

OKLAHOMA WATER NEWS

Bimonthly Newsletter of the Oklahoma Water Resources Board



***from
the desk
of the
Director***

Duane A. Smith

We are very encouraged with the good progress of the OWRB's legislative agenda for this session. I interpret that as a vote of confidence for the Water Resources Board's people and programs.

With the passage of the Oklahoma Flood Hazard Mitigation Act, the Oklahoma Legislature took a giant step toward insulating Oklahomans from the enormous costs of repetitive flood damage. At last, the state has the tool to interrupt the costly cycle by clearing the floodplain of troublesome structures with histories of repetitive loss. The OWRB, Department of Civil Emergency Management and Federal Emergency Management Agency look forward to the next step in providing funding for buyouts.

We are encouraged that there is progress on a lake level management plan for Sardis Reservoir, assuring bountiful water supplies to residents of southeast Oklahoma.

We have resubmitted certain rules pertaining to the Oklahoma Water Quality Standards and their implementation. Concerns expressed by the Water Board's sister environmental agencies about use support assessment protocols (standard methods to be adopted by all agencies to determine which surface waters can support the beneficial uses assigned them) caused us to withdraw those rules. We will continue to work with the other agencies and the public toward developing acceptable protocols.

It is encouraging to see the high level of interest and degree of familiarity with the Standards by our sister agencies. I am pleased that they want to be active and involved in Oklahoma's water quality management program.

The Oklahoma Weather Modification Act, now in conference committee, proposes a program of hail suppression/cloud seeding funded by the insurance industry. A similar successful effort in Canada has saved millions of dollars for insurance companies and policy holders. Should it win legislative approval, the OWRB will promulgate rules to administer the program.

We are encouraged with approval of the base appropriation of \$3.7 million for agency operation and \$4.5 million to the Rural Economic Action Plan in the General Appropriations Bill.

Priority initiatives remaining to be approved are the \$2 million state match to the Drinking Water State Revolving Fund supported by the EPA and \$1 million to continue the energetic Beneficial Use Monitoring Program, begun last year. With a month of the Legislative Session remaining, we are confident they will gain approval.

Towns Turn to Technology to Treat High Nitrates

The small town of Coyle in central Oklahoma recognized a problem with its water supply when water samples began showing nitrate levels as high as 9.5 parts per million (ppm.) The U.S. EPA and Oklahoma Department of Environmental Quality (ODEQ) consider 10 ppm potentially harmful to babies younger than six months and pregnant women. Higher concentrations can depress oxygen levels in the blood. "Lack of oxygen, called methemoglobinemia, or blue baby syndrome, can cause suffocation in young babies," says Derek Smithee, OWRB chief of the Water Quality Programs Division. "Once ingested, the baby's stomach converts nitrates in the water into nitrites, which reduces the body's ability to destroy methemoglobin."

Nitrates dissolve in raw water from naturally occurring pockets in the soil, over fertilization of crops, lawns and

gardens or application of animal wastes by confined hog, poultry and cattle operations.

The town's options to supply safe water to its citizens were simple: purchasing water from the nearby community of Langston, drilling a replacement well and hoping it wouldn't become contaminated, supplying bottled water to those most vulnerable, or finding a way to purify the water.

After exploring the options in water treatment -- reverse osmosis and biological denitrification -- the latter proved to be more economical.

Bio-denitrification is the process of adding naturally occurring, harmless, non-pathogenic bacteria to the well water. The water must be low in dissolved oxygen, accomplished by adding sulfite. The bacteria rely on a carbon-based energy source for respiration, which, in Coyle's case, is acetic acid, injected into the water entering the treatment plant. The bacteria respiration the nitrates in the water into harmless nitrogen and carbon dioxide gases, which are vented into the air, leaving a virtual nitrate-free water supply. However, at this stage, the water is still laden with bacteria, which are removed by carbon and sand filtration. Then, as a final precaution, chlorine is added, just as it would be added to raw water from any source. The nitrate-free water is added to chlorinated well water to produce a blend in the storage tank that meets current state drinking water specifications.

Reverse osmosis is a process achieved at the molecular level in which negatively charged nitrate ions are exchanged for other negatively charged ions, such as chloride. Reverse osmosis creates as by-products very concentrated quantities of nitrates and brine which must be handled as hazardous waste, adding costs for disposal and consuming about 15 percent of the incoming water. Water purified by reverse osmosis is mixed with chlorinated water in the tank to produce good quality drinking water. While bio-denitrification and reverse osmosis are very different, the outcomes and costs per-thousand-gallons are similar.

Officials in the town opted for bio-denitrification and the result is history-making. A Colorado company seeking a prototype site came to Coyle to install the first biological denitrification system in the U.S. approved for municipal use by a state regulatory agency.

Financing for the Coyle project was provided by an OWRB grant for \$100,000 and \$12,839 in local funds. Total cost of the system was \$130,000, with the company that designed and installed the system picking up the difference because of the prototype nature of the project.

Taloga, in Dewey County, also faced problems with a water supply laced with nitrates, but chose reverse osmosis to bring levels to acceptable limits. Construction of the new water treatment plant was enabled by a bond loan and emergency grant from the OWRB Financial Assistance Program, along with other state and local funds. Today, the plant distributes good quality water at the cost of about \$2.18 per thousand gallons.

Innovative strategies to deal with the high nitrate problem include a unique, cooperative approach of nine entities in Kiowa County that united in the Quartz Mountain Water Authority to secure funding to build a reverse osmosis water treatment facility. Some of the entities have very little water available to them; some have nitrate-contaminated supplies; others lack water for adequate fire protection. The communities that have water, although nitrate-contaminated, pipe it to the central plant which processes it and distributes it to member entities.

The water treatment plant was financed by a \$50 per meter fee to water users, along with Community Development Block Grants and Rural Development loans and grants. The Quartz Mountain Water Authority markets treated water at \$2.18 per thousand gallons, with a lower rate allowed communities that contribute raw water. The communities that purchase the water are responsible for all system maintenance outside the plant, as well as billing and accounting services.



Joe Galloway, water treatment plant operator, takes a water sample from the new bio-denitrification system at Coyle.

Lake Wister Revegetation Project Recruits Volunteers

The Water Quality Programs Division is seeking volunteers to help in a lake beautification and water quality improvement project at Lake Wister in eastern Oklahoma. After studying turbidity and nutrient problems in the shallow areas of the Lewis Creek arm of Lake Wister, Water Resources Board specialists determined the problems were caused by poor quality water flowing into the lake, wind-driven waves constantly stirring sediments and fluctuating water levels further muddying the waters. Corps of Engineers researchers from the Lewisville (Texas) Aquatic Ecosystem Research Facility assisted in identifying native plant species that root well in the muddy bottom and flourish in the shallow waters.

Now, as part of this revegetation project, native aquatic plants will be carefully harvested from the shorelines of several other lakes for transplanting in the upper end of Wister Lake. They expect the plants to help calm the waters, remove sediments and nutrients and provide habitat for wildlife, fish and waterfowl.

According to Paul Koenig, OWRB limnologist overseeing the project, the plants will produce a seed bank that will help to establish a stable aquatic community.

"The benefits may not be realized immediately, but in the long-term, we should see improved lake water quality achieved at relatively little cost," he pointed out. "This environmental restoration could take 5-10 years to realize its optimum potential. We're dealing with only a small area of shoreline -- future plantings will be needed to address the entire lake," Koenig said. He said he hopes local cooperators will take on the program, once this effort is over.

However, the Water Resources Board needs volunteers or groups who are willing to help them by spending a day or two harvesting aquatic plants from Lakes Murray and Spavinaw and transplanting them in Lake



This *scirpus validus* (softstem bulrush) is one of several species that will be planted in Lake Wister in an effort to improve water degraded by nutrients and sediment.



Shelly Carter, Larry Sullivan, Robin Randolph and Kim Ross of the OWRB Water Quality Programs Division pot fragrant water lily bulbs in the Kerr Center nursery pond. After the plants establish roots, they will be introduced into Lake Wister.

Wister. In addition to the plantings, a 2100-foot line of round hay bales will be installed to reduce waves and protect the shoreline from erosion.

Tentative schedules for harvesting and planting are June 1-4 and 14-18 at Lake Murray and July 26-30 at Lake Spavinaw. Six hourly workers have also been hired to work with OWRB staff and volunteers at the lake sites through August.

For more information or to volunteer for the Wister Revegetation Project, please call the OWRB Water Quality Programs Division at 405-530-8800.

THE FLOOD CURRENT

Buy-Out Legislation, Floodplain Ordinance Workshops Usher In Flood Awareness Month

This year has been a busy one for members of the Oklahoma Floodplain Management Association. The organization hosted two important events -- the Spring Technical Conference in Tulsa and the annual Legislative Reception at the State Capitol.

The March 9 reception, attended by more than 200 Capitol residents, gave the OFMA membership an excellent opportunity to share with legislators the many benefits of wise floodplain management and flood damage mitigation in Oklahoma. Central to these issues is House Bill 1841, signed by Gov. Keating April 6, which creates a state flood hazard mitigation program fund to assist state communities in reducing their repetitive loss properties. Passage of this important measure demonstrates that Oklahoma's governor and legislature intend to take a pro-active stance regarding flood mitigation. I express gratitude to the many individuals who supported enactment of HB 1841, including authors Rep. Larry Rice and Sen. Kevin Easley; Albert Ashwood, Director of the Oklahoma Department of Civil Emergency Management; Duane Smith, OWRB Executive Director; Paul Zachary, OFMA chair; Danny George, Oklahoma Municipal League; and numerous support staff of the OWRB, ODCEM and House of Representatives. Next year, the Legislature will consider funding levels for the flood hazard mitigation program.

Ken Morris listens to questions concerning HB 1841 posed by Representative Barbara Staggs.

address unimproved real estate disclosure for floodplain lands. Too often, citizens are unaware that the land they purchase is in a flood hazard area. Then they are frequently faced with prohibitive construction costs to build structures above the established base flood elevation.

Earlier this month, the OWRB also hosted our annual series of one-day floodplain management workshops in Norman, Tulsa, Woodward and Lawton. This outreach program provides an excellent opportunity for community floodplain managers from across the state to keep abreast of the latest NFIP compliance requirements and related regulations as well as measures to improve local floodplain management programs.

I also want to encourage all state floodplain officials to attend the 23rd Annual Conference of the Association of State

In the near future, the OWRB and OFMA members would like to see the legislature



Senator Paul Muegge visits with Carolyn Schultz of the OFMA during the reception at the Capitol.

Floodplain Managers in Portland, Oregon, May 23-28. The theme is "Planning Ahead: Flood Loss Reduction in the 21st Century." The program, which includes the unveiling of the national floodplain managers' certification accreditation, looks excellent and will provide a great learning opportunity. Remember OFMA is a Chapter member of ASFPM, Inc. If you're interested in attending, please give me a call at 405-530-8840.

We are again honored that Governor Keating has proclaimed May 1999 as "Flood Awareness Month" in Oklahoma. Historically, Oklahoma's worst flood disasters occur that month and most, but not all, warrant federal aid. For those who live in a flood-risk area, the absolute best form of protection against flood-induced, personal economic ruin is the purchase of flood insurance. For all floodplain managers in Oklahoma, Flood Awareness Month is an excellent time to encourage your residents to purchase flood insurance. And remember, use good judgement when building. It's always better to build up and away from the water!

REMEMBER
*Don't Drive
Into Floodwaters!*

Governor Keating Signs HB 1841 Enabling Flood Hazard Mitigation Fund

A bill signed by Governor Keating on April 6 could help turn the tide on Oklahoma flood waters. Senator Kevin Easley and Representative Larry Rice authored House Bill 1841, the Oklahoma Flood Hazard Mitigation Act.

The measure is designed to provide a fund from which municipalities can draw loans or grants to acquire repetitive flood loss structures in the regulatory floodplain and move them to higher ground.

House Bill 1841 also expands uses of the Statewide Water Development Revolving Fund, allowing creation of a flood hazard mitigation account within the Revolving Fund to be administered by the OWRB. Proponents of the new law see it as means to prevent property owners from building in the floodplain; encourage the purchase of flood insurance; reduce the cost of disaster response and recovery operations; and encourage cities and towns to develop a comprehensive hazard mitigation plan. It establishes the State Hazard Mitigation Team.

Should the legislature later appropriate money, or funds be made available from other sources to support the program, the fund will be used for flood mitigation opportunities

May is Flood Awareness Month



Oklahoma Floodplain Management Association Board members display proclamation signed by Governor Keating declaring May Flood Awareness Month. Left, Cliff Pittner, McAlester; Anna Lee, Woodward; Ken Morris, OWRB; Barbara Hall, Oklahoma City; Ron Flanagan, OFMA vice-chair, Tulsa; Paul Zachary, chair, Tulsa; Hank Elling, OWRB, Lawton.

at the local level, with the local jurisdictions responsible for at least 25 percent of the costs if a grant is used, or for the entire amount of funds if a loan is used. Hazard mitigation project eligibility is clearly defined in federal administrative procedures, and those procedures will be tailored to Oklahoma's program.

How will projects be reviewed for eligibility?

The State Hazard Mitigation Team will be made up from its members of 13 state agencies and the U.S. Army Corps of Engineers. The team will have the primary responsibility of reviewing all flood mitigation project applications submitted by the local jurisdictions and recommending an order of priority for approval and funding.

Members will be actively involved in reviewing all applications submitted by the local jurisdictions for use of the funds. The intent of the program is to help communities that are helping themselves. Project priorities will be developed and funding will be provided based upon locally demonstrated self-help initiatives.

Why do we need it?

The estimated dollar amount for damages to residences as a result of flooding in Tulsa, Oklahoma City and Miami equals approximately \$12,400 per residence per flood event. Recent information provided by FEMA indicates that the state has 664 properties that have repetitive losses -- which means the properties have flooded more than twice.

It is estimated that only about 20 percent of the residential structures that flood throughout the state are covered by flood insurance. Clearly, with approval of HB 1841, Governor Keating and the Oklahoma Legislature have taken a giant step toward enabling removal of repetitive loss properties from the floodplain. Funding and development of a fine tuned and coordinated state and local action plan can indeed turn the tide on Oklahoma's costly flood waters.

NFIP Workshops Scheduled

As the designated coordinating agency for the National Flood Insurance Program in Oklahoma, the OWRB sponsors regular workshops on the program. It is the goal of the NFIP to make low-cost flood insurance available to property owners or renters whose homes lie in the floodplain, thereby reducing losses of lives and property to flooding.

The OWRB conducted workshops in Norman and Tulsa earlier this month and announces two more one-day workshops for local floodplain administrators in Woodward and Lawton. Workshops are free and begin at 9 a.m.

Woodward - May 11, 1999

High Plains Institute of Technology
3921 34th Street

Lawton - May 13, 1999

Great Plains Area Vo-Tech
4500 SW Lee Boulevard
Bldg. 600, Room 656

Although there is no charge, NFIP Coordinator Ken Morris requests advance registration by phone. For more information or to register, please call 405-530-8800.



Three New Reports Available

Librarian Susan Birchfield announces the availability of two OWRB groundwater publications entitled *Hydrologic Report of the Southwestern Oklahoma Groundwater Basin in Caddo, Kiowa and Jackson Counties* (Technical Report 98-3) and *Statewide Groundwater Vulnerability Map of Oklahoma* (Technical Report 99-1.) Technical Report 98-3 costs \$5; Technical Report 99-1 costs \$13 from the Board

The Southwestern Basin report contains information on the basin's physical setting, descriptions of the aquifer parameters, storage and yield capabilities, water use and prior groundwater rights, as well as analyses of water quality.

Authors of the Groundwater Vulnerability report, Noel Osborn and Ray Hardy, developed a map showing the relative vulnerability of groundwater in 30 hydrogeologic basins in Oklahoma that are exposed at land surface, and thus more susceptible to pollution. According to Osborn, vulnerability was computed with the DRASTIC index

method, developed by the U.S. EPA. Hydrogeologic basins are classified in five groups of relative vulnerability from very low to very high. The report contains 13 color maps, discussion and five tables.

A third report concerning *Standard Operating Procedures for Stream Assessments and Biological Collections Related to Biological Criteria in Oklahoma* (Technical Report 99-3) is also available. According to author Chuck Potts, the protocol is intended to establish a uniform biological assessment through which aquatic communities of similar streams can be compared.

To order copies of these reports, call the Oklahoma Water Resources Board at 405-530-8800.

General Counsel Honored

Dean Couch, OWRB general counsel, was named "Employee of the Quarter" at the staff meeting on March 25. The award was presented by Executive Director Duane Smith, who commended Couch on his skill in preparing legal briefs and his work on agency rules.



Dean Couch

Couch graduated from University of Central Oklahoma in 1976 and received his law degree from the University of Oklahoma in May 1982. Before coming to the OWRB, he served as a judicial intern for Oklahoma Supreme Court Judge Robert E. Lavender.

He is active in civic and church groups and is often requested as a speaker on water law. When Dr. Joe Rarick of the OU Law School died in January 1989, Couch was invited to finish out the year teaching Rarick's class in Oklahoma water law.

Couch and his wife, Jeannie, are the parents of two sons, Matthew and Daniel.

New Guidebook Available

GUIDEBOOK for Local Floodplain Ordinance Administrators



Oklahoma Water Resources Board
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The 1999 *Guidebook for Local Floodplain Administrators* is updated and ready for distribution, announced NFIP Coordinator Ken Morris, who worked with James Leewright, OWRB publications designer, to make this version more user friendly.

For the first time, the *Guidebook* includes a chapter on professional development, information on the Association of State Floodplain Managers, the Oklahoma Floodplain Management Association, the OFMA Certification Program and training opportunities available through the National Emergency Training Center.

The publication features an improved format with updated appendices, flood map order form, publications reference list, website addresses and information about Project Impact, a national challenge to floodproof cities.

Floodplain administrators who have not received a copy, should call Morris at 405-530-8800.

At the April Meeting of the Water Resources Board

Executive Director Duane Smith announced the Annual Meeting of the Red River Compact at Broken Bow May 3-5. He announced the June Meeting of the Board will be held at Shangri-La on Grand Lake June 8 at 9:30 a.m. to preface the Annual Meeting of the Interstate Conference on Water Policy June 9-11.

Joe Freeman, Financial Assistance Division chief, asked and received Board approval for emergency grants to Woodward County Rural Water District #1 and Hughes County RWD #4.

The Board approved Rural Economic Action Plan grants for RWD #8 (Wagoner Co.), Grand Lake PWA (Delaware), Clayton PWA (Pushmataha), Ratliff City Water Trust Authority (Carter) and Mountain Park PWA (Kiowa).

On the Planning and Management agenda, Chief Mike Mathis asked and won Board approval of seven temporary and three regular groundwater permits and amendments to one groundwater prior right and one stream water prior right. The Board approved eight regular and one term permit for use of stream water and approved plans for construction of a dam/reservoir.

The Board considered withdrawal of some OWRB Rules and replacement with those proposed by HJR1022 on April 12. Rule revisions included adoption of language consistent with that of the Department of Agriculture concerning the 3-mile setback of animal feeding operations from camps operated by churches and certain other non-profit organizations. Other replacement rules submitted for legislative approval included some definitions contained in Chapters 45 and 46, Oklahoma Water Quality Standards, and some appendices to those chapters. The Board heard and considered changes proposed to the Sardis Lake management plan, but declined to change the rule. The replacement rules adopted by the Board will be resubmitted to the Oklahoma Legislature and Governor.

FINANCIAL ASSISTANCE PROGRAM UPDATE

Approved at March & April, 1999
Board Meetings

FAP Loans

1997 Bonds; 29-year maximum term - Variable Rate

Rogers Co. RWD #7	\$	1,845,000.00
Rogers Co. RWD #8	\$	1,985,000.00

Emergency Grants

Council Hill PWA	\$	100,000.00
Tillman Co. RWD #1	\$	97,100.00
Woodward Co. RWD #1	\$	100,000.00

REAP Grants

Hardesty PWA	\$	69,118.00
Big Cabin PWA	\$	50,000.00
Wagoner Co. RWD #8	\$	108,000.00
Grand Lake PWA	\$	50,000.00
Clayton PWA	\$	136,000.00
Ratliff City WTA	\$	99,999.00
Mountain Park PWA	\$	32,800.00

TOTALS AS OF APRIL 13, 1999

APPROVED Amount	FAP Loans - 206 \$292,750,000.00	CWSRF Loans - 78 \$290,454,754.20
APPROVED Amount	Emergency Grants - 432 \$24,703,242.35	REAP Grants - 151 \$11,642,120.60
APPROVED Amount	DWSRF Loans - 3 \$9,753,675.00	Hardship Grants - 2 \$1,038,752.30

