Suggestions Relating to the Reduction of Groundwater-Surface Water Conflicts & Related Economic Costs in the South Platte Basin.

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I have been working on the groundwater-surface water conflicts in our South Platte Basin since the 1970's and have been tangentially involved with the Idaho Department of Water Resource's attempts to resolve very similar conflicts on the East Snake River Aquifer. I offer just a few brief remarks that may be useful to the Task Force in its deliberations.

1) Appropriations doctrine has long served the western United States (and Colorado in particular) very well by allowing water supplies to be reallocated over time to meet changing and expanding demands..

2) Appropriations doctrine has been surprisingly flexible in adapting to changing demographic, agricultural and climatic conditions. Examples of useful modifications would include conditional water rights, arrangements for out-of-priority diversions and storage, recognition of instream uses (including recreation) as beneficial uses, legislative authorization of water banks in the major basins, authorization of rotating fallow lease plans, etc. These modifications have taken place while enforcing the "no injury rule", thus protecting property rights.

   Given this history, any modifications made to water law, water regulations and institutions will have to take place within the broad framework of appropriations doctrine.

3) The calls on the river that have resulted in the shut-down of wells in 2006 and 2007 have resulted in large economic net losses in the following forms:

   a) the immediate and complete shut-down of agricultural production on the affected farms;
   b) large related losses of income and employment in linked service and processing industries (ref. CWRRI completion report 207);
   c) substantial losses to other parties like the cities of Boulder, Highlands Ranch and a large number of agricultural ditches, all of whom were called out and had to forego valuable water diversions and storage as a result of the calls (Ellinghouse presentation to South Platte Forum, Nov. 2006).
   d) unquantified loss of the optimal use of the aquifer as our most efficient type of storage and as an efficient distribution system (Ralf Topper, USGS, "Nature's Underground Reservoir-Aquifer Storage", Roundtable presentation, July 2006).

Snyder and Coupal (2005) have determined that, in a similar situation, well shut-downs on the Eastern Snake River Aquifer in Idaho would cause losses that greatly exceed the eventual benefits to calling surface water users.

4) Any gains from well shut down to calling seniors will be very long in coming due to slowly rising water tables and aquifer-to-stream flows. This is not to deny that stream flows may be reduced for a long time in those reaches where water tables have declined steadily over time. However, not all reaches of the South Platte have experienced falling water tables in their tributary aquifers (Colorado Division of Water Resources, Pottorff, 2007, "Ground Water Levels in the Alluvial Aquifers of the Lower South Platte River Basin").

5) It seems to be assumed that pumping by unaugmented irrigators is the major cause of the surface shortage. In a very similar situation on the East Snake Aquifer in Idaho, the Idaho Department of Water Resources surface water-groundwater model has determined that the shortages on the Snake that have prompted calls are due 1/3 to drought conditions, 1/3 to recent changes from flood irrigation to sprinklers and 1/3 to groundwater pumping (Snyder & Coupal, Feb. 2005, "Assessment of Relative Economic Consequences of Curtailment of Eastern Snake Plain Aquifer Ground Water Irrigation Rights", report to the IDWR). Under Colorado regulations, pumpers must fully augment whenever there is a call, whatever the cause of the surface shortage. Water right and lease prices have now risen to unaffordable levels for most of agriculture. The Central WAS offered $ 200/acre-foot in 2006 and had no takers (Cech correspondence). This implies permanent loss of optimal use of the aquifer.

6) Water markets can play a central role in reducing these costs and alleviating the resultant conflict among parties in the Basin when appropriate conditions hold. In theory, one would expect those injured by calls to buy out or subordinate the callers if, indeed, the values of water to those injured exceed those of the callers. In a "perfectly functioning" water market, one would expect that priorities would, over time, come to be perfectly correlated with marginal values of water, e.g. senior rights would all be owned by cities, industries or perhaps high-valued recreational uses while junior rights would be owned by lower-valued users, probably crop agriculture. In such a situation, there would be no reason for calls and no remaining worthwhile water transfers.

7) The problem is that most water markets involve high "transactions costs"(Howe, Boggs and Butler, U. of Colo. Law Review, Vol. 61, Issue 2, 1990), i.e. legal, engineering and court costs, eliminating many otherwise beneficial water transfers. The effects of low transaction costs

have been illustrated by comparing the water market for native water rights in Division 1 with the market for shares of the Northern Colorado Water Conservancy District (Howe & Goemans, 2003, Jour. AWRA). The higher transaction costs in Division One for native rights result in large, relatively infrequent transfers while the low costs in the NCWCD result in frequent, small transactions, i.e. essentially a continuous market. The NCWCD conditions cannot be replicated elsewhere, but they suggest that *lowering transaction costs* will facilitate transfer transactions, moving in the direction of the smooth market described in (6) above.

8) How can transaction costs for water transfer and lease arrangements be reduced and worthwhile trades encouraged?

a) through extended rules of thumb for determination of consumptive use, eliminating the need for extensive engineering and agronomic studies;

b) through a clearer recognition of consumptively used water as a private property right that can be transferred with minimal regulatory supervision (MacDonnell, University of Denver Water Law Review, V. 10, Issue 1, Fall, 2006) while accepting profit from water transfers as a legitimate feature of efficient water use (CWCB vs. Vidler);

c) by allowing water to be "speculatively held" for future beneficial uses and getting away from the bugaboo of "speculation". Speculation has a role to play. We allow speculation through conditional rights. Most agricultural holdings have a large speculative component (High Plains case 2006).