



Rights or Fights

Learning Objectives: Students will: (1) explain the four doctrines of groundwater use law, (2) compare and contrast doctrines of groundwater use law and (3) decide a groundwater case based on the groundwater use law.

Subjects: Environmental Education, Science and Social Studies

WMASs: EE: B.8.16, B.8.22, B.8.23, D.8.4

SC: F.8.10

SS: E.8.11

Grades: 9 (and up)

Materials:

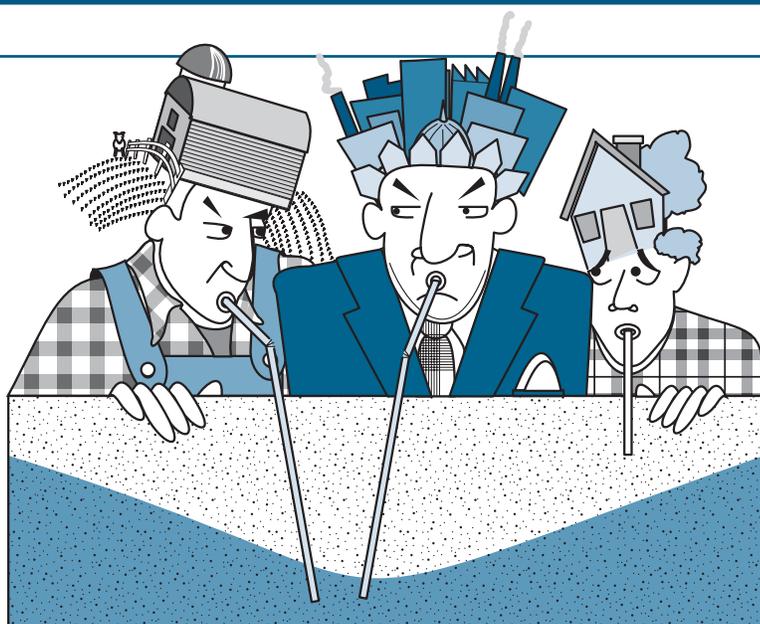
- ❖ Groundwater Law activity sheets

Background: Who owns groundwater? Who has the right to use it? How much can they use? Should they be allowed to change its quality? Can water rights be sold? As with any limited resource, we must have rules and laws to regulate groundwater use and protect its quality. Making groundwater laws is not easy. Courts and lawmakers must consider competing uses, water availability and water quality. Laws must evolve as uses, availability and quality change.

Groundwater rights involve two separate issues, **WATER USE** (quantity) and **WATER QUALITY**. In Wisconsin, groundwater quality is generally covered by legislative law. Legislative law is created by the State's legislative or administrative processes. Legislative laws include constitutions, treaties, statutes, administrative rules and regulations, and ordinances.

Groundwater quantity laws, on the other hand, are generally based on "common law." Common law is law which is developed through court case decisions. A judge establishes societal values as law by issuing decisions in cases that he/she hears. Common law may change as societal values change. This activity focuses on the evolution of Wisconsin's groundwater common law.

Over time, four doctrines of groundwater use law have evolved in the United States. Each state treats groundwater conflicts differently, relying on one or more of the following doctrines as the basis for its groundwater use law.



1. English Rule:

Groundwater use is a property right. Under this doctrine, a landowner has the right to use the water under his or her land at any time and for any purpose. The landowner may also sell or allow others to use his or her water. This rule grew out of the belief that groundwater movement could not be understood and that landowners couldn't anticipate the consequences of pumping groundwater.

2. Reasonable Use Rule:

Groundwater use is a property right. But water may only be used for "reasonable" purposes. A property owner may use the water on the land from which it came or elsewhere, as long as his or her use is reasonable in comparison to the water needs and uses of his neighbors.

3. Correlative Rights Rule:

All landowners in an area have a right to use groundwater. The amount of water each landowner can use depends on the amount of land he or she owns. The landowner cannot pump more than his or her share of water, even for use on his or her own land if other water users don't have enough water to meet their needs.

4. Appropriation Rule:

Sometimes called the rule of "first in time, first in right." Groundwater rights under this doctrine are not connected to land ownership. A person has a right to use groundwater if he or she has obtained

it and put it to a beneficial use such as irrigation, mining, manufacturing, power generation, raising fish, watering farm animals, household or recreational uses. (Water uses may be assigned priority.) Water may be used on the land from which it came or from elsewhere. Appropriation rights may be sold or given to others.

Under the Appropriation Doctrine, in times of water shortage, those who have used the water longest (i.e. those who have the earliest "appropriation date") may use all the water they have used in the past and newcomers may be left with little or no water. If a person stops using his share of water for a beneficial purpose, he or she may lose the right to use the water at all.

With a better understanding of groundwater movement and the water cycle, there has been a general trend from viewing groundwater as **private property** to recognizing it as a valuable **public resource**. The two Wisconsin landmark cases used for this activity, *Huber v. Merkel* and *State v. Michels Pipeline*, illustrate this trend. Another recent trend in groundwater use law is increased legislation rather than a dependence on case law.



Until 1974, Wisconsin's groundwater law was based on the English Rule. In 1903, a Wisconsin Supreme Court decision (in *Huber v. Merkel*) established that a landowner has an absolute property right to use groundwater under his/her land. The judge determined that a landowner may use his or her water for any purpose, including malicious waste.

As you can probably imagine, the 1903 decision was heavily criticized, but the English Rule stood until 1974, when the State took *Michels Pipeline Construction, Inc.* to court for harming local wells and building foundations when they dewatered soil for construction of a sewage pipeline. The Court in *State of Wisconsin v. Michels Pipeline* determined that such injury could be considered a "public nuisance." The 1903 decision was overruled as the judge found in favor of the State on the basis of a Modified Reasonable Use Rule. This doctrine is the basis of Wisconsin's groundwater use common law today. (*Huber v. Merkel* and *State v. Michels Pipeline* are outlined in greater detail on Rights or Fights activity sheet.)

Groundwater use is still considered a property right under Wisconsin's Modified Reasonable Use Rule, but a landowner may withdraw and use groundwater only for beneficial purposes and only if pumping does not cause unreasonable harm to his/her neighbors. "Unreasonable" harm includes lowering the water table, reducing *artesian* pressure and direct effects on water levels of streams and lakes.

Procedure:

1. Explain the four doctrines of groundwater rights law.
2. Read aloud *Huber v. Merkel* from activity sheet. (It may be helpful to explain flowing artesian wells.)
3. Discuss *Huber v. Merkel*.
 - ❖ Why did Mr. Huber take Mr. Merkel to court?
 - ❖ What is a flowing artesian well?
 - ❖ How did Mr. Merkel's actions affect neighboring wells?
 - ❖ What did the State Supreme Court decide in this case?

- ❖ On what groundwater doctrine was the Court's decision based?
4. Read aloud *State of Wisconsin v. Michels Pipeline Construction, Inc.* from activity sheet.
 5. Discuss *State v. Michels Pipeline*.
 - ❖ Why did the State take *Michels Pipeline Construction Co.* to court?
 - ❖ What did dewatering the soil do to local wells and properties?
 - ❖ What did the State ask that the company do to correct this problem?
 - ❖ What did the Court decide in this case?
 - ❖ On the basis of what groundwater doctrine was this case decided?
 - ❖ What is the difference between this doctrine and the one used to decide *Huber v. Merkel*? What are the similarities?
 - ❖ How would this case have been decided on the basis of the old English Rule Doctrine?
 - ❖ How did the *State v. Michels Pipeline* case change the course of groundwater use law in Wisconsin?
 6. Ask students to imagine that they're on the 1903 Wisconsin Supreme Court. Work in small groups and assign a scenario (a–c on the activity sheet) to each group. Tell students that they are responsible for deciding *Huber v. Merkel*. Complete the appropriate section of your activity sheets.
 7. As a class, complete scenario *d*.
 8. Discuss your answers.
 - ❖ How would the case have been decided using Wisconsin's Modified Reasonable Use Doctrine? The Correlative Rights Doctrine? The Appropriation Doctrine?
 - ❖ Which doctrine do you think is the most fair for deciding scenario *d*? Why?

- ❖ Do you think water availability influences the groundwater doctrine followed by individual states? If so, how?
- ❖ In some states groundwater and surface water laws are based on different doctrines. What problems might result if a state used the Appropriation Doctrine for its surface water and the English Rule for its groundwater? (Hint: think about the water cycle!)

Going Beyond:

1. Invite an attorney or other Wisconsin water law expert to discuss laws pertaining to groundwater quality in Wisconsin. Discuss *State of Wisconsin v. Michels Pipeline*. What laws would the Court need to consider if the State's complaint was groundwater contamination by the construction company?
2. Wisconsin follows the modified Reasonable Use Doctrine. Research and report on a state that follows the English Rule, Appropriation or the Correlative Rights Doctrine. How is this state different from Wisconsin? What historical and/or environmental factors do you think influenced groundwater use laws in that state?
3. Collect newspaper and magazine articles on groundwater-related issues in Wisconsin. Using a map of the state, make a display of issues by location. Discuss related groundwater laws, personal costs, responsibility, solutions, etc.
4. Watch the Wisconsin Public Television video *Water Rich Water Poor* and discuss and compare groundwater quality and quantity issues in different parts of the state. See the back of the Groundwater Study Guide packet cover letter for information on the video. See if your school library or public library has a copy.
5. Collect newspaper and magazine articles about groundwater-related issues in a western state (e.g. California or Colorado). Using a map of the state, make a display of issues by location. How are the problems similar to those in Wisconsin? How



are they different? Compare personal costs, responsibility, solutions, etc.

6. Research and report on which governmental agencies (municipal, county, state, and federal) regulate and protect groundwater. How do these groups work together? Discuss roles that other groups play (for more information, see *Groundwater: Wisconsin's Buried Treasure*).

7. Research and report on how water resources have influenced the history of your community. How has water helped your community develop? Has groundwater played a special role? Many areas of Wisconsin are known for having “healthful” spring water. Is part of your community’s history related to spring water? How does your community feel about protecting groundwater?

8. Groundwater is important in the production and processing of many Wisconsin products such as cheese, beer and paper. Investigate some of these products. How much water do they use? How clean should the water be? Are there laws or regulations that govern the quality of the water they use?

Trouble in Paradise

Learning Objectives: Students will: (1) determine the source of groundwater contamination in the mythical town of Paradise using knowledge gained from previous activities, (2) discuss the implications of groundwater contamination in Paradise and (3) recommend possible solutions to the groundwater contamination problem in Paradise.

Subjects: Environmental Education, Science, Health Education and Social Studies

WMASs: EE: A.8.4, A.8.5, B.8.10, B.8.15, B.8.17, B.8.21, B.8.23, C.8.2, D.8.1

SC: A.8.6, B.8.6, C.8.6, E.8.1

HE: A.8.2, G.8.3

SS: A.8.1, A.8.11, D.8.11

Grades: 7–9 (and up)

Materials:

- ❖ Trouble in Paradise handouts
- ❖ colored pencils—red, blue and green

Background: In this activity, wells in the mythical town of Paradise have been contaminated with volatile organic compounds (VOCs). VOCs are a group of commonly used chemicals that evaporate, or “volatilize” when exposed to air. Since they dissolve many other substances, VOCs are widely used as cleaning and liquifying agents in fuels, degreasers, solvents, cosmetics, polishes, drugs and dry cleaning solutions. VOCs are found at airports and service stations; machine, print and paint shops; electronics and chemical plants; dry cleaning establishments; and in household products. Two common VOCs—1,2-dichloroethylene and trichloroethylene—are referred to in this activity.

When VOCs are spilled or dumped, some will evaporate and some will soak into the ground. Once in the soil, VOCs can be carried deeper into the ground by percolating rainwater. If they reach the water table, VOCs can persist for years because the cool, dark, low-bacteria environment does not promote decomposition. If VOCs in groundwater migrate to nearby wells, they can end up in someone’s drinking water.

At least one VOC has been detected in about 2,500 drinking water wells in Wisconsin. Over 80 different VOCs have been found in Wisconsin’s groundwater, with trichloroethylene being the VOC most commonly found. Some 770 private or public water supply wells have had concentrations of at least one VOC above a Wisconsin groundwater standard.

Some VOCs can harm the central nervous system, liver and kidney. For these types of health effects, researchers can determine a “no-observable-effect level”—a maximum VOC dose that does not produce any effect in exposed experimental animals. This “no-observable-effect level” is further reduced by a safety factor, which ranges from one tenth to one ten thousandth (depending on the strength of scientific evidence). From this number state groundwater standards are established.

Some VOCs (such as trichloroethylene) are known or suspected carcinogens (cancer-causers). State groundwater standards for carcinogens in drinking water are conservatively set so that lifetime consumption of the water will cause no more than 1 to 10 additional cancers for every million persons exposed. Additional information on how Wisconsin ground-

water quality standards are developed can be found in Wisconsin’s groundwater law, chapter 160, Wis. Stats., at: legis.state.wi.us/statutes/1993/93stat0160.pdf. Chapter NR 140, Wis. Administrative Code, contains the groundwater quality standards that have been adopted in Wisconsin. NR 140 can be found online at: legis.state.wi.us/rsb/code/nr/nr140.pdf.

Federal drinking water standards (Maximum Contaminant Levels) are set in a similar manner by the U. S. Environmental Protection Agency. Check out epa.gov/safewater/standards.html for information on how federal drinking water standards are developed.

Several factors influence a well’s vulnerability to VOC contamination. One factor is the distance between the well and the source or sources of contamination. Another factor is time. Groundwater usually moves very slowly and it can sometimes take years for a spilled contaminant to reach nearby wells. The time and distance contaminants must travel are extremely important because many wells which presently show no contamination may eventually become contaminated by spills that have already occurred. In other words, we may not know the full effects of contamination we already have caused for many years to come (For more information, see *Groundwater: Wisconsin's Buried Treasure*).

There are two options for dealing with VOC contamination. The well owner can either construct a new well or treat water from the contaminated one. Treatment of the well water has the benefit of removing contaminated water from the ground. Both options are expensive. Drilling a new municipal well can cost as much