



Quarterly Newsletter of the Office of the State Engineer

Rueter-Hess Dam Project

John Redding, Dam Safety Engineer, Denver

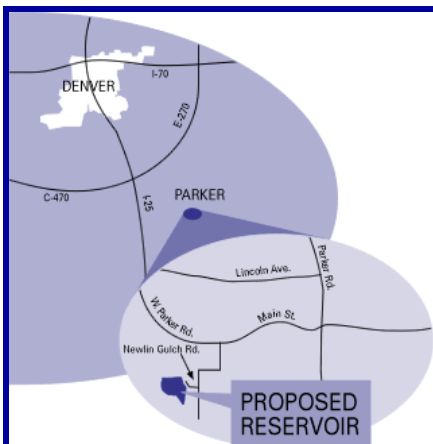
The Rueter-Hess Dam and Reservoir Project is being developed by the Parker Water and Sanitation District (PWSD) to provide raw water storage to meet current and future municipal and industrial water needs in the PWSD service area. The dam is configured to ensure long-term water needs, while also contributing to the area's recreation and 2,000 acres of open space amenities. It will be classified as a Large, Class I (High Hazard) dam based on its size and relative risk to population and infrastructure downstream.

The reservoir and dam will be located east of Interstate 25 in northeastern Douglas County, approximately 3.4 miles southwest of downtown Parker on Newlin Gulch, a tributary of Cherry Creek. The project will occupy approxi-

mately 480 acres in Sections 25 and 36, Township 6 South, Range 67 West of the 6th Principal Meridian.

The dam will be a zoned earth embankment dam with a central clay core, a chimney drain, drain blanket and toe drain. The outlet works are to be located near the right abutment of the dam, and will include selective withdrawal capabilities for the purposes of water quality management. The service spillway will be combined with the outlet works and will be capable of safely passing inflow runoff events of up to and including the 100-year flood. An auxiliary spillway will be located at the left abutment of the dam and will be capable of safely passing flood events greater than the 100-year flood, up to and including the probable maximum flood (PMF).

In 1982, Frank Jaeger, District Manager of the PWSD, first inquired about buying ground water rights from the long-time Parker area Rueter-Hess family. In 1985, three locations were identified in which a reservoir could be created to capture runoff from heavy rains. The Parker Water and Sanitation District promptly filed with the Army Corps of Engineers for a 404 Permit to construct a dam at any of



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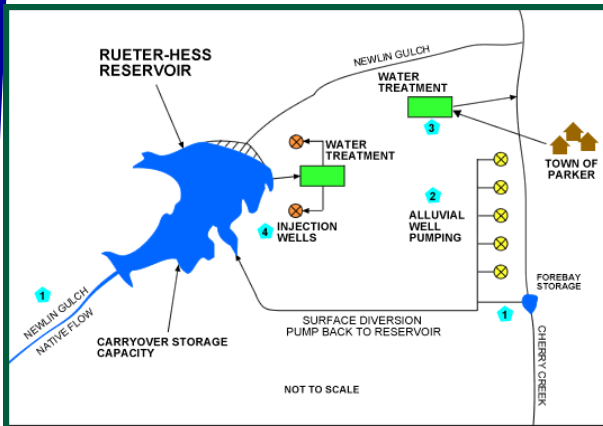


these three sites. The site of the former Castlewood Canyon dam was considered to be the most favorable location for upstream water storage on Cherry Creek. However, in 1993, the Colorado Supreme Court rejected the Castlewood Canyon site, so attention was turned three miles southwest of Parker to Newlin Gulch.

Three thousand acres were then purchased, which seemed an

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Rueter-Hess Dam Project (cont.)



1. Surface drainage (especially storm runoff) comes from Newlin Gulch and Cherry Creek.
2. Shallow wells near Cherry Creek will pump water to the reservoir for storage.
3. Water normally lost through business and residential use is treated, then returned back into Cherry Creek to help maintain proper stream flows.
4. Water is injected back into the aquifer to replenish it.

excessive amount to some since the maximum capacity was originally planned to only inundate 470 acres. PWSD, however, wanted the ability to expand the reservoir in the future, and to have about 2,000 acres of open space. In 1996,



Construction of the output tower and the outlet conduit (comprised of two, 78-inch diameter steel pipes encased in reinforced concrete).

2011). The project will include raising the crest from 135 feet to 196 feet, requiring an additional 7.4 million cubic yards of fill. The reservoir's surface area will correspondingly increase from 470 acres to 1,130 acres. (For comparison, Cherry Creek Reservoir has 880 surface acres).

The new reservoir will allow Parker to capture an amount of water equal to what it discharges from its wastewater plant. The water will be drawn from eight new wells to be drilled along Cherry Creek. Under state law, water pumped from deep, non-tributary aquifers

the District was granted the water right to divert water from Cherry Creek, with a March 20, 1985 appropriation date. Construction officially began in October 2004, with completion expected in the summer of 2007.

That completion date may be delayed, however, because the District is currently working on an enlargement project that will increase the reservoir's capacity from 15,000 to 67,520 acre-feet. (making it likely that the reservoir won't begin filling until

can be used repeatedly until it is gone. By contrast, river water can be used only once before it must be released to flow downstream.

Successful operation of the reservoir will help extend the life of the aquifer in several ways:

- capturing and using storm runoff that normally flows downstream from Cherry Creek and Newlin Gulch;
- allowing reuse of treated wastewater using shallow tributary wells along the creek;
- reducing the need to pump high volumes during high demand summer months; and
- injecting surplus surface water back in to the aquifer during low demand season.

The following are miscellaneous Rueter-Hess Dam specifications:

- 4,850 foot-long crest;
- Upstream slope: 3:1; Downstream slope: 2.5:1;
- Soil-cement upstream slope protection;
- Reinforced concrete low-level intake structure, including a trashrack and provisions for installing a bulkhead;
- 127-foot tall reinforced concrete gate tower, allowing selective withdrawal from three elevations for delivery to PWSD water treatment or to Newlin Gulch (awaiting permission to increase tower height to 188 feet);
- access bridge to be built from dam crest to deck of gate tower;
- two, 78-inch-diameter steel pipes encased in reinforced concrete downstream outlet conduit, with a nominal one percent downstream

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Rueter-Hess Dam Project (cont.)

- slope;
- reinforced concrete impact basin at the downstream end of the 78-inch-diameter pipe to dissipate service spillway and large stream releases prior to entering Newlin Gulch; and
- an excavated channel around the left abutment of the dam will form the auxiliary spillway

Of interest: In November 2004, a team of archaeologists working at the Rueter-Hess site uncovered what might be the

most complete evidence in Colorado of lives lived about 5,000 years ago. Items found included butchered bison bones, spear points, grinding stones and pit houses. It was determined that about five thousand years ago, a band of people built homes on the edge of a stream in what is now Parker. The archaeological discovery has not delayed the dam's construction.

For more information on

Rueter-Hess Reservoir and Dam, log onto www.pwsd.org.



Clay soils are pre-treated with water before excavation. A fleet of scrapers move the treated clay and places it in the dam's core.



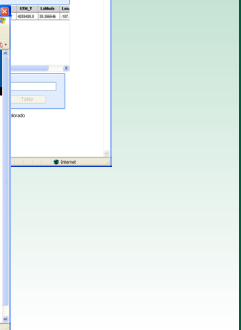
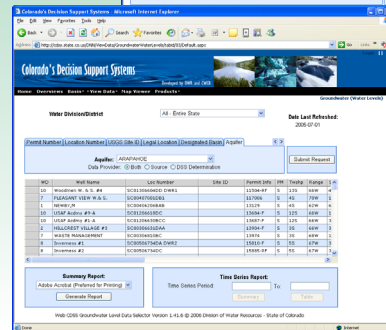
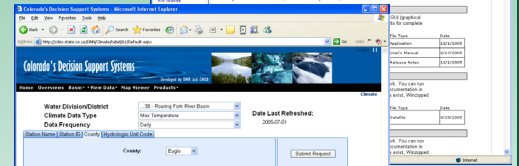
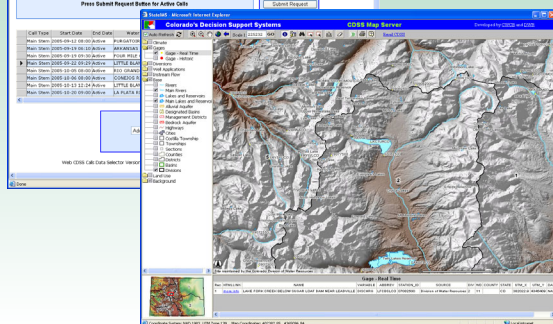
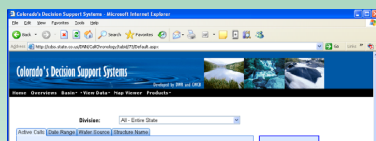
Decision Support System Web Site

The State Engineer's Office has updated the Decision Support System web site with dynamic data links, easier menus to navigate through and a new crisp look and feel.

Basin specific information can be accessed or the "View Data" menu can dynamically retrieve a huge variety of live data for any basin.

The "Map Viewer" tool offers an assortment of GIS data that enhances visualization. The "Products" menu facilitates finding data, models, and other downloads.

Please visit our new site, and continue to look for more improvements!
<http://cdss.state.co.us/DNN/> or click on the link from our homepage
<http://www.water.state.co.us/>.



Using Technology to Keep up with New Demands of Water Commissioners

Brent Schantz, Water Commissioner, Division 1, Districts 1 & 64

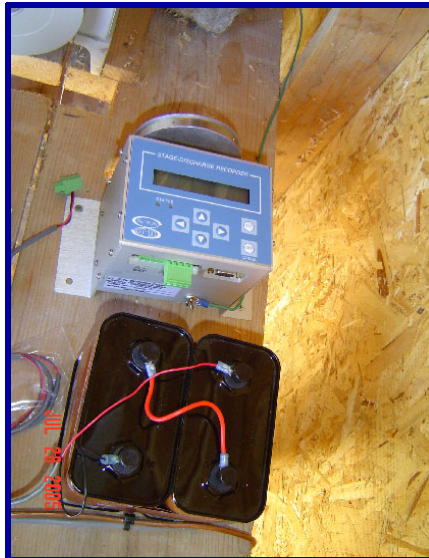
Since the 2003 Supreme Court ruling in Simpson v. Bijou Irrigation Co., et al. and the resulting changes in legislation, there have been approximately 40 new plans for augmentation covering approximately 3,400 wells filed with the Division 1 Water Court. Many of these new plans are located in Districts 1 and 64 on the Lower South Platte River.

These plans rely heavily on recharge operations, reservoir releases, augmentation well pumping and the bypassing of senior ditch water rights to cover the depletions associated with well pumping. The result has been a tremendous increase in the number of recharge sites; at last count, there were approximately 300 actual sites below Kersey. This has placed great demands on the DWR personnel that work in these areas. The accounting needs of the well groups necessitates that data be distributed by the 10th of the following month of operation. Alternate point of diversion wells and plans that wish to exchange their excess accretions require daily accounting.

To assist in this daunting task of data processing, the DWR has embraced the use of data loggers to automate the collection and processing of diversion data. In recent months, data loggers have been paired with cell phone modems, which allows real-time data acquisition day or night.

Sutron Corporation has developed a new SDR (Sutron Data Recorder) based on requests and input from DWR personnel and input from water users. They have built a great product at a great price. There are approximately 50 SDRs in the field in District 1/64,

with more being purchased every day by water users. Paired with a cellular modem from another supplier, they carry a price tag of approximately \$2,000 (\$1,300 for the SDR) with additional monthly phone charges. With chart recorders being similar in price, it has not been difficult for water users to see the value in the data logger.



The ease of programming the SDR and the ability to download the data into an excel spreadsheet make it a very useful tool, with no charts to work! Some water users have had great success pairing a magnetic head flow meter with a data logger for augmentation and recharge wells and to measure their direct flow recharge water.

For the 2006 water year, District 1/64 staff will be working with staff from the Northern Colorado Water Conservancy District (NCWCD) and the Lower South Platte Water Conservancy District (LSPWCD) on a year-long pilot project where different types of data loggers, sensors and telemetry will be installed on 18 major diversion structures from Kersey to Julesburg. Several key sites are already part of the DWR

satellite-monitoring program; and with these additional sites, the administration of 135 miles of river should be a little easier and more precise.

NCWCD is installing the equipment (by April) and will calibrate and maintain it for the period of the study project. Their goal is to try loggers of six different manufacturers, install some on radios and others on satellite and cellular modems. They will install two different types of sensors at each site, shaft encoders, pressure transducers, and other types will be tested. They are also working on a stilling well heater that will keep the stilling wells from freezing. Winter is the busiest time for recharge activities and ice can be a major problem when trying to record accurate data. At the end of the project, NCWCD will present their finding with hopes in assisting those water users who are looking to upgrade their systems from having to spend a lot of time figuring out what does and doesn't work.

The LSPWCD, located in Sterling, will be the collection point for all the data, their staff will be downloading and posting the data. They will also build and maintain a web site that will contain all the data. Augmentation groups can then download the data they need once the Water Commissioner has approved it. It is also hoped to have the data available through the DWR web site.

DWR staff work out of the LSPWCD office and will be reviewing the data daily to ensure its accuracy. Division 1 has dedicated nine SDRs for the project; they will be installed on structures that are critical to administration. The workload has increased dramatically over the last few years but with the use of technology, staff hope to provide better service to the water users and better administer Colorado's most valuable resource.

Is Spring Flooding Likely?

Jana Ash, Hydrographic Branch

The snowpack has a significant effect on the amount of water Colorado has access to throughout the year. Eighty percent of reservoir storage in Colorado is collected from snowpack runoff. Snow reports in January and February were showing an above-average, up to 128 percent, snowpack for areas of the state that have been showing a below-average snowpack during the past couple of years. These facts raised concerns statewide about possible flooding this spring and how the state and local entities were going to coordinate efforts.

The Division of Water Resources (DWR) and the Colorado Water

Conservation Board (CWCB) have met numerous times to make sure there is a collaborative effort with any and all entities to meet the objectives of the CWCB Flood Protection Program responsibilities. CWCB objectives entail: 1) analyzing any spring snowmelt flooding threat, 2) response to an actual flood event, and 3) post-flood recovery activities. The Board works with the Governor's Office, OEM, NRCS, CDOT, DWR, DNR, DOLA, NWS, FEMA, Corps of Engineers, and local governments regarding advanced measures and preparedness, flood fight activities, and post-flood recovery operations.

In an effort to meet the program objectives, CWCB prepares flood reports similar to DWR's water supply report, although on a more frequent basis during runoff. Due to the significant snowpack in several of the basins, DWR has been asked to provide reports on our perspective, concerns, actions and management activities associated with runoff and potential flooding. Information



DWR Hydrographer collecting snow data

in these reports encompass the following information: general basin-wide snowpack overview, specific watersheds and/or gages of interest, preparation activities/meetings that are occurring, current high water or flooding observations.

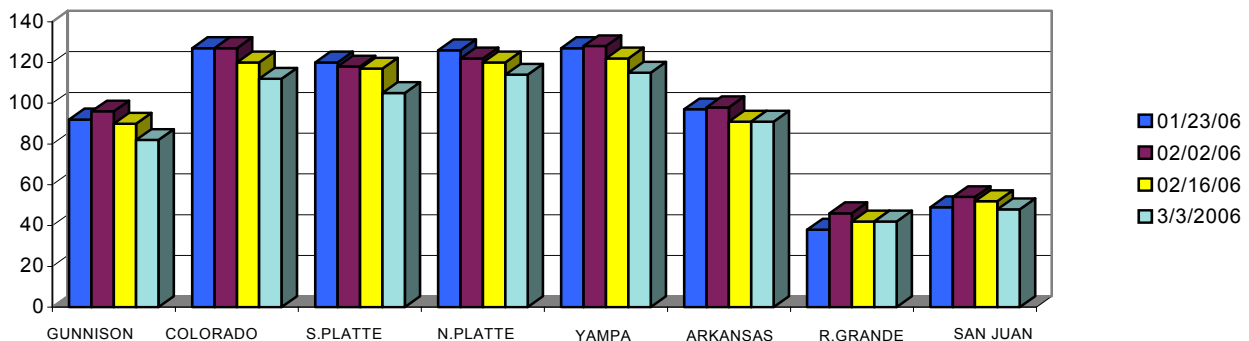
DWR also attends monthly Flood Task Force Meetings headed by CWCB. Emergency management entities from all levels of government attend these meetings, and information is shared and discussed to keep everyone informed of possible flooding activities. Presentations are made on the snow-

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Confluence Park, the South Platte River, during high water, August 4, 2005

Snow Water Equivalent Percent of Average



Is Spring Flooding Likely? (cont.)

pack levels by the Natural Resource Conservation Service (NRCS), reservoir storage and streamflows are made by DWR, short-term weather forecasts are given by the National Weather Service (NWS), and the long-term weather forecast is presented by John Henz of HDR Engineering. All this information is pertinent in attempting to forecast possible flood activity.

Basin specific, the Upper Colorado, South Platte, Laramie, North Platte, Yampa and White Rivers were tracking between 118 to 128 percent of average snow-water equivalent as of February 2. The month of February, on the other hand was a little bit dryer than average, and brought down those numbers to between 102 and 114 percent as of March 9.



Interesting Flood Facts



Colorado Flood Hazard Exposure Facts

- Flood-prone areas have been identified in 267 cities and towns, and in all of the 64 counties in Colorado.
- Over 250,000 people are living in Colorado's floodplains.
- There are estimated to be 65,000 homes and 15,000 commercial, industrial, and business structures in identified floodplains. There are likely many more structures located within unmapped flood hazard areas.
- The value of the property, structures, and contents located in the identified floodplains is estimated to be over 11 billion dollars (1996).

Flood Loss Information

- Average annual flood losses in Colorado are estimated to be \$17,600,000 in property damage based on data from 1896 to 1984.
- Cumulative flood losses for the most damaging floods in Colorado between the turn of the century and 1993 include 331 people killed and \$3.3 billion (1995 dollars) worth of property damage.

Is Spring flooding likely? The weather during the months of

March and April will determine the answer to that question!

Ground Water Commission Invites Public Input on Proposed Rules

Joseph Grantham, Hearing Officer

On February 17, 2006, the Colorado Ground Water Commission authorized the Executive Director of the Commission, Hal Simpson, to proceed with amending rules that govern how the Commission conducts hearings. The existing rules have been in place without review or amendment for 25 years and the Commission believed the rules were well overdue for an update.

These rules, formerly known as Rules of Procedure for All Adjudicatory Hearings Before the Ground Water Commission (2 CCR 402-3), provide the Commission and water users with parameters on how hearings must be conducted when disputes arise within the designated ground water basins located on the eastern plains of Colorado operating under the Ground

Water Management Act of 1965.

The Commission believes an excellent end product of going through this process is that it allows the water users within the basins to provide significant input on how the Commission conducts a large portion of its day-to-day business. By providing this input and updating the rules, both the Commission and the water users will obtain a better understanding of expectations and procedures to follow in these instances. In the long run, this should assist in reducing the time and costs for water users and the Commission when they are engaged in these necessary hearings.

The present target date for a formal hearing on adoption of any amend-

ments to these rules is planned for the Commission's regularly scheduled meeting to be held in August. Formal publication of the proposed amendments will be forthcoming in the near future. Prior to formal publication, the Commission encourages water users and their representatives to provide comments up until April 1, 2006 to the Colorado Division of Water Resources, 1313 Sherman Street, Room 818, Denver, CO 80203, Attention: Joseph (Jody) Grantham. Suggestions will also be accepted via email at: jody.grantham@state.co.us

Copies of the existing and proposed rules can be obtained from the web site, www.water.state.co.us, or by calling (303) 866-3581.

125th Anniversary of the State Engineer's Office

On March 9, 2005, the House of Representatives introduced a tribute (formerly known as a Resolution) recognizing the 125th Anniversary of the Creation of the Office of the State Engineer. On March 20, Senator Entz read the tribute in a formal ceremony in the State Senate Chamber.

On March 5, 1881, legislation was enacted to establish the position of State Engineer responsible for

the administration of water rights and the measurement of water flows in streams and canals. Colorado was the first state to establish such a position. Since that time, twenty-one State Engineers have served the State of Colorado. M.C. Hinderlider served the longest from 1923 to 1954, and was involved in the negotiation of several interstate compacts assisting Delph Carpenter. The role of the State Engineer has expanded over the 125 years and is

now responsible for administration of nine interstate compacts and two federal apportionment decrees, the safety of all dams in the state, the permitting of the use of ground water and the safe construction of water wells, and maintenance of water data and information.

Hal Simpson, the current State Engineer, has served since August of 1992 and is the second longest serving State Engineer.

Human Resources — New Chief of Dam Safety

Mark Haynes was appointed as the new **Chief of the Dam Safety Branch** on December 29, 2005. Mr. Haynes has extensive experience and institutional knowledge with respect to the Colorado Dam Safety Program. He has been instrumental in the review and approval of over \$350 million in dam construction projects in Colorado since 1995. Prior to his current position, he performed dam inspections to determine safe storage levels and also has experience as a private consultant. Most recently, he has coordinated much of the technical information for the National Dams Data Base and ASDSO. Mr. Haynes will work closely with the team of dam safety engineers in the continuous improvement of the Colorado Dam Safety Program and providing leadership on dam safety and security issues at the national level.

New Employees

Bob Erosky was hired in June 2005 as a Deputy Water Commissioner in District 64. Bob comes to DWR with 12 years experience as a ditch rider on the Lower Platte and Beaver Ditch in District 1. Bob is a very capable person and he and his wife, Wanda, live in Hillrose.

Evan Snyder began in District 64 in September 2005. Evan comes from an agricultural background and was working for the Division of Wildlife before being hired by DWR. Evan is a dedicated, hard-working young man and is a welcome to Division 1. Evan lives on the family farm outside of Hillrose.

Charlie Sutter began in Division 1, District 64, in March 2005 as a permanent part-time Deputy Water Commissioner. Charlie comes with a varied background in farming and with eight years experience as a Ditch rider on the Farmers Pawnee Ditch. Since Charlie and his wife, Mary, live in Sterling, he knows everyone and helps make the transition of combining District 1 and 64 an easier process.

Kathleen Albritton was hired on as a permanent part-time Administrative Assistant on February 20, 2006 in the Division 5 office in Glenwood Springs. She originally started working as a temporary in November 2005. In addition to her outstanding qualifications, Kathleen's prior course work as a paralegal brings a unique talent to this support staff position. Kathleen hails from the State of Washington, and truly enjoys living in Colorado.

Kendra Hinkson began work on March 27 filling the position of Deputy Water Commissioner for Districts 8, 9 & 80 after interviewing a highly qualified pool of applicants. Kendra brings a unique mix of qualifications to DWR, including her farming background, a B.S. degree in Recreation Resource Management from the College of Natural Resources at CSU, and her training and experience as a Sheriff Deputy.

David Keeler started working on March 31 as the Republican River Water Commissioner in Division 1, a position created last summer to help Colorado meet its new obligations under the revised Republican River Compact. Previously, Dave was manager of the Y-W Well Testing Association for the last several years. He is a certified well tester and he also brings surface water irrigation experience to this position, having spent several years as Forman of a ranch in the Saratoga, Wyoming area that flood-irrigated 4,500+ acres. Dave grew up in the Wray, Colorado area where his family has lived for nearly 100 years.



CALENDAR OF EVENTS

- April 4** Colorado Board of Examiners of Water Well Construction and Pump Installation Contractors Meeting, Denver, Colorado; for more information, contact Gina DeArcos at 303-866-3581
- May 17-18** Colorado Water Conservation Board Meeting, Colorado Springs or Pueblo, Colorado; for more information, contact Dena Crist at 303-866-3441
- May 19** Colorado Ground Water Commission Meeting, Denver, Colorado; for more information, contact Marta Ahrens at 303-866-3581
- June 6** Colorado Board of Examiners of Water Well Construction and Pump Installation Contractors Meeting, Denver, Colorado; for more information, contact Gina DeArcos at 303-866-3581

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