Report to the Colorado General Assembly

Water Resources Review Committee

Prepared by

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Water Resources Review Committee

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December 2016

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December 2016

To Members of the Seventy-first General Assembly:

Submitted herewith is the final report of the Water Resources Review Committee. This committee was created pursuant to Article 98 of Title 37, Colorado Revised Statutes. The purpose of this committee is to oversee the conservation, use, development, and financing of Colorado's water resources.

At its meeting on October 14, 2016, the Legislative Council reviewed the report of this committee. A motion to forward this report and the bills and resolution therein for consideration in the 2017 session was approved.

Sincerely,

/s/ Representative Dickey Lee Hullinghorst
Chairman

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This report is also available on line at:

https://www.colorado.gov/pacific/cga-legislativecouncil/2016-water-resources-review-committee

Committee Charge

The Water Resources Review Committee (WRRC) was created to contribute to and monitor the conservation, use, development, and financing of Colorado's water resources for the general welfare of the state (Section 37-98-102, C.R.S.). It is also required to review statewide planning for water resources. The committee is authorized to review and propose legislation to further its purpose. In conducting its review, the committee is required to consult with experts in the field of water conservation, quality, use, finance, and development. The committee was authorized to meet six times in 2016, including two times outside of the interim period, and to take three field trips.

Committee Activities

Meetings. During the 2016 interim, the committee held five meetings and took three field trips. The committee met with a broad range of water users and government officials, including local water providers, state water rights administrators, water quality regulators, state water planners, water project developers, and concerned citizens. The committee received briefings on major water issues affecting the state on topics including planning for future water needs; funding needs for state water agencies and water projects; regulation of groundwater use; implementation of new water laws; implementation of the Colorado Water Plan; and other issues.

Field trips. In June, the committee attended a two-day field trip in the Gunnison River Basin, where it visited water diversion and storage facilities, agricultural operations, and hydroelectric facilities. This tour was organized by the Colorado Foundation for Water Education. In August, the committee attended the Colorado Water Congress summer conference in Steamboat Springs, where it held a public meeting and attended presentations about water infrastructure financing, water planning, ongoing water supply studies, and other water management issues. In September, the committee conducted a field trip in the Lower Arkansas River Basin where it visited reservoirs, received briefings on alternatives to agriculture water rights transfers, and visited several agricultural operations. The committee also conducted field trips in the Lower Colorado River Basin and the Rio Grande Basin prior to holding meetings in those basins.

Funding for Reservoir Dredging

Recent funding for reservoir dredging. The 2016 Colorado Water Conservation Board (CWCB) Construction Fund Bill, Senate Bill 16-174, appropriated $1.0 million for reservoir dredging. The bill authorizes the CWCB to use the appropriation to conduct reservoir dredging projects in partnership with a water provider, such as a municipality, district, or irrigation company, subject to the approval by the CWCB with a cost share amount not to exceed 50 percent. The CWCB approved guidelines for the grant applications at its November 2016 meeting. The first round of applications is expected to be reviewed and approved by March 2017. The CWCB has received preliminary information about potential dredging projects for Prewitt Reservoir, Sterling Reservoir, Jackson Reservoir, and Bijou Reservoir.

Committee recommendations. The committee recommends Bill A which appropriates $5.0 million for FY 2017-18, from the CWCB Construction Fund for loans and grants to be used for dredging reservoirs located in the South Platte River Basin in order to restore their full decreed storage capacity. Up to $2.5 million of this appropriation may be issued as grants.

Irrigation Districts

Irrigation districts are formed by landowners under statutory guidelines to finance water infrastructure projects, such as dams and canals. There are 16 irrigation districts in Colorado. Irrigation districts own water rights that are diverted from a stream and allocated to landowners in the district based on the number of acres owned. Surplus water may be leased inside or outside the district for domestic, agricultural, power, or mechanical purposes only. Irrigation districts are funded by assessments on landowners and the proceeds from water leases. The committee heard testimony from two irrigation districts about difficulty they have experienced operating under current statutes that are obsolete or unnecessarily restrictive.

Committee recommendations. The committee recommends Bill B, which updates the 1921 Irrigation District Act. The bill addresses compensation for board members and election judges; clarifies the definition of agricultural land; allows an irrigation district to lease its surplus water for all beneficial uses; clarifies how irrigation district assessments are to be collected and held by district treasurers; eliminates the bonding requirement for district board members; and modernizes election procedures and procedures for selling surplus property. The bill also increases from $20,000 to $500,000, the amount of a contract or an eminent domain proceeding that requires voter ratification in a district election.

Graywater Use

In 2013, the General Assembly authorized the Water Quality Control Commission (WQCC) in the Colorado Department of Public Health and Environment (CDPHE) to promulgate a regulation with standards for the use of graywater. House Bill 13-1044 defined graywater as wastewater collected within a building from sources other than toilets and urinals, kitchen sinks, dishwashers, and non-laundry utility sinks.

Regulation 86. The WQCC adopted Regulation 86, also known as the Graywater Control Regulation, on November 9, 2015. Regulation 86 became effective on December 30, 2015. Following the WQCC promulgation of Regulation 86, HB 13-1044 allows counties and municipalities to adopt local graywater regulations. Where local graywater use is allowed, the governing body of the county or municipality must consult with the local board of health, local public health agencies, and any water and sanitation service providers serving the county, and must also provide for local enforcement of Regulation 86. HB 13-1044 also added graywater treatment works to the rule-making purview of groundwater management districts. Graywater use is limited to applications that are within the uses allowed under the well permit or water right of the original source(s) of the water.

Graywater regulation in other states. There are 26 states with regulations that specifically allow graywater reuse. Of those, 5 states permit graywater reuse using a tiered approach. A tiered approach may establish different permitting criteria based on the size of the graywater system and the risk of human exposure. Colorado and 12 other states regulate graywater reuse without a tiered approach, and 8 states restrict graywater reuse to irrigation use only.

Graywater use for research. According to testimony from Colorado State University (CSU), a residence hall on the CSU campus was built with graywater reuse capabilities. The residence hall reused graywater as part of a pilot research project for several years. Since the promulgation of Regulation 86, the residence hall is no longer allowed to operate its graywater reuse system.

Committee recommendations. The committee recommends Bill C, which authorizes the use of graywater for scientific research involving human subjects, and sets minimum requirements for conducting such research.

Division of Water Resources Statutes

The Division of Water Resources (DWR), also known as the Office of the State Engineer, administers over 150,000 water rights, issues water well permits, monitors stream flows and water uses, and represents Colorado in interstate water compact proceedings. It also inspects dams to ensure safe operations and to prevent catastrophic failures.

According to testimony from the division, its statutes contain some obsolete provisions, as well as outdated fees and language. For example, current law:

- requires appointed positions to post a surety bond as a condition of accepting an appointment to the division;
- limits the sources of grant funding the division may use for investigations, contracting projects, or general operations;
- references outdated monitoring technologies;
- includes a variable fee structure that is typically only assessed five to ten times annually and generates not more than $500 in fee revenue in any fiscal year;
- requires that the State Engineer survey, layout, and locate a ditch in the Arkansas River Basin; and
- contains other unclear or outdated provisions.

Committee recommendations. The committee recommends Bill D, which updates statutes related to the State Engineer and the division by removing obsolete provisions and modernizing language.

Funding for Aquatic Nuisance Species Control

Aquatic nuisance species are invasive animals, plants, and disease-causing pathogens that can impact the state's reservoirs, rivers, lakes, streams, and wetlands. These species are introduced accidentally or intentionally outside of their native habitat range. Because these nuisance species are not native to Colorado habitats, they have no natural competitors and predators, which allows them to reproduce rapidly and out-compete the native species. Once introduced to a habitat, most nuisance species are difficult to eradicate, and the cost of managing the nuisance species is high.

Zebra and quagga mussels are invasive aquatic nuisance species that pose a significant threat to aquatic wildlife and water quality in Colorado. Due to their hard shell and ability to rapidly reproduce, these species are capable of clogging water facilities and impairing the operation of dams, water treatment facilities, and power plants. The zebra mussel has spread

to 33 states, including Colorado, Kansas, Nebraska, and Utah. Currently Pueblo Reservoir is the only body of water in the state considered positive for the presence of quagga mussel; however, mussel larvae have been detected in several other water bodies in the state. The most common way these species are being introduced into Colorado waters is through recreational watercrafts. In 2008, the General Assembly passed the State Aquatic Nuisance Species (ANS) Act. The act makes it illegal to possess, import, export, ship, transport, release, plant, place, or cause an ANS to be released into a body of water in the state. The act also created and allocated funding for the ANS Program in Colorado Parks and Wildlife (CPW), in the Department of Natural Resources. As part of the ANS Program, CPW is authorized to inspect and, if necessary, decontaminate or quarantine recreational watercraft or motor vehicles used to transport a watercraft. According to testimony from CPW, a total of 103 boats coming into Colorado from out of state with attached zebra or quagga mussels have been intercepted at boat inspection and decontamination stations. These boats were found throughout the state at Blue Mesa Reservoir, Boulder Marine, Canon Marine, Carter Reservoir, Chatfield Reservoir, Lake Dillon, Horsetooth Reservoir, Pueblo Reservoir, and Williams Fork Reservoir, among others.

As a part of the ANS Program, CPW drafted the State Zebra and Quagga Mussel Management Plan in 2009. The main component of this plan includes the containment and prevention of the invasion of zebra and quagga mussels through watercraft inspection; decontamination; sampling and monitoring; education and outreach; communications and information; and applied research.

Committee recommendations. The committee recommends Joint Resolution A, which urges the U.S. Bureau of Reclamation, the United States Army Corps of Engineers, and the U.S. Forest Service to provide funding to CPW for implementation of the State of Colorado Zebra and Quagga Mussel Management Plan.

State Well Inspection Program

Division of Water Resources fees for well inspections. The DWR well inspection program was created to protect groundwater resources and public health. The program administers state laws concerning well construction and pump installation through inspections, complaint investigation, and education and outreach. Well inspection fees are used to pay for well inspections and other program activities. Due to recent declines in water well construction, the state experienced declines in well inspection fees and the number of inspectors and well inspections. The program currently consists of a chief well inspector and two well inspectors. The committee requested, but did not recommend, a bill to increase well inspection fees to pay for additional inspectors and to exempt the revenue from the constitutional spending limit, commonly known as the Taxpayer's Bill of Rights (TABOR).

Republican River Water Conservation District

Republican River Basin issues. In 2002, Colorado settled an interstate-compact dispute with Kansas and Nebraska concerning the use of the water in the Republican River Basin that is shared by the three states. The settlement agreement requires Colorado to limit its consumption to the amounts allowed by the Republican River Compact beginning in 2008, based on a five-year running average. It also placed a moratorium on new groundwater development in the basin. Most of the water used in Colorado's portion of the basin is used by irrigators who pump groundwater that is hydrologically connected to the Republican River. The

Republican River Water Conservation District was created by law in 2004 to address water supply challenges in the Republican River Basin and to help Colorado comply with the settlement agreement. The boundaries of the district are currently established by statute as the portion of the Republican River Basin that is located in Colorado. Specifically, the district includes Philips and Yuma counties and the portions of Kit Carson, Lincoln, Logan, Sedgwick, and Washington counties within the Republican River basin. There are approximately 570,000 acres of irrigated land in district. The district is governed by a 15-member board of directors who are residents of the basin and appointed by the commissioners of local counties, boards of ground water management districts, and the Colorado Ground Water Commission.

The district collects assessment fees from irrigation water users, as well as from other minor water users. For 2014, the district's total operating revenue was $7.4 million, $7.0 million of which was from irrigation assessment fees. The fees are collected by each county in the district. The district also uses federal moneys to offer financial incentives to producers who voluntarily retire water rights to reduce consumptive use to the stream flows. It is also paying for a $60 million pipeline project. The water source for the pipeline comes from existing irrigation wells with pumping limited to historic use. The compact compliance pipeline was completed on April 4, 2014. The committee requested, but did not recommend, a bill to expand the boundaries of the district to include areas where groundwater pumping depletes the flow of the Republican River.

Issues of Ongoing Interest

Implementation of Colorado Water Plan

Governor's executive order concerning the Colorado Water Plan. In 2013, Governor Hickenlooper issued an executive order directing the CWCB to commence work on the Colorado Water Plan (CWP). According to the Governor's executive order, the CWP must promote a productive economy that supports vibrant and sustainable cities, viable and productive agriculture, and a robust skiing, recreation, and tourism industry. It must also incorporate an efficient and effective water infrastructure promoting smart land use and a strong environment that includes healthy watersheds, rivers and streams, and wildlife. The final draft of the CWP was released on November 19, 2015.

Senate Bill 14-115. In 2015, the legislature enacted legislation to guide the development of the CWP. Senate Bill 14-115 declares that the General Assembly is primarily responsible for guiding the development of state water policy. It also declares that the law is necessary to protect the interests of the public in the state's water resources and that the General Assembly intends to engage the people of the state in a public dialogue regarding optimal state water policy. The law also affirms the legislature's delegation of policy-making authority to the CWCB, and declares that the law seeks to promote the policies, processes, basin roundtable plans, and Interbasin Compact negotiations conducted pursuant to the "Colorado Water for the 21st Century Act," and the Interbasin Compact Charter. The law required the WRRC to hold at least one public hearing in each geographic region associated with basin roundtables to collect feedback from the public on the scope, fundamental approach, and basic elements of the draft CWP. These hearings occurred during the 2014 and 2015 interims.

Next steps in the Senate Bill 14-115 process. Pursuant to SB 14-115, the WRRC may repeat the review process for the CWP, including public meetings in each basin, whenever the CWCB submits a significant amendment to the plan. By November 1 of each year following the submission to the committee of a plan or plan amendment, any member of the General Assembly may request that the WRRC hold one or more hearings to review the plan or plan amendment. No later than November 1, 2017, and every five years thereafter, the committee is also required to prepare a list of specific topics that it deems necessary to be addressed in the plan. The CWCB must provide its recommendations, including suggestions for potential legislation, for the committee's consideration within eight months after receipt of the list of specific topics.

Implementation of the CWP by the CWCB. In 2016, the legislature authorized an annual appropriation of $5.0 million from the CWCB Construction Fund to the CWCB for studies, programs, or projects that implement the CWP. CWCB staff has recommended the following uses for the 2016 appropriation:

- $1.0 million to support efforts with watershed-level flood and drought planning and response;
- $0.5 million for grants to provide technical assistance to irrigators for assistance with federal cost-sharing improvement programs;
- $1.2 million for water forecasting and measuring efforts;
- $1.3 million to update reuse regulations, as well as to fund a training program for local water providers to better understand AWWA's methodology for water loss control; and
- $1.0 million to support the Alternative Agricultural Water Transfer Methods Grant Program.

In 2016, the legislature also appropriated $1.5 million for fiscal year 2016-17 from the CWCB Construction Fund to the CWCB to support watershed health goals outlined in the CWP. According to this law, the CWCB may use these moneys for planning and engineering studies, including implementation measures, to address technical needs for watershed restoration and flood mitigation projects, aquatic habitat protection, flexible operations for multiple uses, restoration work, quantification of environmental flow needs, and monitoring efforts.

The committee received a briefing from the CWCB on how it plans to implement the CWP. The CWCB testified that it developed a plan to create a repayment guarantee fund, bolster the Water Supply Reserve Fund program, and support several education, conservation, reuse, and agricultural viability actions identified in the CWP. At its November 2016 meeting, the CWCB authorized draft legislation to authorize the following transfers from the CWCB Construction Fund:

- a one-time transfer of $30 million into a repayment guarantee fund;
- a transfer of $10 million for the Water Supply Reserve Fund for water supply projects;
- a transfer of $5 million for the Watershed Restoration Program for the development of stream management plans; and
- a transfer of $10 million for additional non-reimbursable CWCB programming to implement the CWP.

Land Use Planning and Water Efficiency

According to the Governor's executive order, the CWP must incorporate an efficient and effective water infrastructure promoting smart land use. The CWP sets a local land use goal that states, "by 2025, 75 percent of Coloradans will live in communities that have incorporated water-saving actions into land-use planning." The CWCB has pledged to work with the Department of Local Affairs (DOLA), local governments, water providers, local government associations, councils of governments, and homebuilders associations to help reach this goal. The CWP also calls for the encouragement of the use of local development tools, the examination of barriers in state law, the incorporation of land-use practices into water conservation plans, partnerships among water providers and local communities, and funding for land use planning and water efficiency projects.

Senate Bill 15-008. Recommended by the WRRC, SB 15-008 directed the CWCB, in consultation with DOLA, to develop and provide free training programs for local government planners regarding best management practices for water demand management, water efficiency, and water conservation. The CWCB must also make recommendations regarding how to better integrate water demand management and conservation planning into land use planning. The committee heard testimony from the CWCB, DOLA, water providers, and other interested organizations about recent efforts aimed at improving the integration of land use planning and water efficiency, as well as the implementation of SB 15-008. In September, October, and November 2016, DOLA, in partnership with the CWCB and the Pace University Land Use Law Center, hosted a series of webinars targeted at Colorado water providers and local government planners regarding the integration of water efficiency into land use planning.

Water Loss Audit Reports

American Water Works Association manual. The American Water Works Association (AWWA) publishes an industry standard manual for calculating and reporting water losses: *Water Audits and Loss Control Programs, Manual M36*. Manual M36 is commonly used by major water utilities in the United States for water loss accounting. AWWA recommends that drinking water suppliers conduct a water loss audit on an annual basis, and has made software available at no charge for reporting water losses. Manual M36 accounts for both real losses and apparent losses. Real losses are defined as physical losses from the distribution system. These losses can inflate a water utility's production costs and stress its systems. Apparent losses are the non-physical losses that occur in utility operations due to customer meter inaccuracies, systematic data handling errors in customer billing systems, and unauthorized consumption. These losses can cost utilities revenue and distort customer data.

Colorado standards for water loss audit reports. Current law requires water providers that distribute 2,000 acre feet or more each year (covered entities) to adopt a water use efficiency plan, through which covered entities must consider distribution system leak identification and repair programs, as well as several other potential water saving measures. House Bill 10-1051 created a requirement that the CWCB adopt guidelines, with input from stakeholders, for water providers to report water use and conservation data for water supply planning purposes. Since 2014, covered entities have been required to report water loss data to the CWCB annually. The committee heard testimony from the CWCB and water providers concerning the implementation of HB 10-1051 and current practices for managing water losses. Using the AWWA M36 water loss methodology, the CWCB testified that it trains water providers on water audits and loss control programs through workshops held throughout the state. The CWCB also provides information to assist covered entities in developing their water use

efficiency plans. Covered entities often provide the CWCB with an annual water loss audit report that uses methodology from the AWWA Manual M36; however, if this data cannot or is not provided by a covered entity, the CWCB estimates annual water loss on behalf of the covered entity.

Colorado Water Plan. Through the development of the CWP, the CWCB found that water loss auditing and metering are foundational water efficiency measures. The CWP states that every water utility should implement such activities. The CWP cites the AWWA M36 water loss methodology as the standard for reliably measuring water flow and properly accounting for water loss. The Statewide Water Supply Initiative, conducted by the CWCB in 2010, estimated that between 39,100 and 70,100 acre-feet of water could be saved in Colorado by 2050 through water loss control measures.

House Bill 16-1283. In 2016, the House Agriculture, Livestock, and Natural Resources Committee postponed indefinitely House Bill 16-1283. The bill would have required covered entities to submit a validated water loss audit report to the CWCB on or before June 30, 2018, and on or before June 30 of each year thereafter. The bill also required the CWCB to adopt guidelines for the water loss audit report and to establish a score that a covered entity's water loss audit report should attain. The bill would have also authorized the CWCB to award water efficiency grants to covered entities for validation assistance with the required water loss audit reports and to provide technical training and assistance to guide a covered entity's water loss detection programs.

Rising Groundwater in the South Platte River Basin

House Bill 12-1278 study. In 2012, the General Assembly passed House Bill 12-1278, which directed the Colorado Water Institute at Colorado State University to conduct a study of the South Platte alluvial aquifer and the management of the water system in the South Platte River Basin. As part of this study, the Colorado Water Institute examined localized areas of high groundwater that are occurring in the basin near the communities of Fort Morgan, Gilcrest, Julesburg, and Sterling. The results of the study were reported to the General Assembly on December 31, 2013. The report determined extensive development of recharge ponds and changes in groundwater pumping in the past decade have likely changed local groundwater conditions. The report's recommendations include:

- the mitigation of localized high water table conditions by the State Engineer;
- the development of two pilot projects allowing the State Engineer to track and administer high groundwater zones to lower the water table in the area;
- the establishment of a framework for the voluntary movement of excess water supplies between augmentation plans;
- the development of uniform and transparent reporting standards for augmentation plan accounting;
- the implementation of basin-wide management through the development of a basin-wide groundwater monitoring network; and
- the creation of basin-specific guidelines for the implementation of administrative curtailment orders that reduce waste and facilitate efficient management.

Legislation implementing study recommendations. In response to the recommendations of the study conducted in accordance with House Bill 12-1278, the General Assembly passed three pieces of legislation – House Bill 15-1013, House Bill 15-1166 and House Bill 15-1178. The committee heard testimony from the Special Policy Advisor to the Governor on Water and a representative of the Groundwater Technical Committee on implementation of these laws. The committee also heard testimony from communities impacted by the rising groundwater. House Bill 15-1013, which was recommended by the Water Resources Review Committee, implemented two recommendations of the HB 12-1278 study report for the mitigation of localized high water table conditions. The bill required the CWCB and the State Engineer to select two pilot projects to test alternative methods of lowering the water table in areas in the basin experiencing damaging high groundwater levels. One of the pilot projects was to be either located near Gilcrest or LaSalle, with the other being located in Sterling. The bill also required the division engineer to analyze potential changes in the groundwater levels downgradient of the proposed recharge structure resulting from its operation. The first pilot project was located in the town of Gilcrest and was funded with grant money in accordance with House Bill 15-1178. The Gilcrest pilot project ended in November of 2016.

House Bill 15-1166 created a basin-wide tributary groundwater monitoring network in the South Platte alluvial aquifer. The State Engineer is tasked with the design and operation of the monitoring network, which consists of:

- wells in the existing DWR monitoring network with the addition of up to 20 data loggers to collect data and up to 10 new wells to fill data gaps identified by the South Platte Basin Roundtable;
- wells that are part of an independent monitoring network owned by qualified parties other than DNR; and
- wells owned by a state agency, water conservancy district, special district, county, municipality or other unit of state or local government.

The law directed the State Engineer, in consultation with the CWCB and the public, to develop and publish one or more protocols for groundwater level data measurement, data collection, and data entry. To date, 25 wells have been added to the network, and equipment used for data collection has been purchased for each of the wells.

House Bill 15-1178 created the Emergency Dewatering Grant Program and directs the CWCB, in collaboration with the State Engineer, to develop criteria and guidelines and the accompanying real-time collection for the program. As part of the program, the CWCB and State Engineer award grants for emergency pumping of wells permitted for dewatering within or near Gilcrest and Sterling. The CWCB was directed to seek input from the South Platte Basin Roundtable on the general costs associated with dewatering and the infrastructure needed to implement the dewatering program. As part of this program, four grants have been distributed to provide funding for several projects. In the town of Gilcrest, grant money funded the School Well Dewatering System and the Dewatering and Conveyance Improvement Study, which was completed in October 2016. Grant funding was also awarded to the dewatering pilot project in the town of Gilcrest and to help fund the Pawnee Ridge Dewatering System.

Compact Water Banking

According to the CWP, a water bank is a type of alternative transfer method that acts as an intermediary or broker based on water supply arrangements with owners of certain water rights. A water bank could potentially help the state avoid or endure a curtailment under an interstate water compact. For example, under a water bank arrangement, irrigators could be paid to reduce consumptive use, which could trigger the fallowing of agricultural lands or deficit irrigation practices on a temporary basis. The saved water could then be "banked" in a reservoir for later release into the system to help meet requirements of an interstate water compact. This type of approach is currently being investigated in the Colorado River basin.

The committee heard testimony about a proposed Colorado River water bank. The Colorado River Water Bank Working Group consists of the Colorado River Water Conservation District, the Southwest Water Conservation District, the Front Range Water Council, the Nature Conservancy, the CWCB, and other interested parties. According to the CWP, a Colorado River water bank could operate as a demand-management component of the state's contingency plan to prevent reservoirs from dropping below critical levels. In the long term, it could also help prevent shortages under the Colorado River Compact and assist Colorado River water users during water shortages. Recent studies have examined several scenarios that estimate annual usage and the number of irrigators willing to participate in a water bank in the Colorado River basin. The CWCB continues to study the feasibility of water banks.

Alternatives to Agricultural Water Rights Transfers

Impacts of agricultural water transfers. A water right is a property interest that may be sold or transferred, provided that no other water right is injured and the transfer is approved by the division water court. Currently, most of Colorado's water is used for agriculture. Agricultural water rights are also some of the most senior rights in Colorado. Large tracts of agricultural lands have been taken out of production to provide water to Colorado's growing municipalities, especially in the lower Arkansas River basin and the South Platte Basin. Permanently transferring a water right from a farm to a municipality may adversely affect local agricultural economies. Farms that have sold their water rights typically pay less property tax, employ fewer persons, and no longer purchase agricultural supplies from local businesses. The Statewide Water Supply Initiative estimates that by 2050, Colorado may lose 500,000 to 700,000 acres of currently irrigated farmland to meet municipal growth demands. The committee conducted a two-day tour of the Arkansas Basin. It visited water diversion and storage projects in the basin, as well as a project sponsored by the City of Aurora, called the Arkansas Valley Range Project, that is restoring over 20,000 acres of lands affected by agricultural water rights that were transferred to the city.

Implementation of House Bill 13-1248. As part of its Arkansas Basin tour, the committee also met with representatives of the Lower Arkansas Valley Water Conservancy District to learn about the Catlin–Fallowing-Leasing Pilot Project that implements House Bill 13-1248. Specifically, HB 13-1248 authorizes the CWCB to administer a pilot program to test the efficacy of fallowing-leasing as an alternative to permanent agricultural dry-up. The pilot program may consist of the selection of up to ten separate pilot projects, each lasting up to ten years in duration, to test the practice of fallowing irrigated agricultural land and leasing the associated water rights for temporary municipal use. The district provided an economic and engineering analysis of the Lower Arkansas Valley Super Ditch Company, also known as the "Super Ditch." The Super Ditch enables irrigators under a group of ditch companies to collectively lease agricultural water for other uses, including municipal use. The

Super Ditch acts as a negotiating entity for irrigators that are interested in leasing water for temporary use by cities, towns, water districts, and other users. Under this program, the farmers retain ownership of their water, keeping farms in operation for agricultural sustainability. The Catlin Fallowing-Leasing Pilot Project was authorized by the CWCB in 2014. It involves 6 farms that receive water from the Catlin Canal, totaling 902 acres. The project is allowed to fallow up to 30 percent of these lands and deliver up to 500 acre-feet of water per year to three municipalities: Fowler, Fountain, and Security.

Groundwater Management in the Rio Grande Basin

Implementation of Senate Bill 04-222. The committee conducted a half-day tour of the basin and held a public meeting to learn about water management issues in the Rio Grande Basin, including the implementation of Senate Bill 04-222, which is intended to help address depleted groundwater resources. Senate Bill 04-222 requires the State Engineer to manage the use of groundwater consistent with the prevention of material injury to senior surface water rights in the basin. It also requires the State Engineer to maintain a sustainable groundwater supply and preserve the state's ability to comply with the Rio Grande Compact. In response to the 2004 law, the State Engineer and the Division of Water Resources developed a groundwater model to assess the impact of groundwater pumping on senior water rights and to help administer water rights in the Rio Grande Basin. They also drafted rules to regulate groundwater withdrawals in the basin and identified alternative methods to protect senior water rights from the impacts of groundwater pumping, including augmentation plans to offset pumping depletions, participation in subdistricts of the Rio Grande Water Conservation District, substitute water supply plans, and ceasing groundwater pumping altogether.

At the committee's public hearing in Alamosa, the General Manager of the Rio Grande Water Conservation District discussed the formation of subdistricts of the RGWCD and identified measures to stabilize groundwater levels in the subdistricts, including retirement of irrigated acres and groundwater recharge. Subdistrict No. 1 was formed in 2006 and Subdistrict No. 2 was formed in 2016. Currently, Subdistrict No. 1 is the only subdistrict in the San Luis Valley that is operating under an approved groundwater management plan and annual replacement plan that is remedying injurious stream depletions. Several other subdistricts are in the process of being formed to help manage groundwater resources in the basin.

Lead in Drinking Water Systems

Lead, a naturally occurring metal, can be found in all parts of the environment and is used in a wide variety of products found in and around the home. Drinking water is the most common source of lead, but lead-based paint, certain home remedies, duster oils, and plumbing can also result in lead exposure. Excess lead exposure is related to developmental problems in young children but can also result in more long-term health problems for adults. Lead most often enters drinking water through corrosion inside water service lines and household plumbing materials. Service lines are the pipes that connect a water system's main distribution pipe in the street to individual household plumbing. The most common problem is with brass or chrome-plated brass faucets and fixtures with lead solder from which significant amounts of lead can enter into water, especially hot water. Homes built before 1986 are more likely to have lead pipes, fixtures, and solder. The committee heard testimony from representatives from the Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment regarding lead in drinking water, the Safe Drinking Water Act (SDWA), and the

Lead and Copper Rule (rule), which addresses the level of lead and copper in public drinking water systems. In Colorado, the WQCC and the Water Quality Control Division are responsible for implementing the SDWA.

The Safe Drinking Water Act. The SDWA was originally passed by Congress in 1974 to protect public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources, such as rivers, lakes, reservoirs, springs, and groundwater wells. The law does not regulate private wells which serve fewer than 25 people. The SDWA authorizes the EPA to set national health-based standards for drinking water to protect both naturally occurring and man-made contaminants that may be found in drinking water. Originally, SDWA focused primarily on treatment as the means of providing safe drinking water. Amendments made in 1996 greatly enhanced the existing law by recognizing source water protection, operator training, funding for water system improvements, and public information as components of safe drinking water. The SDWA applies to most public water systems in the country. The responsibility of ensuring safe drinking water is delegated to the EPA, states, Native American tribes, water providers, and the public, depending on jurisdiction.

The SDWA specifies the maximum allowable lead content to be 0.25 percent for pipes, plumbing, and fixtures, calculated as a weighted average, or 0.2 percent for solder and flux. In order to address the corrosion of lead and copper into drinking water, the EPA issued the rule under the authority of the SDWA in 1991. The rule has been revised several times and requires public systems to monitor drinking water at customer taps. If lead concentrations exceed a certain amount in more than 10 percent of customer taps sampled, the system must take action to control corrosion. If a certain concentration level is exceeded, the water system must also inform the public about steps they should take to protect their health. Additionally, that water system must take additional actions to control corrosion. Schools or day care centers that receive water directly from a city or other public water system and do not have their own sources are not directly regulated under the rule. However, according to the EPA, it is actively advocating to amend the rule in order to include public schools and day care centers.

Effect of Conservation and Efficiency on a Water Right

Some water users are concerned about decreasing the value of their water right by reducing diversions through conservation or efficiency measures. The committee received a briefing from Colorado State University's Colorado Water Institute and the DWR about efforts to help irrigators increase water use efficiency and inform them about provisions in current law that protect water rights from being diminished as a result of implementing certain conservation or efficiency practices.

Under Colorado water law, a water right is created by applying unappropriated water to a legally recognized beneficial use, such as irrigation. Beneficial use is defined in statute as "the use of that amount of water that is reasonable and appropriate under reasonably efficient practices to accomplish without waste the purpose for which the appropriation is lawfully made." Most beneficial water uses are consumptive. For example, agricultural beneficial use consumes a portion of the water that is diverted from a stream through plant uptake, evaporation, and other mechanisms. Depending upon the type of crop, soil condition, and irrigation method, agricultural consumptive use ranges between 20 to 85 percent of the water diverted from a stream. In general, water diversions that are not consumed through beneficial use must be allowed to return to the stream system for use by others.

Historical consumptive use and abandonment. The amount of water consumed over a certain time period, called historical consumptive use, is the measure and limit of a water right. Historical consumptive use determines the amount of a water right that may be sold or transferred to another user through a water rights change case. A water right owner may lose his or her right if the owner stops diverting water for ten consecutive years through a water court proceeding called abandonment. Abandonment of a water right is defined in statute as "the termination of a water right in whole or in part as a result of the intent of the owner thereof to discontinue permanently the use of all or part of the water available thereunder." This limitation is commonly known as "use it or lose it."

The General Assembly has enacted several laws since 2005 that create exceptions to this limitation for water rights that reduce diversions through conservation or to loan their water right to the CWCB for instream flow use. In 2005, the General Assembly authorized water right owners to protect their water right from abandonment if they cease using the water right as a result of certain water conservation measures or other activities. Specifically, the law states that no intent to discontinue permanent use may be found for the duration that the land on which the water right has been historically applied is enrolled under a federal land conservation program; or the nonuse of a water right by its owner is a result of participation in:

- a water conservation program approved by a state agency, water conservation district, or water conservancy district;
- a water conservation program established through formal written action or ordinance by a municipality or its municipal water supplier;
- an approved land fallowing program as provided by law in order to conserve water; and
- a water banking program as provided by law.

A law enacted in 2013 extended the abandonment protections for a water right to water rights involved in a water right change case. Specifically, this law declares that decreasing water consumption by appropriators who participate in government-sponsored water conservation programs promotes the maximum utilization of Colorado's water resources and is in the public interest. The law directs a water judge to disregard the decrease in use of water in the determination of historical consumptive use in a change of water right case if the water right has been historically applied to land that is enrolled under a federal land conservation program; or the nonuse or decrease in use of the water from the water right by its owner for a maximum of five years in any consecutive ten-year period is the result of participation in the same conservation, fallowing, and water bank programs specified in the 2005 law.

The 2013 law applies to water users in Water Division 4 (Gunnison River Basin), Water Division 5 (Colorado River Basin), and Water Division 6 (Yampa, White, Green, and North Platte River Basins).

Conservation of designated groundwater. Large amounts of groundwater in Colorado's eastern plains are essentially nonrenewable and isolated from surface streams. Wells are the primary source of water in this area. To administer these wells, current law allows the formation of designated groundwater basins that are regulated according to a modified doctrine of prior appropriation. Groundwater basins are designated by the 12-member Ground Water Commission. A law passed in 2013 specifies that once the State Engineer issues a final permit for the withdrawal of designated groundwater, a reduction in the amount of water used pursuant to the permit due to the conservation of water is not grounds to reduce the maximum

annual volume of the appropriation, the maximum pumping rate, or the maximum number of acres that have been irrigated. This law was recommended by the Water Resources Review Committee during the 2012 interim.

Summary of Recommendations

As a result of the committee's activities, four bills and one resolution were recommended to the Legislative Council for consideration in the 2017 session. At its meeting on October 14, 2016, the Legislative Council approved all five of the WRRC's legislative recommendations for introduction.

Bill A — CWCB Grants Loans Dredge South Platte Basin Reservoirs

Bill A appropriates $5.0 million for FY 2017-18 from the Colorado Water Conservation Board Construction Fund for loans and grants for dredging reservoirs located in the South Platte River Basin.

Bill B — Update 1921 Irrigation District Act

Bill B updates the 1921 Irrigation District Act and addresses: compensation for board members and election judges; use of surplus water; how irrigation district assessments are to be collected and held; the bonding requirement for district board members; and election procedures and procedures for selling surplus property. The bill also increases from $20,000 to $500,000, the amount of a contract or an eminent domain proceeding that requires voter ratification in a district election.

Bill C — Graywater Regulation Exemption for Scientific Research

Bill C authorizes the use of graywater for scientific research involving human subjects and sets minimum requirements for conducting such research.

Bill D — State Engineer Statutes Cleanup

Bill D updates statutes related to the State Engineer and the Division of Water Resources. In addition to removing obsolete provisions and modernizing language, this bill removes bonding requirements for certain division staff; expands the allowable sources of grant funding for division activities; directs the division to replace existing monitoring technologies if more cost-effective technologies emerge; eliminates some statutorily defined fee amounts; and makes several other changes to existing law.

Joint Resolution A — Funding Prevent Aquatic Nuisance Species

Joint Resolution A urges the U.S. Bureau of Reclamation, the U.S. Army Corps of Engineers, and the U.S. Forest Service to provide funding to Colorado Parks and Wildlife for implementation of the state's Zebra and Quagga Mussel Management Plan.

Resource Materials

Meeting summaries are prepared for each meeting of the committee and contain all handouts provided to the committee. The summaries of meetings and attachments are available at the Division of Archives, 1313 Sherman Street, Denver (303-866-2055). The listing below contains the dates of committee meetings and the topics discussed at those meetings. Meeting summaries are also available on our website at:

https://www.colorado.gov/pacific/cga-legislativecouncil/interim-committees

Meeting Dates and Topics Discussed

July 12, 2016 - Meeting in Alamosa, Colorado

- Overview of the Rio Grande basin
- Agriculture and subdistricts of the Rio Grande Water Conservation District
- Water education in the Rio Grande Basin
- Forest plan revision, wild and scenic rivers, wilderness areas, federal reserved water rights, and watershed health
- Recreation in the Rio Grande Basin
- Public testimony

August 2, 2016 – Meeting in Grand Junction, Colorado

- Colorado River Basin Roundtable review of priorities, action plan, and progress report
- Stream flow management planning
- Colorado River Compact compliance, system conservation, and compact water banking
- Aquatic nuisance species
- Tamarisk removal and revegetation
- Public testimony

August 16, 2016 – Meeting in Denver, Colorado

- Water well permit fees and well inspection program
- How diversion and beneficial use of water affect the value and measure of a water right
- Potential expansion of the Republican River Water Conservation District
- Graywater use for research
- South Platte River restoration and flood control feasibility study
- Water loss audit report performance standards
- Potential updates to the 1921 Irrigation District Act
- Potential clean-up of Division of Water Resources statutes
- Requests for draft committee legislation

August 24, 2016 – Meeting in Steamboat Springs, Colorado

- Alternative transfer methods and water banking
- Public opinion survey concerning the Colorado Water Plan, the water gap, and storage and permitting
- Update on proposed ballot measures affecting Colorado's water law
- State water project funding and financing water projects as related to the Colorado Water Plan
- Public testimony

September 20, 2016 – Meeting in Denver, Colorado

- Update on rising groundwater in the South Platte Basin
- Regulation of groundwater storage
- Land use planning and water efficiency
- Lead in drinking water systems
- Implementation of the Colorado Water Plan
- Final action on recommendations to Legislative Council