

Plans for Augmentation

In 1879, Colorado enacted its first code for administration of water, "An Act to Regulate the Use of Water for Irrigation, and Providing for Settling the Priority of Right Thereto." The 1879 Act did not provide for the administration of ground water rights. Colorado inhabitants embarked on decades of unregulated ground water usage. The administration of ground water was in a state of great confusion. Water officials had no guidelines. Curiously, although Colorado was a leader in adopting a surface water doctrine, it was one of the last of the western states to deal with ground water.

The legislature first acted on this issue in 1953, but did not address priorities to the use of any water pumped from wells. In the Colorado Ground Water Law of 1957, the legislature did attempt to address a variety of administration issues. However eight years later, the 1957 Act was deemed insufficient and repealed with enactment of the 1965 Ground Water Management Act. It became the obligation and duty of the State Engineer to issue well permits upon finding that there would be no material injury to the vested rights of others. Any diversion of water that would cause material injury to senior appropriators would be curtailed. This placed a tremendous burden on the State Engineer.

The increasing number of wells in the state made the 1965 Act's deficiencies particularly acute. In 1929, there were less than 810 irrigation wells in Colorado. This number increased to approximately 8,900 by 1959 and nearly 14,000 by 1964. In the year 1965 alone, 5,911 wells were completed. As of the year 2000, Colorado had 25,800 registered irrigation wells, 3,200 municipal wells, and 195,000 exempt (domestic) wells.

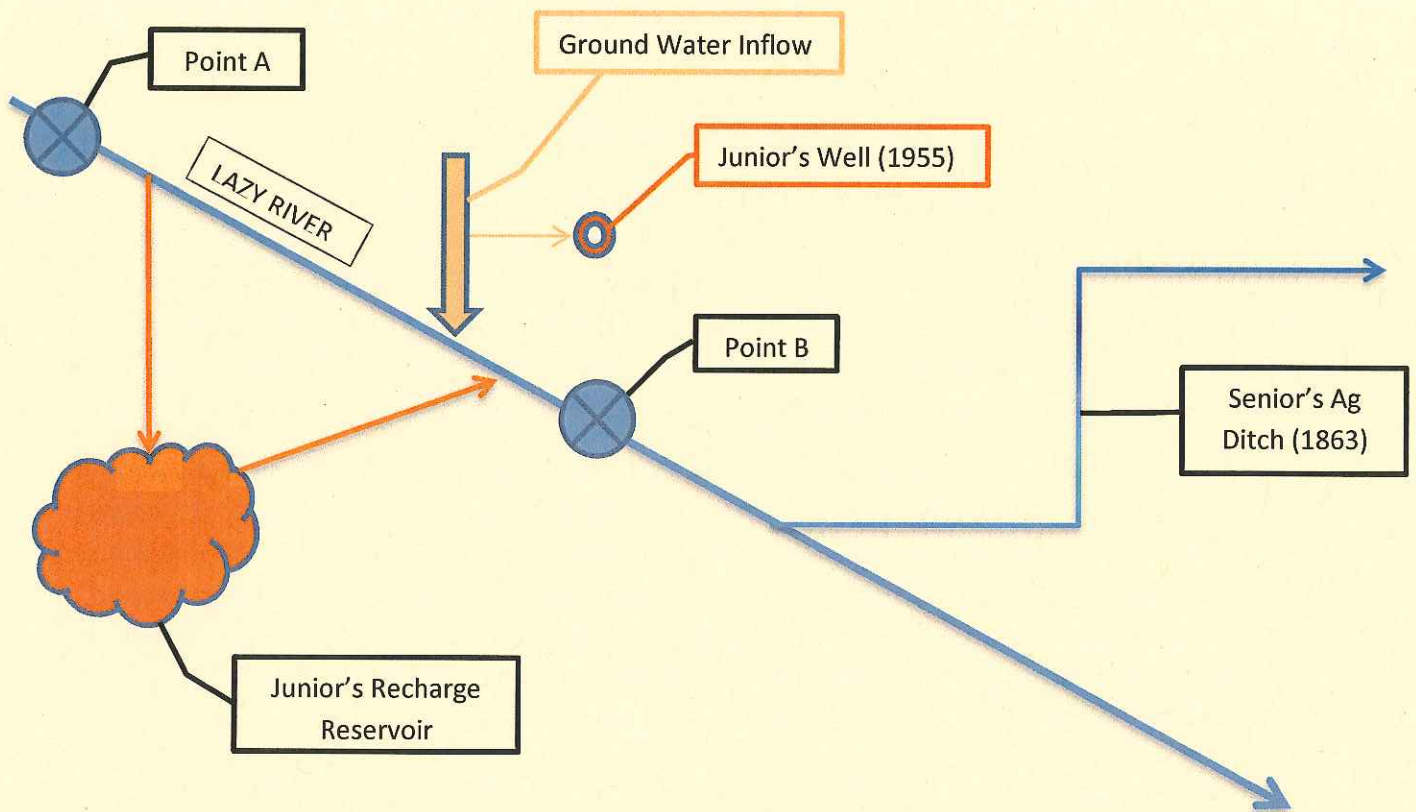
Again determining that existing law was inadequate, the legislature passed the Water Right Determination and Administration Act of 1969 to integrate surface and ground water and to promote the dual aims of protection of vested water rights and the maximum utilization of ground water. The 1969 Act has been amended many times by the legislature.

The Supreme Court found that if a river is fully appropriated at any time of the year, there is no unappropriated water available for wells - pumping must be curtailed if it would have an effect on satisfying a senior's water right. The impact of this requirement, particularly on irrigated agriculture, would be severe. However, wells could be permitted if they were covered under an augmentation plan.

A plan for augmentation is a detailed program to increase the supply of water available for beneficial use by providing substitute supplies of water, development of new sources, or by other appropriate means. Sources of water might include new recharge reservoirs, reusable return flows, and transferred agricultural water rights. Augmentation plans may be either temporary or permanent in duration.

Replacement water must be available not only in the correct quantity needed to prevent harm to other water users, but also at the time the other water users need the water. This also means that the plan may require continuation of replacement water even after the withdrawal of water ceases, if necessary to compensate for the delayed effects of water withdrawal. Only the calculated effects of well pumping on surface water (called stream depletions), and not the entire volume of water withdrawn by the wells, are replaced.

Prepared by the Colorado Water Congress. The above description is almost entirely direct quotes from Vranesh's Colorado Water Law by James N. Corbridge, Jr. and Teresa A. Rice.



Example

Prior to human activity, the Lazy River would typically flow at the rate of 8 cfs at Point A. Downstream, Ground Water flowed into the Lazy River at 2 cfs, and there would be 10 cfs at Point B.

In 1863, Senior's Ag Ditch was constructed with a capacity to divert the entire 10 cfs from the Lazy River. As long as there is at least 10 cfs in the Lazy River at Point B, Senior's water right is satisfied. If there is less water than this, Senior places a call on the river to have upstream water rights curtailed to meet demand.

Junior's Well is drilled in 1955 and can pump 1 cfs. This well intercepts Ground Water that would otherwise contribute to the flow to the Lazy River. This effect is called a stream depletion. However, at the time the well was drilled, Junior's Well could pump without consideration of its effect on the Lazy River.

Due to new legislation in 1969, Junior's Well would be shut down by the State Engineer unless the well depletion was covered under a plan for augmentation. Junior's computer model shows that the well's effect on the stream is not instantaneous. Stream depletion would be at a constant rate of 0.1 cfs and would continue for 20 years after the well stopped pumping.

So if there was 8 cfs at Point A, there would now only be 9.9 cfs at Point B because Junior's Well intercepted (depleted) 0.1 cfs of the 2 cfs Ground Water Inflow. Senior's Ag Ditch would be injured. Junior must augment the stream depletion when Senior's Ag Ditch water right is not satisfied (when there is less than 10 cfs at Point B).

Junior decides to develop an augmentation plan that would include a new Junior's Recharge Reservoir. When needed, water would be released from the reservoir to offset the stream depletion caused by Junior's Well (0.1 cfs). Because Junior's Recharge Reservoir would have a new water right, it will not be in priority very often. It must have a large diversion capacity to capture infrequent high stream flows and a large storage capacity to carry over water from season to season and possibly year to year.

WATER PLAN

REPORT ON ORGANIZATION AND OPERATIONS
OF
COLORADO WATER CONSERVATION BOARD
May 27, 1958

In accordance with your request I have studied the organization and operations of the Colorado Water Conservation Board. I have discussed its operations with a number of persons who are familiar with the Board's activities and I have read the minutes of the meetings of the Board in recent years. After making this review I have come to the conclusion that the Director's office is under staffed.

ORGANIZATION OF DIRECTOR'S OFFICE

As presently organized, the Director has to spend a large part of his time attending numerous meetings and on routine administrative matters. There are three Basin inter-agency committees that Colorado is concerned with, each of which holds from six to eight meetings a year. There are the Governor's conferences on water problems, meetings of the Upper Colorado River Commission, National Reclamation Association meetings, the Director has had to appear at hearings at Washington of the Bureau of the Budget and of the appropriation committees of Congress, and many others.

As a result of these many demands on his time the Director apparently has not been able to work as closely as he might have desired with the local water user groups and others interested in water utilization plans and problems. Some of the misunderstandings and lack of local agreement and support for the

these investigations and planning reports on all of the potential irrigation projects in Colorado are completed at the present rate of progress.

In order for Colorado to plan the best utilization of her remaining unused surface water supplies, she should know the comparative costs and benefits of all of these potential irrigation projects. Every effort should be made, therefore, to accelerate the investigations program. Colorado should urge and assist the Bureau of Reclamation to obtain sufficient funds to carry on this investigation program at a much faster rate.

GROUND WATER INVESTIGATION

The ground water supplies in Colorado are becoming of increasing importance in the State's economy and development and there is an urgent need for information as to the locations and extent of these supplies.

A survey is being made to determine where these underground water supplies are located and their extent under a cooperative agreement between the Board and the Geological Survey. The program is financed half by the State and with matching funds provided by the Federal Government.

This survey is proceeding satisfactorily except for rate of progress. At the present rate it appears that about 20 years may be required to complete the survey. The information and data are urgently needed not only to plan the best utilization of these underground water supplies but also for the proper administration of the Water Code. It is suggested that steps be taken

and maintain sewage treatment works, and would authorize any such municipality to enter into a contract with the commission concerning eligible projects. The bill contains provisions for commission payments for project costs not paid by the federal government.

HOUSE BILL 1367 BY REPRESENTATIVE SONNENBERG

Would provide that it is presumed that all wells drilled prior to July 1, 1967, that fall within the definition of Article 2 of Chapter 14, CRS 1963, in no way affect the prior adjudicated water rights of any flowing stream in the State of Colorado and have a vested right to such water. It would also provide that all ditch companies operating wells and intercept sumps which do not fall within the definition of riparian land right will be metered and charged back against the appropriation and adjudication of these ditch company decrees. The bill provides that those wells registered and in existence prior to July 1, 1967, shall have an adjudication separate from the adjudications of waters from flowing streams.

HOUSE BILL 1370 BY REPRESENTATIVES BURNS, et al

Would provide a moratorium until July 1, 1971 on the drilling of wells to pump water from the sub-surface channel of a continuously flowing surface stream or to increase the capacity of existing wells. The bill would not apply to wells now exempt or to replacement or substitute wells; and it would appropriate \$150,000 for a detailed study of ground waters in all basins of the state outside the boundaries of "designated ground water basins."

SENATE BILL 87 BY SENATOR OLIVER

Would create a state board of examiners of water well and pump installation contractors, and prescribe the duties of this board with respect to licensing and regulation of such contractors.

The commission would be composed of five members, three water well contractors, the State Engineer or his representative and a representative of the State Health Department.

Basic principles in the administration of the act would be: water wells shall be kept in a sanitary condition; wells shall be of adequate capacity to pump volume of water sought; wells shall not pollute water bearing formations; and the commission shall make rules and regulations to implement the provisions of the act.

The bill includes penalty clauses and gives the commission power to seek injunctions.

"We must learn how to manage our rivers of the sky for water supply just as we have learned how to manage our surface waters, our underground waters and the oceans. These four sources of water are all interrelated. Each feeds the others and each draws from the others in a never-ending hydrologic cycle. We must learn how to tap this cycle as needed in order to meet our future water requirements." (Interior Secretary Stewart L. Udall, April 4, 1967)

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LEGISLATURE AUTHORIZES WATER STUDY

THIRTY BILLS affecting the administration of Colorado's water laws were introduced into this session of the legislature. Under the general leadership of Senator Frank L. (Ted) Gill of Hillrose, twelve were agreed upon and passed, the most significant of which provide for alternate or supplemental points of diversion, for a study of water resources, and for relief to certain well appropriators from administration and adjudication pending the completion of the study. The following is a digest of these bills:

Senate Bill 141 by Senator Gill, et al

Amends 148-9-27, CRS 1963, to provide that any appropriator owning or claiming a water right for which a decree is sought or has been granted or has a permit to the use of ground water, may divert the volume of water sought or decreed at alternate or supplemental points of diversion, if this can be done without injury to any other appropriator, and if such right shall be evidenced by a court decree which the district court having jurisdiction may grant in accordance with procedures in other respects provided in this article for original adjudications or for transfer proceedings, as the case may be.

Senate Bill 407 by Senator Gill, et al

Provides for a water study to be made by the natural resources coordinator to investigate relationships in areas where intermingled surface and ground waters are commonly used for irrigation; to determine the need for legislation; to protect water rights and integrated use; to cooperate with any interim joint water committee; and to report findings and recommendations to the second session of the 46th or to the first session of the 47th general assembly.

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DEVELOPMENT OF MODEL PROCEDURES PURSUANT TO
PROVISIONS OF SENATE BILL 81
47th General Assembly
State of Colorado

Prepared for
The Colorado Water Conservation Board
Department of Natural Resources

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Water Resources Engineers
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November 1969

SECTION V. DISCUSSION AND RECOMMENDATIONS

Concerns to be quieted, and objectives to be met, by the various water users wishing to utilize provisions of Senate Bill 81 are different depending upon one's water situation. The objectives may not be in complete agreement with the objectives of the Legislature, water administration officials or the public as a whole. The recommendations set forth in this section attempt to satisfy the public interest as well as the interest of the water users. To some readers they will seem insufficient, and to others they will undoubtedly be "too far out."

Objectives and Concerns to be Met

The basic "public" objective of Senate Bill 81 is to obtain integrated appropriation, use and administration of ground water and surface water in order to maximize beneficial use of water in Colorado. This statement does not mean exactly the same thing to everyone. To the writers it means that ground water and surface water should be considered as one source of water, and that planned utilization of the water from combined supplies (with full consideration of their hydraulic interrelationships) is a goal which will lead to a better use of the total supply.

Water administration officials are concerned about the problems of controlling or regulating pumping because of the large number of wells. This could be very expensive to administer unless local entities such as ditch companies take on the responsibility of the ground water pumping within their systems.

Ditch companies are principally concerned about maintaining their rights and in keeping operating costs at a minimum. FPC Co. officials in particular are concerned about the apparent depreciation in value of their water rights. Because of this depreciation they are also concerned about the possibility that the more recent diversion records may be used by water administration officials to compute a "historical use" figure that will be used to limit their diversions in the future. Some concern has been expressed by FPC Co. Board members about possible well regulation, but little interest was expressed in the Company absorbing any responsibilities in this regard. It is assumed, however, that since the Company is made up of water users it should be interested in participation in whatever activities may help improve and stabilize the water supply situation of Company stockholders.

Five classes of water users have been identified within the FPC Co. gross service area, depending upon the source or sources of water used. The largest portion have direct-flow, reservoir, and ground water, insuring them of a firm water supply. That is, it has been a dependable water supply but may not continue to be as dependable because of impending well regulation. Obviously, because of the voting power, any major change in operating policy or responsibilities taken on by the Company will have to be of some value to water users within this group.