Big Thompson Watershed News

The Quarterly Newsletter of the Big Thompson Watershed Forum

Fall 2003 Volume 4, Issue 3

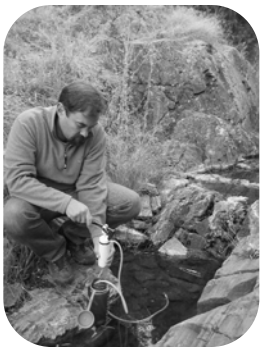
Waterborne Pathogens: what you can't see could hurt you

By Barb Maynard

What backcountry hiker hasn't been tempted to interrupt a strenuous hike with a mighty drink from a crystal clear mountain stream? These days, most people dunk their water filters instead of their overheated faces, restrained by thoughts of Giardia or other waterborne creatures.

Fortunately, most residents of the United States only need to worry about unsafe drinking water in the backcountry, away from treated supplies. However, lack of access to safe water remains a problem for more than a billion people in the developing world. Annually, 2 to 3 million children younger than 5 years old die of diarrheal diseases, many of which are acquired from contaminated water. In countries with modern treatment facilities, outbreaks occasionally occur when pathogens escape treatment processes.

Giardia and Cryptosporidium are the two most common causes of reported waterborne illness in Colorado. In 2002 there were 57 diagnosed cases of cryptosporidiosis and 578 of giardiasis, according to statistics reported by the state Department of Public Health and Environment. (For comparison, there were 3,363 reported cases of the flu.) However, the complete cast includes many more microscopic characters, some yet to be identified. "I don't think we know what the most prevalent pathogens are," said Tricia Klonicki of CH Diagnostics in Loveland. "If you look at reports from the Center for Disease Control on waterborne and recreational outbreaks – about half the time they don't get to an idea of what caused it." Cryptosporidium, which sickened approximately 400,000 people in Milwaukee in 1993, was first identified as a cause of human disease in 1976.



A hiker filters stream water before drinking.

Anyone who has been afflicted with one of these microbes knows the symptoms, even if they don't know which organism caused their illness: intestinal distress, including diarrhea and abdominal cramps, formally known as gastroenteritis. The similarity in symptoms reflects the similarity in transmission.

"We know that pathogens are spread by the oral-fecal route," said Sandra Spence, microbiologist with the US Environmental Protection Agency. "They get in the water, they get in your mouth, you get sick." As the pathogen reproduces in the digestive tract and makes its host sick, some of the pathogen passes out of the host with the feces. Many of these pathogens make cysts, an inactive life stage analagous to a seed. Cysts can withstand harsh environmental conditions, waiting to find their way into the digestive tract of a host. Thus, infection is caused by ingesting cysts found on fecal contaminated material - water, food, or the hands of an infected person. Because only a tiny dose of some of these organisms is sufficient to cause disease, water splashing on the face of a child playing in untreated water can be enough to spread disease.

Water treatment plants often use filtration and chlorination to remove and kill cysts in drinking water. Cryptosporidium cysts, however, can survive chlorination. In addition, chlorination produces toxic byproducts which must then be removed. Some plants are turning to treatment with ultraviolet light to inactivate cysts - see the article on p. 3 for an example.

Different pathogens are thought to be spread most commonly by different routes. For example, Giardia is usually assumed to be transmitted via untreated drinking water, while Campylobacter, another pathogenic microbe, is associated with contaminated food. However, data to back up these assumptions are scarce; on December 1, the Colorado Department of Public Health and Environment will launch a study of mechanisms of Giardia transmission.

The transfer of pathogens from non-human animals to humans is known as zoonosis, and is considered a source of emerging diseases worldwide. The relationship between fecal contamination of water supplies by livestock and human Cryptosporidium infections was illustrated during the 2001 outbreak of foot-and-mouth disease in Scotland. Human cases of cryptosporidiosis dropped by 60 percent in areas where livestock were killed and travel to farms was restricted; unaffected areas saw no such reduction. Once livestock populations rebounded, human cryptosporidiosis cases returned to normal levels.

As with any infection, exposure to waterborne pathogens is most serious for people with compromised immune systems, such as those living with AIDS and the elderly. For others, infection with these pathogens is usually unpleasant, but not life-threatening. For instance, one study showed that 20 percent of young adults in the United States have been infected by Cryptosporidium - most of whom might be surprised to learn of their exposure.

Look inside to learn how pathogens are monitored, how one local water plant is updating its technology, and more.

ABOUT US...

The Big Thompson Watershed Forum is an association of private citizens and representatives of government, organizations, and businesses. We are united with the common goal of protecting water quality throughout the Big Thompson Watershed. We strive to accurately assess conditions in the Big Thompson Watershed and to facilitate informed, cooperative water quality protection.

The Forum is sponsored by the North Front Range Water Quality Planning Association and maintains a strong partnership with the Thompson R2-J School District. The Forum is a Colorado nonprofit corporation.

A Message from the Coordinator:

Why Pathogens?

Rob Buirgy

By Rob Buirgy

As you read about waterborne pathogens in this issue you will learn what they are, how they get in our water, and the risks they pose to our families, domestic animals and wildlife. I would like to provide a brief explanation of why pathogens are in the 'top 3' on our list of water quality concerns in the Big Thompson watershed.

We have a long and successful history of State and County Health Departments working closely with Big Thompson communities to monitor disease-causing organisms and to reduce the human sources. These efforts have usually focused on improvements to point sources such as wastewater treatment plants and programs to provide centralized sewage treatment to homes and businesses. More recently these efforts have expanded to include nonpoint sources such as inadequate septic systems and livestock operations that are clearly a source of fecal pollution to streams and lakes.

Increasing urban development and demographic changes will always present a treatment challenge throughout our watershed. We will continue to experience occasional wastewater treatment plant failures resulting in violations of water quality regulations. In addition to these sewage-related problems, the spread of impervious surface areas (think roads and rooftops) is generating ever-increasing stormwater flows that can be significant sources of pathogens. Dense populations of livestock and wildlife such as elk and geese can be big contributors in some areas. Usually these contributions from stormwater runoff can only be controlled through voluntary best practices, leaving us to rely less on regulations and more on personal choice to direct our actions.

It helps to hold a clear picture in our minds of the benefits we gain by reducing the amount of pathogens in our waters. By protecting our drinking water supplies and recreational waters from high levels of pathogens, we will be protecting our families and friends from microbes such as Giardia, Cryptosporidium, Hepatitis and dangerous strains of E. coli. When I offer my guests water from Little Thompson Water District, or when my students spend the day swimming and sampling water on the Big Thompson River, I know that we are doing all we can to minimize the chances of contracting a waterborne disease. This is the true benefit of living in a well-managed watershed... the knowledge that we are part of a community that knows the value of clean water and works together to protect that resource for the future.

Even though waterborne pathogens are hard to detect and impossible to completely control, there are proven strategies that reduce the risk and minimize the numbers of disease-causing organisms in our surface water. By including pathogens as a high-priority water quality concern, the Forum is supporting the coordinated efforts necessary to understand and minimize the risk from these organisms. As a member of the Forum, you can help us educate all our neighbors about the real need to control the amount of pathogens in our streams and lakes, and make a difference by applying some of the lifestyle choices you'll read about in this issue.

Plan now to Join us for the Forum's 2004 Annual Meeting

The Annual Meeting is an excellent opportunity to learn about water quality issues, the Forum's activities and how the Forum fits into the larger picture of water quality assessment and protection in Colorado.

This year's meeting will be held on
February 19, 2004
at the McKee Conference Center in Loveland.
Call 613-6974 to RSVP or for more information.

Tracking Pathogens: How do we monitor microorganisms?

By Barb Maynard

Assessing the risk of infection in recreational waters is vital for protecting the health of swimmers, fishers, and others who might come into contact with non-treated water. However, directly measuring the numbers of pathogens in water is an impossible task.

"There are so many (different kinds) of them, they are usually present in low numbers, and they can make you sick at low numbers," said Sandra Spence, microbiogist with the US Environmental Protection Agency. "It's just not practical."

Therefore, microbiologists developed the idea of using an indicator species – a microorganism that indicates the presence of fecal contamination. A good indicator species is present wherever there is fecal contamination, is not present in the absence of fecal contamination, can survive in the environment at least as well as the pathogens themselves can survive, and is easier to detect and/or is found in higher numbers than the pathogens.

Fecal coliform bacteria have been used as an indicator species, because they are only found in the intestinal track of warm blooded animals. However, some of the fecal coliforms can reproduce in the environment, which limits their reliability as an indicator.

More recently, E. coli has taken the lead as the preferred indicator species for freshwater environments. E. coli is a member of the fecal coliforms, but it is not known to reproduce in open water. Although E. coli periodically makes headlines for causing disease or even death, most strains of the bacterium do not cause disease. In fact, they are critical for normal digestive function. This means that E coli is ubiquitous in animal (including human) feces. Spence explained the suitability of E. coli as an indicator species: "E. coli is only found in fecal material, and it shouldn't survive or reproduce in the environment. If you have E. coli (in your water), you know you had fairly recent fecal contamination."

Not only is E. coli a strong indicator of recent fecal contamination, it is also highly correlated with incidence of swimmer illness, as Sarah Johnson of the Colorado Water Quality Control Division explained: "In the epidemiological studies, E. coli levels are more highly correlated with human illness than are fecal coliforms. In fact, fecal coliforms aren't at all correlated."

However, research continues to determine how good of an indicator E coli is for the presence of Giardia and Cryptosporidium, which can survive longer than bacteria in water.

Colorado is currently in the process of converting discharge permits to refer to maximum levels of E. coli, but, as the story to the right illustrates, some permits are still written for fecal coliforms. Johnson explained that this is simply a matter of time: "We have over 1,000 permits and each one has a life of five years."

Loveland Progresses in Preventing Pathogen Pollution

By Barb Maynard

By early next summer, the City of Loveland will be lightening its pathogen load on the Big Thompson River. The city's wastewater treatment plant is constructing a new facility that will use ultraviolet (UV) light to inactivate microorganisms in wastewater.

The $7 million facility upgrades will bring the wastewater treatment plant into compliance with new state discharge permit requirements on the amounts of both fecal organisms and ammonia discharged into the river. "We got our new National Pollution Discharge Elimination System (NPDES) permit that includes more stringent restrictions on ammonia and fecals than we currently had," said Al Paquet, Special Projects Manager for the City of Loveland. "We're gong to switch from chlorination to UV to achieve the fecal coliform disinfection requirements."

Under the Clean Water Act, the Colorado Water Quality Control Division is responsible for issuing NPDES permits to any entity that discharges into surface waters in the state. Each permit states the maximum levels of various pollutants a discharger is allowed to release. Permits must be reissued every five years; when the Loveland plant received its permit for operation for August 2002 through July 2007, it included limits on fecal coliform levels that were ten times lower than the previous permit for the months of April through October. Winter limits did not change with the new permit; the seasonal difference is intended to keep fecal contamination to a minimum during the summer recreation season.

The City had anticipated the new regulations, and had planned for the facility capital improvements in advance. "We'd already had this money budgeted, we just needed them to put a hard date on it," Paquet said. The city must meet the new pathogen regulations by June 30, 2004.

The city chose to convert to ultraviolet light treatment rather than upgrading its current chlorination/de-chlorination system partly because of safety issues associated with the use of chlorine. "Getting away from chlorine is not necessarily a bad thing, so we decided to go with the UV," Paquet said. "It's safer for the operators – they don't have to handle cylinders on site or receive deliveries of chlorine cylinders through town anymore. The city's risk management group certainly applauded that decision. UV is just gaining more and more acceptance. Many facilities are turning to it over time if given the choice to construct new chlorine capacity or new ultraviolet. The ultraviolet systems are more power intensive, but there's no chemical component."

The equipment the city chose to install is the TrojanUV 3000 Plus system.

In addition to the ultraviolet equipment being installed to inactivate pathogens, the project also includes a new "step feed" aeration basin treatment facility that will address new ammonia limits that take effect October 1, 2004.

River Life *A focus on the organisms that live in and around Colorado's waters.*

Pathogenic Microorganisms: small but mighty

by Barb Maynard

An individual of Giardia lamblia. The two "eyes" are actually two nuclei in the single-celled organism.

Microorganisms are amazingly diverse, especially considering their size. The disease-causing microbes, or pathogens, that live in freshwater fall into three basic categories: viruses, bacteria, and protozoa. Each category is remarkably different from the others, even though all of them have similar methods of transmission and cause similar symptoms, as discussed in the article on page 1.

Giardia and Cryptosporidium are both examples of protozoans, single-celled organisms that function similarly to tiny animals. Protozoans are the largest of these three groups: Giardia average around 10 to 20 micrometers in size (a micrometer is one-thousandth of a millimeter).

Bacteria tend to be much smaller – a typical bacterial cell is approximately one micrometer in size, or ten times smaller than a protozoan. One of the most infamous waterborne bacteria is Shigella – there are approximately 17,000 reported cases of shigellosis in the United States each year. Salmonella and Campylobacter can also be transmitted through water, but are more often spread through contaminated food or person-to-person contact.

Viruses are by far the smallest type of organism – about 10 times smaller than average bacteria – and don't even fit accepted definitions of life. They are little more than tiny packages of protein and genetic material that reproduce and wreak havoc by taking control of host cells. Two examples are rotaviruses, a common cause of intestinal illness in children, and noroviruses, which caused the outbreaks on cruise ships last year. Both can be spread through contaminated food and person-to-person contact, in addition to contaminated drinking water.

Size differences in the three classes of waterborne pathogens correlate roughly with the length of time they take to cause illness. Each of these pathogens reproduces in the digestive tract before it has any ill effect on its host; viruses and bacteria reproduce quickly, so onset of symptoms roughly 24 to 48 hours after exposure typically indicates that the infection was caused by either a bacterium or virus. Giardia and Cryptosporidium usuallty take upwards of a week before the afflicted person shows symptoms. Of course, knowing for certain how and when a person was initially exposed to a pathogen is next to impossible.

Probing for Pathogens: the Big Thompson Watershed Forum's Data

The Big Thompson Watershed Forum monitors pathogens as part of its professional and volunteer monitoring program. Data are then compared to the state standards for E. coli levels to judge whether each segment of the river is meeting its Clean Water Act requirements. The state standards for pathogens vary depending on the recreational use of the river - in areas where swimming is expected, the limit is 126 E. coli organisms per 100 milliliters (ml) of river water. Where swimming (or "full-body immersion") is a possibility, but less likely, the limit is 205 organisms per 100 ml. Finally, areas in which access is limited and only secondary contact such as wading may occur have a limit of 630 organisms per 100 ml. Seasonal standards are often applied, since swimming is more likely in warmer months. For example, on the Big Thompson, segments downstream of Wilson Ave. have more stringent standards from May 1 to Oct. 15 than they do the rest of the year.

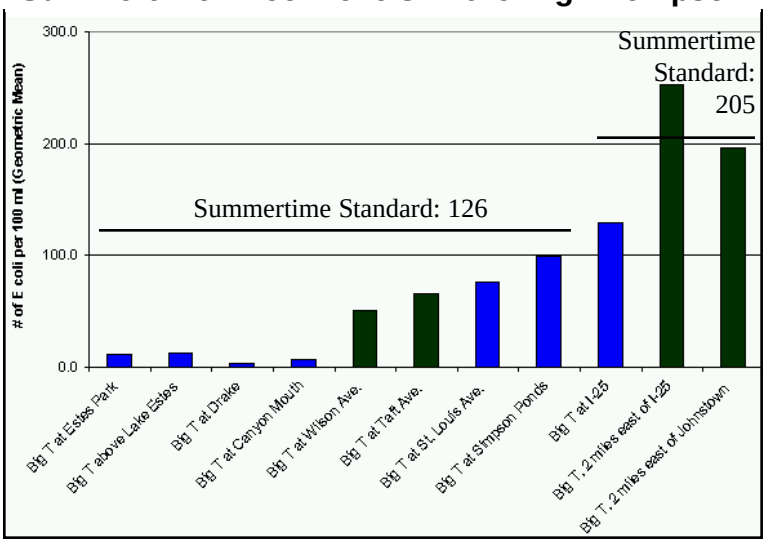
The graph at right displays data collected by the Forum's water monitoring program. Samples have been collected at least monthly since sampling began in August 2000. Blue bars represent data collected by the Forum's professional monitoring program; green bars represent data collected by volunteers. For comparison with seasonal standards, sites downstream of Wilson Avenue include only data from May 1 - Oct. 15. The data indicate that E. coli levels increase as water moves downstream, but only one location exceeds its Clean Water Act standard.

Preventing the Spread of Waterborne Pathogens

People can minimize their exposure to waterborne pathogens by filtering or boiling untreated surface water before drinking. For people with shallow drinking water wells (less than 50 feet deep), a variety of water treatment options are available if contamination is detected. Ultraviolet light systems, which use both a filter and a UV bulb, are becoming more popular.

Proper maintenance of septic systems as well as appropriate management of livestock and pet waste can help to prevent the spread of pathogens. And of course, wash your hands!

Summertime E. coli levels in the Big Thompson



Thompson River Revival Celebrates its Second Year

Over 225 people turned out for the 2nd Annual Thompson River Revival, held on September 20 at Loveland's Centennial Park.

The volunteers started the day by cleaning up the river along the bike path running from Wilson Avenue to US 287. Considering that over 2400 pounds of trash were removed from this same stretch last year, the amount and variety of garbage pulled out this year was impressive. Amongst the goodies found were a picnic table, a purple raft, a skateboard, and a kiddie swimming pool. Glenda Curtiss, who brought a group of volunteers from Starbucks, was spotted leaving the Revival with a skateboard she had found - its riding days were long past, but she was excited about turning it into a wall decoration.

A small portion of the garbage collected.


Aquatic ecologist Jeremy Monroe shows a young ecologist the smaller beauties of the river.


Ginger the Clown entertained younger volunteers.


Students from Eagle Rock School in Estes Park removed over 4 dumptruck loads of Russian olive trees, mulched and watered young trees, and picked up trash.

By far the most exciting find of the day appeared to be an ordinary Sierra Mist can - until an 18-inch snake poked its head out. The snake found itself on display at the River Life table before being released.

After the cleanup, volunteers explored the several informational booths on hand while children enjoyed the Children's Activities table. Don Bosquet of Great Western Flyfishing Company and Carl Cronberg of Trout Unlimited offered flycasting lessons to anglers of all ages.

A hearty barbecue lunch, catered by The Depot, capped the day as the Forum's way of thanking all the many volunteers for their hard work. Thanks to Starbucks for the morning coffee, and to New Belgium Brewing for providing the afternoon beverage - and biodegradable "plastic" cups made of corn products!

The City of Loveland Open Lands Program and the Forum plan to continue this partnership, so look for the Third Annual Thompson River Revival next September!

National Water Monitoring Day Brings Teachers to Outdoor Classroom

State and federal agencies collaborated with the Forum to celebrate National Water Monitoring Day on October 17 by offering high school teachers a chance to learn hands-on about the intricacies of monitoring water quality and quantity. The day was designed to provide teachers with a number of lessons that are practical and relevant for use in their classrooms.

The US Environmental Protection Agency, US Geological Survey, Colorado Division of Water Resources, Colorado Division of Wildlife, Colorado State University and Colorado Watershed Network each taught different aspects of water monitoring to 23 teachers, four Rocky Mountain National Park staff, one EPA intern, three Forum members, and one staff member of Earth Force, a Denver non-profit organization.

Sylvan Dale Ranch generously donated the use of their beautiful facility on the Big Thompson River. If you are planning a conference, wedding, reunion, or other gathering, consider Sylvan Dale and tell them the Forum sent you!

Figures, clockwise from bottom left: Water lawyer Larry MacDonnell explains the complexities of Colorado water law; Bill Reed Middle School teacher Jacquelyn Rideout uses a spectrophotometer to measure the amount of phosphorus in a water sample, in a lesson led by Forum coordinator Rob Buirgy; USGS hydrologist Steve Vandas shows teachers how they can use ordinary gravel roads to illustrate the physical effects of water flow; teachers learn to measure instantaneous discharge unter the instruction of the US Geological Survey's Greg O'Neill; Thompson Valley High teacher Shawny Fordham shows off her progress in measuring dissolved oxygen in a water sample, in a lesson led by River Watch's Lisa Cook; EPA intern Suzanne Pagorek and Thompson Valley teacher Allen Kenyon collect macroinvertebrates from the river; EPA microbiologist Alysia Tani helps teachers measure the amount of E. coli in samples of river water.

H_2Organizations: *information about watershed groups throughout Colorado.*

North Fork River Improvement Association has Fun Bringing the Community Together for the Sake of their River

Tucked away in Paonia, the North Fork River Improvement Association (NFRIA) exemplifies what community involvement can do for a river. NFRIA's stated mission is to meet current and future demands for traditional uses of the river while improving stream stability, riparian habitat, and ecosystem function along the North Fork of the Gunnison River.

With this purpose in mind, NFRIA has thrived on the support that comes from a collaborative approach. Currently their biggest project is transforming a former in-stream gravel mine to a 30-acre river park with public river access.

"The community is really hopped up about it," said NFRIA director Jeff Crane. "The river is 95 percent privately owned with really no place to get down to it, so it always had been kind of an invisible resource to the valley." NFRIA convinced the gravel company to not only quit mining in the river, but also to donate 19 acres to the group for a park. Nearby landowners will donate the rest of the 30-acre package.

An NFRIA volunteer checks a bottle used to measure dissolved oxygen in the river.

Another part of NFRIA's community outreach is their volunteer water quality monitoring program. One part of the program is to assess pathogen levels. "We were interested in monitoring in and around the town of Somerset, because we had reports from people up there of direct discharge from septic systems into the river."

NFRIA director Jeff Crane (center) with his crew on a River Appreciation Float, an NFRIA outreach project.

After two and a half years, NFRIA has found no detrimental effects from the town, but they have been surprised to see an unexplained spike in bacteria in a rural area upstream of town.

NFRIA's river revitalization projects have included rehabilitating the floodplain, stabilizing stream banks, and reconstructing irrigation diversions. Rebuilding the diversions has been a win-win project for irrigation companies and wildlife aficionados alike. "In the past landowners dug a dam in the river, diverted all the water from the river, and returned what they didn't have decree to one-half mile downstream," Crane said. The new structures regulate the amount of water diverted, make maintenance substantially easier, and increase in-stream flows. Plans are afoot to re-build another irrigation diversion this winter.

Visit www.nfria.paonia.com to learn more.

Moisture Management on Thompson School District's Lawns and Fields

By Melissa Adams *Melissa Adams is Logistics and Community Events Coordinator for the Thompson School District.*

Thompson School district lawns and fields are full of activity this school year, unlike a year ago when a drought threatened the life of many grasses and prevented students and recreational leagues from playing on them.

While the grasses are much greener this year, it will take at least two years to bring all fields and grasses back to good health, says Dave Curtis, ground manager for the district. The district maintains some 400 acres, most of which are irrigated. The 15 athletic fields and elementary soccer fields amount to 80 acres of that total.

Last year, the district cut its water usage by 50 to 60 percent. From summer through the winter, brown was the color of nearly all of the district's playground areas, lawns, elementary soccer fields and athletic fields. When a ray of hope came in the form of snow and rain last spring, the district remained cautious but was able to respond by seeding only the athletic fields, Curtis said.

"By the time we knew we had the moisture it was well into May and that was too late to seed the rest of our areas," he noted. Still, most of the fields showed a vast improvement over a year ago. "It will take a couple of years to recover. The grass thinned out and there are a lot of spotted areas. It will need another year of normal moisture to fill out the grass," he said.

The areas hit worst were Berthoud High, Loveland High and Stansberry Elementary schools, which rely only on raw water. Last year, there was hardly any available. This year, the district worked out an agreement with the Town of Berthoud to purchase some domestic water to assist with the water needs at Berthoud High School.

The district relies on four suppliers for water, all of whom have a different set of rules by which they operate. They are the City of Loveland, the Town of Berthoud, the Little Thompson Water District and Loveland-Fort Collins Water.

Under normal water conditions, the district agreed with the City of Loveland to curb its usage by 20 percent. "We won't cut watering on athletic fields this year, but in other areas," he said. The district also has allowed some outlaying areas to "go natural" with dry land grass. These areas include the outer field of Walt Clark Middle School, a triangle of land across from Thompson Valley High School, and an area behind the administration building.

In the spring, if water availability seems normal, the district will reseed its athletic fields as well as some of the areas around buildings that haven't yet recovered.

Larimer County Health Department Proposes Advanced Treatment for Watershed Areas

By Ed Schemm *Ed Schemm is Assistant Director of the Larimer County Department of Health and Environment and former board member and chairman of the Big Thompson Watershed Forum.*

The Larimer County Department of Health and Environment is proposing changes to the Larimer County Individual Sewage Disposal System (ISDS) Regulations that will be beneficial to watershed areas. In response to growing concerns regarding development in environmentally sensitive areas of the County, including areas with shallow depths to groundwater or bedrock and, in particular, watershed areas near rivers and streams, a new provision allowing for "advanced secondary" treatment of septic tank effluent is being proposed.

"Advanced secondary" treatment is an enhanced biological process which reduces levels of biological oxygen demand, suspended solids, and total nitrogen present in septic tank effluent to specified levels prior to final discharge into the soil absorption portion of a system. Commercial building sites and residential sites meeting the criteria for "environmentally sensitive," as defined in the regulations, will be subject to this new requirement through the ISDS permitting process. In advanced treatment applications, normal septic tank nitrogen levels of around 60mg/l will be reduced to 30mg/l prior to discharging to the soil absorption field. In addition, the department may require enhanced bacterial reductions be incorporated into the absorption field by providing better filtration using sand.

The Larimer County Board of Health will consider the proposal in December. If adopted, the new regulations will become effective around February 1, 2004.

BTWF Membership Form

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Membership Type: Private Organization (Please complete next 2 lines.)
Organization: _____
Your Title: _____

Clip and mail this form to the address on the back of the newsletter, or join on-line at www.btwatershed.org. Thanks!

Donations

Please consider donating to the Big Thompson Watershed Forum today. We rely entirely on voluntary contributions for our operating funds. Only with your help can we continue to protect water quality. Your donation is completely tax deductible. Make your check payable to the Big Thompson Watershed Forum and mail it to us at the address on the back of the newsletter. For more information, contact Janeen Simon, jsimon@btwatershed.org, (970) 613-6974. In-kind contributions and volunteer services are also greatly appreciated. Thank you!

Does your employer have a Donation Matching Program?

Water Currents:

Brief updates on legislative and regulatory actions with direct implications for water quality.

• The US EPA has proposed a new regulation, known as the Long Term 2 Enhanced Surface Water Treatment Rule, that is designed to reduce the incidence of disease caused by Cryptosporidium in drinking water.

• Both houses of Congress are considering legislation (Bills HR1856, S937, and S247) that would expand research efforts aimed at curbing algal blooms and hypoxia that cause "dead zones" and other biological problems in the nation's coastal areas and the Great Lakes.

• The Supreme Court will hear a case between the Miccosukee Tribe and the South Florida Water Management District to consider whether a discharge permit is required to move water from one basin to another. The water district argues that since it is only moving the water, and not adding any pollutants, it should not need a permit. The tribe argues that because the water being moved is of lower quality than the water in the basin it is being moved to, a permit should be required. The case has the potential to impact transbasin diversions across the country.

• The Bush administration has decided not to pursue legal action against coal-fired power plants that violated New Source Review regulations designed to protect air quality. The administration has issued new, less stringent regulations and therefore is not pursuing action against some utilities that violated the old rules. Air quality affects water quality through atmospheric deposition of pollutants into water.

Big Thompson Watershed Forum

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THE FUTURE OF WATER QUALITY IS IN OUR HANDS

Join the Forum Today!

The Big Thompson Watershed Forum protects source water for people in the cities of Estes Park, Fort Collins, Greeley, Loveland, and many other Front Range communities. We need you! Your participation broadens our representation and enriches your knowledge and ability to protect water quality. And...membership is free!

To join, visit our web site, call, or complete the form on page 7 inside.

Wet's Happening:
Calendar of Upcoming Events

November 20, 2003: BTWF BOARD PLANNING RETREAT.

December 18, 2003: BTWF BOARD MEETING. 11:30 a.m. to 2:30 p.m., Loveland Water & Power Board Room, 200 N. Wilson Ave., Loveland

January 15, 2003: BTWF BOARD MEETING. 11:30 a.m. to 2:30 p.m., Loveland Water & Power Board Room, 200 N. Wilson Ave., Loveland

February 19, 2004: BTWF ANNUAL MEETING. McKee Conference Center, 2000 N. Boise Ave., Loveland. Call 613-6974 to RSVP or for more information.

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