Colorado Aquifer Management
Groundwater and River Flow Connections
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POLICY CONSIDERATIONS FOR WATER ADMINSITRATION IN COLORADO

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1) General Comments
   a) This conference creates an opportunity for gaining knowledge and understanding of a very complex subject.
   b) Education is fundamental to understanding the complex world we live in including the self-evident responsibility of all of us to wisely develop and use our most precious resource-water.
   c) As with any scarce resource, it is our challenge to manage it in a responsible way that recognizes the many social, economic, administrative and legal frameworks that exist to govern our actions and reactions.
   d) As engineers and scientists we also understand the physical laws of nature that govern our natural world that we live within. We must learn to live within the limits of our environment.
   e) I am charged with maximizing the beneficial use of water in Colorado while protecting vested senior water rights. This has evolved to include the conjunctive use of surface and ground water.
   f) This level of conjunctive use is evident by the fact that over 8,300 high capacity wells have been developed in the South Platte basin. But as we have so painfully learned not only in the South Platte basin but many other basins in Colorado, we have exceeded the sustainable level of ground water use.
   g) I contend that the phrase "maximize beneficial use" does not mean that each water user gets to maximize their beneficial use. It is intended that the entirety of the resource be maximized.
   h) Water is a finite resource and thus we do not have unlimited use.
   i) We must endeavor to weave our way through the myriad of state and federal laws pertaining to statutes, case law, Supreme Court decisions, compacts, rules and policies instituted over 130 years to ensure they are as compatible as they can be with the physical system we are trying to administer. Herein lies the challenge.
   j) Users want regulatory certainty. But they also want a system that they think is fair and consistent and meets the most needs as possible while not creating undue burdens or unintended consequences.

k) We are here today and tomorrow to hear from many speakers on a variety of topics including the science behind the effects of ground water pumping to the natural stream.
l) I think we all can agree that science is critical to our understanding and ultimately in our decision making process.
m) But as Thomas Huxley once said "science is nothing but trained and organized common sense."
n) Our future goal should be to develop a sustainable use of water throughout the state and take whatever appropriate actions to get us there.
o) I am confident that we can get there if we are determined to move forward in a contemplative way.
p) However, we must first ensure that we have agreed to some basic fundamental positions.

2) Fundamental Considerations
   a) We must adhere to the basic tenets of the prior appropriation system. This was also the basis for the 2007 South Platte Task Force and is the foundation of our water administration system in Colorado.
   b) We are now managing a developed resource.
   c) Much of the appropriation of surface water on the South Platte predates any significant ground water development.
   d) Intuitively and according to case law, well owners need to have a means to ensure that their water use does not injure senior water users. The 1969 Act ensures that this gets done. The outcome of the legal and hydrologic conditions is that most wells on the South Platte have solid augmentation plans (even if some of them place limits on pumping based on projections).
   e) The effectiveness of augmentation plans is verified through the extensive use of monitoring water use and replacement. This accounting, through appropriate reporting, is critical to the effectiveness of any administration.
   f) Operation of augmentation plans should not result in unintended negative consequences (e.g., without implication, high ground water tables causing flooding to basements and fields)
   g) The largest obstacle to getting augmentation plans for the remaining wells is the availability of replacement water.
   h) At the end of the day, as administrators, we are bound to administer according to the laws and the decrees.
   i) However, this does not mean that we should not continue to look for opportunities to ensure that our system of administration is the best that it can be. We will continue to evolve in our administration due to many factors particularly with technology.

3) Creating a Sustainable Water Supply
   a) As I stated earlier, our future goal should be to develop a sustainable use of water throughout the state and take whatever appropriate actions to get us there.
   b) One definition of sustainability is the “development that meets the needs of the present without compromising the ability of future generations to meet their own needs. All the while, not materially injuring other water users with a senior right to the water”

c) The only location in the State where sustainability is required by statute is Rio Grande basin per SB 04-222.
    i) We have defined in our draft Well Measurement Rules that "Sustainable Water Supply" means a supply of ground water that is managed to match withdrawals from the supply with recharge to the supply, ensuring that existing and future ground water uses does not result in long-term mining of the aquifer. But even in the Rio Grande basin, new rules require a reconciliation of ground water use with surface water rights and interstate compact obligations.

4) Current Studies of Interest That Will Further Our Understanding and Knowledge (The first two I mention are in response to concerns raised initially by individuals impacted by high ground water levels)
    a) General Ground Water Investigations
        i) $500,000 (from the 2012 Projects Bill) plus an extra $100,000 from CWCB to update SPDSS Model through 2011 and to conduct investigations in two project areas (Sterling area and the Gilcrest/La Salle area)
            (1) These are principally baseline water level monitoring programs to determine the relative relationships between ground water inflows and outflows and the resulting affects on ground water levels.
            (2) Status updates for the Sterling investigation are provided on our website. The investigation in the Gilcrest/La Salle area is just now underway so no updates are currently available.
    b) South Platte Alluvial Aquifer Study (HB 12-1278)
        i) The Colorado Water Institute must conduct comprehensive studies of the available historical hydrologic data through water year 2011 to evaluate the effectiveness of the "Water Right Determination and Administration Act of 1969" in achieving the dual goals of protecting senior water rights and maximizing the beneficial use of both surface waters and groundwaters of the state. First study was done in 1967 to inform the General Assembly prior to enacting the 1969 Act. This study is basically being done to evaluate the effectiveness of the implementation of the 1969 Act.
        ii) Dr. Waskom with the CWI is the lead on this project with a spending authority of approximately $911,000 and will be provide a progress report to the Joint Ag Committee this upcoming session and the final report will be due to the entire General Assembly by December 31, 2013. A final presentation of the final report will then occur before the Joint Ag Committee during the 2014 legislative session.
        iii) THE CWI SHALL EVALUATE AND REPORT ITS FINDINGS AND CONCLUSIONS TO THE CWCB AND THE GENERAL ASSEMBLY REGARDING:
            (1) TO WHAT EXTENT AUGMENTATION PLANS ARE PREVENTING INJURY TO OTHER WATER RIGHTS HOLDERS OR POTENTIALLY CAUSING OVER-AUGMENTATION OF WELL DEPLETIONS;
            (2) WHETHER ADDITIONAL USAGE OF THE ALLUVIAL AQUIFERS COULD BE PERMITTED IN A MANNER CONSISTENT WITH PROTECTING SENIOR SURFACE WATER RIGHTS; AND

(3) WHETHER, AND TO WHAT EXTENT, THE USE OF WATER IN THE BASIN COULD BE IMPROVED OR MAXIMIZED BY AFFORDING THE STATE ENGINEER ADDITIONAL AUTHORITY TO ADMINISTER WATER RIGHTS WHILE ENSURING PROTECTION OF SENIOR SURFACE WATER RIGHTS.

c) The USGS has just released a report (*Streamflow Depletion by Wells—Understanding and Managing the Effects of Groundwater Pumping on Streamflow,* Circular 1376, 2012.) that validates many of the important hydrologic premises that currently guide ground water administration in the South Platte basin.

i) This report stresses the concept of equilibrium.

(1) Many findings in this report continue to support the scientific findings of prior studies and engineering and geologic investigations by consultants performed for many of the decrees for augmentation plans decreed by the water court.

(2) These findings include that the depletion as a net effect on stream flow is the same whether a stream is gaining or losing. Also, transient events such as changes in river stage or rates of aquifer recharge do not affect the timing of depletion by well pumping. Additionally, maximum depletion can occur after pumping stops, particularly for aquifers with low diffusivity or for large distances between pumping locations and the stream.

ii) This report emphasizes it is the sum total of stream flow effects caused by pumping in the entire basin that need to be managed.

5) Closing Remarks

a) I believe the ultimate goal of our actions must ensure sustainability of the entirety of all stream systems. It is not about extracting the most out of every resource but recognizing the delicate balance between maximum beneficial use, preservation, conservation and efficiency. We must maintain the health of our river systems just as we recognize the delicate balance in the health of the circulatory systems in our own bodies.

b) What history has taught us is that we behave wisely when we have exhausted all other alternatives. The future depends on what we do in the present.

c) We must resist the urge to hastily reject, modify or destroy the bridges we have built for the current administrative system. When you build bridges you can keep crossing them.

d) We must continue to involve all appropriate stakeholders in our decision making process.

e) Both the well users and the surface water users have been well represented by high-caliber attorneys and consulting engineers and have gone fairly through the water court process.

f) Although not perfect, our current system is one of the most robust and respected water administration systems anywhere. As many other western states are now undertaking the unenviable task of administering ground water to protect senior surface water rights they often look to Colorado for guidance on how to accomplish this.

g) We have more work to do but we are committed to working with all stakeholders in a collaborative way to address the many complex challenges we face.
h) Thank you for your attention and interest in this very important subject.