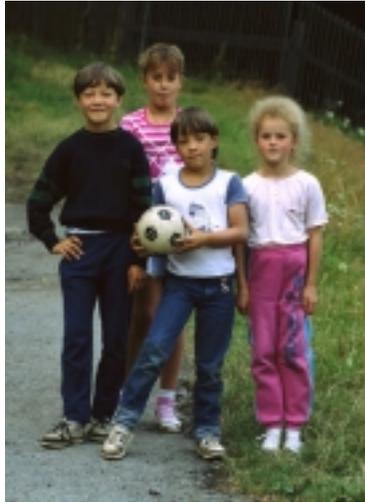


# Our Present



*You must be the change you wish to see in the world.*

~ Mahatma Gandhi

The state of the land and water in our Basin today, and the direction we're heading, is the result of the choices the Basin residents before us made and that today we make. Since the inception of the first Earth Day, April 22, 1970, there's been a dramatic increase in people's awareness of our impact on the earth. Many steps have been taken to correct problems from past actions and to prevent problems in the future. Unfortunately, even with all the efforts to date, current trends, while showing progress in some areas, still show serious impacts to our natural resources - the basis of our survival.

As Basin water, land, and air resources and human actions are explored in this report, it's essential to see how all natural resources and human behavior are ecologically interrelated. For example, contrary to many people's belief, you cannot protect a river or lake simply by protecting its shorelines or nearby property. The actions of everyone living in the watersheds, rivers, or lakes, not just shoreline residents, have a major impact on its water quality.

Another good example is the tie between drinking water and people's behavior on land. Too few people know that you can't protect your groundwater just by installing a proper well. The actions of everyone living in the recharge area of the well's aquifer are related to the health and safety of the water supply in the well.

Air quality and the health of fisheries are tied to human behavior! The results of many actions on the land waft up into the atmosphere and return to earth in quantities or forms that impact the health of the fisheries.

Land use and human behavior is where the action is - for good or bad - in terms of water, land and air protection. Wise land use rests upon choices made by each individual in their daily life and on their land. Wise land use also rests upon people in the community, deciding together to choose patterns of development, road and mass transit development, and green space protection that better reduce the impacts of society on the natural environment in the Rock River Basin.

# Surface Water

*The whole straightening of small rivers and creeks (and urban stormwater systems)...is done to hasten the runoff of local flood waters,...(It) aggravates the... flood peaks in major streams. It is...a process of pushing trouble downstream, of seeking benefit for the locality at the expense of community.*

~ Aldo Leopold

## Why Care?

-  All living things need clean water to live! 80% of endangered plants and animals live all or part of their life near water.
-  Polluted water costs everyone! It costs more money and resources to clean up water pollution that it does to prevent the pollution!
-  Industries, businesses, and recreation need clean water to operate.

## Rivers and Lakes

In the Rock River Basin, a total of 58 streams, stream segments and lakes (approximately 286 stream miles) have been identified as “Impaired Waters of the State” and listed on the Environmental Protection Agency’s (EPA) 303d list. In the Basin, the Upper Rock has 199 river miles listed and the Lower Rock 87 miles. The waterbodies are listed because they do not meet surface water quality standards of the Federal Clean Water Act. As additional Basin water quality monitoring is conducted, more streams will likely be added to the list. However, the root of the problem isn’t in the streams themselves; it’s land use in the watersheds.

The accompanying map shows the rivers and streams and their watersheds on the EPA’s 303d list. The 303d waterbodies are listed for a variety of water quality problems from high levels of nutrients, sediment, heavy metals and other chemical contaminants, high levels of bacteria, or habitat impairments. Note the location, the size and shape of the watershed associated with these waterbodies to see where you live in relationship to these waters.

The unmet water quality standards in Basin waterbodies are a result of one or several of the following factors:

-  degradation from polluted surface runoff (nonpoint sources)
-  degradation from factory and wastewater treatment discharges (point sources)
-  degraded habitat
-  fish containing elevated levels of mercury or other contaminants.

The federal Clean Water Act requires development of a management plan to correct impairments for waterbodies listed on the EPA 303d list. Waterbodies on or named to the 303d list of impaired waters will have a Total Maximum Daily Load (TMDL) calculated for it. A TMDL will be specific to the pollutant or pollutants impacting the stream or lake. Under a TMDL assessment, the waterbody will be evaluated to determine the maximum load it can receive and still meet its water quality standards. All pollutant sources (point and nonpoint) are assessed and waste loads from each source are determined. Each source will make the reductions needed as determined through the TMDL process. In 2002, the DNR strategy to conduct the monitoring and modeling needed for each TMDL development should become final.

🏠 For more information see: [www.TMDL.net](http://www.TMDL.net)

However, every river and lake in our Basin has reduced water quality caused by nonpoint source and/or point source pollution. Many Basin waterbodies are eutrophic (highly enriched) due to their high levels of nutrients. This leads to excessive algae growth and poor water clarity. The poor water quality negatively affects the growth of native plants, the fisheries, recreational use and the potential for rivers and lakes to contribute to the Basin's economy. Only a few streams and lakes in the Basin have good water quality today.

Eight streams or stream segments in the Basin are named as Exceptional or Outstanding Resource Waters (ERW/ORW) and are given additional environmental protection because of their excellent water quality and/or valued fisheries. (See Map 5)

Most Basin lakes and impoundments are impacted by nutrients or sediment from farming, erosion from construction sites or from failed sanitary systems. To help combat these problems, many of the Basin's larger lakes have formed lake management districts, sanitary sewage districts, or lake associations.

Poor water quality in lakes and rivers can directly affect people. One example is beach closings, usually due to bacteriological contamination. Poor water quality also impacts a wide variety of species that depend upon surface water resources. Many different species of mollusks, plants, and water birds living in the Basin are listed as endangered/threatened. Most of these species depend upon protection of the waters they live in or near to complete their life cycles.

## Nonpoint source pollution ~

Pollution whose sources cannot be traced to a single point such as a municipal or industrial wastewater plant discharge pipe. Nonpoint sources include eroding farmland and construction sites, urban streets, and barnyards. Pollutants from these sources reach waterbodies in runoff, and can be controlled by proper land management.

## Point source pollution ~

Sources of pollution that can be traced back to a single point, such as a municipal or industrial wastewater treatment plant discharge pipe.

## Surface Water Monitoring

The DNR conducts many types of Basin water quality, fisheries, aquatic insect, and habitat studies. Numerous monitoring studies are conducted with the US Geological Survey (USGS), the WI Geological & Natural History Survey (WGNHS), and with other state and local government agencies and non-governmental agencies.

Many Basin lake districts and associations participate in the Self Help Lakes Monitoring program. The volunteers provide valuable water quality data that is used to develop and implement lake protection and rehabilitation programs. They also often monitor other components of lake health. These include the type and degree of biological problems, such as the impact of introduced exotic plant and animal species, the loss of in-lake habitat, and the location and mapping of sensitive in-lake plant communities.

In 1998, the Basin wastewater plants joined together in a voluntary coalition called the Rock River Watershed Partnership (RRP). The coalition formed to assess the potential for nutrient trading for phosphorus in the Basin. The RRP is discussed in greater detail in this report's Cities, Suburbs, and Country Living section.

In order to assess the trading potential, more water quality monitoring information was needed. The RRP took the lead in organizing a comprehensive water quality monitoring study in the Basin along with the DNR, University of Wisconsin-Madison, and UWEX. Nine stations across the Basin were monitored for 14 chemical parameters. A computer model of phosphorus and sediment loading sources in the Basin was developed based on the monitoring data. A number of the monitoring sites had additional in-depth fisheries and macroinvertebrates studies conducted.

☆ For information on RRP monitoring / modeling see [www.clean-water.uwex.edu/rrp/index.htm](http://www.clean-water.uwex.edu/rrp/index.htm)

The modeling indicates that overall in the Basin, nonpoint sources (water running off the land) contribute about 59% of the phosphorus load to the rivers and lakes, with point sources (primarily municipal and industrial wastewater treatment plants) contributing about 41%. However, in an individual watershed, the contribution source ratio may vary. Some watersheds have point sources delivering most of the pollutants to the river, while in other watersheds nonpoint sources dominate.

Water quality data show that significant quantities of phosphorus enter the rivers and lakes in the Basin. Phosphorus is a nutrient that enhances plant growth - both on the ground and in rivers and lakes. Excessive phosphorus contributes to nuisance algae growth in our water bodies and excessive dissolved oxygen fluctuations.

Sediment in runoff also can cause significant problems in water bodies. Sediment is soil washed off the land into rivers and lakes. Excessive sediment can directly smother vital fish habitat and impair water clarity needed by many valuable sport fish. Sediment typically has phosphorus attached to it, resulting in both sediment and phosphorus impacts to the stream or lake. Almost all sediment comes from nonpoint sources such as agriculture, construction sites and urban runoff. Maps six and seven show the watersheds contributing the most phosphorus per acre and the highest sediment loads to Basin streams and lakes.

☆ For more information on watersheds and nonpoint source pollution see: [www.cwp.org](http://www.cwp.org)

It's important to consider that high sediment and nutrient loading in the Basin contributes to significant water quality problems found in monitoring far down stream. The Rock River Basin, together with other Upper Mississippi River Mid Western river basins, is identified as a major source of nutrients to the Gulf of Mexico. In the Gulf, off the coast of Louisiana, is a hypoxic (low oxygen) or dead zone, where little life can exist. The hypoxic zone is attributed primarily to large quantities of nitrogen coming down the Mississippi River. National attention is being focused on the nutrient and sediment loading to the Mississippi River from its Basin. More joint water quality monitoring and nitrate control is being promoted and undertaken in the watersheds comprising the Mississippi River Basin.

While considerable surface water monitoring has been done in the Basin, there's much more to do. To learn more about lake and river conditions in the Basin, in 1999 the DNR began a 5-year base-line stream-monitoring program. Each year a number of sites will be studied in detail. After 5 years, the initial monitoring sites will be re-monitored to look at changes. Information collected in this sampling effort can be used to measure future improvement or further degradation. For more information about base line monitoring in the Basin see "Rock River Basin Baseline Monitoring 1999-2001" at the end of this section.

*continued on page 31*

## Impaired Resource Waters (303d)

### Lower Rock River Basin

Badfish Creek (Dane Co.)  
 Bark River  
 Blackhawk Creek  
 Clear Lake  
 Markham Creek  
 Lake Mendota  
 Lake Monona  
 Lake Waubesa  
 Perch Lake  
 Rock River  
 Spring Creek (Jefferson & Rock Co.)  
 Starkweather Creek  
 Steel Brook  
 Stevens Creek  
 Token Creek  
 Turtle Creek  
 Wingra Creek  
 Yahara River

### Upper Rock River Basin

Alto Creek  
 Battle Creek  
 Beaver Dam River  
 Casper Creek  
 Crawfish River (at Columbus Millpond)  
 Davy Creek  
 Flynn Creek  
 Gill Creek  
 Horicon Marsh  
 Irish Creek  
 Kohlsville River  
 Kummel Creek  
 Lac La Belle  
 Limestone Creek  
 Mason Creek  
 Maunsha River  
 Mud Creek  
 North Branch Wayne Creek  
 Park Creek  
 Pike Lake  
 Pine Lake  
 Rock Creek (at Hoopers Millpond)  
 Rock Lake (Jefferson Co.)  
 Rock River  
 Schultz Creek  
 Sinissippi Lake  
 South Branch Rock River  
 Wayne Creek

## Exceptional and Outstanding Resource Waters

Allen Creek (Jefferson / Rock Co.)  
 Bass Creek (Rock Co.)  
 Genesee Creek (Waukesha Co.)  
 Little Turtle Creek (Rock Co.)  
 Rutland Branch (Anthony Branch, Dane Co.)  
 Six Mile Creek (Dane Co.)  
 Spring Brook Creek (Rock Co.)  
 Turtle Creek (Rock Co.)

# **Map 5: Rock River Basin Impaired, Exceptional, and Outstanding Waters**

Please refer to the State of the Rock River  
Basin Report web page to view this map

## **Map 6: Rock River Basin Total Phosphorus Loads**

Please refer to the State of the Rock River Basin Report web page to view this map

## **Map 7: Rock River Basin Sedimentation Loads**

Please refer to the State of the Rock River Basin Report web page to view this map

## Ripples and Tsunamis in Lake Ripley

Ripples (a.k.a. tiny waves) is the title of the Lake Ripley's Lake Management District's quarterly newsletter. Tsunamis (a.k.a. gigantic tidal waves), however, best describes the Lake District's actions protecting Lake Ripley. These actions are impressive - especially for a small, 8-square mile watershed and a lake district that just recently celebrated its 10th birthday. Here are just a few of the lake district's many accomplishments:

-  Created a 99-acre Nature Conservancy with wetland and prairie restorations. Land was purchased and restored in partnership with many local organizations and governmental agencies (\$47,000 raised locally!). Working on easements on other watershed wetlands.
-  Organized Wisconsin's first volunteer Lake Watch program to monitor and report lake violations.
-  Helped pass local ordinances restricting: piers in ecologically sensitive areas, the use of motors in prime fish habitat areas, and the burning of yard wastes within shoreland areas.
-  Established expanded slow-no-wake zones to protect valuable aquatic plant communities and sensitive shorelines.
-  Re-graded and stabilized more than 17,000 feet of eroding agricultural drainage ditches.
-  Continuous monitoring of building permits/construction sites in watershed for soil erosion control.
-  Partnered with local school science classes to conduct water quality monitoring, litter clean ups and field trips.
-  Continuous local community education about nonpoint source pollution and lake protection issues (e.g. lake fairs, newsletters, newspaper articles, locally televised public meetings, tours, etc.)
-  Annually conducts mechanical weed harvesting program to control Eurasian watermilfoil and other non-native, invasive plant species.
-  Recently developed a Comprehensive Lake Management Plan to guide lake-protection and rehabilitation efforts.

For Information:            Lake Ripley Management District  
   101 E. Main St., Suite 2  
   Cambridge, WI 53523

Phone:                        (608) 423-4537  
Email:                         [ripley@bminet.com](mailto:ripley@bminet.com)

Monitoring of streams and lakes shows other water quality contaminants including: pesticides, herbicides, bacteria, heavy metals and other toxic pollutants. Water quality is also impacted by hydrologic modifications such as dams, straightening of streams and ditching and draining of wetlands.

Too much water is increasingly a Basin problem. Many streams flood more often and with larger flows because of increased runoff volume. As will be discussed further on, much of the increased stream volume comes from reduced infiltration of rain into the ground due primarily to human land use and its effect on stormwater runoff.

## The Good News!

In the Basin, 45 lake organizations are leading local efforts to protect their water resources. These include lake districts or associations and several sanitary districts and towns. Recently, two new lake districts formed: Lake Koshkonong and Lake Sinissippi. More and more lake and river property owners recognize the vulnerability of their waterbodies and that local leadership is critical to protect their lake or river. The DNR has a Lake Planning and Protection Grants Program to help groups protect their lakes.

*continued on page 32*

# Rock River Basin Base Line Monitoring 1999-2001

Baseline monitoring helps show citizens, conservation organizations, and government officials the pollutant controls needed to have clean and healthy streams and lakes. Extensive fish shocking, water chemistry and insect collecting indicate the water quality in Basin streams and lakes. Over a five-year period, additional rivers and lakes will be comprehensively tested to show the existing water quality and provide a base of information to compare to future tests. Listed below are the waterbodies that have been monitored 1999-2001.

## Streams/Rivers

Allen Creek  
Alto Creek  
Anthony Branch  
Bass Creek  
Beaver Dam River  
Crawfish River  
Crystal Creek  
Dead Creek  
Duck Creek  
East Branch Rock River  
Harbison Creek (2 stations)  
Kohlsville River  
Kummel Creek  
Limestone Creek  
Marsh Creek (2 stations)  
Maunsha River  
Oconomowoc River  
Rubicon River  
Sixmile Creek (2 stations)  
Stevens Creek  
Token Creek (2 stations)  
Turtle Creek (2 stations)  
W. Branch Rock River  
Yahara River (3 stations)

## Lakes

Beaver Dam Lake  
Blue Spring Lake  
Columbus Millpond  
Fox Lake  
Koshkonong Lake  
Lake Mendota  
Lake Menona  
Lake Ripley  
Lake Waubesa  
Lazy Lake  
Lost Lake  
Lower Spring Lake  
Rock Lake  
Sinissippi Lake

*continued from page 31*

The Wisconsin Lakes Partnership has a major initiative going for shoreland and in-lake habitat protection and restoration in Wisconsin counties. Lake classification grants are available for this purpose. In the Basin, Waukesha, Jefferson and Washington Counties have received grants for this purpose and are in various stages of planning and or implementation of a lake and/or stream classification program. Walworth County is also developing a stream classification program.

In spring of 2000, a group of people concerned with the future of all Wisconsin lakes began developing a plan to guide lake management for the next decade. Their vision, which is under development, is called "The Water Way". This helps chart a course for the future that involves all citizens caring about lakes through education, protection, restoration, enhancement and management initiatives.

- ☆ For information on lake problems, partnerships and a draft of the 'The Water Way', see North American Lake Management Society: [www.nalms.org](http://www.nalms.org) (under Chapter click on Wisconsin, then Wisconsin Association of Lakes, and click on Wisconsin Lakes Partnership).

Rivers also need the helping hands of concerned local citizens. Within the last two years, the DNR started a River Protection Grant Program, similar to the Lakes Protection Grant Program. Grants are provided to help build the ability of groups to protect Wisconsin's rivers and streams. On a larger scale, the Wisconsin Rivers Alliance is actively working to promote and involve citizens in different aspects of river protection.

- ☆ For information on river problems and organizations see: [www.wisconsinrivers.org](http://www.wisconsinrivers.org)

There's good news on a local level. The RRC Surface Water Issue Team is organizing a comprehensive Rock River Basin Citizen Monitoring program. Citizen involvement in stream monitoring will help increase our knowledge of the status of many more rivers in the Basin. In addition, citizen monitoring will give these volunteers more insight into the 'why and how' needed to protect or restore the river or lake they monitor. Citizen monitoring will start in Spring 2002 in: Washington, Waukesha, Dane, Dodge, Fond du Lac, Green Lake, and Rock counties.

The Basin citizen monitoring program will mirror the successful citizen lake monitoring program in progress for many years. Today, 20 lakes are monitored by Self-Help Volunteers for water quality in the Basin. Lake residents and lake recreationists show their love for their lake by actively working to protect it. Streams and rivers also need citizen caretakers.

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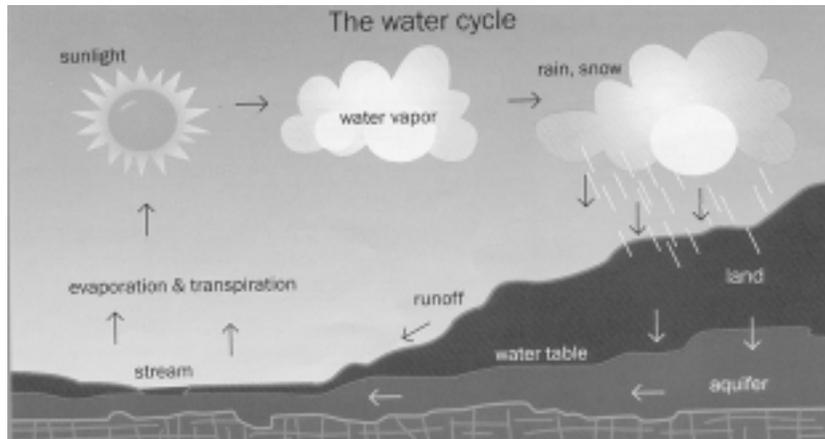
## TO LEARN MORE ...

- ☆ Information about the Rock River Basin, Issue Team actions, and the Rock River Watershed Partnership  
<http://clean-water.uwex.edu/rockriver>
- ☆ Information about the Rock River Coalition:  
[www.rockrivercoalition.org](http://www.rockrivercoalition.org)
- ☆ Wisconsin Watershed Management and Nonpoint Source Pollutants  
[www.dnr.state.wi.us/org/water/wm/](http://www.dnr.state.wi.us/org/water/wm/)
- ☆ Self-help Lakes Monitoring, Aquatic Plant Management  
[www.dnr.state.wi.us/org/water/fhp/lakes/waycourse/thewaterway.htm](http://www.dnr.state.wi.us/org/water/fhp/lakes/waycourse/thewaterway.htm)
- ☆ River Protection and Organizations  
[www.rivernetwork.org](http://www.rivernetwork.org)
- ☆ National Surface/Groundwater Monitoring Information for Wisconsin collected by the U. S. Geological Service  
<http://water.usgs.gov/wi/nwis/nwis>
- ☆ EPA's new initiative to protect U.S. waterways:  
[www.epa.gov/owow/watershed/](http://www.epa.gov/owow/watershed/)
-  DNR Bureau of Community Financial Assistance - Lake, River and Watershed Management Grants 608-266-7555

## WHAT YOU CAN DO . . .

-  Urge local governments to install and maintain stormwater practices such as streambank buffers, detention ponds and native plant landscapes.
-  Become actively involved in groups, projects, and events that protect water resources.

# Groundwater



*Soil beneath our feet and (ground) water health are not two problems, but one.  
There is a circulatory system...common to both...*

~ Aldo Leopold

## Why Care?

-  Almost everyone in the Rock River Basin drinks groundwater.
-  Groundwater aquifers feed base flow in streams and are critical to stream and fisheries health.
-  Well contamination problems and well drilling restrictions in the Rock River Basin show how serious groundwater problems can be.
-  Groundwater contamination is expensive to clean up.

Almost everyone in the Basin drinks groundwater from a public or private well. It's estimated that 155 community water systems serve about 570,884 people in the Basin. The remaining Basin residents have private wells that supply their drinking water. No communities in the Basin use surface water for drinking water supplies. Most private wells draw water from sand and gravel deposits or bedrock located from 20 to several hundred feet below the ground surface. Municipal wells typically draw water from much deeper limestone or sandstone formations, often more than 1,000 feet deep.

Groundwater typically moves very slowly - sometimes as little as a few inches per year. Most often, slow moving groundwater is slow to pollute, slow to clean up, and is expensive to clean up, particularly when compared to the cost of prevention. This is especially true for deep aquifers or aquifers in tight clays, where groundwater travel time can be measured in tens to hundreds of years.

In some Basin areas, pollution has reached groundwater aquifers and is contaminating drinking water. Groundwater contamination is usually found where the water table is shallow and the soils are loosely

*continued on page 36*

## **Map 8: Rock River Basin Atrazine Prohibition Areas**

Please refer to the State of the Rock River Basin Report web page to view this map

## **Map 9: Atrazine testing\* in the Rock River Basin**

Please refer to the State of the Rock River Basin Report web page to view this map

compacted. It is also found in bedrock formations - especially fractured limestone located close to the surface. In some parts of the Basin, limestone sinkholes near the surface allow direct runoff of contamination into the groundwater.

Landowners in Karst areas can report new sinkhole locations to the Wisconsin Geological and Natural History Survey (WGNHS) using their "Karst Inventory Form". WGNHS registers these sites to help area residents prevent pollution to local water supplies.

☆ The WGNHS website: [www.uwex.edu/wgnhs](http://www.uwex.edu/wgnhs)

Most groundwater contamination comes from human land use that allows entry of pollutants into the groundwater aquifers. Some contaminants however, such as arsenic or radium, can naturally occur in certain, generally very deep or localized bedrock formations. Surface contamination can come from many sources - farming, old gravel or limestone quarries, urban land uses, spills or even from pollutants entering old abandoned wells. The DNR has ranked and scored all watersheds in Wisconsin for Nonpoint Source Groundwater Contamination potential. The table in the Report's Reference Section lists the watershed scores for the Basin's 28 watersheds and gives a short description of the land use and groundwater sampling results that determined each watershed score.

Many county, state, and federal agencies and organizations have conducted well and groundwater studies at various times for different chemicals in the Basin. Overall, well water testing shows that groundwater contamination is fairly widespread in certain parts of the Basin. In Dane County, where intensive groundwater testing is conducted, approximately 45% of wells tested shows pollution from surface contamination. However, many Basin areas have not been intensively tested so we do not have a good knowledge of the extent of groundwater contamination.

A major Basin concern is an increased number of Atrazine Prohibition Areas designated by the Department of Agriculture, Trade, and Consumer Protection (DATCP). In these areas, farmers cannot apply Atrazine, a corn herbicide, because the chemical has been found in water supply wells at high levels. Dane County shows the widest spread Atrazine impact in the Basin. Approximately two-thirds of the county is within Atrazine Prohibition Areas. Atrazine use by farmers has been declining even outside the prohibition zones. However, other herbicides are increasingly used,

especially with crop rotations that include crops with poor tolerance for Atrazine residue. Map eight shows Atrazine Prohibition Areas in the Basin.

☆ For more information about Atrazine see: <http://datcp.state.wi.us> (click on agriculture, then land & water, then water quality)

Other Basin areas show chronic bacteriological contamination problems in wells. Many of these sites have fractured limestone bedrock at or near the ground surface. Some areas have been designated as "Special Well Construction Areas". The Basin currently has seven areas under well construction restrictions. In these areas, well drillers are required to drill and case wells to deeper depths. This adds considerable cost to drilling wells.

☆ For more information on water supply wells: [www.dnr.state.wi.us/org/water/dwg/index.htm](http://www.dnr.state.wi.us/org/water/dwg/index.htm)

The most common chemical contaminant in private wells across the Basin are nitrates. Drinking water with high nitrate levels (greater than 10 parts per million) can have serious health effects, including fatalities in babies six months and younger, and suspected birth defects with pregnant women. High nitrates are often associated with improperly functioning private septic fields or excessive nitrogen use on farm fields.

Across the Basin about 13% of the private and public wells tested for nitrates had levels above the enforced nitrate levels, however this percentage varies geographically. In the Upper Rock overall, the percentage of wells with high nitrate levels was 7.9% and in the Lower Rock 18.9%. In Dane County approximately 35% of their wells have high nitrate levels.

Groundwater contamination can also come from leaking underground storage tanks (LUST) and from on-site spills at Environmental Response Facilities (ERF) sites. The most serious LUST and ERF contamination sites, those with groundwater contamination, are being cleaned up with the oversight by the DNR.

Since the LUST and ERF Programs began in the late 1980s, over 825 sites have been cleaned up in our Basin. However over 1,200 sites are still under investigation or remediation. New contamination sites continue to be discovered.

Other potential sources of groundwater contamination are unused wells. Many people don't properly seal abandoned unused water wells. Too often they abandon wells by stuffing them with material like stones, towels, pesticide cans, or old oil containers! Improperly abandoned wells provide a direct conduit for surface water or pollutants and are a potential threat to groundwater aquifers. Properly abandoned wells are filled with bentonite (a highly water absorbing clay) or cement grout. Contact the DNR for information on proper well abandonment techniques.

Arsenic in groundwater is of increasing concern to state and local health officials and the public. The Federal government has recently lowered the permissible level of arsenic in drinking water from 50 parts per billion (ppb) down to 10 ppb. Some areas in the Basin have naturally occurring arsenic concentrations in groundwater that exceed the lowered drinking water standard. The DNR is assessing the potential for arsenic contamination in public and private wells.

Some other water contaminants can enter drinking water through the water distribution system itself. Lead, a potential major health concern for children, has been found in parts of Janesville's and Madison's water supplies. Lead enters the water supply systems by leaching from lead plumbing pipes in many older buildings in these cities. The DNR and Basin cities are working together to develop methods to reduce the exposure of city residents to high lead levels. However, all Basin residents living in older homes should assess the condition of their plumbing system to ensure that lead contamination in their water isn't a problem.

Though the Rock River Basin is groundwater rich, some Basin areas are showing groundwater stress where the groundwater table is dropping. This is a result of groundwater being used at a faster rate than the water table can be recharged. As cities and suburbs grow, more water gets consumed, groundwater recharge land is paved, and groundwater levels drop. A future concern maybe too little water for drinking and other groundwater uses.

In 1997, the Dane County Regional Planning Commission (DCRPC) completed a "Regional Hydrologic Study", in conjunction with federal and local governmental partners. The report assessed better methods to identify the existing and potential impacts of urban development, groundwater withdrawals and interbasin water diversions on Dane County's lakes and streams and groundwater. The DCRPC also has produced

Groundwater Contamination Risk Maps, Well Protection Zones, and inventories of surface and subsurface pollution sources specific to areas in Dane County.

In addition, a Dane County groundwater flow model was developed. Two very interesting results have come out of this model. First, the study showed that the source of the groundwater for drinking water wells in the county, including the City of Madison's deep public water supply wells, comes from rain infiltrating through the land located within the county boundaries. There is no deep underground river bringing clean water to Dane County from far outside the county! The model showed that groundwater protection really does start at home for Dane County. While intensive groundwater studies have not been conducted for most of the Basin counties, the results are likely to be the same. It's local land use that dictates the quality and quantity of water supply wells.

Second, the model helped assess headwater areas of small urban streams where groundwater levels have been declining and affecting stream discharge rates. In some headwater reaches, the stream base flow has been impacted due to the combination of increased well water pumpage and impervious area. Declining groundwater levels and base flow changes in some Basin areas indicate that ample groundwater cannot be taken for granted, especially where there's increasing urban growth. Other counties in the Basin are assessing ways to develop more detailed water resource assessment tools.

## Groundwater Monitoring

Public drinking water wells undergo regular testing by the state, county, municipality or community for bacteria and other contaminants. These results are available to the public through the DNR, your local community water supply department, and other agencies.

✧ For additional groundwater information from Wisconsin Groundwater Coordinating Council see: [www.dnr/state.wi.us/org/water/dwg/gcc](http://www.dnr/state.wi.us/org/water/dwg/gcc)

Testing of private wells is generally the responsibility of homeowners. Typically, private wells are only tested when the home is sold. The DNR recommends that homeowners test their well water annually for bacteriological and nitrate contamination. The well should also be tested if there is a change in taste, odor, or color of the water. Contact your local health department or DNR water supply staff for information on well water testing.

In 1988, the DNR began assigning a Wisconsin Unique Well Number to all newly constructed private and municipal wells. Existing wells, when sampled by the DNR for water quality, are also given a unique well number. With each well number, the geologic, well construction, and water chemistry data is recorded. The information is available to homeowners and municipalities. The information can assist in maintaining a safe, dependable water supply for homeowners. For more information on the Wisconsin Unique Well Numbering program contact the DNR local water supply staff.

County health and sanitary staff and UWEX County agents often also provide area well water screening programs to county residents. In addition, many other federal, state and local agencies do groundwater monitoring. These include the USGS, WGNHS, DATCP, and the Groundwater Resource Center at the University of Wisconsin Stevens Point. They monitor groundwater quality in community and private wells for a multitude of water quality parameters.

Protecting water supply aquifers is where prevention is both health and cost effective. Using pollution prevention land use practices, conserving water use, and maintaining groundwater infiltration are essential to preventing groundwater contamination and protecting irreplaceable groundwater aquifers.

## The Good News!

Most community wells in the Basin have excellent records of producing safe drinkable water for their patrons. Data shows that over 90% of the community wells have few water quality problems. The percentage of wells with bacterial or radium contaminants ranges between 3%-10% percent, depending upon the year. The data also shows that no chemical contaminant violations occurred. Chemical contaminants include arsenic, asbestos, chromium, mercury, nitrate, pesticides, herbicides, industrial chemicals and gasoline related compounds. The DNR continues to work with public water supply facilities to ensure that all people on public wells are supplied with the cleanest, safest water possible.

Many communities are setting up Well Head Protection Areas. A Well Head Protection Area protects public wells from contamination by controlling land uses in the recharge area. Many people still think that their municipal water supply source is a long distance away - beyond their ability to protect it. To date, 16 cities in our Basin are protecting their community wells by regulating land use in local water source areas.

Homeowners are beginning to recognize that the source water for their well is impacted locally - such as their actions on their own land. The DNR works with private well owners on routine water quality and well issues as staff resources allow. Most effort is focused on significant area-wide contamination problems in private wells. Some Basin counties are participating in the DNR's County Delegation Program to increase protection of drinking water supplies in their counties. Dane County works with the DNR to ensure that private and community wells are inspected and unused wells are properly abandoned.

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## WHAT YOU CAN DO . . .

-  Join the Basin Groundwater Issue Team  
Call the Rock River Basin Educator  
(920) 674-7295
-  Urge your local community to join the Well Head Protection Program
-  Properly abandon unused wells. Never dump any improper materials down a well.
-  Test your private well for bacteria and nitrates once a year.

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## TO LEARN MORE ...

-  Geology information from the U. S. Geological Service:  
<http://geology.usgs.gov>
-  Groundwater quality and publications:  
[www.water.usgs.gov](http://www.water.usgs.gov) (type in keywords and then click on search)
-  "Threats to Groundwater" -  
WI Natural Resources Magazine:  
[www.wnrmag.com/supps/1999/aug99/threats.htm](http://www.wnrmag.com/supps/1999/aug99/threats.htm)
-  Atrazine Contamination Areas:  
WI DATCP (608) 224-4501
-  Groundwater and wells:  
WI DNR Bureau of Drinking Water and Groundwater (608) 266-0821