

DIVISION OF WATER RESOURCES
Office of the State Engineer

People, Water and Stewardship

Water Supply, Engineering, and Investigations

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Dam Safety

2004 Annual Report

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Water Supply, Engineering, and Investigations

Forward

The Water Supply, Engineering, and Investigations organization is comprised of a multi-disciplined staff of engineers, geologists, hydrologists, technicians and support staff. We are an integral part of nearly every activity within the Division of Water Resources spanning a broad spectrum of technical and engineering responsibilities.

The key resource and critical component necessary for the accomplishment of all that is discussed in the following is the highly skilled, dedicated and innovative staff. An organization chart and staffing are provided at the end of this report. Several staff participated in activities to foster teamwork in the accomplishment of DWR's mission. **I want to take this opportunity to personally thank each member of the staff for their support dedication and teamwork during 2004. With the many retirements several members of the staff have both in the Denver office and division offices have taken on additional workload with only my personal thanks, I am very proud to work with each of them.**

The following report provides only the highlights of 2004, much of the day-to-day routine customer service and program accomplishment is too vast to include in the limited space of an annual report. Coordination with other local, state and federal agencies continues to be a key goal of our organization. In addition the staff is involved as leaders with many state and national professional organizations that reflect favorably on DWR. This annual report was compiled with tremendous assistance from the staff.

Dam Safety Branch

The Colorado Division of Water Resources' Dam Safety Branch's objective is to prevent property damage and the loss of life, while protecting the loss of water supplies due to the failure of dams in Colorado. The Dam Safety Program includes the enforcement of 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 Program is managed by the State Engineer in accordance with Title 37, Article 87 of 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 the Division field offices. The Branch currently consists of a branch chief, dam safety engineers, and design review engineers. Currently, the program oversees a total of about 2,900 dams in Colorado with 1,879 dams of jurisdictional size. Of these, about 1,757 are non-federal dams. Of the non-federal dams, approximately 591, or about one-third of the total non-federal dams in Colorado, are classified as dams that, in the event of a failure, would be expected to cause loss of life and/or significant property damage to a significant portion of the state's population.

The Dam Safety Program achieved a great number of goals and objectives in the design review and inspection of dams for the determination of safe water storage levels. Although dam safety incidents were reported again this year, because of our program, these incidents resulted in reduced consequences with no loss of life or significant property damage. This is attributed to the increased awareness and responsibility of the dam owners for their dams - including emergency preparedness planning - and to the enforcement of the regulations, policies, and procedures by our office.

The State Engineer's Office approved plans for five new dams and thirty-four plans for alteration, modification, or enlargement. Twelve separate hydrology studies were also approved for determination of the inflow design flood for spillway design. The estimated cost of construction for the submitted plans was over \$39 million.

A total of 621 dam safety inspections and 238 construction inspections were conducted for a total of 859 inspections. In addition, 163 follow-up inspections were performed. At the conclusion of the reporting period, there were 186 dams restricted from full storage due to various structural deficiencies such as significant leakage, cracking and sliding of embankments, and inadequate spillways. Total storage restricted was 137,559 acre-feet. The restrictions provide risk reduction for the public and environment until the problems 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 list during the same time period. The

change in the restriction from the same time last year resulted in a slight reduction in the number of dams on the restricted list and the volume of the restrictions decreased approximately 6,000 acre-feet. Approximately half of the dams on the Colorado Division of Water Resources restricted list have been on that list for ten years or longer.

The Dam Safety Branch continues to use risk-based tools to help evaluate and prioritize the jurisdictional dams in Colorado in order to more efficiently and effectively use program resources.

Interagency coordination occurs as necessary. A Memorandum of Understanding has been executed with the Division of Wildlife (DOW) regarding the responsibilities of each agency in carrying out the safety inspection of DOW dams. The DOW is making safety inspections of their Class 3 (low hazard) dams.

The Colorado Water Conservation Board (CWCB) makes its construction fund available to assist owners with the repair of their dams. We closely coordinate the review and approval and final acceptance of these dams with the CWCB.

Federal Dam Safety Coordination

Routine inspections of federal dams by Dam Safety Engineers have been curtailed in accordance with a legislative audit recommendation. The Branch, however, participates in the evaluation of the safety of some federal dams for special issues and performance problem evaluations, in accordance with the procedure for obtaining approval to participate in these inspections. Less than about 20 hours were spent this fiscal year participating in these safety inspections at a cost of less than \$900.

Memorandums of Understanding (MOU) have been executed with the U.S. Bureau of Reclamation, the U.S. Bureau of Land Management, and the Air Force Academy (AFA) relating to dam safety activities in Colorado. They provide for the exchange of safety related information of dams under each agency's jurisdiction. A MOU is also being updated with the U.S. Forest Service, Rocky Mountain Region, to provide coordination of mutual responsibilities for dam safety and their Travel Management Plan for the National Forests. This is necessary to provide access to private dams located within the forests. MOU's are being pursued with the other federal agencies such as the U.S. Army Corps of Engineers and the Federal Energy Regulatory Commission to assure that the dams under their jurisdiction are being maintained in a safe condition and to coordinate activities and exchange of information and data.

The Branch has curtailed participation in FERC regulated dams in accordance with the audit, but in accordance with the procedures for approval, staff spent about eight hours on inspections to evaluate specific performance or maintenance issues, at a cost of less than about \$400.

Extreme Precipitation Study

The State Engineer and the Colorado Water Conservation Board (CWCB) continued the process to study extreme precipitation in the mountainous areas of Colorado.

During this year scoping meetings were held with Division personnel as well as private consultants and federal government officials. The purpose of these meetings was to discuss technological limitations and potential alternatives to address the ongoing extreme precipitation concerns. Based on these meetings and evaluations performed by dam safety branch personnel, a methodology has been drafted to quantitatively reduce the estimates of extreme precipitation based on established hydrologic procedures. This draft methodology will be evaluated by branch personnel early next fiscal year with the hope that the methodology will be adopted for use in 2005.

Interagency Personnel Agreement

The Dam Safety Branch Chief for 20 years, Mr. Alan Pearson, retired in May 2002. However, due to the current funding status and budgetary limitations, it has not been possible to fill this critical leadership position. Therefore, other funding options were explored to fill this position on a temporary basis. Through some unique resources and abilities, we were able to investigate, request, and obtain approval for an Intergovernmental Personnel Act (IPA) agreement with the Department of the Interior, Bureau of Reclamation, for an individual to provide technical leadership necessary to serve as the Branch Chief. The IPA agreement is valid for up to two years, at the state's discretion, and the Bureau of Reclamation will fund 100 percent of the employee's salary and benefits.

A highly qualified individual, Mr. Douglas Boyer, was selected in mid-October 2002 and began serving as Branch Chief on November 3, 2002. Mr. Boyer has over 20 years of experience in the investigation, evaluation, analysis, design, and construction of embankment and concrete dams. He has an undergraduate degree in geology and a graduate degree in civil engineering. He has been the principal investigator and/or designer for a number of embankment and concrete dams, including the 275-foot-high Ridges Basin Dam, currently under construction in Colorado. Mr. Boyer has authored or co-authored more than 15 technical papers and has been an invited speaker at university classes, dam safety training courses, and international seminars.

During the later part of 2003 Mr. Boyer was appointed to a high level job within the Bureau of Reclamation. However he continues to provide limited assistance to the division on several key projects including the extreme precipitation study. Mr. Boyer's leadership and management skills will be missed, however we do wish him well in his future challenges.

National Dam Safety Program Assistance Grants

The Water Resources Development Act of 1996 established the National Dam Safety Program (NDSP) under the Director of the Federal Emergency Management Agency (FEMA) as the coordinator of the Program. A primary goal of the program is to encourage

the establishment and maintenance of effective State dam safety programs, and to provide financial assistance incentives to States that are moving towards improved safety of non-federal dams. The grants are to provide the dam safety engineering staff advanced training in dam safety engineering subjects, and to acquire computer hardware and software for the analysis of dam performance. Many other general benefits have accrued to DWR through the purchase of computer equipment, safety supplies, and miscellaneous support.

A critical element in the Dam Safety Program is the continued training of our personnel to maintain a high level of technical competency, to keep up with changing technology, to develop additional management and communication skills, and to keep abreast of changes in the development of dam safety programs across the country. The following training opportunities were achieved this fiscal year:

1. ASDSO Annual Conference, Dam Safety 2003, Minneapolis, MN (attended by two dam safety engineers);
2. FEMA Spillway Workshop, Denver (attended by one dam safety engineer);
3. Association of Engineering Geologists, Dams Symposium, Vail (attended by one dam safety engineer);
4. ASDSO Regional Technical Seminar on Seepage and Piping, Boulder (attended by eleven dam safety engineers);
5. U.S. Bureau of Reclamation, Safety Evaluation of Existing Dams Seminar, Denver (attended by one dam safety engineer);
6. FEMA HEC-RAS training seminar, Emmetsburg, MD (attended by one dam safety engineer);
7. FEMA Spillway Hydrologic Deficiencies Workshop, Emmetsburg, MD (attended by one dam safety engineer);
8. U.S. Society on Dams Potential Failure Modes Workshop, St. Louis, MO (attended by one dam safety engineer);

Integration of Risk Assessment

Colorado has relied on an inspection/standards based program for over 20 years to assure the safety of dams in the state. While inspection activities are necessary and provide a basis for dam inventories, evaluation of hazard classifications, and site conditions at dams, too many serious incidents and even failures of dams in Colorado are still occurring. After attending an ASDSO workshop in 1999 on risk assessment, dam safety engineers decided to explore ways to include risk assessment in the Dam Safety Program as a tool for identifying potential failure modes at existing dam and to focus resources at the dams having the greatest risk of failure and significant consequences.

The Dam Safety Branch continued their efforts in using risk-based tools to help evaluate and rank the jurisdictional dams in Colorado in order to more efficiently and effectively use program resources. One tool that has shown promise is the Risk Based Profiling System (RBPS) as developed by the Bureau of Reclamation. The Bureau of Reclamation has been using this tool for a number of years for similar purposes with much success. Based on understanding of the system and initial reviews, an agreement was executed with the Bureau of Reclamation for adapting this system for the state. An Intergovernmental Agreement with the Bureau of Reclamation was issued to revise their RBPS based on program needs. It is the Branch's goal that, by the end of the fiscal year, a modified RBPS is in place that is fully functional and effective at focusing resources where they are most needed.

Water Supply Branch

INTRODUCTION

The protection of Colorado's water resources is a complex and vital challenge to the employees that serve in the Division of Water Resources. Recognizing the importance and value of our responsibilities, the following highlights some of the activities and accomplishments achieved by the staff during 2004. The administrative and functional responsibilities performed include:

- ◆ Analysis and approval of pending Substitute Water Supply Plans (SWSP's).
- ◆ Subdivision review, analysis, and comment to Colorado counties for proposed housing developments in regard to water supply adequacy.
- ◆ Perform all functions of groundwater well analysis and permitting.
- ◆ Conduct engineering analyses and groundwater well permitting functions for the designated groundwater basins. Also serve as technical staff for the Colorado Groundwater Commission.
- ◆ Perform litigation management for our involvement within the judicial and water court processes and expert witness testimony. Coordinate activities with the seven Water Divisions, the seven Water Courts, and legal counsel provided through the Colorado Attorney General's Office.
- ◆ Conduct engineering and technical analyses into all facets of water resource engineering, planning, and administration.
- ◆ Provide water resources training and education to attorneys, consulting engineers, federal/state/county officials, school children and water users through a variety of formal and informal presentations.

The following narrative is a synopsis of our activities in each of these major areas of responsibilities and our anticipated goals for the next year.

SUBSTITUTE WATER SUPPLY PLANS

The authority to evaluate and issue substitute water supply plans (SWSPs) is vested exclusively to the State Engineer's Office. During 2004, this office reviewed and acted upon 163 general substitute water supply plans (including emergencies) and 54 SWSPs related to gravel pits. During 2004, the Division of Water Resources approved one emergency substitute water supply plan to provide drinking water to municipalities and other water suppliers to alleviate public health and safety concerns in Colorado.

SUBDIVISION REVIEW

Subdivision water supply plan reviews must be conducted within 21 days to meet statutory time restrictions. We often satisfy this requirement in substantially less than 21 days. During 2004, a total of 296 subdivision referrals were received and acted upon by this office. This function requires perpetual information sharing and communication with all Colorado counties. As an example, staff met with members from the Adams County and Custer County Planning Departments and Board of County Commissioners to discuss methods to improve our mutual working relationships and describe the specific information we need from the counties to properly evaluate the adequacy of a water supply.

DESIGNATED GROUNDWATER BASINS AND COLORADO GROUNDWATER COMMISSION

In performance of their duties, the Designated Basins staff issued 509 small capacity well permits, 334 large capacity permits/Determination of Water Rights, 89 change application approvals, and were involved in 13 enforcement actions. Staff completed the issuance of final permits in the Upper Crow Creek Designated Ground Water Basin and continued the same process for the Southern High Plains Basin, issuing a total of 326 final permits. Staff also participated in 27 Ground Water Commission administrative cases.

Staff worked with the Ground Water Commission to promulgate 2 sets new rules and conducted one variance hearing as well as 2 hearings on appeal. Staff worked on migrating some of our Denver Basin Aquifer permitting information into digital format using GIS. A member of the Designated Basins team also joined other staff members in revamping the Division of Water Resources website.

The staff continues to be active participants in Designated Basin groundwater management through consultation and participation in Groundwater Management District meetings. Staff from the Designated Basins (with the Denver Basin Team) also gave a presentation to Adams County regarding Subdivisions.

GROUNDWATER WELL PERMITTING

The groundwater evaluation staff received and acted upon 9,943 applications for well permits in 2004. Of this total, 460 were emergency applications for replacement wells. The well permitting staff continues to process and analyze well permit applications, Monitoring-Hole Notices (1256), Changes in Ownership/Address (6165), Well Construction and Test Reports (8,380), and Pump Installation Reports (4,425). All of the applicable permit application forms and report forms were updated this year as a result of the passage of SB 04-185 and the datum change for the UTM coordinate system.

In 2004, SB 04-185 was passed which eliminated the requirement for Statements of Beneficial Use for nonexempt permits outside designated basins. As a result, staff was able to save the equivalent of 1/3 FTE.

OTHER REFERRALS

The Division of Water Resources is a referral agency for other State and Federal agencies including the Colorado Division of Minerals and Geology, the Army Corps of Engineers, and the Colorado Department of Public Health and Environment and miscellaneous Federal agencies regarding environmental assessments and environmental impact statements. Staff acted on over 150 referrals from these agencies.

WATER QUALITY ACTIVITY

Staff received one consultation request from the Water Quality Control Commission regarding their rulemaking hearing scheduled for September 13, 2004. Prior to the hearing, the subject concern of the consultation became mute and we did not formally respond.

Additionally, Staff sent a letter on November 8, 2004 to the Water Quality Control Division at the request of a water user addressing potential water rights impacts of draining a small lake.

In April 2004 an addendum to an existing Memorandum of Agreement was entered into by the following State Agencies:

Colorado Department of Public Health and Environment (CDPHE)
Colorado Water Quality Control Commission (WQCC)
Colorado Water Quality Control Division (WQCD)
Colorado Department of Natural Resources (DNR)
Office of the State Engineer (SEO)

Staff attended several water quality meetings throughout the year.

SPECIAL PROJECTS

- Promulgated revised Geothermal Rules
- Colorado Farm Show
- Colorado State Fair
- Support to Water Quality Control Commission
- SWSP Forum September 1, 2004
- Presenters at the CWWCA Outreach Programs and Annual Meeting
- Presenters at the CSU Cooperative Extension Service Conferences
- Presenter at the International Ground Source Heat Pump Association
- Presentations to local groups regarding water matters

- Presenter at the Colorado Ground Water Association
- Presenter at the Continuing Legal Education on Ground Water
- Presenter at the Division Engineer Spring and Fall Meetings
- Presenter at the Water 101 Conference in Cortez
- SEO/AGO Forum December 2004

2004 LEGISLATION

In 2004, 29 water related bills were introduced by the legislature. Of those, 12 were Senate Bills, 14 were House Bills and 3 House Joint Resolutions. By the end of the session, 13 of these bills were passed and signed into law. The following is a summary of selected bills that passed.

S.B. 04-32 Loans of water rights - decreed agricultural rights - appropriation.

Authorizes an owner of an agricultural irrigation water right to loan such right for up to 180 days during any one calendar year to another owner on the same stream, subject to approval by the division engineer and a finding of a lack of material injury to other decreed water rights.

S.B. 04-185 Ground water - well permits - extension - expiration. Subjects all permits for nonexempt wells outside of designated ground water basins to the same standards for expiration and extension by prohibiting Denver basin aquifer and mine dewatering well permits from being extended more than once. Eliminates the requirement to file a statement of beneficial use for nonexempt wells outside of designated ground water basins. Recodifies existing requirements to clarify the requirements.

S.B. 04-222 Underground water - authority of state engineer - Division 3. With regard to the regulation of underground water use in the Rio Grande basin, grants the state engineer wide discretion to permit the continued use of such underground water consistent with prevention of material injury to senior surface water rights and requires the state engineer to:

- Maintain a sustainable water supply considering aquifer fluctuations from 1978 to 2000 as a benchmark;
- Preserve the state's ability to comply with the Rio Grande compact; and
- Adopt rules that recognize valid existing contractual arrangements between water users; establish an irrigation season for the Rio Grande basin; do not credit the eradication of phreatophytes as a source of replacement water; and do not require surface water right holders to divert using wells.

Prohibits the state engineer from curtailing wells if the withdrawals are made pursuant to a properly adopted ground water management plan adopted by a ground water management subdistrict. Establishes public notice and judicial review procedures for the approval of such plans. Requires the water judge to retain jurisdiction over the water management plan to ensure that the plan is operated, and injury is prevented, in conformity with the court's decree.

S.B. 04-225 Designated ground water - curtailment orders - enforcement - penalties - appropriation. Authorizes the state engineer and ground water management districts to issue well permit enforcement orders to facilitate administration of designated ground water, including a requirement to provide records of energy used to pump ground water. Authorizes the state engineer, ground water management districts, and the ground water commission to seek court enforcement of such orders. Requires the court to award costs and fees to the prevailing party in such a proceeding. Specifies factors for the court's consideration and penalties that would apply except in cases of exempt domestic wells. Creates a well enforcement cash fund and directs the penalties to be deposited in the fund to be used for the investigation and enforcement of violations of orders or to regulate ground water.

S.B. 04-235 Water conservation districts - Republican River - creation. Creates a Republican river water conservation district in Phillips and Yuma counties and those portions of Kit Carson, Lincoln, Logan, Sedgwick, and Washington counties within the Republican river basin, pursuant to the provisions of the existing water conservation district law, with modifications, for the purpose of cooperating with and assisting the state of Colorado to carry out the state's duty to comply with the limitations and duties imposed upon the state by the Republican river compact. Preserves the existing powers of the ground water management districts contained within the district.

Specifies that the county commissioners of each county, the ground water management districts within the district, and the Colorado ground water commission will appoint the 15 members of the district's board. Authorizes the district's board to take such actions as are necessary to cooperate with and assist the state of Colorado to carry out the state's duty to comply with the limitations and duties imposed upon the state by the Republican river compact.

Authorizes several funding mechanisms, including revenue bonds, special assessments, a one percent sales and use tax, ad valorem property taxes, and water fees.

H.B. 04-1073 Adjudications - applications - notice. Requires the water clerk or referee to provide landowners upon which a new or modified diversion or storage structure is or will be constructed with a resume of the application. Allows the applicant to rely on the county assessor's real estate records in determining the identity of the affected surface owners.

H.B. 04-1256 Interruptible water supply agreements - term of operation - appropriation. Allows interruptible water supply agreements to operate for up to 3 years out of ten years rather than only during the year of and following a declared drought emergency. If the option to exercise the agreement has not been exercised during the 10-year period, allows the applicant to reapply a single time for another 10-year period. Allows a party to the original application to file objections based on injury by January 1 of the year following the first exercise of the agreement.

H.B. 04-1402 Water administration fee - repeal - refund. Repeals the water administration fee applicable to water users. Directs the state engineer to refund, by June 30, 2004, any amounts collected, not including interest, attorney fees, or costs incurred by persons protesting the fee. Repeals the water administration cash fund on July 1, 2004. Makes a one-time appropriation of \$1,527,449 to the division of water resources from the operational account of the severance tax trust fund. Adjusts appropriations made in the FY 2004-05 long bill.

LITIGATION

To perform our statutory responsibilities, litigation continues to consume a significant amount of time, effort, and expense for the Division of Water Resources. The following table describes the number of water court applications filed in 2004 and formal Statements of Opposition and Motions to Intervene filed on behalf of the DWR:

Division	Applications	Statements of Opposition & Motions to Intervene	Opposition Percentage
1	468	22	4.7%
2	148	12	8.1%
3	41	5	12.2%
4	236	-	0.0%
5	345	6	1.7%
6	67	-	0.0%
7	118	4	3.4%
Total	1,423	49	3.4%

As depicted in the table below, the number of applications or cases filed in water court continued to decline for the second consecutive year.

Cases	2000	2001	2002	2003	2004
1	265	346	441	527	468
2	153	151	189	119	148
3	44	45	61	60	41
4	250	318	349	345	236
5	307	443	510	443	345
6	86	146	143	132	67
7	100	121	138	129	118
Total	1205	1570	1831	1755	1423

ABANDONMENT

Litigation continues on the protests to the 2000 Decennial Abandonment List as provided in section 37-92-401, C.R.S. Statewide, 2,269 water rights were on the original lists. Following objections to the original Division Engineer lists, 16% of those rights were removed to create the final Revised Abandonment List. Protests (117) were filed on the remaining 1,898 rights and an additional 11 parties filed late protests.

Div	Original Aband. List	Revised Aband. List	Orig vs. Revised Lists	Number of Protests	% of Revised List Protested
1	673	542	-19%	29	5%
2	671	617	-8%	14	2%
3	72	61	-15%	18	30%
4	155	136	-12%	8	6%
5	201	157	-22%	33	21%
6*	110	88	-20%	8	9%
7	387	297	-23%	20	7%
Total	2269	1898	-16%	125	7%

*The Division 6 totals include the WD 43 cases.

Most of the cases have been resolved; more are close to resolution. This table represents the results, and anticipated results, of the protests.

Div	Removed from List by DWR			Protest Withdrawn			Settled			Trials		
	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
1	6	6	6	3	5	8	4	8	11	11	9	4
2	4	4	4	4	4	5	4	4	3	1	2	2
3	0	0	0	1	1	1	13	16	16	1	1	1
4	0	0	0	0	1	1	6	7	7	2	0	0
5	4	3	3	0	1	2	20	24	28	4	1	0
6	0	0	0	0	0	0	8	8	8	0	0	0
7	1	1	1	1	2	2	17	17	17	1	0	0
Total	15	14	14	9	14	19	72	84	90	20	13	7

Ninety (69%) of the protests have, or will settle for a partial abandonment, some requiring court-approved changes or improvements to the structures. Only seven (5%) may be heard in trial.

The General Assembly allocated Legal Services funds for the Abandonment List for FY 03 and FY 04, only. DWR's regular legal services line has absorbed \$17,176.24 for the outstanding abandonment cases, as of December 31, 2004.

The staffs of the Attorney General's Office, the Division Engineers' Offices, and the Denver Office should be commended for their diligence in managing and resolving these cases. Many of the protests require extensive research and field inspections. Resolution of the cases would not be possible had we not had the extensive and irrefutable facts to counter the allegations of the Protestants.

Select Water Court Cases

Great Sand Dunes National Park – Case No. 2004CW35 Division 3

In 2000, Congress created the Great Sand Dunes National Park in the San Luis Valley. The new Park includes the lands previously reserved in the Great Sand Dunes National Monument as well as some additional surrounding land. The legislation that created the Park, "Great Sand Dunes National Park and Preserve Act of 2000," Pub. L. 106-530, codified at 16 U.S.C. <sec> 410hhh, directed the Secretary of Interior to obtain and exercise any water rights required to fulfill the purposes of the Park, including maintaining ground water levels, surface water levels, and streamflows on, across, and under the Park. However, the Act also requires that any such water rights must be appropriated, adjudicated, changed and administered pursuant to the procedural requirements and priority system of the State of Colorado. Further, the Act prohibits any Park water right

from interfering with any non-federal water right in existence when Congress passed the act or from interfering with the operation of the Closed Basin Project.

Based on that legislation, on December 30, 2004, the United States filed a claim for ground water underlying the new Great Sand Dunes National Park. The claim seeks to acquire a water right for all unappropriated ground water within the ground water system underlying the park and a priority date of November 22, 2000. The water right filing has widespread support throughout the San Luis Valley and the Park worked closely with affected water users and the State in crafting the application. The State Engineer's Office and the Colorado Water Conservation Board filed a Statement of Opposition in Support of the Application to ensure that the decree issued in this matter strictly conforms with the requirements, limitations and intent of the Act, State procedural law, Federal substantive law and the tenants of Colorado water law.

Golden v. Simpson re: Vidler Administration - Case No. 03CW176 Division 5

In August 2003, Golden alleged injury from the Division Engineer's administration of its water rights that are diverted through the Vidler Tunnel and are subject to the complex administration of the Blue and Colorado Rivers. Golden has two complaints.

First, Golden believes that the State should not require Golden to allocate its first diversions to the most senior rights. The State contends that no injury occurred; according to Golden's accounting, its junior rights were not in priority in 2003 and Golden took the water that was allocated to the junior rights.

Second, Golden insists that the Division Engineer administer an agreement that Golden has with Denver Water. The State disagrees since a water court has not ratified or accepted the agreement. However, the State has agreed to account for water under the agreement when Golden has notified the Division Engineer prior to taking the water (not at the conclusion of the water-year, as it did in 2003).

Judge Ossola agreed with the State's concern that the outcome of this case would potentially impact other water rights in Division 5 and ordered Golden to publish the complaint in the Division 5 Résumé. As a result, seven parties intervened: Denver Water, Northern Colorado Water Conservancy District, Colorado River Water Conservation District, Middle Park Water Conservancy District, Ute Water Conservancy District, Grand Valley Water Users Association, and Orchard Mesa Irrigation District.

Golden moved for summary judgment. Before his retirement in November 2004, Judge Ossola denied the request. He held that there was a factual dispute whether the State required Golden to take its senior rights. Northern filed a cross-motion for summary judgment that opposed the administration of the Denver stipulation only "as against the Green Mountain Reservoir storage right." Golden asserted that it does not seek to divert under the Stipulation in that manner and Judge Ossola granted Northern's motion.

In January, Golden filed separate motions for clarification and for declaratory judgment to define the meaning of Golden and Northern's phrase "as against the Green Mountain Reservoir storage right." A hearing on these motions is set before Judge Craven on March 18.

Douglas Water & Land Liquidation Co. Case No. 01CW54 Division 1

Applicant claims his groundwater is nontributary. According to the Denver Basin Rules however, it is classified as not-nontributary (NNT). The State argued that the applicant is barred from challenging the NNT designation, since it is not a rebuttable presumptive aquifer characteristic. The Court held, “*Res judicata* applies because the subject water was previously decreed NNT in case no. 99CW147.” Since the Court determined that *res judicata* applied, it did not address the applicability of the Denver Basin Rules’ characterization or any other issues raised in cross-motions for summary judgment.

Although a five-day trial is set to begin on April 18, 2005, since the State’s primary issue has been rendered moot, we are working toward settlement of this matter.

Gunnison RICD – Case No. 02CW38 and 04SA44 Division 4

In 2002, the Upper Gunnison River Water Conservancy District (District) applied for a recreational in-channel diversion (RICD) on the Gunnison River. This was the first such application since the General Assembly passed SB 01-216, which defined the Colorado Water Conservation Board (CWCB) role in reviewing the applications. The water court judge did not uphold the limitations that the CWCB had recommended and granted the District’s application as written.

On December 6, 2004, the Supreme Court heard oral argument on four issues:

1. Whether the water court erred in holding that limitations on the size of recreational instream water rights infringe on the constitution;
2. Whether the water court erred in failing to limit the request RICD to a “minimum stream flow”, as required under SB216;
3. Whether the legislature granted the CWCB the authority to determine whether the application is for the minimum stream flow for a reasonable recreation experience; and
4. Whether the presumptively valid CWCB findings and recommendations must be upheld unless there is clear and convincing evidence that they are in error.

The Colorado Supreme Court has yet to render its decision.

Town of Silverthorne RICD – Case No. 04CW217 Division 5

In December 2004, the Town of Silverthorne applied for water rights for a recreational in-channel diversion on the Blue River for the Blue River Whitewater Course in the Silverthorne Whitewater Park (between the Interstate-70 overpass and the Colorado Highway 9 bridge). The Town applied for water rights of 100 cfs from May through September and 600 cfs for the weekends of Memorial Day, Independence Day and Labor Day. The DWR filed a Statement of Opposition to ensure that the right will be administrable.

Chaffee County RICD – Case No. 04CW129 Division 2

In December 2004, Chaffee County applied for water rights for a recreational in-channel diversion on the Arkansas River to expand boating parks in the Town of Buena Vista and the City of Salida. The County claimed year-round water rights of 250 cfs Sept 1-May 15,

1800 cfs May 16-June 30, and 700 cfs in July and August. The DWR feels this may be more than the amount needed for a “reasonable recreational experience” as defined in SB01-216 and wants to ensure that the right will be administrable.

Steamboat Springs RICD – Case No. 03CW86 Division 6

In December 2003, the City of Steamboat Springs applied for water rights for a 630-foot recreational in-channel diversion on the Yampa River. The application seeks rights in two-week increments from April 15 through October 31 in varying amounts from 120 cfs to 1700 cfs, from 6:00 a.m. to 9:00 p.m. The DWR opposed this case due to concerns with SB01-216 and to ensure that the rights will be administrable.

Meridian Metropolitan District, Case No. 01CW257 Division 1

Applicant sought an augmentation plan and a change of water rights. The primary issue in contest is the applicant proposed to take significant amounts of Denver Basin water, via numerous pre- and post- Senate Bill 5 decrees, and tried to create well fields. More generally speaking, the Applicant attempts to assign the beneficial Senate Bill 5 provisions to decrees without accepting the less desirable Senate Bill 5 characteristics of the water. After several depositions of the applicant’s consultant and our DWR expert, the applicant agreed to our terms and settled before going to trial.

Harmony Augmentation Plan, Case No. 02CW363 Division 1

The 2001 decision in Empire Lodge v. Moyer prompted the formation of many smaller augmentation groups in the South Platte River Basin. As such, Harmony Ditch Co. applied for an augmentation plan for approximately 50 wells, using Prewitt Reservoir and a variety of recharge projects. This case was settled on the proverbial courtroom steps and the trial was cancelled. Many other well augmentation plans are pending in the Division 1 Water Court. Through the diligence and cooperation of our staff and all the parties in the South Platte Basin, we are optimistic that many of the other well augmentation cases can be settled, or at least distilled to their most controversial points.

High Plains A&M, Wollert Enterprises Inc., ISG LLC, et al., Case Nos. 02CW183, 03CW28 and 03CW 68 and 04SA266, 04SA267 and 04SA268 Division 2

In three cases, the applicants sought a change of water rights for shares in the Fort Lyon Canal Company from irrigation to “all beneficial uses, including but not limited to” 50 different uses in 28 counties. The applicants have purchased the shares to market them, but do not cite any end-user leases. Approximately 75 parties filed statements of opposition. Judges Maes granted summary judgment and dismissed the applications for violating the anti-speculation doctrine. Applicants raised 15 issues on appeal, but the primary arguments are that summary judgment was not appropriate and that the anti-speculation doctrine does not apply to change cases.

Oral argument is anticipated for the summer of 2005.

SELECTED SUPREME COURT CASES

Right to Recapture Returned Water

Trail's End Ranch, LLC v. Colorado Division of Water Resources, 91 P.3d 1058 (Colo. 2004)

Trail's End appealed the water court's order denying the declaratory and injunctive relief it sought against the Colorado Division of Water Resources. The Division Engineer for Water Division 2, had ordered Trail's End to stop taking water out of Spruce Creek at locations other than at the points of diversion decreed to its direct flow irrigation water rights, until those other alternate locations were approved by the water court. Trail's End asserted that having once diverted water at its decreed points of diversion and having returned it directly to the stream, it was entitled to "recapture" the returned water further downstream, without adjudicating a change of water right.

The supreme court affirmed the lower court and held that the practice proposed by Trail's End would constitute a change or adding new or supplemental points of diversion within the meaning of the Water Right Determination and Administration Act of 1969, and therefore it could not benefit from the priorities of its existing water rights without adjudicating changes to those rights in a manner prescribed by the Act.

Conditional Right Without Access to Proposed Property

Black Hawk v. Central City, 97 P.3d 951 (Colo. 2004)

In this water rights application case, the Supreme Court held that pursuant to the can-and-will statute, section 37-92-305(9)(b), a conditional water right may be granted where the current denial to access to property is not final and the proposed reservoir enlargement is technically feasible, despite the existence of contingencies. The Supreme Court also held that, in this case, the discrepancy between the location of the proposed reservoir enlargement in the application for conditional water rights and the actual location of the reservoir site was immaterial and did not require republication of an initial application where the interested parties were provided with appropriate inquiry notice.

Water Administration

Golden v. Simpson, Stenzel and Farmers Highline Canal and Res. Co., 83 P.3d 87 (Colo. 2004).

Part of Golden's 1966 change decree was a stipulation between Golden and Farmers Highline Canal and Reservoir Company. When the total flow of Clear Creek at the Oulette Ditch headgate is greater than 3.5 cfs, and Farmers Highline is calling, Golden was to cease diverting its Priority No. 5. Since these conditions were met, the Division Engineer ordered Golden to cease and desist diverting on Friday, September 6, 2002. On Monday, September 9, Golden requested an order restraining the Division Engineer from enforcing his order. At the end of Monday's day-long hearing, the water court ruled against Golden's various motions and ordered Golden to cease the diversions.

The Supreme Court upheld the water court's decision that the plain meaning of the 1966 decree did not give Golden a right to the Priority No. 5 water.

Stay of State Court Case on Black Canyon of the Gunnison Reserved Rights

In re: Application for Water Rights of United States, 101 P.3d 1072 (Colo. 2004)

The Supreme Court exercised its original jurisdiction to review a stay ordered by the water court in a long-pending case brought by the United States nearly thirty years ago to quantify its reserved water rights for the Black Canyon of the Gunnison. When the United States significantly decreased the amount of water it claimed, several environmental groups sued the United States in federal court asserting that its decision violated the federal Administrative Procedure Act. The water court stayed its proceeding until the federal case is resolved. The Colorado Supreme Court held that the state water court's grant of a motion for stay pending resolution of a federal court proceeding was not an abuse of discretion where the federal claims will not affect the water court's ability to quantify the federal reserved water right. The scope of the waiver of sovereign immunity contained in the federal McCarran Amendment is not broad enough to allow state courts to evaluate or adjudicate the federal administrative law claims at issue in the federal case. Under all of the circumstances, the water court did not abuse its discretion by staying proceedings for a relatively brief period of time.

Park County Sportsmen's Ranch Attorneys' Fees

City of Aurora; Park County Sportsmen's Ranch; and Kenneth Burke v. State Engineer, et al., 2005 WL 100855, Colo., January 18, 2005.

The water court dismissed PCSR's augmentation plan and awarded attorney fees and costs to the opposers. Furthermore, the water court determined that Aurora was vicariously liable for PCSR's action, and joined Aurora as a party for purposes of determining the amount of attorney fees to award. The Division of Water Resources settled its portion of the attorneys' fees question and was not an active party in this appeal.

The Supreme Court affirmed in part, reversed in part, and remanded. As a preliminary matter, the Court held that, because PCSR failed to prove the timing of depletions and failed to present evidence of return flows, PCSR must replace 100 percent of its withdrawals. Without a decreed augmentation plan, PCSR failed to produce evidence at trial sufficient to support a decree for any of its remaining claimed surface appropriations. In conclusion, the Court affirmed the dismissal of PCSR's application and augmentation plan.

With respect to the water court's award of attorney fees, the Supreme Court reversed the award in its entirety as an abuse of discretion, except for those fees that Opposers incurred in defending PCSR's claims for precipitation and irrigation runoff, which were frivolous from inception. The Court remanded to the water court for a determination of these amounts. The Court also ruled that Aurora is vicariously liable for attorney fees because PCSR, as Aurora's agent, pursued a frivolous claim.

Appeal of the Decennial Abandonment List

Hammel v. Simpson and Rio Grande Canal Water Users Association, 83 P.3d 1122 (Colo. 2004)

Merely three weeks after oral argument, the Supreme Court issued its *per curiam* decision. Hammel's purchase of land with an advertised water right did not rebut the presumption of abandonment when the water had not been used for at least twenty-five years.

Costs for Forcing a Trial

Fort Morgan Reservoir & Irrigation Co. v. GASP, 85 P.3d 536 (Colo. 2004)

GASP filed an application for a conditional storage right in Ovid Reservoir that Fort Morgan opposed. When GASP won, it moved for an award of costs against Fort Morgan for expert fees and copying costs associated with the trial. Fort Morgan opposed the award, arguing that C.R.C.P. 54(d) should not apply to an applicant's request for costs in a water case, because the applicant is seeking the benefit of a public resource, and the opposer may merely be holding that applicant to its rightful burden of proof. The trial court granted the motion, and awarded costs ultimately stipulated to be \$7,240.65.

The supreme court affirmed the water court, holding that an award of costs is within the discretion of the trial court in water cases because there is no rule or statute that implicitly or explicitly prohibits such an award and the phase of water adjudication for which the trial court awarded costs is similar to civil litigation. Here, the record supports a conclusion that GASP was the prevailing party under C.R.C.P. 54(d), and therefore, the water court did not abuse its discretion in ordering Fort Morgan to pay GASP's costs associated with the contested trial.

PERSONNEL

- Hired Cynthia Love in Team 456 as an Engineer in Training II
- Michael Schaub transferred from Team 237 to the Geotechnical Branch
- Hired Clay Kimmi in Team 237 as an Engineering/Physical Sciences Technician I
- Christina Dumpert joined the Designated Basins Team as an Administrative Assistant and later left to join the private sector
- Hired Sarah Reinsel in the Designated Basins Team as an Engineer in Training II
- Jay Bloomfield transferred from the Records Section to the Designated Basins Team as an Engineering/Physical Sciences Assistant II
- Promoted Chris Grimes to Engineering/Physical Sciences Technician I in Team 1A then he moved to the Designated Basins Team
- Promoted Arlene Boone to Engineering/Physical Sciences Assistant II
- Hired John Read as an Engineering/Physical Sciences Technician I In Team 1B

Geotechnical Services Branch

The Geotechnical Services Branch provides expertise in the disciplines of geology, hydrogeology, engineering geology, geophysics, well construction and satellite assisted surveying. The branch primarily responds to requests by internal or external customers, assisting in general investigations, ground water litigation, ground water data collection and reporting and technical assistance to the Board of Examiners and Groundwater Commission.

The Branch formerly included three professional geologists, one professional engineer and one well drilling inspector. Retirements during 2004 left the Branch to function with two geologists for most of the year; Dave McElhaney and Michael Schaub. Dave was assigned as interim Chief of the Branch upon the retirement of George VanSlyke in December of 2003. Through an open competitive process, Dave was awarded the position and responsibilities of Branch Chief in October of 2004.

Enactment of Senate Bill 03-045 established a requirement for a well inspection program under the direction of the State Engineer. Because the program is developed primarily to support the enforcement efforts of the Board of Examiners and is closely associated with the support activities of the Geotechnical Services Branch, the Well Inspection Group has been assigned to the Branch. The association seems to be working well.

The following is a summary of work done by the Geotechnical Services Branch in 2004.

By the Numbers (approximate)

The following is a statistical summary of the branch activities.

General Investigations

The Branch is involved in a variety of geologic, geohydrologic and geotechnical studies and projects. The following provides a brief description of the key activities in 2004.

- Glenn Graham continued to monitor and participate in Jefferson County Mountain Ground Water Study until his retirement in June of 2004. The major aspects of the study have been concluded and the county is evaluating the recommendations resulting from the study.
- Coal Bed Methane – Glenn Graham continued to be the branch’s lead geologist in questions related to the development of coal bed methane and potential impacts to ground water until his retirement in June. Dave McElhane and Michael Schaub have each assumed a share of the role formerly performed by Glenn.
- SPDSS - Additional meetings have been held with the consultants for the South Platte DSS to insure that geologic and hydrogeologic issues will be addressed. The Branch has provided water level data and geophysical log information to the state’s ground water consultant in their data collection efforts and provided technical review of a series of maps produced from the data. Michael accompanied the consultant during the measurement of ground water levels of approximately 60 wells completed into the Denver Basin bedrock aquifers.
- Upper Big Sandy Study - Michael is monitoring the progress of a ground water study initiated by the Upper Bid Sandy Ground Water Management District.
- The Branch is providing a variety of information and data to the Colorado Geological Survey as it begins a geologic mapping and associated ground water summary for the Dawson Butte/Castle Rock area. The Branch will provide technical review of the products resulting from the effort.

Ground Water Commission

The branch continued to assist the Groundwater Commission through the monitoring of groundwater levels and technical support to the Commission and staff. A few of the activities that warrant highlight are presented below.

- Monitoring of water levels in over 1500 wells covering almost 3/4 of the state are done annually and published by the Branch in a series 10 annual reports.
- The staff provided technical support to the well permitting staff. Michael Schaub evaluated well construction to determine aquifer intervals for approximately 200 final permits in the Southern High Plains Designated Ground Water Basin.

Denver Basin

- Denver Basin – The Geotechnical Services Branch remain involved with the Museum of Nature and Science concerning the depositional history of the Denver Basin and its relationship to the bedrock aquifers. Much of the recent interest in the basin has been

- generated since drilling of the Kiowa core hole and testing of the core. The Branch continues to assist Mr. Bob Raynolds from the museum by providing water level information from the bedrock aquifers.
- The Branch has provided geophysical and water level information for several modeling efforts proposed for the Denver Basin. Ground water and subsurface modeling is currently being conducted by the USGS, Museum of Nature and Science, and the participants in the South Platte DSS effort.

Division Support

- Court actions were limited to general review of findings and performing geophysical log evaluations to provide site specific information for water court applications seeking final determinations of water rights.
- Well Permitting and Subdivision Review Assistance - work continues on a daily basis with these activities. The Geotechnical Services Branch routinely assists the permitting staff by reviewing the geology along the margins of the Denver Basin to determine aquifer boundaries.
- Chuck Roberts prepared Michael Schaub and Heidi Frey for teaching the class for Well Tester Certification. The next class will be taught by Michael and Heidi in 2006.
- Dave McElhaney replaced Glenn Graham as the Division representative to the Colorado Ground Water Protection Council.

Board of Examiners

- Complaint Investigations for Rules Enforcement - Dave McElhaney has spent much of his time working with the newly formed Well Inspection Group that is now receiving complaints and performing investigations to resolve complaints before the Board.
- Variances – 204 requests for variance from the well construction rules were processed during the year. In addition, approximately 20 consultations for proper well abandonment were performed.
- Dave and Joe helped in formulating and revising rules for the Board of Examiners.

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 CCR 402-2*. Specific duties include inspection of water well construction and pump installation; monitoring/observation hole/well construction; well and hole plugging and abandonment; and to conduct complaint investigations; provide education and outreach; and general support of the State Engineer and Board of Examiners. The well inspectors also administer the private well driller and private pump installer examinations in the Division offices where they reside.

Joe Bender, a licensed water well construction and pump installation contractor, was hired in February 2004 to fill the newly created Chief Well Inspector position. Joe was instrumental in hiring and providing initial training and continued guidance to the well inspectors now located in Division 1-Denver (Tom Neefe), Division 3 (Larry Hakes), Division 5 (Doug Stevenson), and Division 7 (Doug Pickering). Joe has done a fantastic job as Chief Well Inspector, but has recently decided to return to the business of contracting. The well inspectors currently assigned to the field began their tenure with the Division in June and have rapidly become an irreplaceable asset to supporting the Board of Examiners.

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 discovered by the well inspectors has been contractors drilling outside the distance limits allowed by the permit (usually 200 ft).

The following is a summary of the well inspection program “by the numbers”*:

Total number of contacts.....	940
Number of contractors contacted.....	140
Number of well sites inspected.....	400
Number of home-owner concerns.....	150

- since mid-July 2004.

Hydrographic and Satellite Monitoring Branch

Overview

The Hydrographic and Satellite Monitoring Branch strives to provide accurate, high quality 'real time' stream flow data. The Branch also develops historic stream records in coordination with other state and federal entities and the water user community. Key staff record and check measurements, maintain equipment and improve the quantity and quality of data used to manage and administer water throughout the State of Colorado.

The Annual Training Meeting was held in Frisco in late September. Training sessions included AquaCalc Meter use training, Parshall Flume information, and equipment information from manufacturers Sutron and Design Analysis. Safety training this year included a presentation by the Colorado State Patrol regarding driving safely and avoiding road hazards. Other discussions included program coordination issues with the USGS and CWCB, hydro program highlights and issues, satellite monitoring program highlights, and division reports.

DWR is cooperating with the USGS and CWCB on numerous activities this year: We have continued to upgrade DWR and USGS gaging sites with monetary assistance from CWCB to 'flood harden' areas that may have likely been damaged and unable to report stage during a flood event. Part of this work also included extending rating curves at 17 gaging sites. In cooperation with CWCB, we launched an Alert, or notification system to notify key staff in the event of low flows, high flow, or rate of change of stage.

Operations

Assistant Division Engineer, Bill Tyner, PE II, provided overall program leadership of the Division 2 Hydrographic Program WY2003. He was supported by Lead Hydrographer, Thomas Ley, PE I; Hydrographic Engineer, Lou Schultz, EIT; and Hydrographic Technicians, Anthony Gutierrez and Adam Adame. Bill Tyner also had oversight responsibilities for hydrographic streamflow record preparation in Division 5 during the water year, and provided overall coordination of the records preparation and review schedule for DWR.

Each of the Division Two hydrographers continued their assigned work with specific gaging stations and geographic areas. Routine work includes responsibility for

regular streamflow measurements, gaging station operation and maintenance, satellite monitoring equipment operation and maintenance and the complete development and computation of streamflow records for specific gaging stations. Additionally, hydrographers respond to requests of water commissioners for water measurement assistance in their respective districts.

Currently the State operates 12 active stream gage sites in the Yampa, White, and North Platte River basins. Of the twelve operated by Division Six, eight of them are equipped with satellite monitoring. Of these eight, two of them transmit reservoir water surface elevation, four transmit stream flow gage height, and two transmits both parameters. Of the remaining four, Bear Lake, Morrison Creek near Fly Ranch below Silver Creek, and Pot Creek at Stateline, are equipped with a paper recorder; and Walton Creek is equipped with a paper recorder as well as a data collection platform (DCP) to record gage heights.

The Pearl Lake gage station (PEARLACO), which records reservoir storage elevation only, experienced equipment problems throughout the entire record period. Both replacement of the AccuBar and installation of a new nitrogen tank were completed with hopes of remedying the problem but with no success. More work will be done in the spring of 2004 with hopes of remedying the problem.

New Stations/Rehabilitations/Modifications

Along with the flood hardening projects, we must also continue to refurbish and maintain our existing gaging sites that are not designated as critical flood sites, but are extremely important for our primary purpose of Water Administration. The CWCB in 2003 granted us \$55,000.00 for this purpose, along with General Fund Appropriations necessary to carry out this work. These dollars were used to allow us to do channel work at our Stateline Station near Julesburg in Division One, as well as several locations in Division Two, Cottonwood Creek near Buena Vista, Purgatorie River at Ninemile, Arkansas River at La Junta. Division Three had work done at Carnero Creek near La Garita, Rio Grande River at Thirtymile Bridge, Terrace Reservoir, Big Spring Creek at Medano Ranch, along with a few projects still pending. Division Four had refurbishment done at Vouga Reservoir, Roubideau/Cummings Gulch, and Razor Creek. Division Six finished a site at Lake Catamount. Here again we continue working when we can to maintain and refurbish stations as necessary.

Division Two refurbished the concrete control at the Lake Fork Creek below Sugarloaf Dam gage by adding a 6-inch thick concrete apron (5 ft x 38 ft) on the upstream side of the control with a 1 ft x 1ft x 38 ft monolith key way poured at the upstream end of the apron. They also added a new coat of paint to several stream gage shelters.

Division Three replaced the cableway at the Rio Grande at Wagon Wheel Gap gage this year. The previous cableway, constructed by the USGS approximately 10 years ago, did not meet our criteria for safety and had been condemned. Nearly the entire cableway, with the exception of the mass anchors, was replaced, making cabling at this site much safer. The left mass anchor at our Rio Grande at 30-Mile Bridge cableway was also replaced this year. This mass anchor had been buried by improvements made to the nearby county road, and it was impossible to determine the condition of the anchor and associated hardware. A construction company was hired to dig up the old anchor and construct a new, much larger mass anchor that will dramatically improve safety.

An additional cableway was also rehabilitated this year. This cableway was located at our Saguache Creek near Saguache gage. The existing cableway was in need of significant repairs, but instead of repairing the old cableway, a new bank operated cableway was installed. Although we have several bank-operated cableways in use in Division 3, this cableway, a 'Tacoma' bank operated cableway system, was the first of its kind that we had installed. It appears to be a very good system and we are looking to install several others in the next few years.

The concrete control at Carnero Creek near La Garita was also rehabilitated this year. The concrete weir had developed some small cracks in it over the last several years. During the very low flow periods this year, the entire flow of the stream was simply running through these small cracks, causing the gage to be isolated from the stream. Repair was made to the entire control. This repair should allow the control to operate properly for many years to come.

Division Four worked with the private Overland Ditch Company to install and operate their privately purchased Sutron 8210 DCP. DWR charged the ditch company \$1,200 for the installation the first year and will be charging \$100 per month after that. Division Four hydro staff completed these field installations and supported the operation using their operating budget.

We encouraged the BOR to replace the sensor at Taylor Park Reservoir. Our Division Four staff with the help of our electronic support staff from Division Three installed the new SDI-12 unit. We cooperated with the Uncompahgre Valley Water Users Association in setting and calibrating the sensor with four water surface surveys. The new sensor was installed on May 22, 2003.

A new concrete ramp flume is done at Roubideau. The inlets have been repaired and replaced, and the A 35 strip chart recorder has been refurbished. The site is on line and transmitting using an 8200 DCP and a used antenna mast from the project at Surface Creek nr. Cedaredge. The final survey and theoretical rating will be

received soon and we are in the process of confirming these with actual measurements.

A new concrete ramp flume is also done at Muddy Creek below Paonia Reservoir. All the invoices have been received. The electronic equipment supplied from the US Bureau of Reclamation was installed, and a new Satlink Logger and a new SDI-12 shaft encoder are in place, but not transmitting due to a communication error. We are in the process of confirming the theoretical rating with measurements.

Another concrete ramp flume has been completed at Surface Creek near Cedaredge. The new shelter has been installed and conduit has been buried for the orifice tubing. The new material for the antenna mast or the new DCP (8210) and Accubar have not been installed. We still need nitrogen bottles and various connecting hoses and fittings.

The Surface Creek at Cedaredge gage is scheduled to get a new/retro fitted 8210 DCP freed up from the Muddy Creek below Paonia project. This is the best, most efficient use of this equipment because it can act in concert with the flood hardening project seven miles upstream.

The old shelter donated by the USGS from Surface Creek near Cedaredge has been installed with a refurbished A 35 Strip Chart Recorder at Cummings Gulch near Delta. We are in the process of developing a rating by making discharge measurements.

Vouga Reservoir/Razor Creek is actually two new stations. Vouga Reservoir elevation and outflow is the first station. We have fabricated and installed a shelter at the outflow on an existing 9X4 ft rectangular cutthroat flume. We have trenched and buried about 300 ft. of schedule 80 3/4 inch conduit between the valve house on the crest of the dam and the outflow structure. We have the data cable and material for the antenna mast, the new SDI-12 shaft encoder, and the Accububble for the elevation on the dam. We still need to pull the data cable through the conduit and construct plywood shelves for the structure. We have purchased the plywood and most of the pipe and fittings, and we still need the Satlink Logger and shaft encoder float. The inflow on Razor Creek has had a shelter fabricated and installed at an existing 8 FPF. We have trenched and buried about 100 ft. of 3/4-inch schedule 80 conduit for data cable to connect the Tommy Ditch, and the shelter for the shaft encoder on the Tommy ditch has been fabricated and installed. We have two SDI-12 shaft encoders for these two stilling wells. We still need to put the wood shelves in the two structures and pull the data cable between them. The antenna mast needs to be assembled and installed, and the grounding plates and electronic components still need to be installed. We also still need a Satlink Logger and two shaft encoder floats for the second station.

Division Five improved a few gages. First, a new water administration satellite monitoring station was installed at a parshall flume for a trans-District ditch which diverts water from District 38 and transports to District 45. Permanent NEMA boxes and masts were installed at two water administration satellite monitoring stations in order to facilitate faster setups for the brief diversion seasons at these stations, and trees in the vicinity of the cableway at the Roaring Fork River below Maroon Creek station were removed as recommended by an inspection maintenance item.

Planning was completed for a new gaging station on the Government Highline Canal in District 72, necessitated by the installation of a fish screen in the canal. When constructed by the spring of 2004, it will be operated in tandem with the old station for WY2004 in order to confirm the rating at the new station. We also coordinated with multiple agencies in the planning of an electric power installation to the Blue River at the Highway 9 Bridge gaging station.

In the summer of 2003, a water commissioner in Division Six discovered an old gage site on Morrison Creek consisting of a shelter and stilling well with a paper recorder in it that appeared to have not been used for years. After some investigation, the owner/operator of the gage could not be determined. DWR set the paper recorder to start recording in the middle of July. Because an operating gage station at this site could prove very beneficial, the DWR hopes to start maintaining this gage. Needed at this site to begin full operation is the installation of a staff gage or setting of a reference point for use with a drop down tape so that a gage height can be determined; and the development of a rating table once several measurements are made.

Division Six installed a new gage station in late September and early October of 2003. The gage station is located on the Yampa River just upstream of Lake Catamount (YAMABVCO) at the Routt County Road bridge 18C. Thanks to the cooperation, support, and assistance of Catamount Development Inc., the gage station was successfully installed. The gage consists of a Sutron shaft encoder Model SE8500 connected to a high data rate Sutron SatLink Logger with satellite telemetry housed in a 42-inch diameter stilling well. This station has already been and will continue to be used by Catamount Development Inc. for reservoir operations and by the DWR for water administration.

Since 1991, the Division of Water Resources has maintained hydrographic records at the Lake Catamount dam. These records have included continuous recording (using a data collection platform) of the lake level and thus the amount of water spilling over the spillway and spot readings of a rated staff gage near the outlet of the reservoir. In the summer of 2003, another parameter was added to the data collection platform (DCP) record that allowed an observer of the outlet staff to manually enter the outlet staff gage reading into the DCP. This allows those using

our transmitted data to not only see the lake level and the amount of flow spilling, but also, the total flow in the Yampa River below Lake Catamount (spillway plus outlet).

High Data Rate

We are continuing our High Data Rate upgrading this year, with CWCB once again contributing \$248,000.00 toward this end. Included in this value was the purchase of twenty AquaCalc electronic measurement recording devices along with 20 magnetic head pygmy meters, to enhance and speed up stream flow measurements. When fully utilized, this new equipment will help our hydro section do their jobs more quickly and efficiently.

Sixteen gaging stations in Division Two were upgraded with SatLink DCPs and high data rate GOES radio transmitters (300 baud rate, hourly transmissions). These gages are now updated hourly on the DWR real-time streamflow web site. Upgrades at fourteen of these sites required installation of SDI shaft encoders and upgraded grounding equipment. SatLink DCPs were installed at two sites to replace SDI Radio Bridges which have proven to have operational reliability issues.

Thirteen stations were fitted with high data rate DCP's this year in Division Three. Eleven of those stations originally had regular DCP's and were upgraded to high data rate. The other two stations did not previously have any type of DCP. Since eleven other stations were upgraded to HDR DCPs last year, Division Three is approaching the halfway mark for all of their stations to be upgraded. These HDR DCPs transmit every hour instead of the traditional rate of every four hours, which enhances our ability to make real-time decisions about water management.

Three gaging stations in Division Five were upgraded with SatLink DCP's and high data rate GOES radio transmitters, and Division Six has two gaging stations equipped with High Data Rate (HDR) equipment with no plans for additional upgrades to HDR.

Flood Hardening

Our Flood Hardening projects continue to be one of our top priorities. The CWCB gave us an additional \$100,000.00 this year for the continuation of this extremely important phase of our overall mission. We either finished or are working on several projects in Division Four. These include the installation of two new ramp flumes, one each at Surface Creek near Cedaredge and Muddy Creek below Paonia Reservoir. Also, equipment has been upgraded in cooperation with USGS at 3 locations on the Colorado River. They are Colorado River near Dotsero,

Colorado River Near Cameo, and Colorado River near Grand Junction. St. Vrain Creek at Lyons was also finished this year in our Division 1, Greeley Office. A new building was installed on the Rio Grande at Trinchera location out of our Alamosa, Division Three Office. There was a continuation of upgrading of gaging sites at the Hayman Burn Site, in Douglas County, and we have several ongoing project sites that we hope to have finished in the next few months.

Division Two completed installation of flood hardening equipment and facilities at five gages: The Arkansas River near Wellsville, and the Purgatoire River below Highland Dam near Las Animas, a flood block and new orifice lines were installed. At the Arkansas River near Rocky Ford, a flood block, new orifice lines, and a new wire weight gage were installed. At the Arkansas River at Nepesta Bridge near Nepesta, installation and armoring of new conduit and orifice lines to a high water orifice located in flood block below shelter was completed. They also installed a new gaging station for flood warning and monitoring, at Raton Creek above Starkville

One of the larger Division Three construction projects undertaken this year was the replacement of our Rio Grande above the mouth of Trinchera Creek gaging station. This station was replaced due to the extreme deterioration of the old wooden shelter and well, and the fact that the gage was very near to the river. There was a concern that the gage may be washed away in very high flow conditions. As a replacement, an exposed aggregate shelter and concrete well were installed. The new gage was also placed at a higher elevation and farther from the river to minimize flood damage potential.

DWR had two contracts for extending rating curves at locations where the curve did not exist for high flows. A rating curve contract with E&H, Inc. developed and/or extended ratings for high flows at the new Raton Creek above Starkville gage, the Cucharas River at Harrison Bridge near La Veta gage, and the Arkansas River below Catlin Dam near Fowler gage. The extended ratings have been reviewed and implemented. The USGS, with cooperation from DWR employees, was contracted to extend ratings on twelve other gage sites. The final ratings have not yet been released.

Alert

In cooperation with CWCB, DWR has set up an Alert notification program that provides automated alerting by email, phone (pager or fax) of specific individuals when threshold high and/or low stage conditions or threshold rate of change conditions occur at a stream or reservoir gage. The DCPs at each of the alert system gages were programmed in the field for the specific alert thresholds desired. We are looking into the feasibility of adding USGS gages to the system in the

future. We currently have 59 Alerts in our system; 45 upper limit alarms, 8 lower limit alarms, and 6 rising rate alarms.

Measuring/Records

The DWR published 214 sites in our annual Streamflow publication this year. In Division Two, the hydrographic staff completed 43 streamflow records, and made 592 discharge measurements at stream gages and 121 discharge measurements on canals and diversion structures. Seven of these streamflow records are also published by the US Geological Survey in their Annual Water Resources for Colorado Data Report. The Division Three hydrographers measured and/or developed meter notes for stream and ditch measurements over 1,090 times. These measurements were used to develop fifty-eight yearly records of flow, which were published in the annual publication. In addition, several stations were operated as administrative stations with their flow records not being published. Division Four made about 50 administrative measurements in the Grand Mesa and North Fork areas, with five of these on a trans district diversion. Division Five made 68 river discharge measurements (including 41 measurements for the Fry-Ark Project) and 14 ditch/canal discharge measurements in WY2003. Ten streamflow records for WY2003 were completed for publication in the annual report, including 8 records for streamflow stations in the Fry-Ark Project.

The Gunnison River below Redlands Diversion was seen to have a historic low flow on April 10, 2003. Two measurements were made to confirm about 13 cfs below the Redlands Diversion Dam, which was during a time before the BOR contracted to deliver water below Redlands from the Aspinall Unit, kicked in on June first. Eight measurements were made of the Redlands Canal and the Gunnison River below Redlands Diversion Dam combined during the last week of March and the first two weeks of April to assure that the low water conditions were captured and that an accurate V Shift table was in place during a critical administrative situation.

A new Aqua Calc Pro was acquired in the first part of May in Division Four. They have converted all of their measurements to this new tool. It has proved to be more accurate in that it can be programmed to use the meter formula. It is faster because it can calculate a velocity after 40 seconds. A Price AA meter has been converted to a magnetic head, which reduces resistance of the cat whisker contact and saves time in adjusting the contact. A new HIF rated Pygmy meter has really helped the accuracy of measurements in concert with the AquaCalc Pro. The shallow depth and fast velocity of many flumes can be more accurately measured, as the really fast velocities couldn't be counted using a conventional cat's whisker contact. The drought situation and a call by the Gunnison Tunnel meant that we were measuring the South Canal on a much more frequent schedule to account for aquatic growth. We, also, cooperated with the USGS in alternating with their measurements of the Gunnison River below the Gunnison Tunnel in the Black Canyon of the Gunnison

River. The hydro section of Div4 also participated in checking USGS published records worked in Div7 for WY2002.

In Division Six, forty-two measurements were taken at gage sites in addition to many other measurements taken in ditches and other streams at the request of water commissioners. Hydrographic records will be published for four of the twelve sites: Walton Creek near Steamboat Springs, Michigan River near Walden, Michigan River near Meadow Creek Reservoir, and Illinois River near Rand.

In water year 2003, Division Six acquired bridge-measuring equipment to facilitate the ability to take high flow measurements. For the first time ever in Division Six, high flow measurements were taken in the Spring of 2003 - two measurements were taken on the Yampa River above Lake Catamount, three measurements were taken on the Michigan River near Meadow Creek Reservoir, and three measurements were taken on the Illinois River near Rand.

Division Six also acquired an AquaCalc in the spring of 2003. Because the AquaCalc has difficulties functioning with flow meters equipped with a cat-whisker, a magnetic head pygmy was also acquired. Both these pieces of equipment have proved to be very beneficial.

The Division 7 hydrographer made 169 river measurements and 22 ditch measurements, and water commissioners in Division 7 made 34 river measurements and 4 ditch measurements. A large number of the hydrographers measurements were made to calibrate the ramp flume constructed on the Florida River above Lemon Reservoir last year. A good definition of the rating curve was obtained. They published six hydrographic records, and met the publication deadline. Three of these were used as diversion records for the Irrigation Year. They worked an additional record that wasn't published or used for diversion records, but had high significance for the Endangered Fish Recovery Program and subsequent contractual obligations of the BOR and significant importance of being below the lowest calling structure on the Gunnison.

Miscellaneous

We are looking at having to upgrade our computers for our hydro branch also, as the new equipment will not work with old laptops. Also, some new bridge measuring equipment needs to be purchased.

Division Two had numerous miscellaneous activities:

- intensive measurement and monitoring of the Fountain Creek at the Mouth stream gage and comparison with Fountain Creek at Pueblo stream gage;

- inspection of two cableways in Division 2 as part of the DWR Hydrographic Program Cableway Safety and Inspection Program;
- inspection and flow measurement checks on several augmentation stations in Water Districts 11, 17 and 67;
- design and implementation of a transit loss estimation study on Trout Creek Ditch in WD 11 involving a total of 33 measurements at ten locations along the Ditch over a two day period;
- inventory and analysis of Arkansas River Basin stream gages in cooperation with the USGS and presentation of results at the 2003 Streamgaging Symposium;
- receipt of and training in the use of AquaCalc stream flow computers and magnetic head Pygmy current meters;
- preparation and delivery of a report describing the results of analyses of 67 historical releases and deliveries of water from John Martin Reservoir to the Colorado-Kansas Stateline, the purpose of which was to evaluate transit losses occurring during delivery of water to Kansas;
- preparation and delivery of a presentation on the DWR satellite monitoring system and hydrographic program to the NOAA GOES user group meeting hosted by CO DWR in June in Frisco;
- led the development of two new standard operating procedures and equipment use policies for DWR Hydrographers regarding the use of AquaCalc Streamflow Computers and magnetic head Pygmy current meters;
- routine coordination of stream and reservoir gaging activities with the USGS Pueblo Subdistrict office, the US Bureau of Reclamation, and the US Army Corps of Engineers and other State and federal agencies during WY2003.

For the second year in a row, Division 3 experienced severe low flow conditions in most of its rivers and streams. Although not as dry as 2002, this year was again a struggle to ensure that our stations collected reliable low flow data. Ironically, we also experienced floods at a few locations because of indirect effects of the drought. The very dry conditions last year led to a major forest fire in the area above our South Fork of the Rio Grande gage. The loss of vegetation in this area, combined with hydrophobic soils created by the intense heat, in turn led to several flash floods on the South Fork and the mainstem of the Rio Grande below the confluence.

Division Four cooperated with and helped the USBR install a new Accububble at the Gunnison River below Redlands Diversion Dam on February 21, 2002. This was the result of a good working relationship with the local Grand Junction Projects Office and the fact that we encouraged them to purchase the unit.

We cooperated with the Gunnison River Transit Loss Study conducted by the USGS and funded by the USBR, CWCB, Fish and Wildlife Service.

We cooperated in a transit loss study of the Ruby Anthracite and North Fork of the Gunnison conducted by Wright Water Engineers. This was to establish values for augmentation water released from Lost Lake Slough. The increased coal mining activity on the North Fork precipitated the need for better accounting of the needed augmentation water. Division Four hydro staff check measured the USGS gage, the North Fork of the Gunnison near Somerset during two days of the study. We also check measured the Parshall flume below Lost Lake Slough on the first day of the study.

DWR participated in the Children's Water Festival conducted by Montrose School District for fourth graders, and participated in the Montrose County Useful Community Service program. Eight people worked 355 hours from November 22, 2002 to January 14, 2004 which allowed needed maintenance at gages to be performed. Five gages were brought up to standards for grounding utilizing this program.

During the low water of the summer of 2002 the reach below Dallas Creek near Ridgway and Ridgway Reservoir was searched for a shelter that washed away in 1999. The local landowners were contacted and asked to keep an eye out, and this season we were contacted about a possible lead. This was investigated and turned out to the missing shelter. It was barely visible and wedged under an under cut bank. The Colorado State Park Service administers the area about 0.96 miles below the gage site, so they were going to help excavate it with one of their rubber-tired tractors. This has not happened even after several follow up inquires. We will not be sure if the Sutron 8200 DCP is inside till we can get into the inside

In addition to maintaining the gage sites, Division Six made many field trips with water commissioners to conduct flow measurements on ditches, reservoir releases, and streams. On the horizon, the Division Six hydrographic program foresees the potential of re-establishing a gage station on the Williams Fork River of the Yampa River once operated and maintained by the USGS and on Service Creek of the Yampa River also once operated and maintained by the USGS. The potential need for these is the result of the Fish and Wildlife Service Endangered Species Program on the Yampa River and the recently applied for recreational in-channel diversion by the City of Steamboat Springs, respectively.

As a result of the satellite monitoring system a high water measurement was made on September 9, 2003 at the La Plata River at the Colorado/New Mexico Stateline. The 1200 cfs measurement was the highest measurement since July 25, 1977.

Board of Examiners for Water Well Construction and Pump Installation Contractors

In Article 91 of Title 37, the Colorado legislature created the State Board of Examiners of Water Well Construction and Pump Installation Contractors under the Division of Water Resources in the Department of Natural Resources. The Board consists of five members, one of which is the State Engineer who has historically provided staff to support the activities of the Board and to assist the Board in the efficient and effective discharge of its duties and responsibilities. In 2003, the legislature passed Senate Bill 03-45 authorizing an increase in well permit fees and authorizing the creation of a well inspectors program (section 37-91-113, C.R.S.). During 2004, the State Engineer hired a Chief Well Inspector and four Well Inspectors to monitor compliance with applicable statutes and the Water Well Construction Rules adopted by the Board. The Chief Well Inspector is based in Denver along with one Well Inspector that covers the northeast and central plains. The remaining Well Inspectors are located in Alamosa, covering the south central and southeast; Glenwood Springs, covering the northwest; and Durango, covering the southwest. In addition to the Well Inspectors, several DWR employees in Denver, as well as Water Commissioners and Division office staff, contribute part-time to supporting the activities of the Board.

Entry of data from well construction reports, pump installation reports, and well abandonment reports required by the Board is currently being accomplished by Jessie Dunbar who also shares his time supporting the permitting section. Data entry of well construction, pump installation, and well abandonment information continues to be kept current by Mr. Dunbar's efforts. Mr. Dunbar also identifies potential well construction and/or pump installation deficiencies and forwards the information to the Well Inspection Branch for further investigation.

General Support

Activities of the support staff are focused in three general areas: complaint/enforcement actions, variances from the requirements of the Water Well Construction Rules, and licensing of well construction and pump installation contractors. In addition to these functions, the Staff provides technical and professional assistance to the Board in the development of its administration rules, construction rules and associated Board policies. The Staff also reviews and presents to the Board new technology developed in the well construction industry, coordinates the activities of the Board with the objectives and requirements of the Division of Water Resources and other agencies, disseminates information to contractors, and provides education and general information concerning the Board's activities in a variety of public forums.

During 2004, the support staff, at the direction of the Board, developed Rules and Regulations for Administration of Licensing, Financial Responsibility, Continuing

Education and Remedial Action (2 CCR 402-14) and subsequently revised the Water Well Construction Rules (2 CCR 402-2) to remove duplicative rules. The most significant change to the construction rules was to include minimum standards for cistern installations.

The staff is active in reviewing and recommending accreditation of proposed continuing education courses for contractor's compliance with section 37-91-105(7), C.R.S. Criteria for accreditation were established in conjunction with the Colorado Water Well Contractors Association (CWWCA). The Board established an accreditation committee composed of staff, a CWWCA representative, and a Board member to ensure the timely review of applications for course accreditation.

Complaints and Enforcement Actions

The State Engineer's Well Inspectors and Staff supporting the Board of Examiners are responsible for the investigation of complaints that allege well construction or pump installation that violates the provisions of Article 91 of Title 37, C.R.S., and/or the Water Well Construction Rules. The investigations often result in bringing the issues before the Board of Examiners for resolution, while staff actions authorized by the Board resolves other issues. The well inspectors and staff also conduct "follow-up" actions to ensure that contractors and well owners are complying with Orders of the Board, including pursuing a judicial remedy if necessary. The staff works closely with the Attorney General's Office to accomplish these tasks. Credit for successful resolution of issues in the judicial arena goes to Shana Smilovits, Amy Stengel, and Susan Schneider of the Attorney General's office.

The following is a summary of complaint/enforcement actions brought before the Board or resolved by the Board or support staff during calendar year 2004.

New Complaints Investigated.....	69
Complaint Type: Construction violation.....	12
Permit violation.....	32
Unlicensed contractor.....	21
No Work Report Filed.....	2
Order to Fix or Plug.....	2
Complaints Resolved.....	44
2002/2003 complaints resolved in 2004.....	9
2004 complaints resolved	35
Resolution/Action: Dismissed, withdrawn, discontinued, or otherwise resolved.....	9
Complied with Order.....	2
Court action (fines and fees).....	9
Letter of admonition/reprimand/fine.....	23
Suspension/probation/fine.....	1

In addition, the staff processed 204 requests for variance and infiltration gallery plans. The staff reviewed 8631 completion reports, 4421 pump installation reports, 1209 abandonment reports, and more than 2000 well owner completion notices.

In 2004, the Board of Examiners granted an amnesty program for late filing of well construction and pump installation reports. The amnesty was granted in an attempt to acquire as many reports as possible and improve the state's well construction/pump installation information. The amnesty period that expired in December 2004 was successful in obtaining many construction and pump installation reports.

Licensing

The Board licensed a total of 323 contractors in 2004, including 8 new contractors. Gina DeArcos coordinates the licensing activity.

Education and Outreach

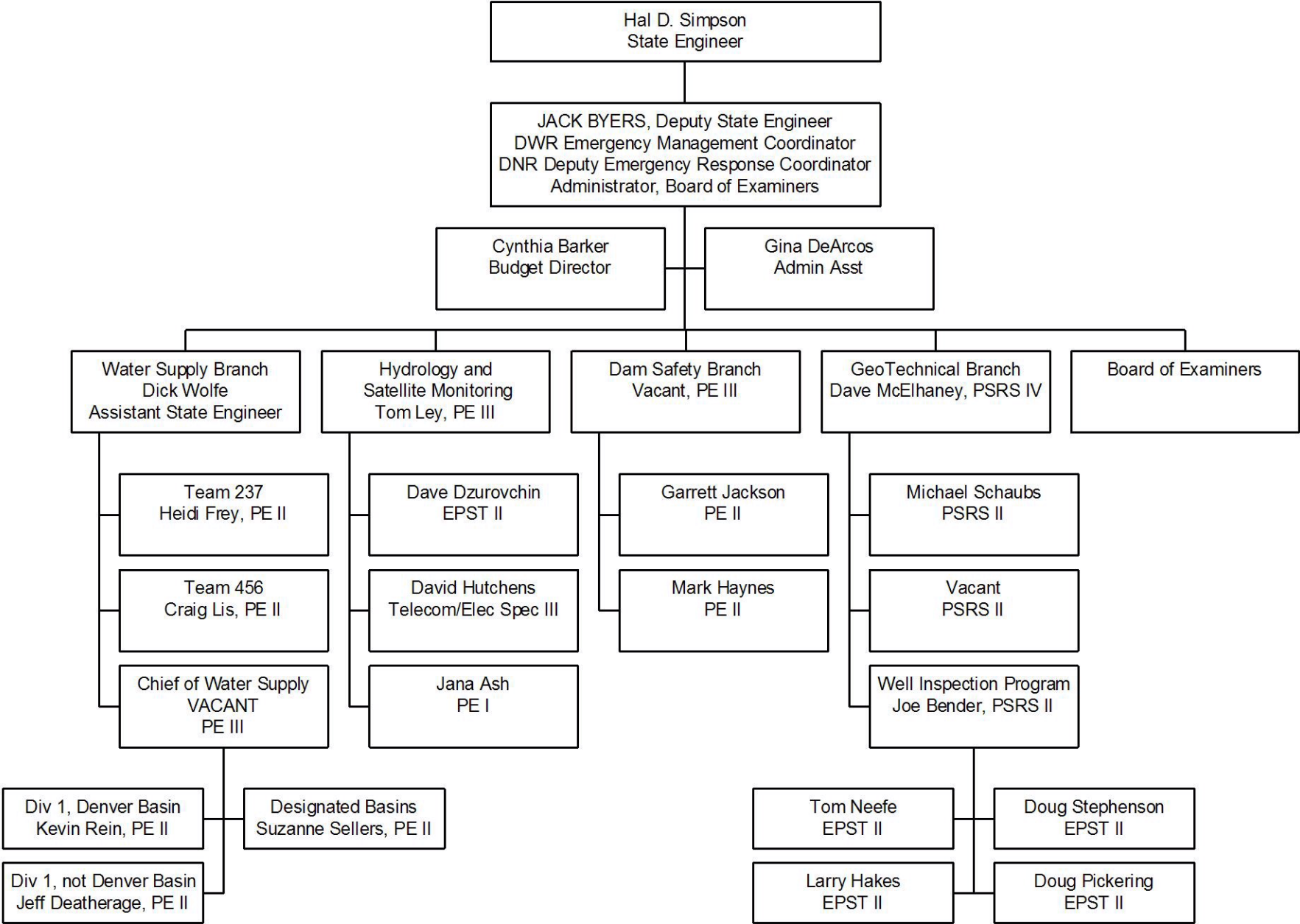
The staff continues to work with the Colorado Water Well Contractors Association (CWWCA) to provide information to the licensed contractors. This is accomplished by individual outreach through mailings, CWWCA newsletter articles and examination preparation workshops. Staff provides instruction on permitting and construction standards at the mid-year and annual conferences of the CWWCA.

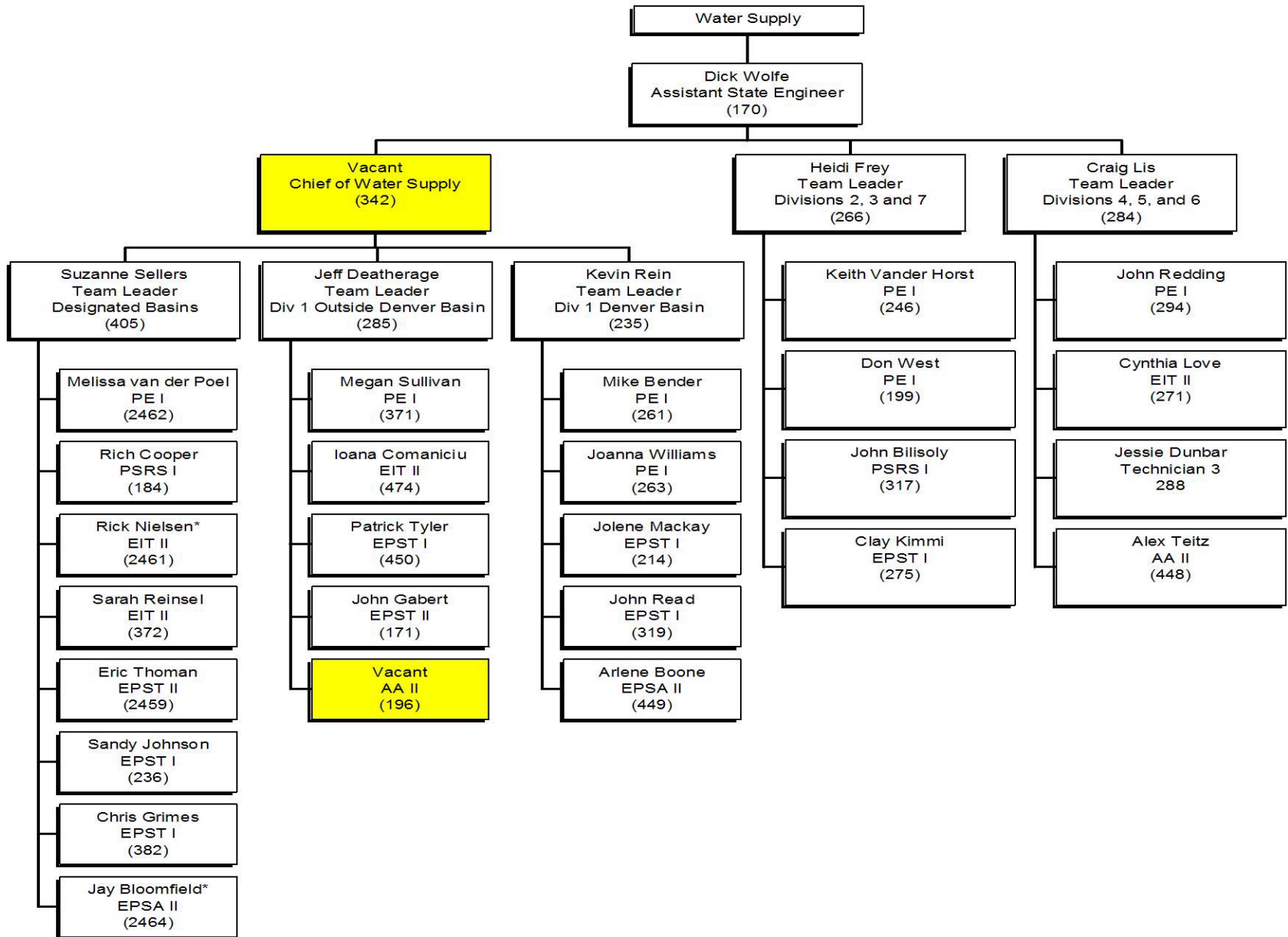
Well Inspection Program

The well inspection program is proving to be a tremendous asset to the Board of Examiners' enforcement activities. The well inspectors are doing an outstanding job as is described in the Geotechnical Services Branch section of this report. It is anticipated that, as the program becomes more fully developed, the proportion of violations discovered as a result of the inspection program will decrease. Since inception of the inspection program, it is evident that the many licensed contractors are refining their well location and construction practices to ensure full compliance with the Board's Rules.

Organizational Charts

DEPUTY STATE ENGINEER





*Approved in 1998 for final permits; expire July 1, 2007.

Updated March 16, 2005

