alluvial system. It makes one wonder what the call regime will look like in the coming years.

Wells do improve agricultural productivity in the South Platte Basin by increasing the farmer's flexibility. Wells are also an effective buffer from a drought. However wells must also have adequate augmentation plans to protect senior water rights from any injury associated with the lagged depletions from well pumping.