

2019 Annual Report



Rio Grande Dam, photo by Matt Gavin

“...passion and engagement is critical for us to do our work as water administration will only become more challenging in the coming years.”

Kevin Rein
State Engineer



Hand Pump well, South Park
Photo by Kevin Donegan

To begin this 2019 report, I want to refer to two notable items in my 2018 report. Those are my reference to the drought of 2018 and the fact that I had structured discussions with all employees about the work they do during the 2018 fall meetings.

First, regarding the drought conditions of 2018, as often happens, Colorado rebounded nicely and we had above average runoff and reservoir storage around the state in 2019. This was a welcome relief for Colorado. However, the above average snowpack can often cause its own problems. This was true around the state and particularly true in the San Juans, where Colorado saw numerous avalanches. In Hinsdale County, the combination of significant avalanches and the associated debris, along with impending high runoff, created a public safety concern with the historic Ute Ulay and Hidden Treasure dams. This was an unusual situation and to assist the local community, DWR Dam Safety employees led a multi-agency group in determining, and following through on the steps to ensure those historic dams were preserved to the extent possible while keeping the public safe.

Regarding the second item from my 2018 report, the structured employee meetings in 2018, I continued to see the characteristics of employees in 2019 that were highlighted in those meetings. In the review of the rest of this Annual Report, you can see that Colorado water users are not slowing down in their efforts to meet water demands, and the need for DWR employees to respond to those efforts remains critical. We do that through water administration, acting on water court applications, evaluating temporary changes of use through Substitute Water Supply Plans, following-leasing projects, and responding to innovative efforts such as instream flow concepts and moving water between reservoirs, just to name a few.

In 2019, two different sets of rules were at different stages of their lifecycle. In January, the State Engineer filed the *Republican River Compact Rules* in the Division 1 Water Court. Then in March, the Division 3 Water Court approved the *Groundwater and Irrigation Season Rules for Division 3*; a significant accomplishment for DWR staff. Both sets of rules reflect how complex water administration in Colorado is. In 2019, the level of activity that the Denver office Water Supply staff responded to did not decrease and I believe we will continue to see a steady or increasing level of substitute water supply plan applications and other obligations on our office as Colorado water users need to develop ways to respond to increasing demands.

While we are responding to these demands, we also need to manage our interstate compacts. Our Division Engineers actively manage several compacts around the state. The Colorado River Compact and the Upper Colorado River Compact are two compacts that do not currently require active administration. However, because the Drought Contingency Plan was signed in 2019, bringing CWCB's efforts to investigate feasibility of a Demand Management program to the forefront, in 2019 the State Engineer began to speak more openly about Compact administration should there be a need to take action to maintain compliance on the Colorado River Compact in the future.

All of this activity shows that DWR employees are just what we determined them to be in 2018: knowledgeable, passionate, and focused on responding to water administration needs around the state, regardless of the use of the water. This passion and engagement is critical for us to do our work as water administration will only become more challenging in the coming years.



Colorado River, Glenwood Springs
Photo by Rachel Zancannella

Programs

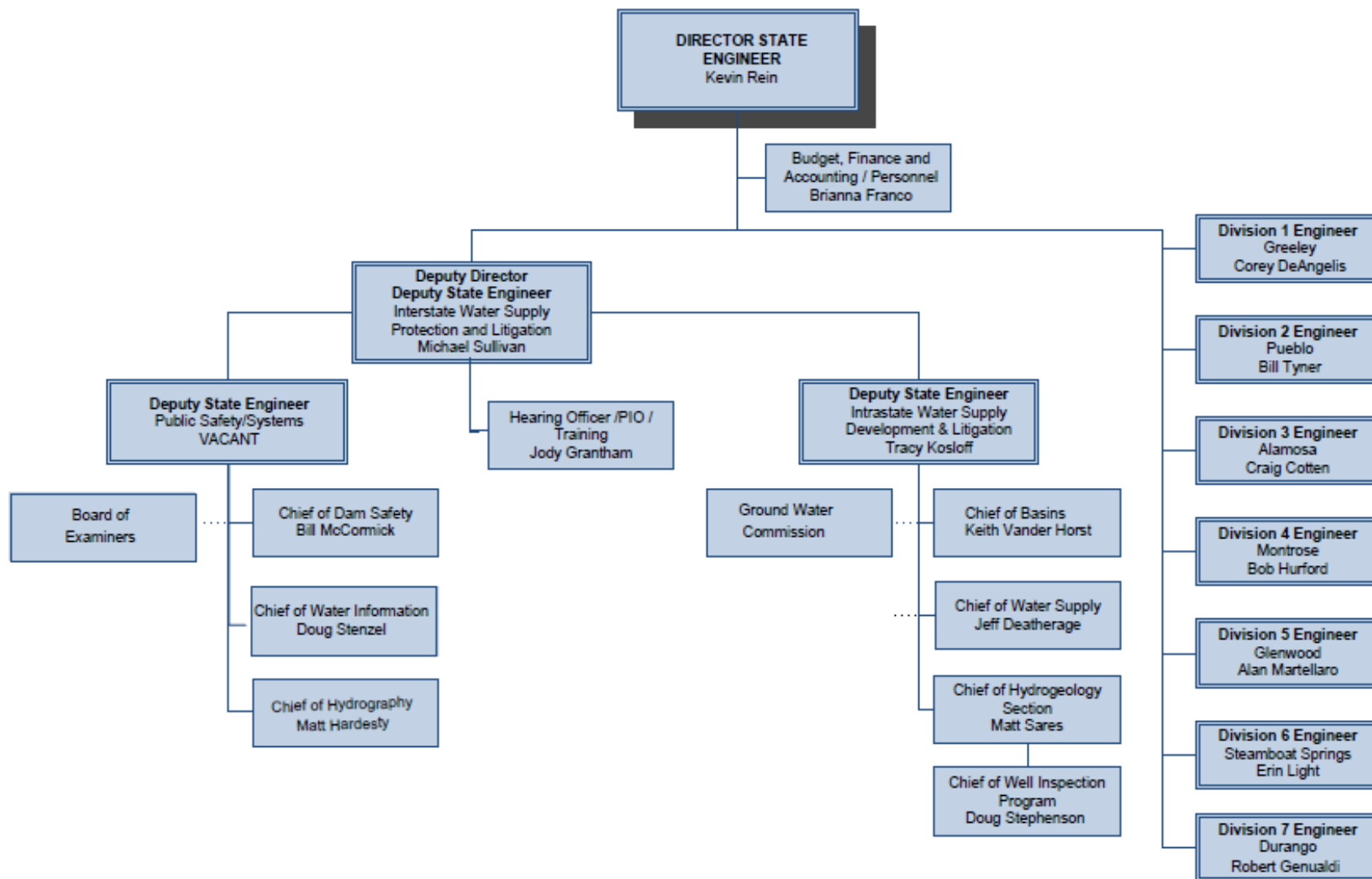
- Dam Safety
- Hydrographic & Satellite Monitoring
- Hydrogeological Services
- Interstate Compacts
- Modeling & Decision Support Systems
- Water Supply
- Water Administration

Mission

The Colorado Division of Water Resources will administer the waters of the State to maximize lawful beneficial use, ensure that dams and water wells are properly constructed and safe, and provide information about water resources to the public.



COLORADO DIVISION OF WATER RESOURCES ORGANIZATIONAL CHART



Dam Safety Program Statutory Authorities

CRS Title 37 Article 87

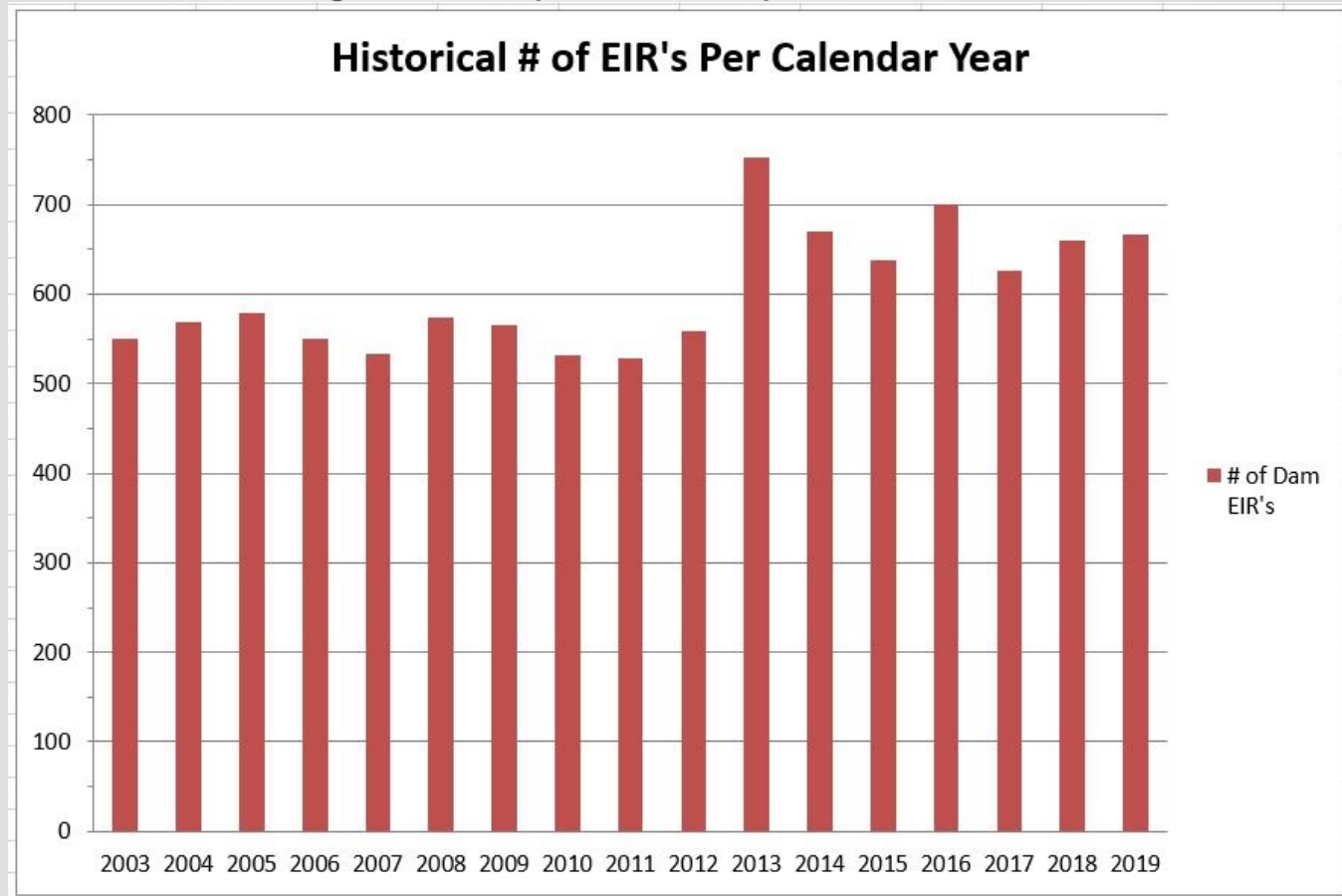
- *37-87-105-Approval of Plans for Reservoirs*
 - Make and Maintain Rules and Regulations
 - Review and Approval Authority for; New Dams, Alteration, Modification, Repair and enlargement of existing dams
- *37-87-107- Safety Inspections-Amount of Water to be Stored*
 - Inspections
 - Determination of Safe Storage Level



70 Ranch Dam

Dam Inspections

Engineer Inspection Reports (EIR's)



100% High and Significant Hazard dams



COLORADO
Division of Water Resources
Department of Natural Resources

Emergency Action Plan Analysis Summary - 2019-2020

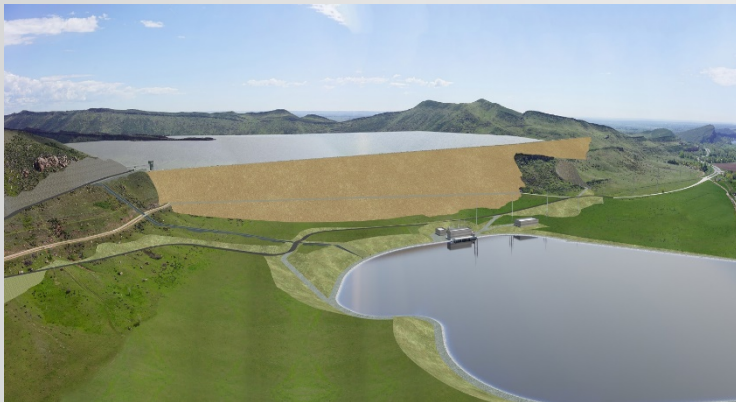
EAP Analysis 2019 & 2020				
	4/16/2019 Summary		4/28/2020 Summary	
HH Dams	429		438	
EAP - Yes	421	98%	435	99%
EAP -No	8	2%	3	1%
HH Age < 5yrs	328	77%	344	79%
HH IM Maps	377	89%	408	93%
HH IM SHP	289	61%	323	74%
SH Dams	297		290	
EAP - Yes	286	96%	278	94%
EAP -No	11	4%	12	6%
SH Age < 5 yrs	177	60%	173	60%
SH IM maps	181	61%	178	61%
SH IM SHP	95	32%	97	33%



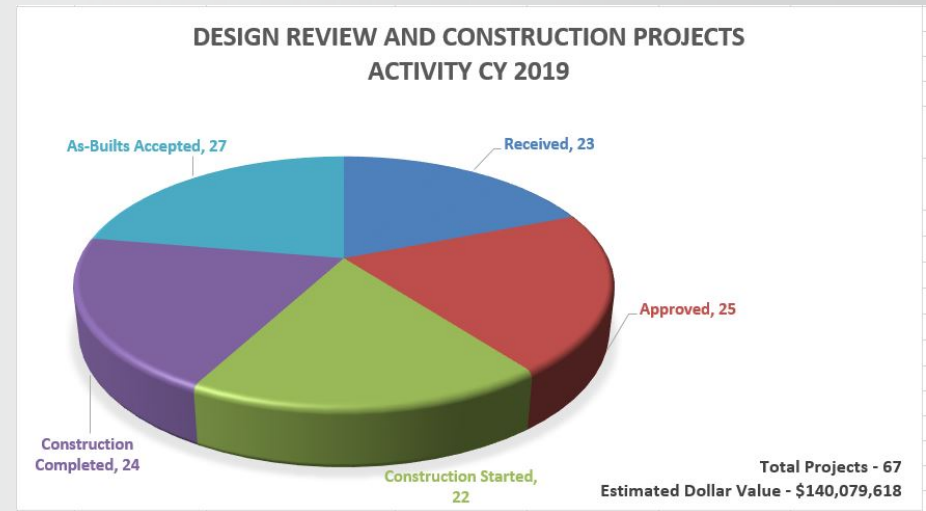
Adobe Creek Dam, Div. 2

Dam Design Review Summary - CY2019

DESIGN REVIEW AND CONSTRUCTION PROJECT ACTIVITY SUMMARY for CY 2019		
DESIGN REVIEW ACTIVITY	NO. COMPLETED	ESTIMATED DOLLAR VALUE
Received	23	\$37,075,152
Approved	25	\$47,424,657
Construction Started	22	\$57,911,731
Construction Completed	24	\$57,166,391
As-Builts Accepted	27	\$48,465,930
Total Projects	67	\$140,079,618



Glade Reservoir Dam, conceptual rendering



Hydrographic & Satellite Monitoring Program



Division							
1	2	3	4	5	6	7	Grand Total
1375	784	1587	151	155	82	387	4521

Streamflow Measurements by Water Division

- DWR Hydrographic and Satellite Monitoring Branch main mission is to collect, analyze, and present 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 and water commissioners made 3,719 discharge measurements in 2019. These measurements were made to calibrate stage-discharge relationships at stream gaging stations, in canals and ditches in support of real-time water administration decision-making and in support of historic streamflow record development.
- Hydrographers in 2019 performed 4,521 gage station visits to assist in support of the historic streamflow record.
- The Satellite-linked Monitoring System (SMS) provides the Division of Water Resources, other State and federal entities, the water user community and the public at large with access to real-time streamflow and storage data from gaging stations across the State of Colorado. As in 2018, 2019 saw approximately 50 DCPs replaced to improve the quantity and quality of data used to manage and administer water throughout the State of Colorado.

Hydrogeological Services

- Staff assistance
 - Aquifer determinations ▶ 750 (-10%)
 - Recharge Pond Reviews (HB 1013) ▶ 2 (37 Structures)
- Board of Examiners Support
 - Variances to Well Construction Rules ▶ 95 (-39%)
- Groundwater Monitoring Program ▶ 1,329 wells
- Permit Cond. Amendments ▶ 278 (+28%)
- Well Inspections ▶ 763 (+5%)
- Complaints/Violations ▶ 99 (+254%)
- Nontributary Initial Determinations ▶ 1 (+/0%)
- Colorado Oil & Gas Conservation Commission Reviews ▶ 2 (-87%)



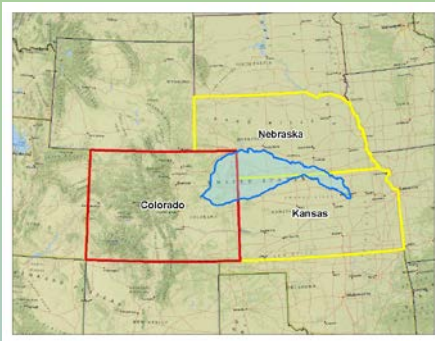
COLORADO
Division of Water Resources
Department of Natural Resources



Drill Rig, Mount Blanca, photo by Larry Hakes

Interstate Compacts

- Upper Colorado
 - Demand Management workgroup
 - Consumptive use workgroup
 - Compliance workgroup

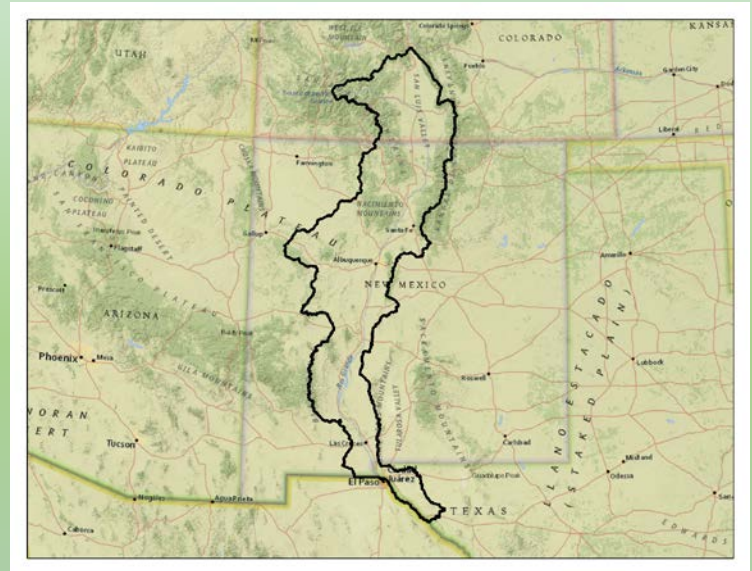


Republican River
Flooding

Conservation Reserve Enhancement Program (CREP) continues
Settlement of Hutton Case
Compact Rules in water court

Interstate Compacts

- Rio Grande Compact
 - Texas v. New Mexico & Colorado
 - Ongoing since 2014
 - Discovery and briefing continues
 - Stipulation
 - Upper Rio Grand Model Complete
 - Phase 7 of Rio Grand Decision Support System
- Federal update
 - WOTUS revocation and new rules
 - NEPA new rules
 - Farm Bill (NRCS) new rules
 - Paradox – EIS
 - YBCC – Critical Habitat 2014-2020



Modeling & Decision Support Systems

- **Statewide**
 - **Statewide Gridded Evapotranspiration (ET) Dataset** - A daily ET dataset has been developed based on ASCE Standardized methods on a 2.5 mile grid covering the state. The dataset is being used in the ArkDSS models so that elevation and cloudiness changes are considered where irrigated acres are far from climate stations and being deployed with tools meant to simplify, streamline, and standardize historical consumptive use analyses.
 - **CDSS Support** - Staff continue to support software and modeling datasets that are maintained as part of the Colorado Decision Support System. Development has continued on OpenCDSS which is an open source approach to maintain and enhance CDSS software with documentation and repositories for CDSS software code on a public website.
- **Rio Grande Basin**
 - **Upper Rio Grande (URG) Model** - A new URG groundwater model and response functions were developed to determine pumping depletions to the Rio Grande between Del Norte and South Fork similar to other sub-district management areas.
 - **RGDSS Phase 7 Models** - Continued with RGDSS phase 7 to update geologic representations, datasets, and processes in the RGDSS models.
 - **Support** - As new sub-districts have finalized their water management plans, staff provided technical support, training, and information to Division 3 staff, individuals/group of well owners, consultants, districts and associations on how to determine pumping depletions using the model tools.
- **Arkansas River Basin**
 - **ArkDSS** - The phase 1 GIS and administrative tool portions of the project have been completed including development of 11 historical irrigated acreage datasets and online tools for meter data entry and requests for and display of river and reservoir operations. Development of the STATEMOD surface water model is continuing and will support the 10-year review of the Trinidad Project.
 - **Colors of Water Tool** - An RFP has been issued for development of the phase 2 Colors of Water Tool which will incorporate dynamic transit losses, routing, and forecasting to estimate “water class” amounts throughout the Arkansas River system.
 - **Compact Support** - Staff continued to support requirements related to the Arkansas River Compact including annual updates of the H-I Model, modeling for the Surface Water Improvement Rules, and management of lysimeter operations.

Water Supply Branch

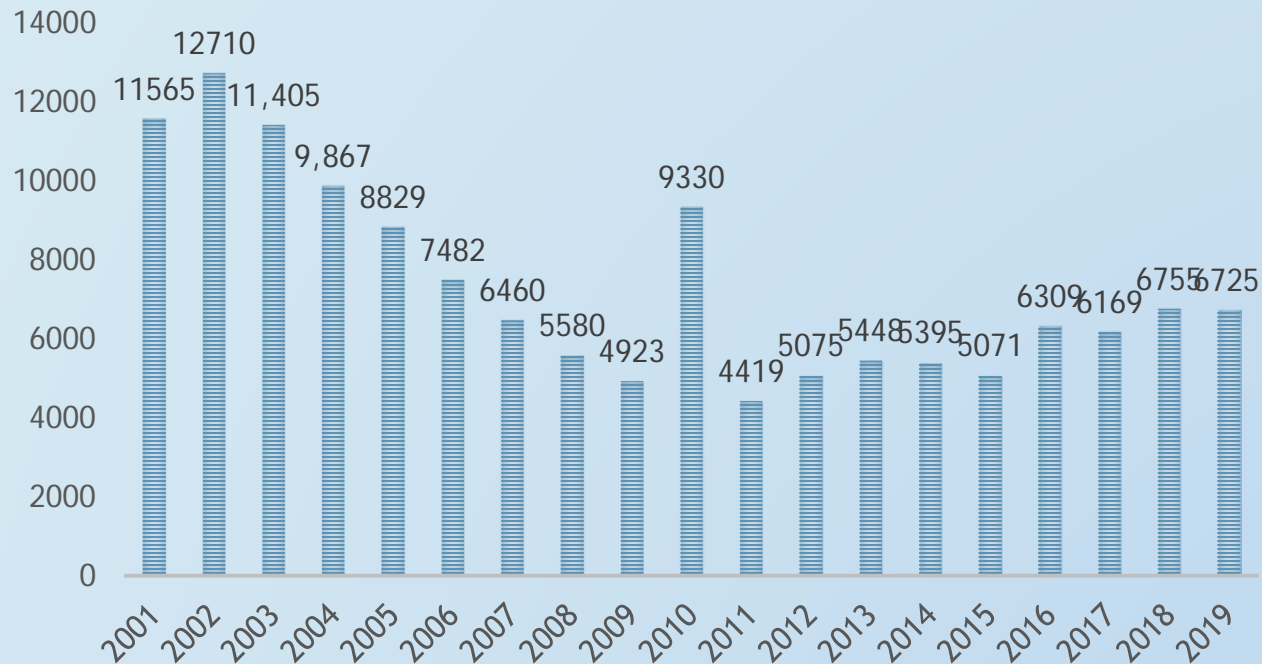
- Analyzed and approved 128 general Substitute Water Supply Plans (SWSPs) and 86 SWSPs for gravel pits
- Reviewed, analyzed, and provided 691 comments to Colorado counties regarding the water supply for proposed subdivisions and other land use actions
- Received and acted on 6,725 well permit applications and processed 1,044 Monitoring Hole Notices, 8,928 Changes in Ownership/address, 3,740 Well Construction and Test Reports, and 3,895 Pump Installation Reports
- Issued zero final permits, 239 determinations of water rights, 24 change application approvals and twenty (20) replacement plans in designated basins.



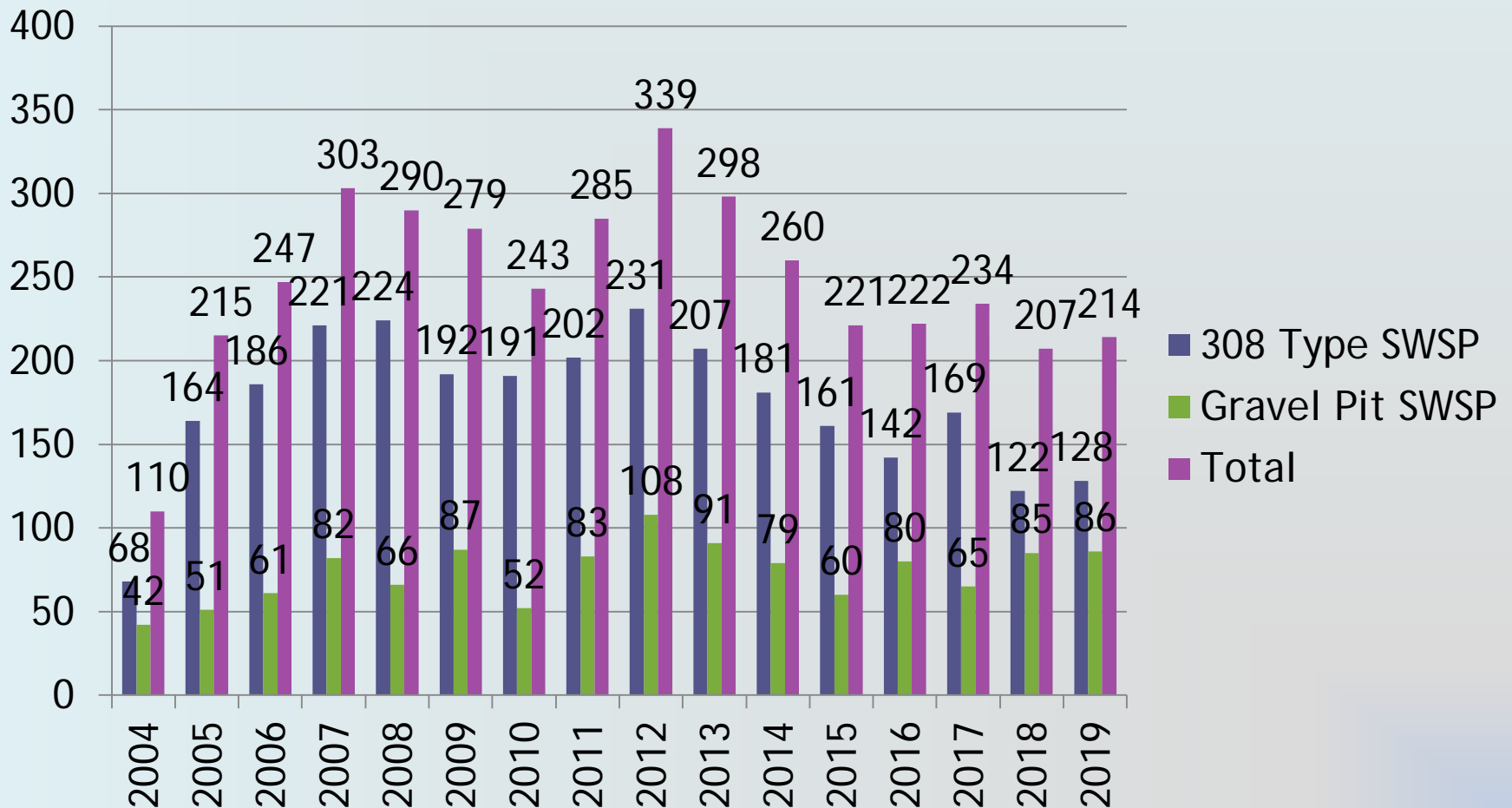
Suano Reservoir, Photo by Rachel Zancanella

Well Permit Activity

TOTAL APPLICATIONS



Substitute Water Supply Plan Activity



South Platte River Basin, Water Division 1



- There were a total of 21 days South Platte Compact Call during water year 2019, a 30% reduction from 2018.
- Efforts continued throughout 2019 in the administration of the South Platte Measurement Rules, including the Well Team conducting approximately 85 installed flow meter verification field tests, processing over 1,300 submitted measurement tests into DWR's database, the field inventory of approximately 450 wells, inspection for compliance of 75 wells filed as inactive, as well as responding to many questions from water users. Approximately 130 wells were identified as non-existent. The Well Team recertified 21 well meter testers and de-certified one tester.
- The State Engineer filed the Republican River Compact Use Rules with the Division One Water Court in January 2019, Case No. 2019CW3002. The rules would allow the state to administer surface water and groundwater wells for compliance with the 1942 Republican River Compact.
- The Republican River Well Team continued their efforts of administering the Republican River Basin Groundwater Measurement Rules (Rules) in 2019, including conducting approximately 221 well measurement device verification field tests, the inventory of more than 972 wells, and field inspection of approximately 230 wells filed as inactive in accordance with the Rules. The Republican River Well Team assisted with Well Tester certification training classes, and conducted in-field one-on-one recertification of approximately 25 certified well testers.



Clear Creek - Dist. 7



Chatfield Reservoir, photo by Brianna Krauser

Division One Water Use and Operations



Berthoud Pass Pond, photo by Jason Smith

- Currently there are approximately 1,900 decrees in Water Division 1 that include a plan for augmentation.
- Monthly submittals are received for approximately 530 decreed augmentation plans.
- The Accounting Team receives, digitally archives and verifies that all of the accounting is in accordance with the terms and conditions of the decree and does not result in any negative impacts to the river (depletions caused by applicant not replaced).
- The Water Accounting Team “audits” all newly decreed water accounting spreadsheets to ensure their compliance with the accounting sheet decreed terms and conditions.



COLORADO
Division of Water Resources
Department of Natural Resources



Strontia Spring Reservoir, photo by Sydney Alexander



COLORADO
Division of Water Resources
Department of Natural Resources

Arkansas River Basin, Water Division No. 2

- Water supply conditions in 2019 were above average within the Arkansas River basin, with a very good snowpack and reasonably good reservoir storage as a strong basis for a good water supply during the year. It should be noted though that the monsoon rain season was not particularly strong during 2019 resulting in some areas of diminished supply emerging later in 2019. During March 2019 a unique snow event occurred termed the “Bomb Cyclone”. This storm produced significant snowfall, primarily in the South Platte Basin, but also in the Arkansas Basin.
- The final report for the period November 15, 2018 through March 14, 2019 showed a system grand total of 100,072 acre-feet which was 30,889 acre-feet or 23.6% less than was stored in the previous year and 33,104 acre-feet or 24.9% less than the previous 20-year average.
- During 2019 the irrigation well pumping represented in the H-I Model totaled 68,647 acre-feet. For User Groups 1-14 (above John Martin Reservoir Area) the total pumping was 34,180 acre-feet and for User Groups 15-24 (below John Martin Reservoir) the total pumping was 34,467 acre-feet.).
- Eighteen new Augmentation Plans were decreed during 2019, bringing the total to 737 plans within Div. 2
- The H-I Model is used for the purpose of determining depletions to usable stateline flow caused by well pumping of a ten-year period, which is updated annually. The update made in 2019 was for the period 2009-2018. This update showed a stateline credit balance of 14,677 acre-feet.



Arkansas River at Nepesta, photo by Rachel Zancanella

The Rio Grande Basin, Water Division No. 3

- Groundwater Rules and Regulations approved by the Div. 3 Water Court on March 15, 2019.
- Rules permit the continued use of groundwater with the prevention of material injury to senior surface water rights.
- Rules regulate the use of Confined and Unconfined aquifers to maintain a sustainable water supply in each aquifer system.



Rio Grande Reservoir

- Water year 2019 saw significant improvement in snow pack and runoff with snowpack at 146% of average, leading to the highest annual streamflow on the Rio Grande River in the last 20 years. Fourth lowest annual streamflow on the Rio Grande and the Conejos River.
- Total flow subject to Rio Grande Compact in Rio Grande and Conejos Rivers was 1,356,400 acre-feet. Colorado owed 560,500 acre-feet and delivered 561,300 acre-feet for an 800 acre-feet credit in 2019.

The Gunnison River Basin, Water Division No. 4



Blue Mesa Res. at Dry Creek Boat Ramp
Lowest end of season content at 30% capacity

- While 2018 was one of the worst snowpack conditions on record (55% of average), 2019 was one of the top supply years on record, with a peak of 143% of average basin-wide.
- Inflow to the Aspinall Unit (Blue Mesa, Morrow Point and Crystal Reservoirs) as of May 1, 2019 was 144% of the 30-year median seasonal peak.
- Runoff conditions from the Grand Mesa were at historic high levels. In 2019 natural flow in the streams on Division 4 side of the Grand Mesa were sufficient to meet water demands by irrigators into the second week of July, a very rare occurrence, and all of the reservoirs filled and spilled.
- 396 total permits were issued during 2019 with 349 permit being exempt well permits issued by the Division 4 staff.

The Colorado River Basin, Water Division No. 5

- Storage for the basin began the water year at 92% of average. The water year ended at 107% of average storage. With the exception of Rifle Gap Reservoir, the basins larger reservoirs either filled or attained a paper fill. The USBR operated reservoirs, Granby, Green Mountain and Ruedi had a maximum physical storage just below the uncontrollable spill elevation.
- The 2019 irrigation season ended with gaged flow for the Colorado River near Cameo ranking as the 24th wettest year in 86 years of record. The flow for the Colorado River near Dotsero ranked as the 23rd wettest in 78 years of record. Below are Colorado River near Dotsero and Colorado River near Cameo gaged flow histograms for comparison of the 2019 irrigation year with previous years of record.
- Considerable storage was available for release to the Endangered Fish Recovery Program.
- The Shoshone Power call was maintained throughout the winter of 2018-19 with a total for 2019 irrigation year of 233 days. The gaged flow near Cameo was ranked as the 24th wettest year in 86 years of record.

- Well permitting activity was slightly up from 2019 with 787 applications received and 725 water well permits approved.



Green Mountain Reservoir Spill 2019

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



Properly installed measurement device

- As with the above median snowpack, actual streamflows were above average at all of the below reported gages.
- Snowpack was above normal for water year 2019, and resultant stream flows were below normal for the year. However, it was good compared to the rest of the state.
- For the first time ever, the Yampa River went under administration in 2018. However, in 2019, the snowpack was quite high and though the basin experienced little rain in July, August and September, the snowpack sustained the base flows and no administration of the Yampa River was necessary.
- In March 2019, notices to owners of all known structures that were not equipped with an operable headgate and/or measuring device were sent. The notices requested water right owners to install these devices by July 31, 2019 and failure to do so would result in an Order being issued by the Division Engineer pursuant to CRS 37-92-502. Approximately 500 orders were issued to individual owners for failure to comply. However, extensions were granted to many and some decided to forgo diversions until their device was installed.

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



Avalanche Chute near Animas Forks, late May, 2019.

- Snowpack in the San Juan and Dolores River Basins during the winter of 2018-2019 (Water Year 2019) was one of the best on record, following one of the worst years on record.
- Precipitation in February, March and May saw approximately 200% of average (140% of average for the year).
- All reservoirs were able to fill. Many reservoirs were challenged on how to release excess runoff, but runoff was slow and all reservoirs managed the process.
- There were 173 well permits issued in Division 7 in water year 2019. Of these, 117 were exempt domestic well permits, 4 were non-exempt well permits and 12 monitoring well permits were processed in the Durango office. There were also 24 non-exempt well permits, 1 monitoring well permit, 11 monitoring hole permits and 5 oil and gas well permit. No dewatering wells or geothermal permits were issued during 2019.

Colorado's Decision Support System Site



CDSS Data & Tools

dwr.state.co.us/tools

Apps ICCES Project Screenshot Suggested Sites Imported From IE Water Law Research University of Denver CBA The Colorado Bar View from the Gran... The Bluebook - Blu... Integrated Colorad... Colorado Judicial Br... Water Transfers and... Toolkit Videos and...

 **COLORADO'S**
Decision Support Systems
CWCB / DWR

Welcome Guest, [Click here to Login](#)

CDSS Data & Tools Help

Administrative Calls
Active, Historical & Analysis Tools

Groundwater
Water Levels & Geophysical Logs

Water Rights
Decree Details, Court Docs, Net Amounts

Aquifer Determination
Denver Basin & Dakota/Cheyenne

Location Tools
Coordinates & Distance Calculators

Climate Stations
Temperature, Precipitation, Snow, Etc

Stations
Current Conditions & Historical Data

Well Permits
Application History & Well Details

Call Analysis Tools
Structure and Water Source Analysis

My Stations
Station Lists and Alerts

Dam Safety
Dams, Livestock Water, Erosion Control

Structures
Diversion Records & Other Details

Map Viewer
DWR Online GIS Products

Information Marketplace
DWR Data on "CIM" Platform

REST Web Services
GET CDSS Data Programmatically



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



Twin Lakes Reservoir, Photo by Rachel Zancanella