2009

DWR Annual Report

Colorado Division of Water Resources

State of Colorado

12/31/2009

Contents

FOREWORD 2009

In keeping with the objectives of the Greening of State Government Coordinating Council, this report is a summary of the annual operations of the Division of Water Resources (DWR). The sections will contain a brief synopsis of the purpose of each section and a summary of the activities under that section. If a more detailed report is available, a reference to that report is included.

Colorado's continued slowing economy during 2009 was reflected in the decrease in the total number of well permit applications received and the total number of well permits issued by DWR. DWR has responded to the statewide need to trim budgets by cutting operating expenses, furloughing staff, and holding positions vacant under the hiring freeze.

The Governor's freeze on hiring for all state agencies was lifted in July 2009. However, the freeze prevented DWR from filling existing vacant positions, as well as positions vacated during the freeze. With the freeze lifted, DWR worked to fill almost 35 vacancies that had accumulated. I want to take this opportunity to thank each member of the staff for their support, dedication, and teamwork during 2009. With the many staffing changes in the Denver and the division offices as a result of the economic downturn, the employees have taken on additional workload with only my personal thanks, and I am very proud to work with each and every one of them.

Colorado experienced a good runoff due to the generally better than average snowpack in 2009. The snowpack also allowed for most of the reservoirs to fill, even on the tributaries. Municipal supplies along the Front Range continued to be in good shape because of significant storage reserves. Some basins experienced a quick and early run-off, possibly due to dust-on-snow events, but this was tempered by somewhat cooler weather in the state.

Litigation continued to consume a significant amount of time, effort, and expense for DWR. In particular, we continue to be actively involved in the adjudication of many large augmentation plans involving wells in Water Divisions 1 and 2. DWR successfully stipulated to most of the cases in which we were a party, thus avoiding significant trial expenses. However, some cases generated further appeals and eventually legislation to address the impacts of court decisions.

WATER SUPPLY BRANCH

The water supply branch is responsible for the protection of Colorado's water resources, a complex and vital challenge to the employees that serve in DWR. Recognizing the importance and value of our responsibilities, the following highlights some of the activities and accomplishments achieved by staff during 2009. The administrative and functional responsibilities performed include:

- Analyze and approve of Substitute Water Supply Plans (SWSPs);
- Review, analyze, and provide comments to Colorado counties regarding the water supply for proposed subdivisions;
- Perform well permitting and the associated analysis;
- Serve as technical staff for the Colorado Ground Water Commission;
- Manage DWR's involvement with litigation in the water court process, including providing expert witness testimony. Coordinate activities with the seven water divisions, the seven water courts, opposing parties, counsel and consultants, and DWR's legal counsel from the Colorado Attorney General's Office;
- Conduct engineering and technical analyses to support all facets of water resource engineering, planning, and administration; and
- Provide water resources training and education to attorneys, consulting engineers, federal, state, or county officials, school children and water users through a variety of formal and informal presentations.

Substitute Water Supply Plans

The authority to evaluate and issue SWSPs is vested exclusively with the State Engineer's Office. During 2009, the State Engineer's Office reviewed and acted on 205 general SWSPs (including emergencies) and 90 SWSPs related to gravel pits.

Subdivision Review

Although subdivision water supply plans must be reviewed within 21 days to meet statutory time restrictions, the Denver Staff often acts on them in substantially less than 21 days. During 2009, the State Engineer's Office received and acted on a total of 160 subdivision referrals. This does not include the numerous comments that we provide for non-subdivision referrals. This function requires continuous information sharing and communication with all Colorado counties.

Designated Ground Water Basins, Colorado Ground Water Commission, And Republican Well Measurement Team

To perform their duties, the Designated Basins staff (i.e., the personnel of the State Engineer's office that acts as staff for the Colorado Ground Water Commission) issued six final permits[1], acted on 334 small capacity well permits and 469 large capacity permits and Determination of Water Rights, 47 change application approvals, one replacement plan, and was involved in several enforcement actions.

As a result of the December 31, 2008 adoption of the *Rules and Regulations Governing the Measurement of Ground Water Diversions Located in the Republican River Basin within Water Division 1,* (Republican River Measurement Rules, or Rules), the manager filled the remaining positions on that team and began acting on the Rules to meet deadlines. By March 1, 2009, the Rules required all high-capacity wells within the Republican River Basin to be equipped with either a verified totalizing flow meter or with an alternative method of measurement that is granted a variance, such as a Power Conversion Coefficient, or be declared inactive. The Rules also required the owners of these wells to report by December 1, 2009, and every year thereafter, the annual amount of water pumped from the wells for the period of November 1 through October 31.

In order to administer this program, four FTEs were added to DWR staff. In addition to the four new staff positions, Lead Water Commissioner Dave Keeler's position was transferred from Division 1 to the Republican River Well Measurement Team.

With support from Division 1 and the Designated Basins Team, the Republican River Well Measurement Team processed meter verifications and/or well inactivity for 3,782 high-capacity wells. For the wells within the Republican River Basin subject to the Rules, the Republican River Well Measurement Team found 3,184 verification tests to be acceptable and failed 206 tests. In addition, 576 wells were declared inactive. The Republican River Well Measurement Team also processed 400 of the annual pumping reports that began flooding in with the December 1, 2009 deadline.

The Republican River Well Measurement Team also performed numerous field inspections for the Rules and engaged in well permit enforcement actions. Additionally, the Republican River Well Measurement Team aided the State of Colorado in its efforts to get into compliance with the Republican River Compact. The Republican River Well Measurement Team continually met with water users individually or at the numerous public meetings to provide information on the Rules and the status of Colorado's Compact Compliance Pipeline efforts.

Ground Water Well Permitting

The well permitting staff received and acted on 4,923 applications for well permits in 2009. Of that total, 603 were applications for replacement wells. In addition, the well permitting staff processed Monitoring-Hole Notices (523), Changes in

[1] Note: Staff vacancies resulting from reassignments and other high priority matters caused a reduction in the emphasis on final permitting during 2009.

Ownership/Address (5,391), Well Construction and Test Reports (3,154), and Pump Installation Reports (1,799).

Other Referrals

DWR receives referrals from other state and federal agencies including the Colorado Division of Reclamation, Mining and Safety, the Army Corps of Engineers, the Colorado Department of Public Health and Environment and miscellaneous federal agencies regarding environmental assessments and environmental impact statements. The Water Supply staff acted on 174 referrals from these agencies.

Special Projects

- Answered numerous questions from the public that were submitted through "AskDWR" on the website;

- Continued involvement with the Governor's Energy Office in assisting with education to remove roadblocks in geothermal development;

- Presented information on water rights to various groups of real estate agents and appraisers, well contractors, and governmental agencies. In addition, the Water Supply team had presenters at a Colorado Bar Association conference;

- Presented information on Colorado water rights at three out-of-state conferences: the Association of Western State Engineers, the American Ground Water Trust – ASR, and the Center for Water Resources Groundwater conference;

- DWR initiated new legislation to address well permitting and administration issues for oil and gas wells that produce water. HB-1303 was passed during 2009 and the rulemaking authority given by this new legislation resulted in Advisory Committee meetings, submittal of rules to the Secretary of State, and ultimately rulemaking hearings; and

- Water Supply staff worked to modify application forms, WellTools, and processes to accommodate new legislation, primarily for rooftop precipitation collection, rainwater harvesting pilot projects, and oil and gas well permitting and administration.

Litigation and Hearings

Litigation continues to consume a significant amount of time, effort, and expense for DWR. In particular, we continue to be actively involved in the adjudication of many large augmentation plans involving wells in Water Divisions 1 and 2, as well as water rights issues in Division 5 and 6. In December, 2009, the State Engineer conducted a hearing to consider the adoption of Produced Nontributary Groundwater Rules. The hearing considered a set of rules that would give guidance on making determinations of nontributary ground water and considered three "alternate proposed rules" that actually delineated geographic areas, inside of which groundwater would be considered nontributary for certain formations. The hearing concluded in December and the State Engineer's decision became effective in January 2010.

Personnel Changes

- Sarah Reinsel was reassigned to Team 1B;
- Cynthia Love resigned from Team 456 effective April 30, 2009;
- Mark Vanarelli resigned from Team 456 effective December 31, 2009; and
- Jim Martin was promoted onto the Republican Well Measurement Team and Chris Kucera and Ben Krause were hired on to that same team as new DWR employees.

GEOTECHNICAL SERVICES BRANCH

The Geotechnical Services Branch provides expertise in the disciplines of geology, hydrogeology, engineering geology, geophysics, well construction, well testing, and satellite-assisted surveying. The Geotechnical Services Branch responds to requests by internal and external customers for assistance in general investigations, supports the engineering sections in groundwater litigation, collects and reports ground water data, and provides technical assistance to the Board of Examiners of Water Well Construction and Pump Installation Contractors (Board of Examiners) and to the Colorado Groundwater Commission (GWC).

The Geotechnical Services Branch is currently staffed by three geologists/hydrogeologists, four well inspectors, and a part-time data entry specialist. Dave McElhaney is Chief of the Branch, Michael Schaubs is the senior geologist, and Elizabeth Pottorff is staff hydrogeologist. Jessie Dunbar assists the Geotechnical Services Branch and supports the Board of Examiners by reviewing and inputting data from pump installation, well construction, and well abandonment reports. Jessie entered information from more than 6,400 work reports in 2008. Ivone Cruz has assisted the Geotechnical Services Branch with special projects associated with the Denver Basin aquifers and the High Plains aquifers.

Enactment of Senate Bill 03-45 established a requirement for a well inspection program under the direction of the State Engineer. Because the program primarily supports the enforcement efforts of the Board of Examiners and is closely associated with the support activities of the Geotechnical Services Branch, the Well Inspection Program was assigned to the Geotechnical Services Branch. The administration structure is efficient and continues to be very effective.

The table below summarizes the work completed by the Geotechnical Services Branch in 2009.

Geotechnical Services Branch - 2009 Summary of Work

Well construction variance requests reviewed	166
Geophysical logs evaluated	28
Geophysical log waivers reviewed	61
Oil and Gas injection and cathodic protection well proposals reviewed	49
Well permit evaluation consultations	241
Designated Basins Final Permit aquifer evaluations	0
Well abandonment consultations	0
Water levels measured	966
Phone contacts and general evaluations	710

General Investigations

The Geotechnical Services Branch is involved in a variety of geologic, hydrogeologic, and geotechnical studies and projects. The following provides a brief description of the key activities in 2009.

- Coal Bed Methane (CBM) – CBM producers continue their efforts to develop models to determine a boundary between tributary and nontributary groundwater sources and

the extent of stream depletions resulting from CBM production of tributary groundwater. The geologists of the Geotechnical Branch assist, monitor, and provide technical review of the model development. Dave McElhaney functions as the lead geologist in questions related to CBM and its relationship to the aquifers and groundwater in the San Juan Basin; Elizabeth Pottorff is lead geologist in CBM matters in the Raton Basin and Michael Schaubs is assigned the Piceance Basin. At least three modeling efforts assessing the location and amount of tributary groundwater withdrawn by CBM wells are in various stages of development. The Geotechnical Services Branch continues to provide geologic and hydrogeologic information and technical review in support of the projects. The Geotechnical Services Branch provided review of models submitted for the CBM rulemaking hearings held toward the end of 2009.

- SPDSS - The Geotechnical Services Branch has assumed the water level monitoring activities that were being performed by the state's groundwater consultant, Camp, Dresser, and McKee, Inc., in their efforts to collect data for the South Platte Decision Support System.

- Colorado Geological Survey (CGS) Construction of Geologic Cross-Sections - The CGS continued its effort in describing the rocks of the structural Denver Basin that comprise the Denver Basin aquifers by constructing geologic cross sections across the basin. The Geotechnical Services Branch has provided geophysical data and technical review/comment of the sections and consults with CGS to ensure that geologic interpretations by CGS that deviate from the aquifer boundaries of the Denver Basin Rules and existing nomenclature will not result in confusion about DWR administrative aquifer boundaries. Close consultation between DWR and CGS has been coordinated through the Geotechnical Services Branch to ensure that preliminary plats or cross-sections shared with the public are not misinterpreted or misused.

- Geothermal energy continues as a topic of interest and discussion in the state. The Geotechnical Services Branch provides expertise and comments to potential geothermal developers and other interested parties. Governor Ritter and his administration actively promote development of the state's renewable energy sources, including its geothermal resources. Utilization of Colorado's geothermal resources currently includes direct uses from hot springs and wells and the installation of numerous geoexchange systems. Mt. Princeton Geothermal, LLC, consults with the Branch regarding their efforts to evaluate a geothermal source for potential energy production.

Ground Water Commission

The Geotechnical Services Branch assists the GWC through the monitoring of groundwater levels and providing technical support to the GWC and Designated Basins staff. A few or the activities that warrant highlight are presented below.

- The Geotechnical Services Branch collected annual water level data from more than 966 wells covering almost 75 percent of the state. Many of these water level measurements are from wells in the Designated Basins. Normally the Geotechnical Services Branch would collect data from over 1,200 wells however, due to budget and travel restrictions in 2009, the Geotechnical Services Branch had to limit its contracts for obtaining water level data and reduce its travel to collect data. Water levels collected in early 2009 were published as usual.

- The staff of the Geotechnical Services Branch provides technical support to Designated Basins well permitting staff. When needed, the Geotechnical Services Branch testifies regarding geologic and hydrogeologic issues at GWC hearings.

- During 2009, Michael Schaubs worked on construction of maps to indicate the remaining saturated thickness of the Northern High Plains Aquifer.

Denver Basin

The Geotechnical Services Branch has provided extensive geophysical and water level information for modeling and mapping efforts in the Denver Basin. Modeling of the bedrock aquifers by the USGS is complete, but still under internal peer review. Based on geophysical information (much of which was provided by the Geotechnical Services Branch), CGS continues its efforts to complete subsurface maps and cross-sections of the stratigraphic sequence that contains the Denver Basin aquifers.

- The Geotechnical Services Branch continues to compile information on the amount of groundwater currently permitted for withdrawal from the bedrock aquifers of the Denver Basin. Permitted amounts and producing aquifers have been determined for all non-exempt wells of record. Aquifer identification for more than 40,000 exempt wells in the basin continues. In 2009, 14,692 aquifer evaluations were completed.

- The Geotechnical Services Branch continues to evaluate geophysical logs and reviews waivers for geophysical logs.

Division Support

- The Geotechnical Services Branch routinely addresses court actions through general review of findings and evaluating geophysical logs to provide site-specific information where water court applicants seek determinations of water rights.

- Well permitting and subdivision review assistance continues on a daily basis. The Geotechnical Services Branch routinely assists the permitting staff by reviewing the geology along the margins of the Denver Basin to determine aquifer boundaries, saturated sand thicknesses, aquifer intervals, and hydrologic parameters at various locations throughout the state.

- Elizabeth Pottorff continues to monitor the progress of the exploration and proposed development of an in-situ uranium mining project in Weld County. Elizabeth is also actively pursuing expansion of the Denver Basin groundwater level monitoring

network by requesting information from municipalities and water providers that routinely collect water level data.

- Michael Schaubs provides groundwater hydrology expertise for the Well Tester Certification training statewide.

- Elizabeth Pottorff is the Geotechnical Services Branch and Division representative on the Colorado Ground Water Protection Council.

- The Geotechnical Services Branch evaluated several requests for nontributary groundwater during the past year and, as indicated in earlier reports, had expected to see more effort by persons seeking groundwater supplies to identify nontributary sources. The Geotechnical Services Branch expects this trend to continue.

Board of Examiners (BOE)

- Complaint Investigations for Rules Enforcement –Dave McElhaney is the administrator for the BOE staff. Dave continues to spend much of his time working with the Well Inspection Group that receives complaints and performs investigations for the BOE. Dave also participates at Technical Working Group meetings held bi-monthly with representatives of the Colorado Water Well Contractors Association, the Colorado Ground Water Association, as well as various consultants. Nolan Lloyd is the primary contact and handles most of the day-to-day activities related to well construction, pump installation and unlicensed contractor complaints. Nolan investigated 22 new complaints filed with the BOE in 2009 and continues to conduct follow-up on those cases not resolved during the year. During 2009, 25 complaints were resolved.

- Variances – The Geotechnical Services Branch (primarily Michael Schaubs) processed 166 requests for variance from the well construction rules during the year.

Well Inspection Program

The well inspection program was instituted for the protection of groundwater resources and public health through enforcement of the *Rules and Regulations for Water Well Construction, Pump Installation, Cistern Installation, and Monitoring and Observation Hole/Well Construction, 2 C.C.R. 402-2*. The staff's duties in this program include inspecting water well construction and pump installation, monitoring and observation hole/well construction, well plugging and abandonment, complaints investigations, providing education and outreach, and generally supporting the State Engineer and BOE.

Nolan Lloyd, Chief Well Inspector, is based in Denver and supervises the well inspection program. Nolan handles the day-to-day operations of the program as well as the complaints regarding well construction and/or pump installation activities. The vacancy created as the result of a resignation in August 2007

continues to be unfilled. Doug Stephenson relocated to Denver in early 2008 and covers well inspections in Divisions 1 and 2. Well Inspectors are also located in Alamosa (Larry Hakes), covering the south central and portions of the southeast, and Durango (Doug Pickering), covering the southwest and northwest. The Glenwood Springs position formerly occupied by Doug Stephenson, covering the northwest, is currently vacant. The well inspection program has proved to be a tremendous asset to the State Engineer and BOE's enforcement efforts. Although budget constraints have sometimes limited the ability of the well inspectors to travel, they continue to do an outstanding job.

A key focus of the well inspectors and the inspection program is to locate and initiate action against unlicensed contractors working illegally in the state. With regard to licensed contractors, the most frequent violation continues to be contractors drilling outside the distance limits allowed by the permit (usually 200 feet).

As the well inspection program developed, the staff experienced a decrease in the proportion of violations discovered as a result of inspections. This was anticipated. Since the inception of the inspection program, it is evident that many licensed contractors are refining their well location and construction practices to ensure full compliance with the BOE's Rules.

The well inspectors conducted more than 1,488 inspections in 2009. As in previous years, nearly half of the inspections were conducted in Division 3. Well inspections were distributed across the state generally as follows:

Percent of inspections by Water Divisions

Div 1, 2, and 8	Div 3	Div 4, 5 and 6	Div 7
26%	53%	4%	17%

Geotechnical Services Branch On-going Operations

- The Branch continues to cooperate with the CGS in support of its mapping and cross-section construction of parts of the Denver Basin. The Branch also provides information pertinent to the Denver Basin bedrock aquifers in support of the ground water modeling effort by the USGS along with technical review of publications regarding the Denver Basin.

- The Branch continues to review and compile permitted appropriations from the Denver Basin aquifers. The Branch's efforts to verify surface elevations and well locations in the geophysical log database are on-going. Updating and expanding working maps in the Dawson Butte, Castle Rock and Designated Basins areas continues.

- Michael Schaubs continues management of the water level monitoring programs and, with Elizabeth Pottorff's assistance, continues to modify the programs as needed to replace monitoring sites that have been discontinued and to add new sites to provide better coverage.

2009 HYDROGRAPHIC AND SATELLITE MONITORING BRANCH

Introduction

The primary mission of DWR Hydrographic and Satellite Monitoring Branch is to collect, analyze, and present accurate, high quality "real time" flow and content data in Colorado rivers, streams, creeks, canals, ditches, and reservoirs to support the water rights administration mission of DWR. Hydrographers around the state operate and maintain a system of over 500 gaging stations on these watercourses and water bodies, perform streamflow measurements to maintain stage-discharge relationships at gaging stations, and maintain satellite monitoring equipment. The DWR Hydrographic and Satellite Monitoring Branch also develops historic streamflow records at a subset of stream gage locations in coordination with other state and federal entities and the water user community.

The satellite-linked monitoring system (SMS) provides DWR, other state and federal entities, and the water user community with access to real-time streamflow and content data from gaging stations across Colorado. These data and software systems provide for more effective and efficient water rights administration, water resource management, computerized hydrologic record development, and high (flood) and low flow alerts. The SMS allows DWR to collect, process, store, and distribute any kind of environmental data transmitted from remote locations. "Users" include DWR personnel, other water users wanting real-time flow data for water rights administration, computer systems performing other analyses, and the varied user community of state and federal agencies, municipalities, canal companies, attorneys, recreationists, and consulting engineers needing access to real-time stream flow data.

Staffing

Hydrographic staff is located in each of the seven Division offices and in Denver.

Gaging Station and Hydrographic Operations

A total of 283 gaging stations are monitored by Division 1, up from 269 last year. The main source of growth has been the increase of gages on the cooperative flow program (SDR/cell phone telemetry), which now totals 69 sites. No hydrographic involvement occurs at 44 of the 46 USGS gages monitored, as well as at a small number of satellite sites still maintained by NCWCD and USACE. Division 1 staff are responsible for maintaining relevant gages, maintaining the satellite equipment, publishing an official record, conducting regular measurements and rating update activity at approximately 165 gages. Streamflow records are prepared at 80 of these gages. Significant cooperative maintenance previously provided by the USBR and USACE for their gages was no longer available in 2009. Therefore, while the station

numbers have remained the same, the workload has increased. Division 1 hydrographers are not responsible for the maintenance or accuracy of 69 gages that are on cell phone telemetry, but do contribute to creating the rating tables used in the SDR recorders. They also assist with the SDR set-up and installation.

There are a total of 189 satellite monitoring gaging stations monitored by Division 2 hydrographic staff. Of these, 104 sites are operated and maintained by staff. Of the 104, streamflow records are prepared at 47 sites. Gages operated solely by Division 2 require periodic visits to confirm the equipment is functioning correctly. The remaining sites are operated and maintained by other agencies, primarily the USGS. Division 2 staff monitors these sites, and as needs arise, perform gage operation and maintenance and check measurements.

In Division 3, 78 gages with satellite telemetry are maintained, which includes 58 stream-gage record stations. One of these stations is linked into the satellite telemetry network via a line-of-site radio bridge to a station with satellite telemetry. There are currently only three stream-gage record stations with no satellite telemetry. Other stations with satellite telemetry include eight stream-gage administrative stations of which one is hardwired to a reservoir station, 11 stream-gage diversion stations, and seven reservoir stations. Two of the stream gage record stations with satellite telemetry also have phone line telemetry. There is an additional two stream-gage administrative stations that do not use satellite telemetry, but the data loggers are maintained. One is equipped with an 8210 data logger and phone line telemetry and the other utilizes an SDR data logger. DWR owns the data logger /transmitter equipment at 66 of these stations.

Division 4 has 25 satellite monitoring stream gages. Streamflow records are prepared at seven of these locations. Division 4 is closely associated and cooperates with the USGS at four additional gages and cooperates with the United States Bureau of Reclamation at four sites, including three stream gages and one reservoir station.

Division 5 operated and maintained 39 satellite monitoring stations in Water Year (WY) 2009. Streamflow records were published for 14 of the stations. The other gages were used for water administration and/or to develop diversion records. Three of the stations

are reservoir gages. In addition, there was active monitoring of many of the 86 satellite monitoring stations in Division 5 that are operated by other entities.

Division 6 operates 14 active stream gage sites in the Yampa, White, and North Platte River basins. Streamflow records are prepared at 9 of these locations. Of the 14 gages, 13 are equipped with satellite monitoring. Of these, three transmit reservoir water surface elevation, nine transmit stream flow gage height, and two transmit both parameters. The remaining gage is equipped with a DCP to record gage heights

Division 7 operates and maintains 56 stream gages, 44 of which are satellite monitoring gages. Thirty-eight gages have been upgraded to high data rate (hourly) transmissions. Streamflow records are prepared at 23 of these sites.

Streamflow Records

The Hydrographic Branch prepared a total of 243 streamflow records for publication in the DWR Annual Streamflow Publication for WY 2009. Of these, 11 records were published by the USGS Colorado Water Science Center in their annual streamflow data report for WY 2009, and the New Mexico office of the USGS will publish four.

Streamflow records for WY 2009.

Division 1	Division 2	Division 3	Division 4	Division 5	Division 6	Division 7
80	47	63	7	14	9	23

A total of 65 WY 2008 streamflow records (27% of those prepared for publication in WY 2008) underwent a quality assurance/quality control review. Fifteen were reviewed by the USGS and 50 were reviewed by the DWR Lead Hydrographers and the Chief Hydrographer.

Streamflow Measurements

Hydrographers and water commissioners across the state made over 3,440 measurements in 2009 in streams, rivers, canals and ditches (Table 2). These measurements were made to calibrate stage-discharge relationships at streamgaging stations, in canals and ditches in support of real-time water administration decision-making and in support of historic streamflow record development.

Discharge measurements made in 2009.

Division 1	Division 2	Division 3	Division 4	Division 5	Division 6	Division 7
1220	515	1000	168	125	128	285

DAM SAFETY

A comprehensive 2009 report of the Dam Safety branch is available at http://www.water.state.co.us

The mission of the DWR's Dam Safety Branch is to prevent the loss of life and property damage and protect against the loss of water supplies due to the failure of dams in Colorado. The Dam Safety Branch accomplishes this mission primarily through Safety Evaluations of Existing Dams (SEED) to determine the safe storage levels of reservoirs within the state. Additional program tools include a comprehensive set of regulations, policies, and procedures for the design, construction, and maintenance of dams; the safe operation of reservoirs; and emergency preparedness planning.

The Dam Safety Branch is managed by the State Engineer in accordance with Title 37, Article 87 of Colorado Revised Statute (C.R.S.) and the Livestock Water Tank Act, Title 35, Article 49 of C.R.S. The program is implemented by the State Engineer through the Dam Safety Branch and division field offices. The Colorado Dam Safety Branch oversees a total of about 2,900 dams with 1,930 dams of jurisdictional size. Of these, about 1,802 are non-federal dams. Of the non-federal dams, approximately 614 (310 High Hazard and 304 Significant Hazard), or about 35 percent, are classified as dams that, in the event of a failure, would be expected to cause loss of life and/or significant property damage within the flood plain areas below the dams.

For WY 2009, the Dam Safety Branch accomplished a number of the goals and objectives identified in the past annual report. Through the diligent field observations of dam safety engineers statewide, several near-failure incidents were acted upon in time to diffuse potentially dangerous situations and possible loss of life. As a direct result of these actions, no loss of life or significant property damage occurred in Colorado in W Y 2009. This is attributed to the increased awareness and responsibility of the dam owners for their dams, including emergency action planning and to the enforcement of the regulations, policies, and procedures by DWR.

During WY 2009, the State Engineer's Office approved one plan for a new dam and 31 plans for alteration, modification, or enlargement of existing dams. Hydrology studies for five dams were also approved for determination of the inflow design flood for spillway adequacy or design. The estimated cost of construction for the submitted plans was over $103.7 million.

During WY 2009, a total of 533 dam safety inspections and 159 construction inspections were conducted by dam safety engineers for a total of 692 inspections. In addition, 122 follow-up inspections were performed. At the conclusion of this reporting period, there are a total of 168 dams restricted from full storage due to inadequate spillways and

various structural deficiencies such as significant leakage, cracking, and sliding of embankments. The restrictions provide risk reduction for the public and environment until the deficiencies identified are corrected. Although many dams were repaired and removed from the restricted list within the last year, a number of dams were also added to the restricted list. More specifically, two High Hazard; four Significant Hazard; 16 Low Hazard structures dams were restricted amounting to a total of 2,602 acre-feet of storage restricted. This reporting period showed a slight decrease in the number of dams on the restricted list by three dams and the storage volume of the restrictions increased by approximately 2,436 acre-feet.

The Dam Safety Branch has been able to acquire and maintain a full staff of experienced professional engineers, and has adequate statutes, regulations, policies, and procedures to implement and carry out the program. The Dam Safety Engineers continue to participate in vital state and national dam safety and security activities.

The following is a brief summary of Branch activities during WY 2009 in addition to the dam safety activities previously mentioned:

- A total of 13 dam incidents occurred this reporting period requiring emergency responses and investigations by the Dam Safety Branch;
- The Dam Safety Branch engineers attended several technical trainings and seminars to maintain a high level of expertise in the area of dam design, hydraulic analyses, and emergency action planning;
- Several dam safety engineers presented technical papers on engineering studies and procedures at national and regional conferences;
- The Dam Safety Branch continues to educate dam owners on dam safety and the importance of emergency action plans. Currently all high hazard dams and 98 percent of significant hazard dams have Emergency Action Plans (EAPs) in place;
- The dams database (DAMS) has been updated and upgraded this water year. Recent upgrades to DAMS provides the dam safety engineers with access to the database while in the field and the ability to prepare safety inspection reports remotely and upload the reports to the database. This system is used to update the National Inventory of Dams (NATDAM or NID) periodically when requested by the U.S. Army Corps of Engineers;
- A number of publications are available at no cost on the Dam Safety web page at http://www.water.state.co.us/damsafety/dams.asp. The documents are in a variety of common formats including Microsoft Word and Adobe Acrobat PDF;
- The Risk Based Profiling Score continues to show positive results and has allowed the dam safety engineers the ability to more efficiently allocate resources to those dams determined to present the greatest risk to public safety;
- Several dam safety engineers participated in several EAP tabletop exercises for federal and non-federal dams throughout Colorado;
- Paul Perri, Design Review Engineer, is participating in several plenary meetings on the revisions to the Colorado Water Conservation Board (CWCB) Floodplain Rules

and Regulations. Paul provided insight to the activities and recommendations that the National Committee on Levee Safety as it relates to the proposed revisions to the Floodplain Rules and Regulations;

- Bill McCormick, Dam Safety Engineer from Division 2, was presented with Professional of Year for DWR. Most notable Bill provided the Colorado Department of Emergency Management with an evaluation of the potential impacts of a breach of the Leadville Mine Drainage Tunnel near Leadville, CO;
- As an Association of Dam Safety Officials Board member, Mark Haynes participated in the American Society of Civil Engineers (ASCE) Policy week in Washington D.C. to visit the offices of Senators Udall and Bennet, and Representatives Salazar, Markey, and Coffman, to bring attention to the condition of our nation's infrastructure and to encourage support for the Dam Rehabilitation and Repair Act. ASCE recently completed a 2009 report card on the nation's infrastructure, where the condition's of the nations dams was given a "D". Colorado's local section of ASCE also prepared a report for the infrastructure within Colorado and the dams in the state was given a grade of "B". This grade can be attributed to the dedication and effectiveness of the dam safety engineers.
- Mark Haynes, Chief of the Dam Safety Branch, continues to serve as one of eight state representatives on the Dam Sector committee of the Department of Homeland Security (DHS) Government Coordination Council (GCC). The GCC is a diverse federal, state, local, and tribal interests to develop and identify collaborative strategies that advance critical infrastructure protection and security.
- Paul Perri, Design Review Engineer is currently serving as a voting member representing DWR on the National Committee on Levee Safety (NCLS). In January 2009, the NCLS released *Recommendations for a National Levee Safety Program.* Among the twenty recommendations, Recommendation 14 – Design and Delegate Program Responsibilities to States to assist states and local governments develop effective levee safety programs focused on continual and periodic inspections, emergency evacuation, mitigation, public involvement and risk communication/awareness will need to be addressed and possibly incorporated into the dam safety program in the near future.

DECISION SUPPORT SYSTEMS AND MODELING BRANCH

The Modeling Branch exists to provide technical expertise to DWR and other agencies through review, development, analysis and execution of complex hydrologic computer models. The Modeling Branch consists of four professional engineers who independently or as a team conduct investigations and analysis of computer models designed to simulate surface and ground water systems. The investigations and analysis are conducted to forecast stream flow, determine stream depletions due to pumping ground water, determine diversion requirements, transmission losses, evaporation losses, determine historic consumptive use, and general characteristics of stream regime. The Modeling Branch staff provides expert advice to other agencies, provides expert testimony before the Ground Water Commission and water court, and recommends plans for water use and development within Colorado through analysis by computer modeling.

Rio Grande Decision Support System (RGDSS)

The Modeling Branch staff continued to coordinate with the RGDSS peer review team in the refinement of the ground water model for use in the analysis of Ground Water Management Subdistricts in the San Luis Valley.

Ground Water Model Enhancements

The RGDSS ground water model of the San Luis Valley continued to be enhanced through the peer review team. Water level data continues to be refined in cooperation with the Rio Grande Water Conservation District (RGWCD) for further calibration of the model and for defining the sustainability of the confined aquifer. Division 3 has made significant progress in updating the well database with accurate location, depth, screen interval information, and meter records to refine the well pumping input to the model as well as provide significant insight regarding well capacities and usage. The StateCUconsumptive use estimates of pumping, recharge, and sub-irrigation on a ditch-by-ditch basis continue to be honed with refined mapping of irrigated acreage and crop type. All of these data refinements and enhancements increase the accuracy of the model input stresses and ultimately provide a better calibration of the model for use in application of the model to specific areas and unique situations in the San Luis Valley.

South Platte Decision Support System (SPDSS)

The State of Colorado's Water Budget Model (StateWB) was developed to perform a water balance for a wide range of basins or sub-basin combinations. StateWB is a Visual Basic computer program that calculates the mass balance of a defined area's surface and ground water inflows, outflows, and changes in storage on a monthly, annual, or average annual time step. For the South Platte in 2009 there are two datasets completed: 1) an average annual water budget for the entire South Platte Basin in Colorado for the period 1950 through 2006; and, 2) an average annual water budget for the Ground Water Model Area for the period 1950 through 2006. These data sets include basin or sub-basin surface and ground water inflows, outflows, and changes in storage. Task memorandum of the development of the water budgets for both the South Platte and Laramie Basins were completed in 2009. In 2009, the Irrigated Parcel Well Adjustment Procedure was developed and initiated. This process adjusts the 2005 irrigated parcels with new information on groundwater usage by wells associated with those parcels. In 2009, the SPDSS continued activities scoped for Phase 5 of the 6-phase project. The Ground

Water team released the updated Geographic Information Systems (GIS) groundwater data layer for transmissivity and posted it to the Colorado Decision Support System (CDSS) webpage. The database team continued working on numerous enhancements to the CDSS tools including TsTool, the time series processor and StateDMI, the model preprocessor. Application of the state's surface water model, StateMod, to the Lower South Platte from Kearsey to the Stateline will be developed to verify the SPDSS enhancements required to simulate water transfers, augmentation plans, recharge pits and reuse of return flows in the South Platte. In coordination with State IT personnel, HydroBase, the CDSS database, was refreshed to include 2009 data, aquifer parameters, and water level data collected under SPDSS.

Kansas v Colorado Litigation Support

In 2009, after 24 years, the *Kansas v. Colorado* Supreme Court suit was closed. Colorado continues to work with Kansas to assure that the Arkansas River Compact is properly administered. In an agreement with Kansas, the sufficiency of the Use Rules was evaluated using the Hydrologic-Institutional (H-I) Model. The experts for each state agreed that a document be drafted to formalize the procedures for evaluating the presumptive depletion factors provided by the Use Rules and to formalize other issues regarding the Use Rules that the experts had evaluated and discussed. The draft agreement has been prepared and negotiations are on-going to finalize the agreement.

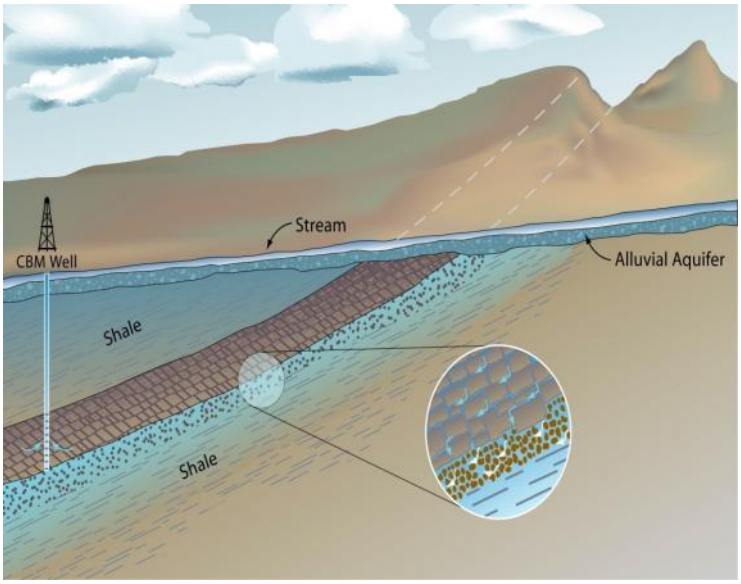
An annual update of the H-I Model data sets was performed to include calendar year 2009 and it was determined Colorado was in compliance with the Arkansas River Compact based on results from the H-I Model and the procedure provided in the Judgment and Decree in *Kansas v. Colorado*.

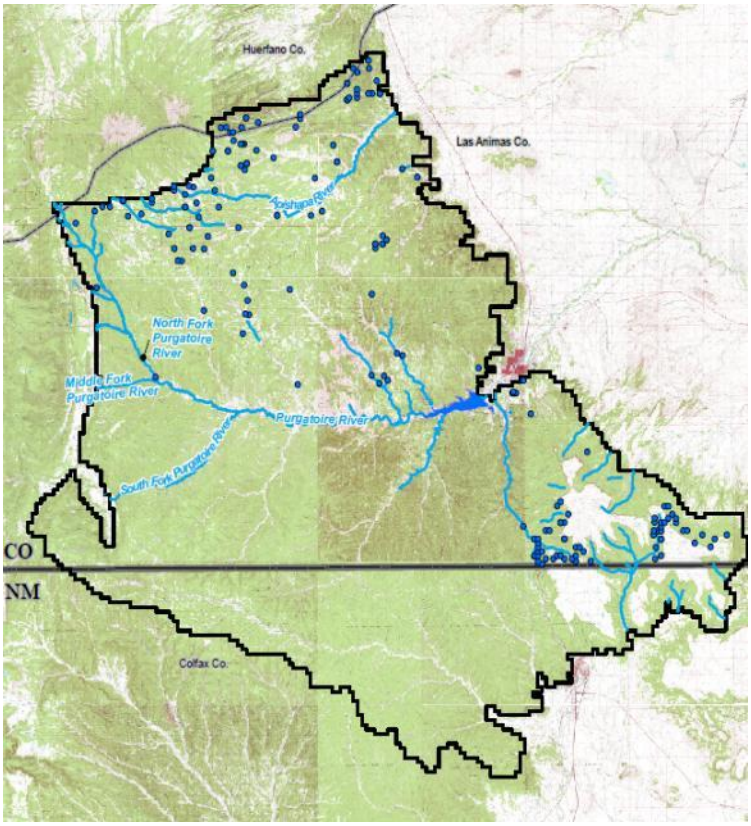
The project to design, build, and operate two lysimeters at Rocky Ford, Colorado, continued in 2009. The first (3m x 3m) lysimeter, having been completed in April, 2007, was used to collect evapotranspiration (ET) data for alfalfa for the entire growing season of 2009. Simultaneously, environmental data was collected and analyzed using the ASCE Standardized Reference ET Equation (Penman-Monteith) to obtain the predicted alfalfa reference ET and compare it to the actual alfalfa ET. The preliminary results of the first year of data collection and analysis were presented as a poster presentation at the American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and Soil Science Society of America (SSSA) Joint International Annual Meetings in Houston, Texas, on October 6, 2008. The Rocky Ford phase of the construction of the second smaller (1.5m x 1.5m) lysimeter commenced in May 2008, after completion of: the fabrication of the steel inner and outer structure, the final design of the scale system, and, the final design of the helical pier/anchor supported foundation. Construction and calibration of the smaller lysimeter was completed and a forage crop of oats was planted on the lysimeter and the surrounding field.

Coal Bed Methane Production in Colorado

The Colorado Oil and Gas Conservation Commission (OGCC) regulates the production of Coal Bed Methane (CBM) in Colorado. However, the associated water produced from CBM production falls under the jurisdiction of DWR. Modeling staff assisted the State Engineer in review of models proposed under the promulgation of rules. Per legislation, the State Engineer promulgated rules on water produced as part of minerals mining.

CBM Rules were promulgated in September 2009 and alternate rules proposed and heard in December 2009. The CBM Rules affect approximately 35,000 wells in Colorado.





LITIGATION

Volume and Trends

To perform our statutory responsibilities, litigation continues to consume a significant amount of time, effort, and expense for DWR. The following table describes the number of water court applications filed in 2009 and formal Statements of Opposition (including Motions to Intervene) filed on behalf of DWR:

2009 Court Applications and DWR Interventions

Division	Applications and Amendments	Statements of Opposition and Interventions	Percent Opposed
1	225	9	4.0%
2	150	7	4.7%
3	34	3	8.8%
4	190	0	0.0%
5	196	8	4.0%
6	75	5	6.7%
7	97	0	0.0%
Total	**967**	**32**	**3.3%**

When compared to previous years, the volume of cases continues to generally decline from the peak of 1,831 applications in 2002 (due to the drought and the *Empire Lodge* opinion). There is a slight anomaly in Division 1, where well augmentation cases continue to seek final decrees. DWR requires party status to ensure that these complicated decrees can be administered in the field. The effort required by Denver and division office staff remains high due to the lag effect of the large number of cases filed in past years as those cases work their way toward trial.

Long Term Trends in Water Court Applications

Div	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
1	265	346	441	527	468	394	350	388	239	225	364
2	153	151	189	119	148	113	138	146	123	150	143
3	44	45	61	60	41	25	36	63	27	34	44
4	250	318	349	345	236	314	280	235	79	190	260
5	307	443	510	443	345	362	319	295	206	196	343
6	86	146	143	132	67	83	99	135	37	75	100
7	100	121	138	129	118	108	140	115	94	97	116
Total	**1205**	**1570**	**1831**	**1755**	**1423**	**1399**	**1362**	**1377**	**805**	**967**	**1369**

COLORADO SUPREME COURT

Court Changes 2009

In 2009 the legislature approved new Water Court Rules that are designed to streamline the Water Court process. These rules generally require a complete application for initial filing and set up an expedited time schedule for resolution of the cases. A complete list of the Water Court Rules is available on the Colorado Courts webpage at; http://www.courts.state.co.us

In 2009 the legislature moved the jurisdiction for White River filings from the Division 5 Water Court (Glenwood Springs) to the Division 6 Water Court (Steamboat Springs). The White River basin has long been administered by the Division 6 Division Engineer.

Case Announcements 2009

In March 2009, the North Sterling Case (08SA29) decision was announced. In this case North Sterling Irrigation District appealed the District Courts order affirming the State and Division Engineers' authority to implement a fixed water year to administer storage rights in accordance with the one-fill rule. The Supreme Court affirmed the District Courts order.

In April 2009, the Vance case (07SA 293) decision was released. This case centered around the depletions caused by the operation of CBM wells and the State Engineer's authority to regulate the water produced as part of minerals mining. This case resulted in legislation directing the State Engineer to promulgate Rules and Regulations regarding water produced during minerals mining activities.

In June 2009, the Court issued its decision in the Aurora Case (08SA222). This case centered upon conditional water storage rights and their proposed reservoir sites, and the need for the holder to demonstrate that it can and will gain access to the disputed reservoir sites. The Supreme Court upheld the District Court's dismissal of the claims for the conditional storage rights.

In October 2009, the Confined Aquifer Rules Costs Case (08SA312) decision was announced. This decision regarded an appeal of the awarding of costs to the State and supporters in the trial on the promulgation of Rules and Regulations concerning new appropriations from the Confined Aquifer of the San Luis Valley. The decision upheld the District Court's ruling awarding costs to the state and supporters; however, remanded the case for a more complete determination of the proper amount of the award.

The Pagosa Springs Rehearing Case (08SA354) decision was announced in November 2009. This case was earlier remanded to the District Court who entered a conditional decree for the Pagosa Area Water District. Opposer Trout Unlimited, questioned the 2055 planning period and the conditionally decreed amounts of water. The Supreme Court upheld the 2055 planning horizon, but remanded the case to the District Court for further evidence regarding the determination of the amounts of water reasonably necessary to serve the District's need in the 2055 period.

In late 2009, the Supreme Court issued its decision in the Central WAS case (08SA224). In its decision the Court::

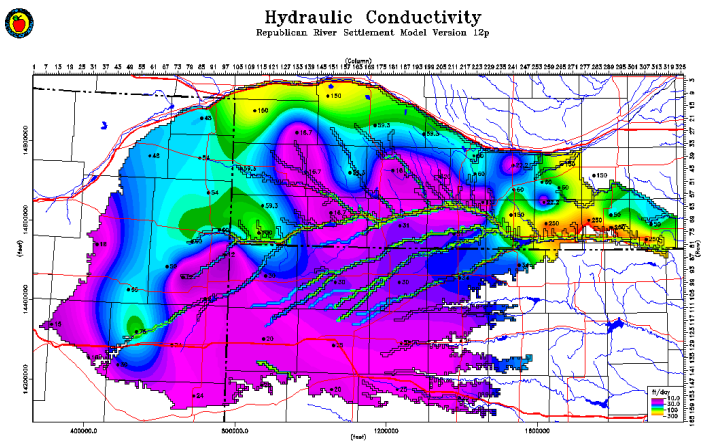
- Upheld the District Court finding that the applicant was required to provide replacement water for post-pumping depletions made before the filing of the augmentation plan application.
- Upheld the finding that replacement obligations in the Box Elder Creek basin must be determined based on surface water conditions that would exist absent groundwater pumping.
- Declined to advise on whether the State and Division Engineers have authority to implement the "well call" administration system.
- Reversed the District Court finding that Substitute Water Supply Plan (37-92-308(4)) appeals should be de novo and found instead that the appeals should be reviewed pursuant to the Colorado Administrative Procedures Act (24-4-106).

INTERSTATE COMPACTS

Please see
http://water.state.co.us/SurfaceWater/Compacts/Pages/default.aspx for more information concerning all interstate compacts.

Republican River Compact

Under the Final Settlement Stipulation (FSS) reached between the states of Colorado, Nebraska and Kansas in 2002 (the U.S. Supreme Court approved the stipulation in May 2003) , groundwater was included in the Republican River compact. This inclusion and accounting as a result of the settlement indicates that Colorado is not in compliance with the Republican River Compact due to groundwater use being exacerbated by the extreme drought that started in 2002. Colorado and the Republican River Water Conservation District (RRWCD) proposed a pipeline to pump water to the Republican River near the Colorado Stateline to assist in compact deliveries. In 2009, Colorado twice presented resolutions to the Republican River Compact Administration (RRCA) to accept Colorado's augmentation plan including the Colorado Compliance Pipeline (CCP) and augmentation accounting. In both instances the other states denied the resolution.



Colorado filed for non-binding arbitration under the terms of the FSS to determine the reasonableness of the denials.

As Colorado awaited the decision of the arbitrator she continued to work with Kansas and Nebraska to develop an amicable resolution on accounting for water delivered to the downstream states via the proposed CCP. The RRWCD secured a majority of the funding for the purchase of water rights and construction of the CCP from the CWCB and purchased water rights sufficient for the CCP in its present need. Colorado also participated in arbitration hearings on Kansas claims against Nebraska for overuse/underdelivery of compact obligations and for Nebraska's claims for restricting of the groundwater model used to determine groundwater impacts on the streams in the Republican River Basin.

Arkansas River Compact

During 2009, Colorado continued to work with Kansas to finalize the settlement of the long running *Kansas v. Colorado* lawsuit regarding compact compliance. Kansas filed a motion under the retained jurisdiction of the Final Decree regarding the adequacy of the 1996 Well Use Rules at the end of the 2008. Colorado worked with Kansas to demonstrate the adequacy of the Rules.

In an effort to avoid potential future violations of the Compact, the State Engineer formed a special advisory committee to assist in developing rules and regulations regarding irrigation efficiency improvements made in the basin to surface water irrigation systems. These improvements are subject to the compact under certain circumstances. The rules were promulgated and delivered to the water court for review in September. Over 20 objections to the rules were filed and trial is scheduled for November 2010.

Colorado River Compact(s)

Colorado is subject to the Colorado River Compact and the Upper Colorado River Compact. These compacts allocate a portion of the flows in the Colorado River basin to Colorado's use. With uncertain climatic conditions and growing demand for water from this system, Colorado is considering how compact deliveries can be made in the event insufficient water is available for all uses. DWR is working with CWCB to initiate studies to determine current needs and depletions in the basin and to assist in developing strategies as to how the four water divisions on the Colorado River in Colorado would operate in a short supply situation.

La Plata River Compact

Hydrologic conditions in the southwest part of the state remained dry during WY 2009. The La Plata Compact requires deliveries under varying hydrologic conditions and New Mexico has long been concerned about Colorado's administration during dry conditions. The LaPlata and Southwest Water Conservancy Districts are sponsoring Long Hollow Reservoir as a potential solution to the long-standing concerns. Animas-La Plata settlement funds on reserve with the Colorado Water and Power Development Authority were used to initiate dam design in 2009.

Rio Grande Compact

The Rio Grande Compact had a near normal water year in 2009 despite dry late season conditions. Extensive use of recharge was made in the basin to avoid over-delivery of water to downstream states. In the lower part of the basin endangered species issues and the Elephant Butte Operating Agreement were the larger issues. The Compact Commission continues to observe the impact of endangered species on New Mexico's water operations. The Operating Agreement was developed to incentivize the conservation of water in Elephant Butte Reservoir by allowing the two districts to build carryover pools in the reservoir. Finally, the Rio Grande Compact Commission is discussing salinity studies, via the formation of a salinity group, that can access Army Corps of Engineers, Water Resource Development Act funding, in the lowest part of the upper basin (below Elephant Butte Reservoir to Ft. Quitman, Texas).

ADMINISTRATION

Budget Issues

DWR remains conservative in its expenditures; DWR is 90% funded by the General Fund and 85% of expenditures are personnel related. With the economic recession that started in 2008, DWR was asked to limit some activities and to freeze all vacant positions into July 2009 so that the General Fund would not be overspent. DWR was again tasked to develop data on fee adjustments that could be used to backfill any permanent cuts made to operating funds. However, no fee adjustments were approved by the legislature.

Key Personnel

Many changes in personnel occurred in 2009. Most are discussed in the individual division and branch reports. Of interest are the major personnel changes listed below:

- Bob Hurford was appointed to be the Division Engineer in Division 4 (Gunnison Basin).

- Craig Cotten was appointed Division Engineer in Division 3 (Rio Grande Basin).

Legislation

Four pieces of legislation that affect DWR were passed in 2009.

Senate Bill 09-80: The Precipitation Collection Limited Exemption bill allows domestic well permit holders to install cisterns capturing precipitation and use the water for the same purposes as allowed under their domestic permit. The bill requires a permit be obtained so DWR has amended permitting operations to record cisterns as part of a permit if a person desires.

House Bill 09-1129: The Precipitation Harvesting Pilot Projects bill authorizes a pilot program for the collection of precipitation from rooftops for non-potable uses. The program can include up to 10 new residential or mixed-use developments. The purpose of the program is to determine how much precipitation returns to the natural stream system and develop a baseline set of data and methods to measure local precipitation patterns, native plant consumption, and ground water flow information. It will also evaluate precipitation harvesting designs and determine how to prevent injury to water rights. DWR worked with CWCB on implementation of this legislation.

House Bill 09-1174: Because rules on wells in the South Platte did not go into effect until 1974, and well pumping prior to 1974 did not require augmentation, this bill provides that augmentation is not required for current depletions caused by pumping prior to 1974.

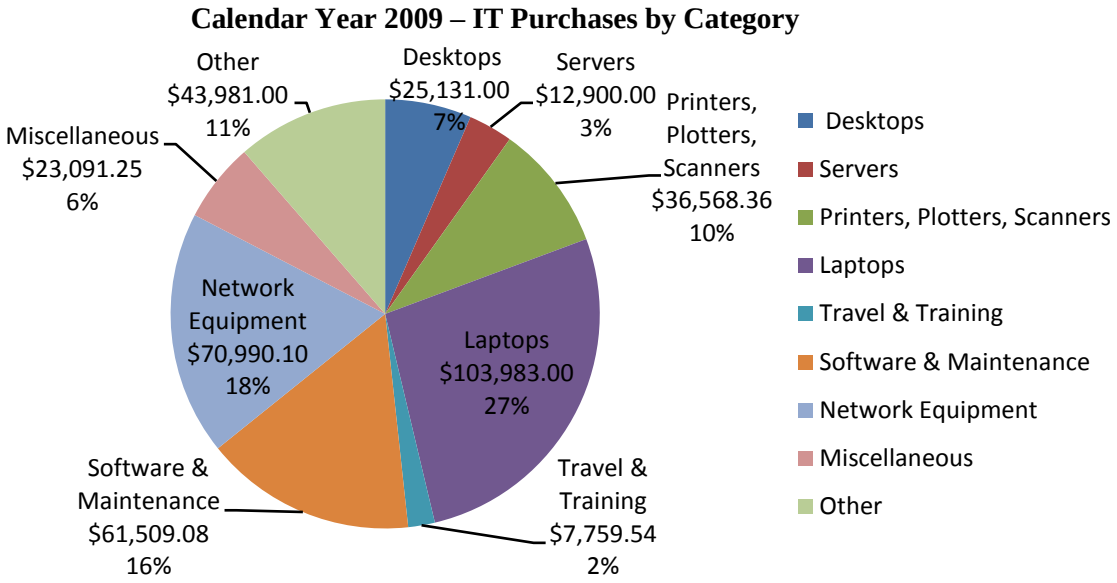
Senate Bill 09-147: Authorizes the State Engineer to approve substitute water supply plans for the replacement of out-of-priority depletions caused by diversions from wells that occurred prior to January 1, 2003, and are also included in decreed augmentation plans.

INFORMATION TECHNOLOGY

The IT staff continued to provide technical support to the divisions and the central office in 2009. One resignation occurred during the year however, approval of a new hire, Aili Cheng, was allowed.. The new programming position that was created last year to support hydrographic efforts, and was filled by Phil DeArcos, left a vacancy that was filled by Margaret Herzog. The IT support position in Division 3 was lost to the new OIT consolidation and it will be abolished along with the two network positions that were forfeited.

Summary of Information Technology Expenditures

The year 2009 required expenditures going towards replacing aging and/or failing equipment, especially in the field offices. Equipment is now on a 4-year replacement cycle and warranties are purchased on the equipment to cover the additional time. Additionally, the IT budget suffered a reversion of $23,981 for the FY08-09 budget year.



Imaging (Laserfiche)

During 2009, DWR continued to supplement the content in Laserfiche. The content grew by over 75,000 available documents, or 6%, during this time frame.

DWR Imaging Content

Template Name	2008	2009	% growth
DWR - Abandonment Lists	51	58	14%
DWR - Consent Maps	82	82	0%
DWR - Dam Construction Drawings	2803	2849	2%
DWR - Diversion Records	19214	19176	0%
DWR - Division 1 Filing	0	9473	100%
DWR - Geophysical Logs	3839	3966	3%
DWR - GWDMS Forms	11855	22690	91%
DWR - Hearings	0	3527	100%

Template Name	2008	2009	% growth
DWR - Historical Court Actions	170	170	0%
DWR - LSWTECD	26536	26535	0%
DWR - Map and Filing Statements	30576	30576	0%
DWR - Miscellaneous Documents	16	16	0%
DWR - Official Tabulations	108	109	1%
DWR - Pre-SB213 Worksheets	1188	1192	0%
DWR - State Archive Inventory	33	37	12%
DWR - Straight Line Diagrams	1197	1196	0%
DWR - Subdivisions	34856	35916	3%
DWR - Water Court	336883	361051	7%
DWR - Water Court Resumes	3558	3648	3%
DWR - Well Permit Information	885597	912210	3%
Total	**1360570**	**1436486**	**6%**

Infrastructure/Networks/Desktop Support

Two new servers were deployed to the field offices during the calendar year. This was as a result of a failing server in Alamosa and the need for expanded processing power and storage capacity in Pueblo.

21 desktops were purchased and replaced, many of these failed Gateway equipment, as well as 49 laptops that were mostly for Division personnel.

The upgraded communication lines to Alamosa, Greeley, and Pueblo were activated. New lines were installed for the Durango and Pagosa Springs office moves. The problems experienced with the Voice Over Internet Protocol (VOIP) were mainly resolved during 2009, but new issues arose with the upgrade to the IPCC and Unity hardware and software that controls the phones. These are being worked on by the infrastructure staff.

Desktop support personnel are reporting to a new manager now, Kate Polesovsky, as mandated by the OIT Consolidation efforts. As part of the OIT consolidation the Division has lost the network support personnel that were previously employed.

Software Development/Database Administration

During 2009 the Development staff made enhancements to existing systems and deployed several new products.

Colorado's Well Permit Search, a new tool created to search for well permit data,was dictated by a Decision Item that required OIT to create this functionality using funds saved through the abolishment of two positions in the Records Section. This tool has received wide usage by both internal and external customers (see WellViewWeb statistics chart below). The Records Section has seen a dramatic decrease in foot traffic by having a tool available via the web that allows people to obtain these records at no charge. In addition, a new web component was added to the **CDSS Water Rights** tool, an Image Downloader, which allows public access and viewing of the Water Court records. This code was written in a generic form, allowing DWR to re-use it for other applications.

Design work continues for the Ground Water Data Management System (GWDMS) on the Data Collection, Accounting and Reporting modules of the system. Division 3 and the Republican River team are using the system to enter their data as it relates to ground water. The development efforts and release of new functionality were diminished by the resignation of Scott Neale, our dedicated resource on GWDMS.

The Well Tools system has been enhanced to incorporate the addition of Rooftop Precipitation "wells". This was necessitated by legislation that allows for this type of water collection in the state.

The Development staff has written 60 additional web methods. These new Web Services can be consumed by programs that individuals and agencies develop to get data from our systems. These have been created for the majority of the HydroBase data that is requested by contractors, researchers and other state agencies. The Division of Wildlife has expressed interest in using these for a major project that they will working on in 2010.
IT has been tracking, in detail, usage of the SMS Webservice that was implemented last calendar year. This was accomplished by creating a SMS Webservice Usage Tracking tool. Although there are not a lot of individuals that are using this service, the amount of data they are accessing is impressive. Details of the usage can be found in the table below.

Coding was also completed on a Bulk HydroBase Data Exporter tool that allows individuals, via the web, to download all HydroBase data from individual divisions, or the entire state.

Work has begun on the HydroBase Editor Abandonment Manager in support of the 2010 decennial water rights abandonment process. Although this work will continue into 2010, the generation of the determination list, specifying the rights proposed to be abandoned, tracking the history and printing the abandonment publications has been completed.

Design work has progressed on the HydroTools Consolidation Project as well as some development. This project is slated to be completed in 2010. In addition, enhancements were made to the realtime streamflow website to differentiate data provided by external sources, and several feature improvements were made to the data analysis and reporting on this site.

At the end of the year work commenced on migrating the DWR internet site from custom written ASP web pages to Microsoft Office Sharepoint Services (MOSS) 2007 for sophisticated content management. This work will continue in earnest and a completed website will be available within the first half of 2010.

Although done by a vendor, there was much effort put into the insuring that functionality was still available after a version upgrade to Laserfiche 8.1 and the implementation of the RIO licensing model. A benefit of this licensing model is that it will allow DWR to

make images available to the public without purchasing additional individual licenses to handle the demand.

Additional enhancements to systems, and support to division personnel in performing their jobs, were completed in what was overall a very productive year for the development staff.

SMS WebService statistics for 2009 were as follows

2009 SMS Webservice Statistics				
Month	User Count	Total DB queries	Rows returned	Largest Resultset
March	2	756	33657	145
April	5	19813	413096	587
May	4	14022	368918	592
June	6	28714	818934	1361
July	4	188033	15418169	600
August	4	94307	6611810	600
September	5	90180	6343454	598
October	4	93961	6676389	599
November	9	102021	6147852	1377
December	10	99907	5676143	1377

CDSS site visit statistics for 2009

CDSS Web Page	2008	2009	% growth
Active Calls	7197	1226	-83%
Advanced Product Search	278	251	-10%
Aquifer Determination Tools	364	2034	459%
Arkansas	593	2019	240%
Call Chronology	13115	16899	29%
Climate Data	1041	1907	83%
Colorado	765	2314	202%
Consumptive Use	816	1255	54%
DMI Utilities	213	291	37%
Dolores / San Juan	182	1452	698%
GIS	1906	2108	11%
Ground Water Model	341	403	18%
Groundwater (Other)	1446	3402	135%
Groundwater (Water Levels)	1374	3418	149%
Gunnison	223	1425	539%
Home	42872	55953	31%
Map Viewer	9313	13877	49%
Other Data	1089	1991	83%
Other Products	352	416	18%
Overviews	1882	3807	102%
Products	686	2102	206%
Rio Grande	413	1708	314%
Search	0	1807	100%

CDSS Web Page	2008	2009	% growth
South Platte	2546	3946	55%
Stations (Streamflow)	6377	5041	-21%
Structures (Diversions)	16208	18554	14%
Surface Water Model	663	674	2%
View Data	4403	6627	51%
Water Budget	160	234	46%
Water Information Sheets	988	1104	12%
Water Rights	15588	22912	47%
Web Services	0	38	100%
Yampa / White	321	1452	352%
Total	**135723**	**184656**	**36%**

This Satellite Monitoring System, along with Water Talk, the telephone data retrieval program, were visited the following number of times in 2009.

Stations Statistics - 2009 Totals

HitType	PHONE	Web Graph	Web List	Web Table
January	1266	93879	58481	48469
February	1632	89287	60809	51840
March	3459	117962	80560	62083
April	7669	153399	154010	67791
May	15512	243999	256982	84788
June	13616	250330	304344	97722
July	12563	215673	270658	108369
August	7669	157297	191002	101603
September	4504	131577	156417	85491
October	3447	126158	135419	92024
November	2687	136860	106781	80684
December	1451	121865	88874	88397
Total	**75475**	**1838286**	**1864337**	**969261**

The 2009 Top 10 most popular stations: web and phone

Web		Phone	
Abbrev	Hits	Abbrev	Hits
FALIDACO	519430*	PLACHECO	8419
BOCOROCO	107357	ARKPARCO	2703
PLACHECO	77557	ARKNATCO	2425
PLAHARCO	57583	PLAHARCO	2266
ARKSALCO	48173	BLUGRECO	2035
CLAFTCCO	39965	BLUDILCO	2025
PLAGEOCO	33481	MORCANCO	1976
ARKWELCO	32013	COLKRECO	1930
PLABAICO	31524	CLEGOLCO	1720
BTBLESCO	30897	PLADENCO	1561

**Attributed to one web user who was pulling data every minute to display on their personal web page – person contacted and their code corrected*

A new tool that was deployed in late June of this calendar year is WellViewWeb. This is a method by where the public can search online for well permit data:

WellViewWeb Statistics 2009

Month	User Count	Searches	View Details	Exports	Total DB queries	Rows returned	Largest Resultset
June		38	45	0	83	8383	3447
July	1234	16676	14512	683	32005	2382911	102801
August	2160	18104	16171	688	56924	3409862	404144
September	2009	18892	17590	624	65389	2931475	364451
October	1976	19256	18142	563	63604	5794447	350542
November	1769	15692	16630	570	53829	4323175	465054
December	1641	21722	22825	521	73356	3353897	314014
Total	**10789**	**110380**	**105915**	**3649**	**345190**	**22204150**	

Geographic Information Systems (GIS)

The GIS team decommissioned the DWR Online Mapping tool this year and migrated applications to an area outside the firewall that allows public access to the servers residing there. DWR Online Mapping was in operation for 6 years, with the last year reporting 39,229 unique user sessions.

Enhancements were made to the AquaMap tool that now shows structures, grouped by type, to assist in the Abandonment process. Additional accommodations were made to incorporate Oil and Gas Commission rules, such as 600-foot spacing, into the existing AquaMap program.

Field users of GIS tools were upgraded to the ArcMap 9.3.1 version, standard data directory structures were implemented, data was synched in all online tools and all users were given access to it. Programs and ftp sites were automated and the DWR GIS User Group has been established so that people working in this discipline can share the tools they create, the pitfalls that they've found, and generally share ideas with each other. Another group that was spearheaded out of DWR is the DNR GIS User Group which has created a DNR Consolidation Recommendations document, upgraded the National Map Grant software, and has increased departmental data sharing and organization.

DWR became the official steward of the National Hydrography Dataset (NHD) project within Colorado and a grant was obtained to hire a contractor to assist in the data cleansing. The first publication of the completed data is expected in calendar year 2010. One tool that has been developed for use by the Geographic Names Information System project (GNIS) is a quality control effort that determines the distance of an identified water rights structure to its water source.

Additional projects that were completed by the GIS team include on-going support for the Dam Safety branch including hazard classification studies and dam failure flood

inundation models; and a project that determined what types of water projects will be affected by the designation of new roadless areas within Colorado.

The GIS staff will also come under new management structure due to the OIT consolidation. As of July 1, 2010, they will report to new management and the GIS Data Governance Group at OIT.

BUDGET, FINANCE, and ACCOUNTING BRANCH

Introduction

The Budget, Finance, and Accounting Branch prepares the DWR annual budget, working closely with staff of the Department of Natural Resources, the Office of State Planning and Budgeting, and the Joint Budget Committee. The Budget, Finance, and Accounting Branch also provides fiscal analysis of proposed legislation to the Legislative Council of the General Assembly.

Following approval of the annual budget, the Budget, Finance, and Accounting Branch provides the financial, procurement, and accounting services required to ensure appropriate financial administration of the DWR in accordance with Colorado statutes and fiscal rules.

Staffing

Cynthia Barker, Budget Officer, manages the Branch. Kathryn Radke provides part-time assistance in the preparation of budget documents and completion of special projects. Carol Quintana supervises the Accounting section and coordinates accounting activities with seven Program Assistants in the division offices. Ruby Gomez works with Carol as an Accounting Technician, and pays most expenses for the Denver Office.

The Budget Process

The budget process begins with the development of a strategic plan by all departments of the Executive Branch. It serves as a guide to the departments' core business and as a tool to evaluate performance over time. DWR supports the Department of Natural Resources in updating these plans, and developing and updating specific quantifiable performance measures that are used to evaluate the effectiveness of individual programs within the agency. The strategic plan becomes the basis for annual Budget Requests.

Each department submits a "base budget request" for the next fiscal year to the Office of State Planning and Budgeting (OSPB) in the spring. This request documents the funding required, assuming no change in the agency's programs, no inflation, and no change in salaries and benefits. In June, the OSPB provides an initial estimate of additional funding that may be available to the Department of Natural Resources for the coming year. After accounting for anticipated increases in salaries, employee benefits, and selected operating expenses, the department estimates the amount of additional spending authority that may be available to support new, essential needs of the individual agencies. During this period, DWR will assess specific issues, needs, and trends that merit new appropriations. These needs are documented as "decision items" that are used to request budgetary changes required to continue the current level of services, expand an existing service, or provide a new service. Each decision item is presented as a detailed proposal describing the need it would address along with a fully justified cost/benefit analysis. All decision items that OSPB's funding guidelines can accommodate are prioritized, and the Executive Director's Office formally submits these proposals to OSPB on August 1. OSPB reviews these requests and makes their final recommendations for inclusion in the formal budget request submitted to the Joint Budget Committee of the General Assembly on November 1.

During the summer months, DWR prepares additional reports that will comprise the final budget package. The components of the budget package include, in addition to the decision items:

- A financial accounting of all expenses incurred during the last two years, and an estimate of expenditures for the current and next fiscal year. This information is presented by object of expenditure for all agency appropriations. These reports also identify all fund sources used to support the appropriations.

- A narrative description of all appropriations and financial reconciliation of all agency appropriations over a four-year period.

- Cash fund reports that provide revenue and expenditure data for all cash funds over a five-year period. The purpose of these reports is to demonstrate that the agency has sufficient cash funds to support anticipated expenses, and that fund reserve balances remaining at fiscal year-end do not exceed requirements established by TABOR. In most cases, surplus reserves cannot exceed two months of expenditures.

- Estimates of all salary increases and employee benefit costs for DWR at the employee level.

Following submission of the budget on November 1, an analyst assigned by the Joint Budget Committee (JBC) reviews the DWR decision items, and presents them to the JBC, usually in December. The agency then formally appears before the JBC several weeks later to provide written and verbal responses to questions of the Committee.

In January, the JBC considers Supplemental Budget Requests, which are requests to change the budget for the current fiscal year, based upon new needs that are identified following approval of the budget during the last legislative session.

During February and March, the JBC staff reviews and makes recommendations to the Committee on funding levels, financing, FTE, and footnotes for each department for the upcoming fiscal year. Following this process, the JBC finalizes the Long Bill and introduces it to the General Assembly. After review, consideration, possible amendment, and passage by the General Assembly, the Long Bill is sent to the Governor, who usually signs it in May.

While the General Assembly is in session, new legislation may be introduced that has significant fiscal impact upon our agency. In those cases, DWR's budget office analyzes the legislation, determines if fiscal impact is present, and documents the fiscal impact. In a typical year, 10-20 individual bills are analyzed.