

MADCS

Issue 2

January 2007

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Message from the President

Happy New Year! The Montana Association of Dam and Canal Systems is looking forward to our third year of operation helping dam and canal owners in the State of Montana. Our annual workshop attendance has doubled. Support from vendors has been fantastic, giving us valuable information on canal maintenance, dam repair, measuring devices and engineering techniques.

Recent workshop attendees suggested the following topics for future workshops and newsletters:

1. Discussions on canal liners, measuring devices and gates.
2. Detection and mitigation of solving seepage problems.
3. Hands on demonstrations and case studies.

I am very interested in hearing from you on topics you consider to be important. My contact information is listed on this page.

Thank you for your support, Larry

2006 Workshop Wrap-up

Thanks to all who attended the 2006 Annual workshop last September in Butte America. we would also like to thank the City of Butte for the showing us the Basin Creek #1 Project and the State Prison Ranch for taking us on a tour of Upper Taylor Dam.

We had 84 registrants including representatives from:

- | | | |
|-------------------------------------|---------------------------------|-------------------------------------|
| 2M Company | Fred Burr Water Users | Pioneer Technical Services |
| Ackley Lake Water Users | Granite County | Pondera Canal and Reservoir Company |
| AMCI | Greenfields Irrigation District | Ruby River WUA |
| Aquoneering | HKM Engineering | Sears Lake Reservoir |
| B.A. Fisher Sales Company | Hydrometrics | Sunset Irrigation District |
| Bitterroot Irrigation District | JT Water Management LLC | Teton Cooperative Reservoir CO. |
| City of Helena | Montana DNRC | Tetra Tech |
| City of Kalispell | Montana Tech | Thomas Dean & Hoskins |
| Crazy Mountain Ranch | Mountain Water Company | Town of Phillipsburg |
| DJ Engineering | Nevada Creek Water Users | Upper Musselshell WUA |
| Dynotek | North Fork Smith River WUA | US Forest Service |
| Firestone Building Products | NRCS | Van Mullem Engineering |
| Flint Creek Water Users Association | Phillip Morris USA | Whitetail WUA |
| | | WWC Engineering |

We are working on developing our mailing list, so if you failed to receive an announcement of the workshop, please accept our apologies and confirm that we have your correct address so that you will get all future mailings.

Thank You Vendors/Sponsors of 2006 Workshop!

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HELP WANTED!

MADCS is looking for people interested in helping the progression and continuation of this organization! Please contact Larry Draper at madcs1@gmail.com or (406) 961-1490 if you are interested in helping!

Gabions Make Sense By Charlie Atkins, DNRC Canal Section

Facing wintertime construction? Too cold to pour concrete? DNRC State Water Projects Bureau (DNRC-SWPB) has had good luck building structures from gabions in lieu of concrete. Gabion structures are rectangular wire mesh baskets that can be filled with rock at the project site to form flexible, permeable, monolithic structures such as retaining walls, weirs, and abutments. They are also used for erosion control, bank stabilization, and channel linings. Gabion strength lies in their double twisted hexagonal mesh of steel wire. The wire will not unravel even when cut. Assembly is easy, requiring no specialized

labor and nearby rock is used for fill. With 30% voids, gabion structures offer free drainage, which is often beneficial.

DNRC-SWPB has successfully used gabions to build canal drop structures on the Martinsdale Outlet Canal and a spillway / stilling basin on the Deadman's Basin Supply Canal. The spillway / stilling basin was designed by HKM Engineering, Inc., of Billings, Montana and was constructed by Martin Excavating, LLC, of Two Dot, Montana at a cost of approximately \$40,000. Two gabion drop structures on the Martinsdale Outlet Canal were built by Martin Excavating, LLC, at a cost of approximately \$30,000.



Deadman's Basin Supply Canal Spillway



Martinsdale Outlet Canal Drop Structure

2007 Proposed Water Related Legislation

Groundwater Appropriation in closed basins and augmentation

This legislation will protect senior existing surface water rights from groundwater appropriations yet still allow responsible development. The legislation would require a groundwater applicant in closed basins to present a report on the groundwater surface/surface water connection and also require an augmentation plan to mitigate adverse impacts.

Exempt water rights

The legislation will further protect senior existing water rights to surface water from groundwater appropriations. Under the exemption from permitting statute anyone can drill a 35 gpm well (not to exceed 10 acre feet volume a year), put the water to use, and simply file a "notice of completion" with the DNRC to obtain a water right. The exemption is allowed even if the well adversely affects other water users or depletes nearby streams.

The requested legislation would lower the exemption from 10 to 1 acre foot per year consistent with many other western states for domestic and commercial uses. The stockwater exemption would remain at 10 acre feet per year.

Controlled groundwater area legislation

This legislation that would change the present process to designate a controlled groundwater area from a contentious hearing process to the same rulemaking process the DNRC uses to close a basin under 85-2-319. The current statutory process is old and does not work well. Numerous shortcomings with the current statute have come to light in recent controversial and contentious proceedings. By using the rulemaking process instead of a formal hearing process that is expensive for petitioners and opponents, the DNRC would use its scientific expertise to decide whether or not to adopt a rule designating a controlled groundwater area based on the information presented in a petition. Public input would still be available, but would not require an expensive hearing process.

Ownership update of water rights

This legislation that would create a more effective way to keep Montana's water right ownership records current. It is evident from the HB 22 adjudication fee billing process that sellers continue to fail to file water right ownership updates after they have sold property. Under this requested legislation computer matching of records between DNRC and the Department of Revenue will update most ownership records. In the remaining cases, however, deeds could not be recorded until required water right ownership update information is filed with the DNRC.

Water commissioner authority over changes

This legislation would clarify that a water commissioner can enforce change authorizations granted by the DNRC. To properly distribute water, a water commissioner needs authority to not only distribute water according to Water Court decrees, but also according to changes of those decreed rights as approved by the DNRC. The Water Court decrees water rights, but the DNRC authorizes changes of water rights. Examples are changes in point of diversion, place of use, purpose of use, or place of storage.

Extension of sunset for loans to water users

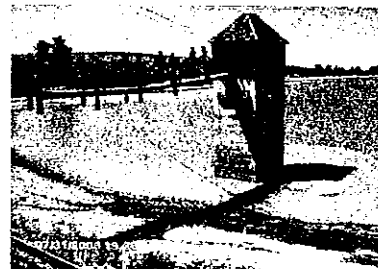
This legislation would extend for four years the June 30, 2007, sunset provision for loans to water user associations (Mont. Code Ann. § 85-1-613). SB 498 passed by the 2005 Legislature included a sunset provision for large loans to water user associations. In part due to the large increase in the maximum loan amount, an amendment was added to sunset the provision on June 30, 2007. If the sunset provision is not removed, the maximum loan amount will be reduced from the \$3 million authorized in SB 498 to \$300,000. Given the size of the infrastructure improvements faced by water users associations, a larger loan amount is necessary.

Lake Frances East Dam Rehabilitation

By Jay Thom, HKM Engineering

Pondera County Canal and Reservoir Company (PCCRC) is in the process of completing a two-phase rehabilitation project of the Lake Frances East Dam. This dam is a 50 ft high, 800 ft long embankment dam with an internal concrete cutoff wall that impounds 115,000 Ac-ft of storage in Lake Frances near Valier, Montana. Vern Stokes, who is the treasurer of MADCS, is the manager of PCCRC.

The East Dam was constructed in the early 1900's with an attempted initial filling in 1908. During this filling, the outlet works experienced settlement of approximately nine inches which halted filling of the reservoir. Repair plans were developed that included installing a new lake tower at the inlet of the outlet conduit and grouting of the outlet cracks and placing steel sleeves inside the concrete conduit at the crack locations. The repairs were completed by 1913 and the reservoir was placed into service. In 1922, seepage from the left abutment caused a large hole to be eroded at the downstream toe of the dam. Drains and a berm were placed in the eroded hole and grouting of the sandstone abutment was recommended. It is unclear whether the grouting was ever completed.



Apparently, the dam functioned without any significant problems for the next 80 years. Investigations in 2001 found voids in the embankment near the upstream portion of the outlet conduit. The original cracks had opened up and the steel sleeves were loose inside the conduit. The surrounding embankment had "piped" through the cracks into the conduit forming dangerous voids within the dam. The monitoring wells, measuring pore pressures within the embankment, also indicated that the concrete cutoff was ineffective where the outlet passed through the cutoff and there was potential for development of a piping failure along the outlet conduit. A grouting program was designed and implemented in 2001 to fill the voids around the conduit and restore the cutoff around the outlet. This grouting program was successful in restoring the dam to a safe operating condition. At that time, PCCRC initiated plans to replace or rehabilitate the outlet works.

In 2006, PCCRC retained HKM Engineering to develop the final design for rehabilitation of the East Dam. A two-phased approach was developed that salvaged the downstream portion of the existing outlet and replaced the upstream portion.



Excavation for new berm

The first phase consisted of improvements to the embankment and seepage collection around the portion of the outlet to be retained. The earth berm on the downstream face of the dam was removed to expose a portion of the outlet conduit and allow the installation of filter sand around the conduit. An internal chimney drain constructed of filter sand was also installed along the entire length of the embankment at the same time. This first phase was constructed by PCCRC employees from mid-September to mid-November 2006. PCCRC was able to significantly reduce construction costs by utilizing their own equipment and personnel.

Lake Frances East Dam Rehabilitation (continued)

The second phase will consist of removal of the outlet conduit upstream of the center cutoff wall and removal of the free-standing lake tower. A new control tower will be located at the upstream face of the cutoff wall and a new conduit will be installed from the new tower to the upstream toe of the dam. This construction is planned for the fall of 2007. Once again, PCCRC is planning to utilize their own crews to perform the demolition and earthwork portions of the construction. Construction of the control tower will likely be contracted to a structural contractor. A more extensive grouting program along the entire length of the cutoff wall is also planned.

The phased approach allows for normal operation of the reservoir, assuring delivery of irrigation water during rehabilitation. It also accommodates the utilization of PCCRC crews and equipment to perform most of the work. The total costs for the first phase of construction totaled \$330,000 and the total project budget is \$2,500,000.

Q & A Funding of MADCS

Question: How is MADCS paying for workshops and newsletters?

Answer: In 1996, the National Dam Safety Act was signed into law. This act provides each state funds to improve dam safety. The State of Montana has allocated a portion of these funds to help with the startup and support of the MADCS.

Question: What is the Department of Natural Resources and Conservation's (DNRC) involvement in the organization?

Answer: The DNRC Dam Safety Program is the state organization that receives National Dam Safety Grant Funds on behalf of the State of Montana. The Dam Safety Program uses a portion of the grant funds to pay salaries for staff that help MADCS. Grant funds are also used to pay for workshop expenses, mailing expenses and publication costs of newsletters and other announcements.

Question: Why is there talk of a membership fee, if grant funds pay expenses?

Answer: MADCS is working to become financially independent of grant funds. Membership fees will allow MADCS to build up their coffers. In addition, National Dam Safety Act grant funds are used for many other purposes besides supporting MADCS. The portion of grant funds that are allocated to MADCS are insufficient to pay all of MADCS expenses, so MADCS will need to have some membership fees to keep in operation. However, MADCS is committed to keeping membership fees very low for dam and canal owners and operators.

Question: How are you going to keep membership fees low? I am not interested in joining an organization with a high membership fee.

Answer: The annual workshop will be a source of revenue for operating expenses throughout the year. MADCS is looking into advertising in the newsletter as another source of revenue. With any organization, one of the biggest expense is staff salaries. DNRC has committed to use federally funded staff to help with



MADCS, which will allow membership fees to remain low.

Question: Will MADCS be a government run organization?

Answer: No. The MADCS board of directors is 100% dam and canal owners. Federal and State employees are not allowed to be on the board. Decisions made by MADCS are completely independent of any government agency

Question: So what's in it for DNRC?

Answer: DNRC is committed to safe dams and canals. DNRC believes that the training and information exchange provided by MADCS will help dam and canal owners in the State of Montana understand the importance of regular repair and maintenance. DNRC also believes MADCS could be influential in bringing rehabilitation grant funds to dam and canal owners in the state.

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MONTANA ASSOCIATION OF DAM
AND CANAL SYSTEMS

MADCS

Legislature to Evaluate Dam & Canal Rehabilitation Grant Applications

The Montana Legislature established the Renewable Resource Grant and Loan (RRGL) Program to fund the conservation, management, development and preservation of Montana's renewable resources. One of the first tasks the legislature will undertake in 2007 is to evaluate RRGL applications. Only a portion of the 80 applications will receive funding. *The MADCS is committed to helping dam and canal applicants pursue rehabilitation funds and will be watching closely for when legislative hearings are scheduled.*

There are 7 dam and canal related applications:

Ackley Lake Dam (Judith Basin County) Rehabilitation will consist of installation of new drains and a toe berm to control the seepage and construction of a new outlet conduit to replace the existing, deteriorating structure. The dam is owned by the DNRC and operated by the Ackley Lake Water Users Association.

Beaver Creek Dam (Hill County)

This project seeks to mitigate seepage problems on the right abutment at Beaver Creek Dam by installing a seepage control berm. The dam is owned and operated by Hill County

Carter Pond Dam Rehabilitation

(Fergus County) This proposal is to rebuild the Upper & Lower Carter Pond dams. In 2004, the upper dam had a slow failure due to pipe corrosion and the trickle tube on the lower dam collapsed. The project is a cooperative effort between a private landowner; local, state, and federal entities; and Ducks Unlimited to re-establish a fishery, waterfowl habitat; and recreation area.

East Fork Siphon Replacement and Main Canal Lining Project (Granite County)

This project seeks to rehabilitate the canal by installing canal lining on the most pervious reaches of the canal and fortifying the canal against slope failure by applying shotcrete on the left inner side slope. The dam is owned by DNRC and operated by the Flint Creek Water users Association.

Middle Creek Dam - Automated Instrumentation (Gallatin County)

This project seeks to enhance dam safety by installing an automated instrumentation system at the dam and by evaluating the feasibility of installing an early warning system that would alert emergency response personnel in the event of a dam failure. The dam is owned by DNRC and operated by the Middle Creek Water Users Association

Raymond Dam Rehabilitation Project (Sheridan County)

This project seeks to conduct an engineering assessment and dredge the sediment from the reservoir to preserve recreational and other public benefits provided by Raymond Dam.

Smith Creek Canal Seepage Abatement and Rehabilitation

(Lewis & Clark County) This project seeks to rehabilitate the canal by installing canal lining on the most pervious reaches of the canal and fortifying the canal against slope failure by applying shotcrete on the left inner side slope. The canal is owned by DNRC and operated by the Nilan Water Users Association.