

# EMERGING TRENDS

## Ethanol

In the 1980s, the State of Minnesota began to promote the production of corn-based ethanol to help reduce the United States' dependence on foreign oil and to provide a more stable market for farmers. Millions of dollars have been invested by Minnesota to construct ethanol plants across the state including 10 operating in the Minnesota River Basin along with a number of others either proposed to be built or currently being built in this watershed.

To process ethanol a large amount of water is needed (approximately 4.0 to 4.8 gallons of water per gallon of ethanol produced) not to mention the water needed to grow and harvest the corn. In 2008, the Gopher State Plant at Granite Falls consumed too much water from groundwater

sources – depleting it – and was forced to pump out of the Minnesota River to keep producing ethanol. Statewide, the ethanol industry consumes about 2 billion gallons of groundwater per year. Water usage in ethanol production has become more efficient here in Minnesota but the production of ethanol is only expected to increase (it could quadruple by 2011), along with the use of water.

Most of the ethanol produced in Minnesota comes from corn, which helped fuel a dramatic increase in the amount of acres planted to this commodity as prices spiked at record levels in the summer of 2008. Land enrolled in the Conservation Reserve Program (CRP) took a big hit with over 80,000 acres across Minnesota removed from the program and converted back to agricultural production. According to resource officials, up to 800,000 of additional CRP acres could be lost over the next five years. All of this will have a major affect on habitat and water quality in the Minnesota River Basin. Some of this could be offset by the development of technology to use other plant material – grasses, trees, etc. – to produce cellulosic ethanol on an industrial scale. Unfortunately, most experts agree this could take as long as 5 to 10 years.

## Emerging Contaminants

For well over a decade, scientists have been studying what they call “emerging contaminants” in our water and the effect it has or could have on us and aquatic organisms. Emerging contaminants are identified as medications, soaps, fragrances, cleaning products or chemicals we wash down the drain or flush down the toilet. These compounds were detected in 80% of the 139 streams examined by the U.S. Geological Survey in a 2002 study. They reported many of the sites were located downstream of urban areas.

Scientists are particularly worried about “endocrine disruptors,” which mimic hormones. A wide range of chemicals fall under this category including certain cosmetics, shampoos, shaving lotions, skin creams, dishwashing liquids, pesticides, flame retardants, plastics and anti-bacterial soaps. No one really knows the long term effects on humans but for fish it has caused males to exhibit female characteristics including ovarian tissues that produce immature eggs. There is a concern among scientists that fish populations could decline because of the endocrine disruptors.

Humans don't live or breathe in the water, making us less vulnerable than fish to endocrine disruptors and no conclusive evidence has been found to link these emerging contaminants to human health problems. Although, some scientists are examining any potential connection between the well-documented trends of earlier puberty in girls and reduced sperm counts in men with endocrine disruptors in the water. There has been discussion to phase out or replace some of these chemicals and educating the public not to flush unused medication down the toilet.



Winthrop Ethanol Plant

Scott Kudelka

## Emerging Trends continued

### Hard Rock Mining

Some of the oldest known exposed rocks – 3.8 billion years old – are found in the Minnesota River Valley, in particularly along the river channel. These Gneiss outcrops and other granite rock outcroppings comprise some of the last remaining undisturbed areas in the basin. Granite rock outcroppings are under constant threat as the construction industry seeks new deposits of gravel to build our roads, homes and other modern infrastructure.



Scott Kudelka

Granite rock outcrops hold some of the most endangered and unique native plant and animal populations in the basin. This includes the rare Great Plains prickly pear and brittle cactus along with the Five-lined Skink. Unlike prairie and wetlands which can be restored, once these granite rock outcrops are mined they are gone forever, along with the diversity of plants and animals that count on them.

A large section of the granite rock outcropping is located in a stretch of the Minnesota River that falls under the state's Wild and Scenic River Program. Designated in 1977, it extends from Lac qui Parle Dam to Franklin. Under this program, hard rock mining has been outlawed but it allowed the extraction of sand and gravel deposits. The demand for gravel and other rock will only grow stronger as elected officials, citizens, business interests and government agencies attempt to maintain a balance for protecting some of the most threaten areas in the basin and promote economic development.

### Big Stone II Coal Plant



Scott Kudelka

This proposed coal-fired plant is being initiated by four private and municipal power companies as a major expansion of an existing facility on the South Dakota side of Big Stone Lake. As the second coal-fired plant at this site, it would generate between 500 and 580 megawatts of electricity to be distributed across new transmission lines in Minnesota. The State of South Dakota granted the power companies a permit to withdraw up to 3.2 billion gallons of water annually from the Minnesota River and another permit for 3.2 billion gallons of water from the Veblen Aquifer. Despite a call for reconvening the Minnesota-South Dakota Boundary Waters Commission by the Minnesota Department of Natural Resources and others, the permit was granted without any direct input from the State of Minnesota.

Environmental groups, government agencies and citizens have expressed major concerns about this proposed coal-fired plant due to the large water usage from the Minnesota River and an increase in mercury emissions, a potent neurotoxin that can cause permanent brain damage. A dramatic decrease of water levels in the Minnesota River, especially during drought situations could result in lower dissolved oxygen levels that cause harm aquatic organisms including the potential for fish kills, along with a greater concentration of nutrients like nitrate and phosphorus that can stimulate excessive algae growth and be devastating on aquatic organisms. The Minnesota River is currently listed impaired for mercury residue in fish and the construction of a second coal-generated plant (largest emitters of mercury) could increase the already high levels. In 2008, the nonprofit organization American Rivers listed the Minnesota River as the fifth Most Endangered Rivers because of the proposed Big Stone II Coal Plant.



Big Stone II

Artist rendering of proposed expansion