Colorado Farm Bureau

Report of the
South Platte Water Task Force

Received, filed and approved by:
Colorado Farm Bureau Board of Directors
April 20, 2010

Presented to:
Colorado Farm Bureau Water Advisory Committee
July 19, 2010
EXECUTIVE SUMMARY

The Colorado Farm Bureau (CFB) Board of Directors, at the request of the CFB delegate body, commissioned a taskforce of CFB members to research, discuss and prepare potential solutions to the ground water and surface water conflicts within the South Platte River basin. This working group was comprised of one farm bureau member from each of the nine (9) counties encompassed in the South Platte River Basin.

The South Platte Task Force was charged with the following:

to recommend and report to the CFB Board of Directors what can be done from a public policy perspective to increase water usage in the South Platte River Basin given the real and current parameters set forth by current Colorado water law including the 1969 law, the 1974 augmentation requirements and Colorado Supreme Court Decisions.

Several presentations were made to the board by individuals and organizations involved in the issues associated with both surface and ground water usage. Based upon these presentations and personal knowledge, several recommendations were made that would enhance the use of the water resources in the South Platte River Basin.

Based on the information provided to the task force and the subsequent discussion amongst task force members, the following recommendations are made by the CFB South Platte Water Task Force:

1. **Better Basin-wide data collection, coordination and evaluation.**

   The South Platte Decision Support System (SPDSS) has collected and assembled large quantities of hydrologic, geologic, and water rights data. Much of this data has been entered into several data storage systems such as Hydro Base. It appears that detailed data to describe the ground water resource may be missing, although a number of agencies have collected water level data, pumping data, and geologic data in the past. An effort is needed to collect these scattered data and evaluate it for administrative and management decisions for the combined usage of surface and ground water.

2. **Reorganize Division of Water Resources into two separate Sub-divisions: State Engineer’s Office and Regulatory Division.**

   In order to manage the water management activities for the state of Colorado, the Department of Water Resources should be reorganized and split into two sections: engineering and regulatory affairs. Under this scenario, the State Engineer would be responsible for data collection and analysis while the regulatory division would be responsible for the administration and management of the state’s water resources. This type of proposed reorganization would keep the State Engineer’s office free from the
regulatory and administrative activities and ideally be removed from political pressures that come with the administration of the water resource. Enabling language needs to be proposed giving specific authority to the Regulatory Division within the Department of Water Resources to administer the water resource in each of Colorado’s water divisions.

### Alternative to DWR Reorganization

As an alternative to the above proposal, policy leaders need to explore the feasibility of establishing a South Platte River Basin Authority, such as now exists in the Colorado River Basin, Rio Grande Basin, Republican River Basin and Colorado River Basin, which would develop policies and construct facilities to maximize the use of both ground and surface water for all South Platte River Basin residents.

3. **Establish a pilot project that can demonstrate the effects of pumping and recharge on aquifer levels and stream flows.**

   Two defined reaches of the river should be identified: one that contains all the basic parameters to be evaluated and any additional data requirements that should be obtained, and a second segment that would not have significant, if any artificial recharge capabilities. A computer model would need to be developed for the selected demonstration areas (1). The model also needs to be able to predict the effect of pumping and recharge activities on water table depths and stream flow. The results of this pilot project would be used to evaluate and improve the current technology used to quantify pumping and recharge impacts on stream flows and thus improve the accuracy of administrative court decreed provisions.

4. **Demonstrate what effect phreatophytes are having on water resources in the South Platte Basin and ways of controlling phreatophytes.**

   At the very least, data needs to be developed that demonstrates how phreatophyte consumptive use is impacting the South Platte River Basin and its flow rates. A demonstration project should be developed in an area that contains phreatophytes in sufficient quantities to demonstrate that removal of a major portion of this material can be used to determine the effects phreatophytes are having on the water resource, including return flows. In addition, the demonstration project should evaluate various ways of controlling phreatophytes including removal and/or ground water depth reduction.

5. **Increase water storage within the South Platte Basin, specifically in the upper end of the basin.**

   Water storage projects (surface and sub-surface) within the basin need to be developed, approved and constructed expeditiously. By allowing increased water storage in the upper portion of the basin, numerous benefits could be realized including the ability to re-
time river flows, decreasing the amount of “free” water flowing to Nebraska and allowance for more augmentation opportunities if more water storage is available.

6. **Education.**

It was discussed that Colorado Farm Bureau already has an educational program set up called Colorado’s Farm and Ranch Future and that program could be modified to encompass water issues across the state, including those in the South Platte Basin. The CFB Board of Directors, the membership of CFB, and all Colorado citizens should be exposed to the full range of information that we as task force members have had the privilege to learn. We believe that through education CFB members will see the necessity to adopt a policy that will safeguard Colorado irrigated agriculture, making CFB a leader in correcting the current river administration mismanagement. Further, Colorado State University has announced the desire to start a new agricultural literacy program within Colorado. We encourage CFB to explore a cooperative program with CSU that will enlighten the population of Colorado to the plight of irrigated agriculture in Colorado. The support from the voting public will be necessary to effect a legislative change that will stop the waste of our water to Nebraska and instead, further boost Colorado’s economy.

7. **Manage both ground and surface water use so as to maximize the beneficial use to water right owners while protecting senior surface water rights from injury as required by 1969 statute.**

The task force believes that ground water could be pumped and better utilized to mitigate stream flows during drought conditions. The restriction of ground water pumping in order to force a full aquifer solely to provide surface water to senior surface appropriators does not necessarily maximize the available water and may not be the best use of the total resource.

8. **The State Engineer needs to be required to annually evaluate the adequacy of augmentation plans to prevent injury to senior rights.**

The State Engineer should be required to evaluate augmentation plans and other water use policies such as artificial recharge to assure maximum utilization of both ground and surface water for all South Platte Basin water users.

Current policies within the South Platte Basin are allowing significant water flow to Nebraska above and beyond compact requirement. Recent ground water measurements are measuring at an all time historic high. The existing high water tables and restricted irrigation pumping within the South Platte Basin has resulted in the significant flow of water from Colorado to Nebraska well above the level required by the current interstate water compact.
The State Engineer has retained jurisdiction in all of the court decreed augmentation plans to make adjustments in order to prevent injury and waste of our water resource. The State Engineer’s office should implement the retained jurisdiction provision in such a way that would maximize the beneficial use of Colorado water as required by the 1969 Act.

9. Evaluation is needed to determine what science and technology is needed to better utilize and better manage both ground and surface water resources within the South Platte Basin.

The Glover modeling method (AWAS) currently used for calculating stream depletions due to pumping and the river accretions due to artificial recharge is not as accurate as it needs to be. For example, the data collected by SPDSS data logger wells does not show that cones of depression caused by well pumping are accumulative for the many years of historic pumping (back to 1976). The status quo methodology used today is no longer acceptable and must be updated and enhanced in order to maximize the beneficial use of the entire resource.
I. INTRODUCTION

Water conflicts are a part of life here in Colorado and have been a part of our collective history, even before Colorado was a state. Conflicts have arisen between West Slope and Front Range interests, between urban and rural interests and even between interests within a particular basin.

The South Platte River Basin has been no stranger to water conflicts. The South Platte Basin covers an area of approximately 22,000 square miles in northeast Colorado. This area includes the Northern Front Range, Upper Mountain Counties, the Lower River Area, and the Eastern Plains. The largest cities in the area are Denver, Boulder, Fort Collins, Longmont and Greeley. The largest part of the projected population growth will be along the Front Range in Boulder, Weld and Larimer counties. It is estimated that this area’s population will almost double in size by the year 2030 to 1,608,000.

Approximately one-third of the Basin’s land area is publicly owned, and the majority of these lands are forested areas in the mountainous western portion of the Basin. The areas along the main stem of the South Platte River and its tributaries are irrigated farm land and urban development. The Lower River and Eastern Plains regions are a combination of irrigated ground, dry land farming and grasslands. The Pawnee National Grasslands are in the northeastern part of the basin area.

The South Platte River and its tributaries provide water for agricultural, environmental, recreational, municipal and industrial uses. These uses of water support a diverse and growing economy. The agricultural economy in the South Platte Basin is significant. Weld County agriculture alone contributes 1.1 billion dollars per year to the State’s economy. There are approximately one million acres irrigated in the South Platte River Basin below Denver. It is estimated that 18 percent of that area is irrigated by ground water only. The mainstream reaches of the South Platte from Denver to Orchard are irrigated with both ground and surface water. Some of the area downstream from Orchard to Julesburg is irrigated with only surface diversions or reservoir water because the underlying geology is not conducive to well production. With a few exceptions of those areas served with very senior water rights, the irrigated area is water short. In some areas the ground water pumping has exceeded the natural recharge and the aquifer is drying up.

There are approximately 9,000 decreed irrigation wells in the South Platte Basin. As many as 4,000 of those wells are partially or totally restricted from pumping which has had significant impact on the agriculture economy and forced bankruptcy on a number of farmers.

Until recently, the farming areas downstream of metro-Denver have been enjoying the use of Denver’s effluent discharges to supplement their river diversions. During recent years municipalities have placed emphasis on water conservation. By changing water appliances and discouraging excessive lawn irrigation, the per-capata daily water use has been reduced by 25%.
Denver has used the saved water to serve new customers, thus increasing consumptive use in the basin and reducing historic treated effluent used by downstream irrigators. Conservation practices which increase consumptive use will injure downstream water rights.

The drought of 2002 accelerated Denver’s efforts to capture all of their trans-basin effluent by diverting it into old gravel pits along the main stem of the South Platte River and use it to extinction. In addition, the metropolitan communities have been competing with agriculture to acquire both purchased and leased water resources. This competition for water has set the metropolitan areas and urban development in direct conflict with agriculture. Not only are the surface flows being restricted to downstream users, the water necessary for pumping augmentation plans has now either become unavailable or so high priced that agriculture cannot afford to acquire it. Thus, the cities have now made a significant impact on both the surface and ground water resource otherwise available to agriculture.

The basin is also impacted by the South Platte River Compact entered into between Colorado and Nebraska in 1923. The Compact requires Colorado, from April 1st to October 15th of each year, to curtail diversions in District 64 which are junior to June 14, 1897 in order to make available 120 cubic feet per second of water at the state line. In most years the Compact call will be in priority and thus come ahead of any rights junior to June 14th, 1897.

The issue of conflicts amongst various water interests within the South Platte Basin has spilled over and caused disagreeing opinions even within the agricultural community and The Colorado Farm Bureau has not been immune to these conflicts. For the past several years there has been substantial debate and discussions on the floor of the CFB delegate body.

At the CFB Annual Delegate Meeting in November, 2009 a motion was made on the floor to form a task force to look into the Junior well pumping versus Senior surface water right owners issues of the South Platte Basin. The Directive is as follows:

“CFB shall form a working group to find solutions to the ground water and surface water conflicts.”

In response to this motion, the CFB Board of Directors commissioned a task force made up of one Farm Bureau member from each South Platte River Basin county and CFB offers the following statement as a focus for the task force:

Recommend and report to the CFB Board of Directors what can be done from a public policy perspective to increase water usage in the South Platte River Basin given the real and current parameters set forth by current Colorado water law including the 1969 law, the 1974 augmentation requirements and Colorado Supreme Court decisions.

The CFB South Platte Taskforce was charged with completing a report in time to be considered by the CFB Board of Directors at the April 20, 2010 Board meeting.
The following members participated in the task force:

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<tr>
<td>Don Hirsch</td>
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<td>Jules Van Thuyne</td>
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<td>Bob Bee</td>
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<td>Dave Hernandez</td>
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<td>Jim Tomky</td>
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<td>Chuck Powell</td>
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<td>Veryl Eschen</td>
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<td>Gene Kammerzell</td>
<td>Weld County</td>
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<tr>
<td>Alan Foutz</td>
<td>CFB President (exofficio)</td>
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<td>Don Shawcroft</td>
<td>CFB Vice President (exofficio)</td>
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<td>Bruce Bosley</td>
<td>CSU Extension (Moderator)</td>
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II. Purpose and Objective....the Charge to the Task Force

As stated above, the purpose and objective of the task force was to complete the following charge:

Recommend and report to the CFB Board of Directors what can be done from a public policy perspective to increase water usage in the South Platte River Basin given the real and current parameters set forth by current Colorado water law including the 1969 law, the 1974 augmentation requirements and Colorado Supreme Court decisions.

The CFB South Platte Water Task Force met a total of five times. In those meetings, task force members were provided input from several individuals who made presentations regarding everything from water law history to South Platte Basin history and management to individuals presenting potential solutions to parts or components of the basin’s water conflicts.

The task force then spent substantial time discussing the data and information that was presented and debated and discussed areas of agreement and disagreement. The result of the CFB South Platte Water Task Force is this report.

III. Water History

The task force was presented with an ample amount of information pertaining to Colorado water law, water history and the history of court cases in Colorado.
Irrigation wells were first constructed in the South Platte Basin in the early 1900’s and farmers continued to drill them to supplement the direct surface water diversions and reservoir releases. Those direct flow diversions and reservoir releases were not adequate to provide a full dependable water supply for senior surface rights. Code, in his 1943 report, documents the existence in 1940 of over 1950 irrigation wells which pumped 220,000 acre feet of water. Over 80 percent of those wells were used to supplement the surface diversions. Well pumping was employed because the surface diversions plus reservoir water did not provide either a full water supply or a dependable water supply during droughts. Even the most senior water supply can benefit from well pumping.

**Historical Water Legislation in Colorado**

The primary water law in Colorado is the law of prior appropriations. Prior appropriations can be defined as, in short - “first in time/first in right.” This means that the first person to “beneficially” use water from a water body becomes the senior water rights holder (the water is appropriated), and has the right to continue to use that quantity of water for that purpose. The remaining water in the stream can be used by junior water rights holders, for their own beneficial purposes provided that they do not harm the rights of senior water users. The South Platte River Basin has three types of ground water: tributary ground water, designated ground water and non-tributary ground water. Tributary ground water is the water in the alluvial aquifer of the South Platte River and some of its tributaries. Designated ground water is the ground water in the Kiowa/Bijou, Lost Creek and Northern High Plains Designated Basins. Non-tributary ground water is the water in the Denver Basin bedrock aquifers. Only the tributary ground water is involved with the conflict due to pumping by irrigation wells on the flows in the South Platte River and potential injury to senior surface water rights. The same issue is present in the Arkansas and Rio Grande River Basins.

The tributary water of the South Platte River Basin is administered by the priority doctrine. The 1969 statute required all large capacity wells to obtain water court decrees and to be integrated into the priority system by 1973. It is those court decrees that specify the priority dates for the individual wells.

**The 1953 Act** established the process to license well drillers, it forbade waste of water brought to the surface by a well, and brought under the partial control of the CWCB all wells producing from a 3 inch or larger diameter pipe.

**Colorado Ground Water Law of 1957** established the following: required permits for drilling of new wells and increased use of existing wells. The permits were issued by the State Engineer. The permit for a well did not cover or create a water right; it was merely a necessary step to initiate the right.
The 1957 Act also established the Colorado Ground Water Commission and authority of the Commission to designate Ground Water Districts.

**Ground Water Management Act of 1965.** The most important part of the 1965 Act was that it required the State Engineer to make a finding prior to issuing a new permit to pump tributary ground water to irrigate new lands that there would not be injury to any other water right. This was the first statutory authority for the State Engineer to deny a permit. Because the South Platte, Arkansas and Rio Grande River Basins were all considered to be over appropriated in 1965, it resulted in the State Engineer denying new well permits to pump alluvial tributary ground water. The State Engineer could issue a new irrigation well permit to pump alluvial tributary ground water after 1965 only if there was a court approved augmentation plan in force.

**SB 67-407**, in response to the Fellhauer case, called for the State Engineer to preserve the status quo regarding wells and provided that well appropriators may, but need not, adjudicate their priority rights.

**Water Right Determination and Administration Act of 1969.** This act created seven water divisions corresponding to the seven major drainage systems and gave Water Court exclusive jurisdiction over water matters. The '69 Act also attempted to integrate ground water into Colorado’s water system with a stated policy of conjunctive use – requiring wells to be integrated into the priority system. The Act allowed for the creation of plans for augmentation and the substitution of water for exchanges to allow junior wells to pump out of priority.

The 1969 Act implemented the findings of the Fellhauer case and required that the ground and surface water be administered to maximize the beneficial use for all of Colorado’s citizens. The legislature recognized the need to pump ground water to supplement surface water supplies. They also recognized the need to prevent injury to other vested water rights while avoiding the waste of water.

Almost immediately after the enactment of the 1969 Act, the State Engineer promulgated well regulations for the South Platte River basin. These rules were challenged by a host of protesters who raised numerous objections, including well owners who wanted no regulation or curtailment of wells. The Water Court agreed with the well owners and permanently enjoined the operation of the 1969 rules. Soon after, the Colorado Supreme Court reversed the Water Court decision and the State Engineer immediately began work on new rules that eventually became the 1974 Amended Rules.

**HB 71-1205** - The General Assembly reacted to the dismissal of the 1969 Rules by enacting HB 71-1205, indicating that strict priority administration of wells was not intended but that well owners were expected to replace out-of-priority depletions. HB 71-1205 was another attempt by the General Assembly to integrate existing wells into the priority system and restrict the State Engineer's power to curtail these wells.
SB 74-7 - Authorized the State Engineer to grant temporary plans for augmentation after an applicant filed an application for a plan for augmentation in the water court.

1996 Act - Substitute Water Supply Plans (SWSP). The ’96 Act created a mechanism to replace out-of-priority depletions on an interim basis. It required that approved SWSP include stringent terms and conditions to ensure that operation of the plans will not injure other water rights.

HB 02-1414 – This Act allowed for special procedures for SWSPs that allowed the State Engineers Office to approve out-of-priority diversions subject to very limited conditions, provided that those operating under SWSPs had one year to file with the water court for approval of an augmentation plan. The General Assembly did not define the scope of the State Engineer’s Office's authority under the rulemaking power to approve SWSPs year after year with no augmentation plan pending before the Water Court.

SB 03-73 – This Act amended C.R.S. 37-92-308 to provide authority for the State Engineer to approve SWSPs for pre-existing wells for years 2003-2005, under interim standards. The Act went on to delete language that would have preserved the State Engineer’s authority to grant SWSPs indefinitely and stated that after December 2005, “the State Engineer’s Office shall not have the authority to grant approval for SWSPs unless they are operated pursuant to a decreed or pending augmentation plan. The Act also allowed for a grace period until December 2005 for well users by allowing pre-1972 wells to continue pumping out of priority pursuant to State Engineer’s Office-approved SWSPs. Finally, the 2003 Act mandated that after December 2005, the wells will be totally curtailed unless the well users can supply proof that they are awaiting adjudication of an application for an augmentation plan.

Due to the 2002 and 2003 statutes, all wells have to have a court decreed augmentation plan or an approved substitute supply plan while awaiting court action on their court application. The court decreed augmentation plans use the Glover (AWAS) method to quantify depletions. That method relies on many assumptions, which are not satisfied, and results in over estimation of depletions lasting for 20, 30, or even 50 years. Historic ground water level data do not support that estimation of depletive effect. This has resulted in River administration calls to expand from the 90-120 day calls from the 1940-2000 period to calls now being placed for 200-250 days or even year around. This increased period of call is one of the issues causing wells to be curtailed. Efforts must be undertaken to investigate how to keep the call off the River so wells can be allowed to pump within their own junior priority.

Historical Colorado Water Court Cases

Fellhauer v. People – 1967 - In Fellhauer v. People (1968), the court ruled that regulation of tributary wells to protect senior surface rights was constitutional and directed the State Engineer to promulgate reasonable rules, regulations and standards to maximize the beneficial use of ground water, while preventing material injury to senior water users.
Empire Lodge Homeowners’ Ass’n v. Moyer – 2001 - In *Empire Lodge Homeowners' Ass'n v. Moyer*, the Colorado Supreme Court Held that out-of-priority diversions required a decreed augmentation plan that authorized such diversion. The court went on to state that the Water Court did not abuse its discretion in enjoining Empire's out-of-priority diversions pending approval of a permanent replacement plan from the water court; and that (3) C.R.S. § 37-80-120 did not grant the State Engineer’s Office the authority to approve SWSPs.

The Empire Lodge case was a dispute between neighbors over a tributary of the Arkansas River, hundreds of miles away from the South Platte River Basin. However, the decision by the Division Two Water Court judge, later affirmed by the Colorado Supreme Court, aggravated the controversy along the South Platte River by expressly stating that the State Engineer’s Office exceeded its statutory authority in approving Empire's SWSPs for twelve consecutive years with no proof Empire had filed an application for an augmentation plan with the Water Court. This had significant implication to how GASP and Central Colorado Conservancy District had operated for 30 years.

Simpson v. Bijou Irrigation Co. – 2002 - In *Simpson v. Bijou Irrigation Co*, the Colorado Supreme Court held that the State Engineer’s Office could only approve SWSPs in accordance with House Bill 02-1414. The court further held that review and approval of augmentation plans were, and should remain, within the exclusive jurisdiction of the Water Court. The Supreme Court affirmed the water court's determination that the SEO's authority to approve SWSPs was restricted to the four narrowly defined situations set forth in the provisions of § 308. The Supreme Court went on to find that the State Engineer’s Office failed to preserve its existing authority to continue to grant SWSPs on a year-to-year basis, and failed to establish another legal basis for expanding this authority by claiming that, pursuant to § 308, the SEO could promulgate and implement rules and regulations for the South Platte River Basin.

Well Augmentation Sub-district of CCWCD v. City of Aurora – In *Well Augmentation Sub-district of CCWCD v. City of Aurora*, the Colorado Supreme Court held that the Water Court had the jurisdiction and authority to order the Sub-district to provide augmentation water for out-of-priority depletions due to well pumping that occurred prior to filing augmentation application and that replacement obligations must be based on surface water conditions absent well pumping.

**Conjunctive Use**

The issue of conjunctive use was thoroughly discussed within the task force. Conjunctive use in Colorado can generally be defined as “the use of surface water and ground water sources in a cooperative fashion to optimize the use of both resources for an entity’s water supply.”

Conjunctive use has been practiced in Colorado since the first irrigation wells were constructed in the early 1900’s. The wells were used to supplement the inadequate and undependable stream
diversions and reservoir releases. Our forefathers recognized that large capacity irrigation wells could be constructed and pumped when there were little or no flows in the rivers and the surface reservoirs were dry. Especially during the 1930’s, 1940, 1955-57, and 1964 drought years there were a large number of new wells drilled by individual farmers using their own money. Those expenditures were justified and the water was used to make a more reliable and dependable irrigation supply.

An integral part of conjunctive use in the South Platte Basin is the concept that the South Platte Aquifer is an underground reservoir that should be managed together with surface stream flows. What is surface flow at one point in the hydrologic cycle becomes ground water at some other point and vice versa. Conceptually, the South Platte Aquifer would or could be drafted heavily during dry cycles, and then recharged during wet periods by transferring surface water supplies underground. Surface water rights may be better served by the water stored underground if it could be pumped to the surface and beneficially used. There are significant benefits for ground water storage, such as elimination of evaporation from surface water and availability of storage space.

**Water Development on the South Platte River**

Well pumping since December of 2005 has been curtailed and many of the stipulated water court decrees for augmentation have relied upon artificial recharge as the source of augmentation water. Ground water levels throughout much of the South Platte River Basin have risen to an all time high; resulting in higher consumptive use by phreatophytes, significant increase in river flows and the delivery of over 187,000 acre feet of excess flow above and beyond the compact requirements for water year 2009 to Nebraska. Such management of both the ground and surface water use is not maximizing the beneficial use to the citizens of Colorado as required in the 1969 statute. To manage the ground water resource, administrators and managers need additional data such as historic water levels, current pumping data, and aquifer geologic parameters upon which to base their decisions.

**Colorado Big Thompson Project**

One of the largest distinguishing features of the Roundtable area water supply is the Colorado Big Thompson (C-BT) water project. The trans-basin water delivered by the project is equivalent to a second Poudre River. The C-BT is administered by the Northern Colorado Water Conservancy District and provides supplemental water to municipalities and farmers throughout northeastern Colorado. The largest water provider in northern Colorado, the Northern Water Conservancy District has played an important role in the development of water use and policy in Northeastern Colorado.
IV. DISCUSSION TOPICS

The following topics were highlights of the issues discussed by the Task Force:

A. State Commitment to Irrigated Agriculture:

The task force discussed the issue of the state’s commitment to irrigated agriculture. While the population in general has a favorable opinion of agriculture, political and social decisions do not always portray a strong commitment. The State of Colorado, because of the economic value and environmental contributions of irrigated agriculture, needs to take a stand to assure the availability of water for future years.

B. Discussion of conjunctive use in the South Platte Basin:

The task force had a thorough discussion regarding the methods of using South Platte Basin water in a conjunctive manner. It was recognized that the 10.5 million acre feet of water now stored in the ground water aquifer is a valuable resource. Especially during drought conditions it is essential to pump ground water by both irrigators and municipalities as stream flows will be greatly reduced and sources of water for augmentation will not exist. The challenge is to use existing technologies, new water use policies, and probably drilling and operating additional wells so as to provide water to senior appropriators thus preventing injury to senior water rights. To rely on outdated policies or operating procedures (use status quo) is not acceptable to maximize the beneficial use of both ground and surface water as required in the Fellhauer Case and the 1969 Ground water Administration statute. The report entitled “A Drought Relief Study In the South Platte River Valley Emphasizing Conjunctive Use” by the State Engineer’s Office dated January 1978, deserves further consideration as a way of solving the junior well versus senior water owner issue.

C. Development of a “management zone” for the South Platte Basin:

The task force embarked in a brief discussion regarding the recent development of the San Luis Valley Conjunctive Management Strategy, where folks in that basin are attempting to establish a management zone within the aquifer in that particular basin, with an added emphasis that no harm or injury could occur to senior surface water rights holders within the SLV. The task force discussed whether such a management strategy could ever be developed within the South Platte Basin. The task force concluded that there are numerous legal (mostly court ordered) hurdles that would need to be overcome before a similar strategy would have a chance to be implemented in the South Platte Basin. Further study is needed to explore what statutory changes could be made to allow a river basin authority for the South Platte similar to the Colorado, Rio Grande, Republican and Colorado Basins. The largest barrier to overcome to create such an authority would be to get the various water interests to accept the idea.
D. Maximum Beneficial Use:

The task force discussed the meaning of maximum beneficial use and the intent of the 1969 Act that referred to the term. The task force heard from Fred Anderson who was Senate President in 1969 when the legislation was adopted. In short, Mr. Anderson informed the task force that the legislative intent of the ’69 legislation was to use the water resource in the South Platte Basin in a maximum beneficial manner in such a way that would “do no harm to vested rights while not wasting water”.

The 1969 statute did not require every large capacity well to have a court decreed augmentation plan to prevent injury to senior rights. It was well recognized that by keeping the call off the river, more junior wells could pump out of priority without causing injury. That was substantiated by GASP and Central Colorado Water Conservancy District operation for over 25 years. In addition, using wells as alternative points of diversion for ditch diversions was considered and implemented in the early 1970’s.

The task force agreed that the term “maximum beneficial use” could generally be defined as “the use of water resources (both surface and ground water) within the basin in such a way that optimizes irrigated agricultural production in the basin.”

E. More Information is Needed:

While there is much information available regarding such topics as ground water table depths, pumping data, stream flow records, etc. it is not well organized and consequently is not being used effectively. We need to know what, if any, additional information is required to more accurately determine the relationship between ground water and stream flows. The task force heard a presentation on the present status of the South Platte Decision Support System (SPDSS). Based on this discussion it appears that the SPDSS is not yet completed and in its present form needs more development to be useful in determining the relationships between pumping on ground water levels and the overall effect on the river (See Appendix A).

Examples of the additional data needs along with comments received from Dr. Robert Longenbaugh are presented in Appendix B. The need for additional relevant data was confirmed by representatives from other organizations such as the Northern Colorado Water Conservancy District and the Central Colorado Water Conservancy District.

One of the issues regarding ground water data management is that there are several independent agencies and entities collecting ground water related data, but there is not a system available to integrate, coordinate and evaluate all the data being collected within the South Platte Basin. A public central data management system needs to be developed
and employed so as to monitor the state of our ground water resource and to provide data needed to conjunctively manage ground and surface water.

F. Reorganizing the State Engineers Office:

The Task Force discussed the need to divide the current responsibilities of the State Engineer’s Office. Currently, the State Engineer is responsible for the performance of regulatory activities such as data collection, managing the river and enforcement as well as engineering responsibilities. This provides a chance of being in a conflict of interest as well as diluting his efforts on any one area of responsibility.

It is necessary to return flexibility to how the State Engineer administers the system. In times of flood flows, snow melt runoff, and drought conditions with futile calls, it is essential that he make decisions that maximize water availability at that time and for the future. The current surface reservoir operating procedures are now dependent upon strict priority administration and do not allow storage out of priority that was up to the State Engineer’s discretion for over 50 years (1950-2000). Legislation may be necessary to return that flexibility to water administration.

The State Engineer must also be required to evaluate the adequacy of augmentation decrees to account for depletions caused by pumping and take administrative action to assure injury does not occur. Further, the State Engineer should also be required to determine if augmentation plans are over delivering water to the river in excess of the amount needed to replace pumping depletions. If that occurs, he should under his retained jurisdiction in all court decreed augmentation plans, make the necessary findings and administer the river so as to not waste water or require wells to over augment.

G. Effects of Pumping on local Ground water Levels:

The effects of pumping on local ground water levels were presented by Dr. John Halapaska and Dr. Robert Longenbaugh. Several hydrographs of well pumping data obtained by continuous monitoring of water table depths during pumping and recovery were presented (See Appendix C). Those charts show that well pumping results in lowering the water table and that recovery, in general, returns to the original ground water levels in a relatively short time. For much of the South Platte Alluvium, the spring to spring measurements return to the same elevation indicating that the aquifer is still full and under equilibrium conditions. There does not appear to be a carryover of drawdown coming from year to year and thus no carryover of depletions from year to year.

Dr. CharlesLeaf has estimated that the pumping of 234,000 acre feet of ground water in a drought year would only reduce river depletions resulting from non-augmented wells by only 17,000 acre-ft(1). Current regulations require full augmentation of estimated well
depletions and no wells in the alluvial aquifer can be pumped without an augmentation plan.

**H. Excess water in the lower end of the South Platte Basin:**

The task force discussed the issue of excess water in the lower end of the South Platte Basin and the amount of excess water leaving the state and going to Nebraska free of charge, particularly in “wet” years. The task force discussed several options to help alleviate this issue including the need for more storage within the basin. The task force agreed that it would likely make most sense to “catch” some of that water further up in the basin via storage prior to the resource getting to the lower end of the basin, where an excess exists. The task force also discussed the potential use of the aquifer underlying the South Platte Basin as a storage vessel and wells to “re-time” the river.

River flows in the lower end of the Basin are made up mostly from ground water which returns to the River. Most of the ground water outflow results from the deep percolation of irrigation water below the root zone. To reduce surface water outflows to Nebraska, it would require better management of the ground water higher up in the basin. By regulating pumping, artificial recharge and by lowering the water table in the alluvium, the ground water outflow and its timing could be managed to minimize downstream flows crossing the state line. Knowing the state of the aquifer’s conditions and administering well pumping, artificial recharge and surface applications it would be possible to reduce the flows to Nebraska and increase the amount of water that is used in Colorado.

The 1969 Administrative Act provides the statutory authority to maximize beneficial use. What remains to be done is to develop policies and cooperation among water right owners to implement water administration to meet that goal.

**V. CONCLUSIONS AND RECOMMENDATIONS:**

The members of the Task Force recognize the importance of return flows to the more junior water rights on the river. However, we feel that there needs to be a better understanding of the relationships between well pumping, water table depths and return flows. Only by a better understanding of these parameters can a defensible decision be made as to whether or not the alluvial aquifer can support a higher degree of conjunctive use. To support any decision, models should be based on measurable parameters such as pumping quantities, water table depths, and stream flows (return flows). Since the current status of the *South Platte Decision Support System* does not have these capabilities at the level required for this effort, additional development is required.
Too much time and money has been spent on such things as studies, “expert opinions” and computer programs that are not based on measurable parameters. The task force feels that the following recommendations would provide a basis for developing a better understanding of the relationships associated with irrigation activities and effects on stream flows and in the process demonstrate the State’s commitment to irrigated agriculture.

1. **Better Basin-wide data collection, coordination and evaluation.**

The South Platte Decision Support System has collected and assembled large quantities of hydrologic, geologic, and water rights data. This data has been entered into several data storage systems such as Hydro Base. It appears that detailed data to describe the ground water resource may be missing, although a number of agencies have collected water level data, pumping data, and geologic data in the past. An effort is needed to collect these scattered data and evaluate it for administrative and management decisions for the combined usage of surface and ground water.

2. **Reorganize Division of Water Resources into two separate Sub-divisions: State Engineer’s Office and Regulatory Division, or alternately, explore the development of a basin-wide management authority for the South Platte River Basin.**

In order to manage these activities, the Department of Water Resources should be reorganized and split into two sections: engineering and regulatory affairs. Under this scenario, the State Engineer then would be responsible for data collection and analysis while the regulatory division would be responsible to the administration and management of the state’s water resources. This type of reorganization would keep the State Engineer’s office and would be free from regulatory activities and hopefully be somewhat removed from political pressures that come with the administration of the water resource. Enabling language needs to be proposed giving specific authority to the Regulatory Division within the Department of Water Resources to administer the water resource in each of Colorado’s water divisions.

Or, as an alternative to the above suggestion, Colorado policy leaders need to explore the feasibility of establishing a River Basin Authority, such as now exists in the Colorado River Basin, Rio Grande Basin, Republican River Basin, and the Southwest portion of the Colorado River Basin, which would develop policies and construct facilities to maximize the use of both ground and surface water for all South Platte River Basin residents.

3. **Establish a pilot project that can demonstrate the effects of pumping and recharge on aquifer and stream levels.**

Two defined reaches of the river should be identified: one that contains all the basic parameters to be evaluated and any additional data requirements that should be obtained, and a second segment that would not have significant, if any artificial recharge capabilities. A computer model would need to be developed for the selected demonstration areas (1). The model also
needs to be able to predict the effect of pumping and recharge activities on water table depths and stream flow. The results of this pilot project would be used to evaluate and improve the current technology used to quantify pumping and recharge impacts on stream flows and thus accuracy of administrative court decreed provisions.

4. **Demonstrate what effect phreatophytes are having on water resources in the South Platte Basin and ways of controlling phreatophytes.**

At a minimum, data needs to be collected and developed that demonstrates how the consumptive use of phreatophytes is impacting the South Platte River Basin flows. A demonstration project should be developed in an area that contains Phreatophytes in sufficient quantities to demonstrate that removal of a major portion of this material can be used to demonstrate the effects on the water resource, including return flows. In addition, the demonstration project should evaluate various ways of controlling phreatophytes including removal and/or ground water depth reduction.

5. **Increase water storage within the South Platte Basin, specifically in the upper end of the basin.**

Water storage projects (surface and sub-surface) within the basin need to be developed, approved and constructed expeditiously. By allowing increased water storage in the upper portion of the basin, numerous benefits could be realized including the ability to re-time river flows, decreasing the amount of “free” water flowing to Nebraska and allowance for more augmentation opportunities if more water storage is available.

6. **Education.**

It was mentioned to task force members that CFB already has an established educational program component titled Colorado’s Farm and Ranch Future. That CFB educational program could be modified to encompass water issues as well. The CFB Board of Directors, CFB general membership and all Colorado citizens would benefit from exposure to the full range of information that we as task force members have had the privilege to learn. The task force believes that through education, CFB members and all Colorado citizens will see the necessity to adopt a policy that will safeguard Colorado irrigated agriculture, making CFB a leader in correcting the current South Platte River administration mismanagement. Further, Colorado State University has announced a new initiative with regard to an agricultural literacy program within Colorado. We encourage CFB to explore a cooperative program with CSU that will enlighten the population of Colorado to the plight of irrigated agriculture in Colorado. The support from the voting public will be necessary to effect legislative changes needed to stop the waste of Colorado’s water to Nebraska and in doing so, further boost Colorado’s economy.
7. **Manage both ground and surface water uses so as to maximize the beneficial use to water right owners while protecting senior surface water rights from injury as required by the 1969 statute.**

The task force believes that ground water could be pumped and better utilized to mitigate stream flows during drought conditions. The restriction of ground water pumping in order to force a full aquifer solely to provide surface water to senior surface appropriators does not necessarily maximize the available water and may not be the best use of the total resource.

8. **The State Engineer needs to be required to annually evaluate the adequacy of augmentation plans to prevent injury to senior rights.**

The office of the State Engineer should be required to evaluate augmentation plans and other water use policies such as artificial recharge to assure maximum utilization of both ground and surface water for all South Platte Basin water users.

Current policies are allowing significant flow to Nebraska above and beyond compact requirement. Ground water measurements in the fall of 2009 and again in the spring of 2010 are at an all time historic high. These high water tables and restrictions on irrigation pumping have caused the significant waste of Colorado water to no one’s benefit except Nebraska.

The State Engineer has retained jurisdiction in all of the court decreed augmentation plans to make adjustments in order to prevent injury and waste of the State’s water resource. The State Engineer needs to implement the retained jurisdiction provision in a way that maximizes the beneficial use of water as required by the 1969 Act.

9. **Evaluation is needed to determine what science and technology is needed to better utilize and better manage both ground and surface water resources within the South Platte Basin.**

The Glover modeling method (AWAS) currently used for calculating stream depletions due to pumping and the river accretions due to artificial recharge is not as accurate as it needs to be. For example, the data collected by SPDSS data logger wells does not show that cones of depression caused by well pumping are accumulative for the many years of historic pumping (back to 1976). The status quo methodology used today is no longer acceptable and must be updated and enhanced in order to maximize the beneficial use of the entire resource.
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