



OKLAHOMA

water news

MONTHLY NEWSLETTER OF THE OKLAHOMA
WATER RESOURCES BOARD

Gerald E. Borelli, Chairman

Earl Walker • L.L. Males • John B. Jarboe • James H. Norick • R.G. Johnson • Ralph G. McPherson • Gary W. Smith • Ernest R. Tucker

OWRB Coloring Book Teaches Conservation to School Children

At what point in life are people most receptive to new ideas? The Oklahoma Water Resources Board hopes they have found the answer with the printing and release this week of a free water conservation coloring book designed for grades K-3.

Oklahoma teachers may order them in classroom quantities through the Curriculum Section of the State Department of Education.

The book, "Be a Water Watcher," is intended to help instill an early awareness of water and its impacts on life by teaching conservation techniques through line drawings captioned with simple, bold-type messages.

"We wanted younger children to learn that conservation doesn't have to mean doing without — just doing with less. If they are made aware of waste, they can make more responsible decisions for themselves and their communities as they grow," said Mary Whitlow, Informational Representative at the Oklahoma Water Resources Board.

The state's water problems in 1980 provided the impetus for the development of the books. During the long, hot summer, heat and drought combined to create water problems in hundreds of communities. Many localities

were pumping water 24 hours a day to keep up with customer demand, leading to frequent breakdowns in pumps and delivery lines. By mid-August, the physical damages stood at \$2 million, and 362 communities had curtailed their water service. Rationing was the rule.

"People weren't conscious of the water they were using. They just weren't aware of the water-wasters in their homes and what conservation measures they could take," Whitlow recalled.

During the development of a Water Use Reduction Education and Information Program instituted in response to the critical situation, the idea of a coloring book was advanced. The concentrated, low-budget campaign didn't allow time for development of the books, so the idea was temporarily shelved.

Still, in the months that followed there was a demand from teachers for water conservation materials. Whitlow knew that most of the available materials could be obtained only at a price.

"We wanted something to give them free of charge. School systems were already burdened with costs," she said.

With encouragement from the State Department of Education and an offer to distribute them, the OWRB decided to go ahead with the project. Marie Kash, a Central State University senior art student and OWRB summer intern, developed the appealing characters that illustrate the conservation theme.

Hopes for greater water awareness are higher now that the books have been released. Even adults can benefit from the publication, as inside the front cover is a list of water conserving ideas aimed at parents and teachers.

"The books are designed for children, of course, but parents usually look at the things their children bring home," Whitlow explained.

If old habits truly do die hard, then it may be a while before adults get the water conservation message. Perhaps when water crises become as consistent as the energy crises, a time experts predict is coming, adults will switch their ways of using water.

But unconstricted by experience, the natural impulse of children to explore and imagine may allow them to experiment with reduced water use. With further cur-

Continued on page 2



STAFF PHOTO BY GARY GLOVER

Artist Marie Kash, illustrator of the "Be a Water Watcher" coloring book, points out water conservation rules to aspiring artist Michelle Melton, daughter of Assistant Director Mike Melton.

Coloring Book, Continued from page 1

riculum development, a lifetime of responsible decisions regarding our natural resources may follow.

Teachers who would like to order the free coloring books for their classrooms should write or call the Oklahoma Department of Education, Curriculum Section, 2500 North Lincoln, Oklahoma City, 73105.

Tar Creek Solutions Elusive, Governor Asks Further Study

Despite great strides toward effecting a solution to the problem of acidic mine waters contaminating surface and ground water in the Tar Creek area of northeastern Oklahoma, definitive answers may still be a year away, according to Ron Jarman, OWRB Water Quality Division Chief and Tar Creek Task Force co-chairman.

"In these past 18 months of study a considerable amount of effort has gone into this work, and we now know a great deal more than we did. Nevertheless, there are still some gaps to be filled in before we can make an informed, intelligent decision as to the best way to approach the problem," Jarman said in a briefing for the Governor on January 8.

Ed Pugh, Senior Administrative Assistant for Natural Resources to Governor Nigh, concurred with Jarman.

"We find the problem is so large, so complex and potentially so expensive to solve that some additional studies are needed to assure that a sound technical base is available to us for decision making," Pugh said.

Although the work of the Task Force was to end in January, Nigh extended the life of the study group after being apprised of the status of the project and viewing a work plan proposed for the next year.

The Task Force will soon turn to the job of determining the extent of contamination to the Roubidoux aquifer lying 400 feet beneath the abandoned mines holding the polluted water. A minimal level of water sampling in the mines and surface water will be employed to alert the Task Force if unforeseen changes in water quality occur.

Jarman said the group would analyze all available data to more closely approximate the amount of water present the mines. The work plan also calls for locating exact sources of pollutants and determining the environmental impacts of drainage from chat piles left when mining operations ceased in the mid-1960's.

The contamination of stream and ground water in the area is traced to 435 abandoned lead and zinc mines that have left the water showing concentrations of aluminum, arsenic, iron, manganese, nickel and cadmium in addition to lead and zinc. In late 1979, a rising water table inside the mines began to spill onto the surface, causing widespread fish kills.

Jarman emphasized that there is no immediate danger to public health despite the possibility of leakage from the mines downward to the Roubidoux aquifer.



STAFF PHOTO BY GARY CLOVER

Tar Creek Task Force member Ben Moody, left, and Co-Chairman Ron Jarman, right, listen as Co-Chairman Ed Pugh updates Gov. Nigh on alternative solutions and a course of study proposed for the upcoming year.

"Our biggest problem now is the great extent to which the contamination is damaging the local environment," Jarman said.

Bruce Schiebach, Senior Hydrologist with the consulting firm of Hittman Associates, told Nigh and members of the Task Force at a briefing session that the most feasible solution currently would be the collection of stream and mine waters for surface treatment at a 2 mgd facility. Such action would reduce the potential for further contamination of the Roubidoux formation in a 23-year program carrying a \$20.6 million price tag.

Jarman said that with so many questions still to be answered, the Task Force was not tied to any specific solution.

"There are half-a-dozen or more options available to us, including future alternate water supplies for affected areas. We're seeking the most cost-effective measures possible to minimize contamination," Jarman said.

Finding answers to the problems will bring the Task Force and the EPA into a closer working relationship, according to Pugh.

In November, 1981, the EPA designated the Tar Creek area as one of the ten most hazardous waste sites in the nation, qualifying the state for "Superfund" assistance in cleaning up the mining region.

"I think the fact that the pollution is spread over such a wide area and the issues involved are so complex is why the EPA selected this site as one of the worst environmental problem areas in the nation," Pugh pointed out.

Appropriations from the "Superfund" to help cover the cost of further study may be forthcoming in March or April, Jarman said.

"Of course, we were working on this problem long before there was a possibility of Superfund money," Jarman said. "We're in a hurry to clean it up. We want it cleaned up as fast as possible, but at this point we need additional information. A year from now we should be able to give the answers."

Board Cites Fresh Water Waste, Denies Permit to Oil Company

Strongly reemphasizing its interest in efficient use of the state's supply of fresh ground water, the Oklahoma Water Resources Board denied Superior Oil Company a permit for use of fresh water for tertiary oil recovery in Garvin County. The ruling was made by the Board at its January 12 meeting in response to Superior's application for the use of the 141.2 acre-feet of fresh ground water annually to support its 16-year waterflood operation.

J.A. Wood, former OWRB Ground Water Division chief, and Board General Counsel Tom Lay had held months of strife-ridden hearings and concluded that the company's proposed 3-phase procedure to extract oil from the Hart Sand would waste water.

The strategy proposed by Superior would require a preliminary flush of fresh water through the oil zone, followed by circulation of fresh water mixed with caustic sodium hydroxide, and a final flush of fresh water.

No provisions were made for treating or recirculating the briny waters produced in the three steps. Those brines, along with the calcium, magnesium and caustic fluids, would then be immediately and permanently disposed of in a waste injection well. During the hearings, company representatives had explained that the first flood was designed to remove calcium and magnesium from the formation, the caustic flush to reduce tension in the particles so they released oil, and the third flood to again remove the calcium and magnesium before another circulation of the caustic mixture. This process would be repeated again and again. Each step in the process would begin with a new supply of fresh ground water which, in its circulation, would accumulate heavy loads of salt — up to 160,000 parts per million — too much, the company maintained, to economically treat for reuse.

Only after nine years of the 3-stage caustic flooding would any salt water be used.

Wood and Lay maintained that such fresh ground water use would be an inefficient, nonbeneficial and wasteful use. Wood declared that salt water slightly exceeding 5,000 ppm — the Board's standard for distinguishing salt water from fresh — was available for the company's use from the shallow, underlying Wellington and Pontotoc formations.

Wood also contended that other alternatives, such as flushing the oil-bearing formation with a sodium orthosilicate mixture (an alkaline solution prepared from soft water or reservoir brine) were available and possibly could recover more oil than the caustic fresh water-sodium hydroxide mix described by Superior representatives.

In denying the Superior Oil Company permit, the Board said that after being used one time, the fresh ground water would be lost for any further or additional future beneficial use. Oklahoma law defines "waste" as "the use of fresh water in an inefficient manner or any

manner that is not beneficial . . . taking or using fresh ground water in any manner so that it is lost for beneficial use" . . . and "using fresh ground water in such an inefficient manner that excessive losses occur."

Wood anticipates more and more applications for water use for tertiary oil recovery as the search for energy intensifies in the state. "The Board will examine every one of those applications to be sure Oklahoma's water resources are safeguarded against waste."

ACTIVE CONSERVATION STORAGE IN SELECTED
OKLAHOMA LAKES AND RESERVOIRS
AS OF JANUARY 15, 1982

PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY
SOUTHEAST		
Atoka	113,200	91.6
Broken Bow	770,484	83.9
Pine Creek	77,700	100.0
Hugo	157,600	100.0
CENTRAL		
Thunderbird	81,885	77.3
Hefner	69,100	91.7
Overholser	15,169	100.0
Draper	91,300	91.3
SOUTH CENTRAL		
Arbuckle	62,571	100.0
Texoma	2,363,748	89.6
Waurika	143,746	70.7 ¹
SOUTHWEST		
Altus	17,255	12.9
Fort Cobb	62,315	79.5
Foss	129,843	53.3 ²
Tom Steed	63,212	71.0
EAST CENTRAL		
Eufaula	2,045,920	87.8
Tenkiller	558,307	88.9
Wister	27,100	100.0
NORTHEAST		
Eucha	79,567	100.0
Grand	1,348,630	90.4
Oologah	544,240	100.0
Hulah	30,594	100.0
Fort Gibson	365,200	100.0
Heyburn	4,344	65.8
Birch	19,046	99.2
Hudson	200,300	100.0
Spavinaw	27,700	92.3
NORTH CENTRAL		
Kaw	426,703	99.5
Keystone	509,424	82.7
NORTHWEST		
Canton	47,419	48.6
Optima	4,397	— ¹
Fort Supply	13,900	100.0
Great Salt Plains	31,400	100.0
STATE TOTALS	10,503,319	87.7³

1. In initial filling stage

2. Temporarily lowered for maintenance

3. Conservation storage for Lake Optima not included in state total

Data courtesy U.S. Army Corps of Engineers, Bureau of Reclamation, Oklahoma City Water Resources Dept., City of Tulsa Water Superintendent's Office.



Water Conference Summary Available

Proceedings from the Governor's Second Annual Water Conference staged December 1, 1981 in Oklahoma City have been condensed and are now available in summary form. Copies may be obtained by writing Librarian Susan Lutz at OWRB offices, P.O. Box 53585, Oklahoma City, 73152 or calling (405) 271-2555.

Tourism and Recreation Conference Feb. 16

The Governor's Tenth Annual Conference on the Recreation and Tourism Industry will be held February 16 at the Sheraton Century Center in Oklahoma City.

Registration costs \$15 (which includes lunch) or \$40 (which includes Legislative Appreciation Dinner). Tickets are available at the Department of Recreation and Tourism, 500 Will Rogers Building, Oklahoma City, 73105.

Water Activist Orville Saunders Dies

Former OWRB Member Orville B. Saunders, 75, died on January 19 in Oklahoma City. His distinguished career in water resources development included Oklahoma compact commissioner on the Red River Compact, chairman of the Mountain Park Master Conservancy District and leader in the development of Tom Steed Reservoir. Mr. Saunders was also former mayor of Altus, active in church, civic and higher education circles and principal organizer of Westview Boys' Home in Hollis, Oklahoma.

Fred Simpson Dies, Former Board Engineer

Longtime OWRB engineer Fred Simpson died in San Antonio, Texas, on January 24 at the age of 89. He retired from the Board in November 1970. During his 20-year career with OWRB and the Oklahoma Planning and Resources Board, Simpson was instrumental in negotiating two interstate stream compacts on the Arkansas River and served as compact engineer on the Red River Compact. He was a WW II veteran and member of several professional engineering societies.

JANUARY CROP AND WEATHER SUMMARY

Adequate moisture combined with favorable pasture conditions have enabled state cattlemen to provide supplemental feeding on a normal basis as livestock were reported in good condition at mid-month. Damage to wheat from recent cold temperatures was minimal, and cattlemen took advantage of generally good weather by utilizing 45% of the wheat for grazing.

Wheat, oats and barley were in good to excellent condition at mid-month, despite growth and development retarded by cold weather passing through the state.

Temperatures averaged seven degrees below normal in the Panhandle to 17 degrees below normal in the south central section of Oklahoma. Precipitation varied from a trace in the north central area of the state to .53 in the southeast. Both topsoil and subsoil moisture supplies were adequate to surplus in most of the state.

Oklahoma Crop and Livestock Reporting Service

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