COLORADO
Division of Water Resources
Department of Natural Resources

2016 Annual Report

Lake Granby Spill

Dick Wolfe
State Engineer

Colorado's Water Administration System is Well-Suited for the 21st Century

It is undisputed that Colorado water law is complex and not easily understood. But it has served the State well overall and continues to evolve to meet the ever growing population demands and associated needs for the environment, recreation and agriculture. I believe the Doctrine of Prior Appropriation will continue to serve us well in the future because it has the ability to respond to the many variables that affect hydrology, including the challenges of future climate variability. While it does not solve the challenges of meeting future water needs, it does provide the foundation that decision makers can rely upon when making difficult decisions about future tradeoffs between our consumptive and non-consumptive needs.

We must continue to educate the citizens of Colorado regarding the complex interrelationships of water demand and water supply because misunderstandings and misperceptions can lead to conflict. We all must ensure that the proper legal and institutional regulatory framework continues in order to properly protect and administer water. Users want and demand regulatory certainty.

Colorado will do an excellent job meeting its need to develop and manage a sustainable water supply, including healthy forests and watersheds, for the future. We must institute plans today that are based on sound science that will allow us to plan as far ahead as possible. The existing planning horizons of 30-50 years reflect the limit of our ability to predict any further into the future due to limited data and our current understanding of the complex world we live in.

Respectively, we must continue to be flexible to the evolving circumstances within this horizon given the inability to predict with absolute certainty. We must continue to recognize the important roles that recreation and the environment play throughout the state. Recreational in-channel diversions have created a significant economic boost in many areas of the state, but have also potentially limited future upstream development. In-stream flows have also played a vital part of the preservation and enhancement of the environment, and their full benefit may not be fully recognized for years to come when these rights become more actively administered.

Cooperative approaches are necessary to address some of our state's most contentious environmental issues. The use of in-stream flows in water resources has aided consumptive water users by ensuring that Colorado meets its obligations under the Endangered Species Act. Colorado is already implementing collaborative solutions through several Endangered Species Recovery Programs, wherein water and resources are being provided to maintain and improve streamflow for endangered fish.

In times of conflict and negotiations we must never assume the other parties have bad intentions, but rather assume their intentions are well-placed based on their perspectives. In doing so, we are able to reach solutions that work for all parties involved. Litigation is not a substitute for sound science and facts. Cooperation and restraint from litigation will provide greater certainty and a more secure water supply for the entire state. Essentially, we must encourage greater and earlier coordination and collaboration amongst users and uses. Addressing issues in a conflict-rich environment rarely yields timely and effective solutions.

As I end my tenure as State Engineer and Director of the Colorado Division of Water Resources I want to thank my family for allowing me to have this adventure that I have truly loved and also thank my greater and more extended family. being everyone whose life has touched my life during this amazing run. From my fellow employees, to the numerous professionals, to the farmers and all water users throughout the state and bordering states . . . I thank you. I truly thank all of you for enriching my life and professional career and allowing me to serve you. Water has been and always will be a passion for me and I have been truly blessed to work in a greater community that also cares so deeply for our most precious resource . . . water!

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Our Mission is:
To provide competent and dependable distribution of water in accordance with statutes, decrees and interstate compacts.
To ensure public safety through safe dams and properly permitted and constructed water wells.
To maintain and provide accurate and timely information concerning water.
To promote stewardship of all human, fiscal and natural resources.
To serve the public through the generation of creative solutions to problems.
To help the public understand complex water issues.
To promote stability in the use of the state's limited water resources.
To apply modern technology to its greatest advantage.

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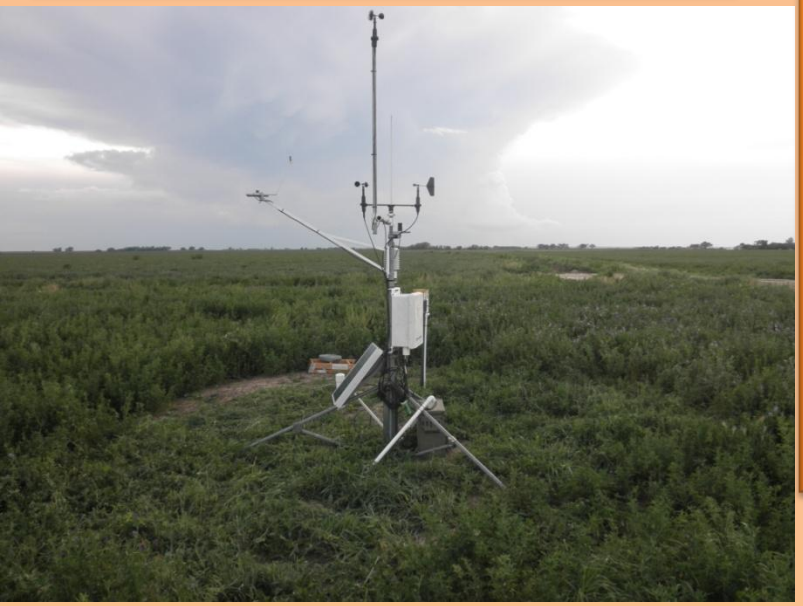

Programs

- Dam Safety
- Hydrographic & Satellite Monitoring
- Hydrogeological Services
- Interstate Compacts
- Modeling & Decision Support Systems
- Water Supply
- Water Administration
  - Field Offices

Dam Safety Program

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The National Dam Safety Program, in cooperation with Association of State Dam Safety Officials, developed a benchmark called the Model State Dam Safety Program to assist state officials in initiating or improving their state programs. The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to reduce the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations. Colorado's weighted percentage ranks very strong compared to the to other states.

1989	1998	2010	2016	
58%	83%	76%	90%	Colorado
59%	66%	77%	79%	National Average

Hydrographic & Satellite Monitoring Program

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New Satellite Monitoring System on the Selig Canal

- DWR Hydrographic and Satellite Monitoring Branch collects, analyzes, and presents accurate, high quality 'real time' flow and storage data in Colorado rivers, streams, creeks, canals, ditches and reservoirs to support the water rights administration mission of DWR.
- Hydrographers in each Division office around the State operate and maintain a system of 579 gaging stations on these watercourses and diversion structures
- Performed 3,992 streamflow measurements to maintain stage-discharge relationships at gaging stations
- All satellite monitoring system Data Collection Platforms (DCPs) were upgraded with Satlink 2 and approximately 50 DCPs are replaced annually with the goals of improving the quantity and quality of data used to manage and administer water throughout the State of Colorado.
- The Branch develops historic streamflow records at a subset of stream gage locations in coordination with other State and federal entities and the water user community.

Hydrogeological Services

- **Staff assistance**
  - Aquifer determinations ► **421** (+7%)
  - Aquifer hydraulic properties ► **14** (-18%)
  - Recharge Pond Reviews (HB 1013) ► **5**
  - Geothermal permitting support ► **1**
- **Board of Examiners Support**
  - Variances to Well Construction Rules ► **104** (-4%)
- **Groundwater Monitoring Program** ► **1,243** wells
- **Permit Cond. Amendments** ► **156** (+25%)
- **Well Inspections** ►800 (+32%)
- **Complaints/Violations** ► **24** (-20%)
- **Nontributary Initial Determinations** ► **8**
- **Colorado Oil & Gas Conservation Commission Reviews** ► **17** (-5%)

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Interstate Compacts

- Republican River Compact
  - Resolved Compliance issues (Resolutions 8/24/2016)
  - Harlan County Lake Resolution
  - Water Supply Year determination changes
  - Republican River Compact Compliance Rule Making
  - Conservation Reserve Enhancement Program expansion
  - Compact Rules being developed in Colorado.
- Rio Grande
  - TX v NM & CO Original No. 141
  - Special Master Report
    - Draft 2016
    - Final 2017 (exceptions filings complete summer 2017)
  - USGS/BOR Modeling in Elephant Butte Project area continues
- Upper Colorado
  - SCPP (System Conservation Pilot Program)
  - Upper Colorado River Commission - Expanded Weather Station Network and 4 EC towers
  - Water Bank Working Group
  - Drought Contingency Planning
  - Risk Study
  - 24 month study (April 2017) - projected 9maf Release plus increase in storage at Powell
- Animas La-Plata
  - Filing for Clarification of Direct Flow Diversions at AP per decree of 2015

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Modeling & Decision Support Systems

- **Statewide Colorado Decision Support System (CDSS).** CWCB and CDWR initiated the transition of the CDSS software tools to open source licensing and for use in an open and collaborative software project management approach.
- **South Platte River Basin Decision Support (SPDSS)**
  - The surface water/water rights planning models within the major tributary basins (except the Cache la Poudre) of the South Platte were completed.
  - The SPDSS Alluvial Groundwater model update through 2012 was completed.
- **Arkansas River Basin Support** - New pre-processors were developed in 2016 to convert H-I Model input data into model files. Using H-I Model results, new presumptive depletion factors for well pumping were determined and accepted by Kansas.
- **Colorado River Basin Decision Support System (CRDSS) -** In 2016, Colorado River Basin surface water/water rights models were updated through 2012 for the Colorado main stem, Gunnison, San Juan/Dolores, Yampa and White River basins.
- **Rio Grande Basin Decision Support System (RGDSS)** - In 2016, the documentation for the RGDSS was completed. This documentation included thirty-six project task memorandums which were published and made available to the public. Phase 7 of the RGDSS was also launched. Phase 7 updates the RGDSS datasets, processes and models, plus it extends the end date of model input from 2010 to 2015.

Water Supply Branch

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- Analyzed and approved 162 general Substitute Water Supply Plans (SWSPs) and 86 SWSPs for gravel pits
- Reviewed, analyzed, and provided 177 comments to Colorado counties regarding the water supply for proposed subdivisions and other land use actions
- Received and acted on 6,220 well permit applications and processed 1,027 Monitoring Hole Notices, 8,843 Changes in Ownership/address, 4309 Well Construction and Test Reports, and 2,066 Pump Installation Reports
- Issued 25 final permits, 94 determinations of water rights, 31 change application approvals and five replacement plans in designated basins.
- Coordinated with division staff to manage DWR's involvement with litigation in the water court process, including providing expert witness testimony.
- Conduct engineering and technical analyses to support all facets of water resource engineering, planning, and administration

South Platte River Basin, Water Division 1

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- Overall reservoir storage as a percent of average was at 92% capacity by the end of May 2016 compared to end of May average of approximately 82%.
- The Republican River Well Team continued their efforts of administering the Republican River Basin Groundwater Measurement Rules (Rules) in 2016, including conducting approximately 175 well measurement device verification field tests, inventory of more than 500 wells, and field inspection of more than 160 wells filed as inactive in accordance with the Rules.
- There were 37 days of South Platte Compact call during the 2016 Irrigation Year, which is a notable increase to the 7 days recorded in Irrigation Year 2015.
- Efforts continued throughout 2016 in the administration of the South Platte Measurement Rules, including the Well Team conducting approximately 40 installed flow meter verification field tests, processing over 560 measurement tests into DWR's database, the inventory of more than 450 wells, and the inspection of more than 160 wells filed as inactive in accordance with the Rules.

South Park

Arkansas River Basin, Water Division No. 2

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- Hydrological conditions resulted in 2016 being an average year in the basin
- Winter storage accumulation at the end of the Pueblo Winter Storage Program storage period on March 14, 2016 was 151,734 a.f. and 22,631 a.f. more stored than the previous year and 14.6% greater than the previous 20 year average
- Overall irrigation well pumping in 2016 was above average since Colorado's Amended Use Rules for well pumping went into effect in 1996
- Cannabis industry water administration issues continued to be time consuming but progress continued with updates to policies concerning the use of exempt wells and by inclusion of DWR at the Governor's Marijuana Working Group
- Colorado remains in compliance with Arkansas River Compact

Fort Lyon's Horse Creek Flume

The Rio Grande, Water Division No. 3

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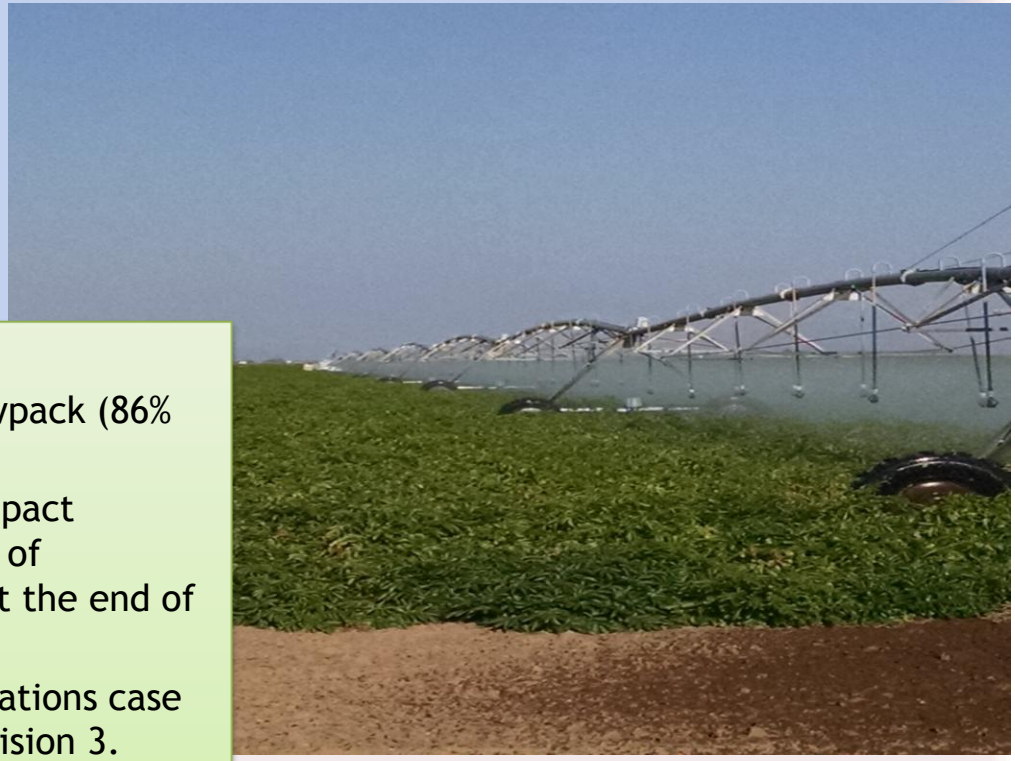

Center pivot sprinkler irrigation in the San Luis Valley

- Eight year in a row of below average snowpack (86% of average)
- Colorado was close on its Rio Grande Compact delivery obligations for 2016, with a total of approximately 7,300 acre-feet of credit at the end of the year
- Negotiations continued on rules and regulations case concerning the use of ground water in Division 3. Trial set for January/February 2018.
- Texas v. New Mexico and Colorado (Original #141) continues before the US Supreme Court. Issues center around groundwater pumping below Elephant Butte Reservoir.

The Gunnison River Basin, Water Division No. 4

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•Snowpack conditions well below normal, however very wet spring improved water supply conditions to nearly 100 percent of normal.

•Inflow to the Aspinall Unit (Blue Mesa, Morrow Point and Crystal Reservoirs) as of May 1, 2016 was 78% of the 30-year median seasonal peak. However, late April and May precipitation resulted in "double peak" flow measured at the Whitewater stream gage.

Ironstone Canal Radar Gage

•274 well permits were issued within Division 4, during 2016 water year, an increase from the 217 permits issued the previous year. 236 of those permits were exempt permits (individual water supply).

•Two additional Satellite Monitory Stations were installed in the Division brining the total SMS to thirty-one.

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The Colorado River Basin, Water Division No. 5

- 2016 Division 5 over-all runoff was very average with above average flows in the upper reaches of the basin and below average inflows in the lower tributaries. Water supplies throughout the basin were boosted by full reservoirs and the continued good conditions on the East Slope leaving un-diverted transmountain water in the Colorado River.
- Coordinated Reservoir Operations did occur in 2016 for the second consecutive year to assist in endangered fish recovery. Bypassing inflows began on June 3, 2016 and continued through June 11, 2016. Accounting for the various delivery times the flows in the critical reach were enhanced from June 5th through June 13th. Accounting for transit losses the maximum peak enhancement was on June 11th at 2,107 cfs. The actual peak at the Colorado River at Palisade gage did occur during this enhancement on June 10th at 17,400 cfs. Total deliveries (bypasses less transit losses) for 2016 were 26,536 acre-feet.
- The Shoshone Power Plant operations maintained a call throughout the winter of 2015-16. The Shoshone call was removed on April 11, 2016 for spring runoff and remained off until July 31st. Except for two short period of maintenance the call continued through the end of the irrigation season. The total call days from Shoshone during the 2016 irrigation year was 237 days.


Mount Sopris, April 2016

Colorado River near Dotsero, and Colorado River near Cameo **2016 Gaged** (depleted) flows

	April - July			April - September		
	Flow, AF	% of avg	Historic avg	Flow, AF	%of avg	Historic avg
Dotsero	1,007,955	104%	965,726	1,190,278	103%	1,150,251
Cameo	1,721,320	95%	1,817,640	2,016,068	95%	2,127,264

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The Yampa and White River Basins, Water Division No. 6

- As a result of the above median snowpack, streamflows were above average at each of the reported gauges with the exception of the White River near Meeker.
- Water administration in water year 2016 in Division 6 was limited to the typical calls.
- Of the 75 Orders issued to 100 structures to install measuring devices all but 20 are in compliance and the division continues to work with those owners to comply.
- In 2016, releases were made at a rate of 10 cfs from Stagecoach Reservoir under the City of Steamboat Springs' contract (552 acre-feet) with Upper Yampa Water Conservancy District, along with a sublease from the Colorado Water Trust (264 acre-feet) who had entered into a contract with the District in the fall. The releases were made in an effort to reduce streamflow temperature at the location of the City of Steamboat Springs' effluent discharge point along the Yampa River.
- Releases were made from Elkhead Creek Reservoir between August 17, 2016 and October 8, 2016 for a total of 5,000 acre-feet. This release was made for the purpose of in-river fish habitat, river flow maintenance and enhancement under the Upper Colorado River Endangered Fish Recovery Implementation Program.

Pennsylvania Ditch, Division 6

Animas and La-Plata River Basins Water Division No. 7

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- 2016 Water Year returned to a more normal pattern.
- Most reservoirs were able to fill completely in 2016.
- An in-stream flow call was placed by the Colorado Water Conservation Board on the Dolores River downstream of McPhee Reservoir for 78 cfs on October 4th, 2016. The call was recorded in Division 4 because the most downstream location of the in-stream flow is located that Division. The Water Commissioners, Assistant Division Engineer, and Division Engineer were active in working with water users in the Dolores Basin to provide water to this river reach
- Long Hollow Reservoir, with a live capacity of 5,300 acre-feet, contained 147 acre-feet at the start of the water year. Long Hollow Reservoir filled to a volume of 769 acre-feet on April 1, 2016 and dropped to a low of 118 acre-feet on August 27, 2016. This was the second year Long Hollow made releases of storage water for delivery to the state line for Compact purposes and to irrigation ditches by exchange or direct delivery.
- There are currently over 3,900 coal bed methane (CBM) wells in Division 7, 90% of which lie within the Southern Ute Indian Reservation boundary. The Colorado Supreme Court upheld the question of authority to administer non-tributary groundwater within the Ute Reservation. Case as stayed pending Supreme Court rulings became active once again. Consultation between the Division 7 Office and the Attorney General occurred in preparation for the anticipated work load in 2017 to address these wells and associated applications for water rights and plans for augmentation.

Animas River at Cascade Creek Near Tacoma Power Plant

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For detailed field office and branch reports please visit
“Publications & Reports” located on our website at: water.state.co.us