

WISCONSIN GROUNDWATER: LAW, PROBLEMS, PROPOSALS

by

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Abstract

Wisconsin water law has developed with little, if any, recognition of the hydrologic cycle. Courts and legislatures have dealt with water depending upon physical location and thus created legal distinctions and classifications of water which are contrary to hydrologic fact.

Today it is generally recognized that all water is part of an interdependent and continuous cycle. Despite such knowledge, Wisconsin has developed and solidified legal classes of water and separate doctrines for water which perpetuate obsolete factual premises.

The objective of this study is to make proposals for a groundwater law which could be incorporated into a water code dealing with all water, and thus abolish artificial legal distinctions based upon the location of water.

The approach taken to arrive at this objective was to examine the influence of Wisconsin surface water doctrines on groundwater law, attempt to identify legal and hydrologic problems with respect to groundwater, and study the case and statutory law of other states to determine how such states resolve disputes involving groundwater.

The study shows that some riparian states have taken a new look at groundwater and its relationship to surface water. Through legislation, distinctions between the two have been abolished.

The study also revealed that recent decisions of the Wisconsin Supreme Court have overturned long standing law regarding groundwater and surface water through adoption of a reasonable use rule. The constitutionality of a statute requiring a permit to divert surface water was also upheld. These factors taken together with the legislative enlightenment of other states could indicate a willingness on the part of the court to accept legislation which treats all water as an invisible part of the hydrologic cycle and a proper exercise of the police power.

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I. INTRODUCTION

Water is abundant in Wisconsin, and, availability of the resource has to a large extent dictated growth and development of the State. The resource provided the first avenues for exploration, crossroads for settlement, and power for primitive industry. While water was important to the early settlement of the State, it now has become vital to future development. The changes that have occurred in our society on both a national and state scale have placed added emphasis on the maintenance of good water quality. With the event of new technological achievements, our natural resources are being exploited at an ever accelerating rate. Our population is increasing and congregating in large urban areas. We no longer have a continent to subdue but a quality of life to protect. Our society has moved to a plateau of unparalleled prosperity which has as its trappings, central air-conditioning, automatic washers, dishwashers, and automatic lawn sprinklers. According to Earl F. Murphy, "every element of modern life has cojoined to increase the diversity and intensity of use on the water resource."¹

SURFACE WATERS

The Wisconsin Department of Natural Resources has documented 10,355 inland lakes in Wisconsin which contain 929,119 acres of water.² Most of these lakes are located in the Northern part of the State in the headwaters of the St. Croix, Chippewa-Flambeau, Wisconsin and Wolf river systems. In the South, most lakes are in the Fox-Wolf, Illinois-Fox and Rock River basins.³ In addition to inland lakes, the State is bounded by Lake Superior on the north, Lake

Michigan on the east and the Mississippi River on the west.

Seven principal river systems drain the interior of the State.⁴ Wisconsin lies in two major drainage systems and approximately 70% of the State area drains to the Mississippi River with the balance of the drainage to the St. Lawrence River through Lakes Superior and Michigan.⁵ While much is known about Wisconsin surface water, groundwater, with its great abundance and potential, has been largely ignored.

GROUNDWATER

With the exception of portions of the Central Sand Plain Province, Wisconsin has a large supply of underground water. The volume of groundwater in Wisconsin is estimated to contain 900 cubic miles, more than 100 times the yearly discharge of all Wisconsin streams.⁶ Despite the large volume of groundwater available and its present and potential value, little is known about the resource compared to the data compiled on surface water. Possibly this is due to the greater visibility and usability of surface water.

Generally, groundwater is easily available, at low cost, and of sufficient quality for municipal, industrial, rural and recreational use. With growing demands on the water resource of the State this valuable source of water can no longer be ignored. It must be actively studied to learn of its movement, occurrence, and distribution, so that sound plans may be made for the management of the resource.

There is a close relationship between ground and surface waters. Many Wisconsin lakes are land locked with no surface outlets

and are actually visible parts of the groundwater table in low lying areas.⁷ Groundwater is constantly being diminished by flow to lakes, streams and by pumpage. It has been estimated that approximately 27,000 cubic feet per second of groundwater seeps into streams to maintain their base flows.⁸ In 1970, groundwater withdrawals were estimated to be about 3% of the groundwater release to streams.⁹

Groundwater is the principal source of water for Wisconsin farms and municipalities. The exception to this is the populous Southeastern part of the State where most water is drawn from Lake Michigan. As of 1973 there were 650 public water utilities in the State, of which 625 utilized groundwater and served a population of nearly 1,570,000.¹⁰

USES OF WATER

Because of its abundance and availability, water has been a dominant factor in the development of Wisconsin. Like other resources, water gains value only when it is used, and it is the use of water which characterizes development. Basically, water use can be grouped into four broad overlapping categories: municipal, industrial, rural and recreational.

Municipal

Municipal use of water is increasing rapidly, spurred by growing population and technological progress which brought us air conditioners and many other thirsty innovations. Municipal use of water is not limited to so-called domestic or household uses but

also includes such services as firefighting, street cleaning and supply of water to industries. In 1959 total municipal pumpage from ground and surface supplies was approximately 370 mgd (million gallons a day).¹¹ The figure had risen to 444.4 mgd by 1965¹² and totaled 480 mgd by 1970.¹³

Industry

Use of water in industry takes many forms depending upon the various production processes employed. Some common industrial uses are power generation, cooling, cleaning and other related activities. While much water used by industry is supplied by municipalities, a significant portion is self-supplied. Self-supplied water accounted for 3,600 mgd in 1960¹⁴ with an increase to 5,600 mgd by 1970.¹⁵

Rural

Rural use of water for domestic use, livestock and supplemental irrigation has increased over the years. A total of 144 mgd was the estimated pumpage for domestic and livestock use in 1960 with 130 mgd being supplied by groundwater. In the same year Wisconsin had 41,000 irrigated acres which received an estimated 15.3 mgd with 12 mgd being supplied by groundwater.¹⁶ By 1970 domestic and livestock pumpage had risen very slightly to 145 mgd but by this time 100,000 acres were under irrigation and pumpage had jumped to 52 mgd.¹⁷ In ten years the amount of irrigated land had more than doubled while the water usage for irrigation had more than tripled.

Recreational

While other states claim to be "water wonderlands" and "land of 10,000 lakes," Wisconsin offers a wealth of water based recreation. The annual tourist stampede to Wisconsin attests to the recreational opportunities provided by our lakes and streams. Swimming, boating, fishing and related activities require good water quality such as is found in the State. Not only does water quality provide aesthetic enjoyment but because of its impact on tourism, the quality of the waters of the State have a direct impact on the State's economy. Tourism is a major State industry; in 1974 revenues totalled \$3.25 billion and 17,000 jobs were created.¹⁸ Protection of our water resources is vital to this industry.

HYDROLOGIC CYCLE

In order to get a proper perspective of the water resource in the State, we must understand the nature and occurrence of water. The earth is surrounded by a water layer called a hydrosphere, in which water exists in liquid, solid and gaseous states.¹⁹ It is found in the air as well as above and below the surface of the earth. Commonly we recognize rain, snow and steam as examples of water as a liquid, solid or gas. The occurrence of water in its various forms is continuous, interdependent, changing and moving. Water falling as snow changes to a liquid when it melts and moves either into or over the surface or is evaporated back to the atmosphere as water vapor by the sun's energy. The changes of form which water undergoes are both partly responsible for, and partially caused by the movement of water in this cycle. The move-

ment of water may be rapid as in the case of falling rain or the flow of a swollen stream. Movement may also be slower as with water flowing in groundwater. The fact that all water is constantly changing state, is in continuous motion, and interdependent is the basis of the hydrologic cycle.

In theory the hydrologic cycle appears to be quite simple. The sun shines on a body of water, be it a lake, stream, or puddle and causes water to evaporate. The water vapor rises into the atmosphere until it is cooled and condenses forming clouds which may result in precipitation. The precipitation falls to earth replenishing water bodies which are the source of further evaporation, thus continuing the cycle.

On closer examination, however, the hydrologic cycle takes on some complexity. The precipitation released by the clouds may fall toward earth but some will be evaporated before reaching the surface. Other precipitation will fall on the roofs of buildings, vegetation, and pavement where it is intercepted and collects into puddles and pools to be quickly evaporated without entering the land based portion of the cycle.

Precipitation not intercepted reaches the ground where it either soaks into the soil (infiltration), flows over the surface (surface runoff) or remains on the surface in ponds and puddles (surface storage). If the precipitation infiltrates, it moves into the soil to become part of the soil moisture, some of which will be removed by evaporation or vegetation usage, called transpiration. Taken together the processes of evaporation and transpiration are known as evapotranspiration. Should the precipitation travel deeper

into the earth, through the soil mantle, to the groundwater table it is said to be percolate. Water which becomes groundwater can be retained for years or longer. It will eventually be removed from the ground by flowing into bodies of surface water where it is evaporated or by upward movement to the soil surface to be evaporated or transpired.

All water is involved in a continuous self-sustaining cycle. This cycle does not always run smoothly and is capable of interruption. In desert areas where rainfall is infrequent the cycle is irregular. Rains may fall upon large water bodies and never touch the land surface. The cycle can also be affected by man's activities such as weather modification, dam building, marsh draining and irrigation. These activities have the result of increasing or decreasing stream flow, raising or lowering water tables and increasing or decreasing evaporation loss.

Occurrence of Groundwater

Groundwater is primarily derived from precipitation which has percolated down into the zone of saturation. Only a small amount is obtained from other sources. Hydrologically a distinction is made between soil moisture which exists below the surface of the earth and groundwater which is part of the sub-surface water in the zone of saturation beneath the water table. Groundwater does not include soil moisture in the zone of aeration.

By way of illustration:

. . . If a bucket were filled with dry sand and about a quarter of a bucket of water were poured over the sand, the water would completely fill the spaces between the grains of sand upward from the bottom and form a zone of saturation. Water sticking to the sand grains above the zone of saturation would be soil moisture in the zone of aeration. The boundary line between these two zones is the water table. In other words, if a hole was pushed through the dry sand into the saturated sand, the level of water standing in the hole is the water table. In simple model form, you have just drilled a well into a bucket of groundwater.²⁰

While groundwater is available in large quantity we must understand that it is influenced to a great extent by the geology and climate of an area. Climatic factors such as temperature, precipitation, humidity, and solar radiation influence evapotranspiration, and runoff. In Wisconsin between 28 and 32 inches of precipitation fall annually, with the average annual runoff in streams and rivers ranging from 6 to 20 inches.²¹

Geological factors such as the type and nature of rocks in which groundwater is found and flows through will have an impact on its occurrence, amount available, movement, rate of flow and quality. Geologically there are three major groups of rock formations, unconsolidated sediments, consolidated sediments and massive rock.²² Unconsolidated sediments such as glacial fill and alluvial fill are the most productive water bearing formations due to their porosity and permeability which permits ease of flow through the formation and storage of groundwater.

Granite, a massive rock formation is generally a poor aquifer due to its lack of porosity, although water is often stored in cracks in the formation.²³

There are five principal aquifers or water-bearing geological formations in Wisconsin.²⁴ These major groundwater provinces provide or have the potential to provide access to 900 cubic miles of water.²⁵

II. WATER LAW

DEVELOPMENT

Laws are the rules of conduct which a society sets for itself through its institutions. The development of law is compelled by need, either real or imagined, felt by society. A society living in a landlocked country feels no need for laws creating a navy, but the rumblings of an aggressive neighbor can bring legislation providing a strong army. Until man colonizes the moon it is doubtful that anyone will recognize any reason for interplanetary laws. The law of water, like all law, grew out of need.

The law of water has been developing at a fairly rapid rate in the last ten years. Water has been the subject of broad federal and state legislation in response to the growing public concern over pollution and other closely related environmental issues. However, prior to this recent surge of legislation the development of water law has been slow and, in the light of our present science,

almost stagnant. It is now apparent to our society that the conservation and management of our water resource is a vital public concern and one which we must understand more clearly.

Early development of water law dealt first with surface waters as they were visible, accessible and most easily converted to use. As water law developed, classifications of water evolved which were used as a basis for further legal doctrines and distinctions. Generally water is classified as surface water, diffuse surface water, and groundwater. Groundwater is usually further classified as underground streams which flow in a defined channel, percolating groundwater which seeps and oozes through the sub-surface strata without a definite channel and springs. These legal distinctions have no factual basis in the physical universe according to Professor Charles E. Corker, who states that "the law has not yielded to the science of hydrology" and still perpetuates "myths and misinformation."²⁶ The legal distinctions of water have come under much criticism particularly as knowledge of the resource grows. At a National Groundwater Quality Symposium, Stanley M. Greenfield, Assistant Administrator of Research and Monitoring with the Environmental Protection Agency stated, "I think that it is clear enough for anyone to understand. Water is water--a basic natural resource, whether it is on or under the surface of the earth."²⁷

While the definitions lack physical reality, it must be remembered that the law developed in ignorance of many hydrological facts and that men administering the law are limited by the facts

and the extent of their knowledge. Many early legal decisions regarding groundwater appear to be unwarranted in light of the science of today, but at the time the court's decision was sound in view of the limited knowledge available. The only other course open to the courts would have been to speculate as to the facts regarding groundwater and base law on such speculation. Additionally, the law developed to punish crimes, resolve civil suits and adjudicate rights, not undertake water resource management.

Harold E. Thomas, in *The Conservation of Groundwater*, stated with respect to legal doctrines concerning water:

The legal concepts concerning water, which set the permissive limits of development, have necessarily been founded upon the hydrologic information available at the time they were formulated and thus reflect the incompleteness of scientific knowledge to a degree. The hydrologist can build from scratch in the area of his most profound ignorance. The specialist in water law has a more difficult job, because legal concepts have been developed even when the hydrologic facts and the underlying physical principles were not known.²⁸

The legal distinctions which separate water into classes appear to be arbitrary when it is recognized that all water is part of one cycle. In order to better understand the influence of nonstatutory legal distinctions and doctrines on the water resource we should discuss them briefly.

SURFACE WATER DOCTRINES

Riparian Doctrine

In the United States there are two basic prevailing water law doctrines, the doctrine of riparian rights and that of prior appropriation. Wisconsin is rich in water resources and as a result the basis for its water law is the riparian doctrine. The riparian

doctrine is the foundation of most water law in states east of the Mississippi. The prior appropriation doctrine prevails, for the most part, in the more arid western states.

Basically, the riparian doctrine provides that a property owner whose land is adjacent to a natural body of water has a right to use the water so long as his use is reasonable. The right accrues to the owner of riparian land and is an incident of ownership. The right is not dependent upon whether or not the water is used, and nonuse will not cause a loss of the riparian owner's water rights.

As between competing interests of riparian owners along a watercourse there are two principle theories of water allocation, the natural flow theory and the reasonable-use theory.

Natural Flow Theory

The natural flow theory provides that it is the right of a riparian owner on a watercourse to have the water maintained in its natural state without material diminution in quantity or impairment of quality. Early Wisconsin cases seemed to indicate that the natural flow theory was accepted in Wisconsin.²⁹ However, it appears that the Supreme Court was "merely indulging in preliminary observations" which were modified and the reasonable use rule applied.³⁰ In the case of A.C. Conn Co. v Little Suamico Lumber Manufacturing Co. the Wisconsin Supreme Court held:

To say, therefore, that there can be no obstruction or impediment whatsoever by the riparian owner in the use of the stream or its banks, would be in many cases to deny all valuable enjoyment of his property so situated. 'There may be, and there must be, allowed of that which is common to all a reasonable use.'³¹

If the natural flow doctrine were literally followed, little use could be made of water since maintaining its natural state without material diminution in quantity or quality would probably be impossible. Clearly any consumptive use of water would be prohibited and any diversion of water by a riparian would diminish the natural flow of the stream. Under this rule the natural state of the water is the norm and deviation is a violation of the law. This rule gives an amount of certainty to the law but tends to promote existing uses of water to the detriment of progress.

Reasonable Use Theory

In Wisconsin the "natural flow doctrine" has been modified by the doctrine of "reasonable use". This doctrine provides that a riparian owner may make reasonable use of the water flowing past his land but may not interfere with the same right to reasonable use of other riparian owners. The use of the water must be reasonable under all circumstances and in all situations.³² This doctrine provides that the only determinant of riparian rights is reasonable use. Since reasonableness by itself is incapable of definition it must be determined in each case by the particular facts of that case.³³ While the reasonable use theory does lend uncertainty to the law, it is characterized by flexibility which permits an expansion of water use, provided it is reasonable. Despite the language of the Wisconsin Supreme Court in early cases with reference to the natural flow doctrine, it appears that the reasonable use doctrine prevails in Wisconsin. The Attorney General has stated, "no riparian owner has an absolute right to the flow of all the water

in its natural state, but instead his right is limited by the right of the upper riparian to make a reasonable use. . . ."³⁴

Diffuse Surface Water

Thus far the riparian theories discussed have application to surface water found in watercourses. Wisconsin, however, further classifies surface water as diffuse surface water, or water found on the surface in places other than watercourses.³⁵ Since precipitation which causes such water is intermittent, the water has no permanent source with which to establish or maintain a watercourse.³⁶

Until recently, controversies over diffuse surface water were decided by application of the "common enemy rule". This rule provided that a landowner could deal with diffuse surface water as he desired, without regard to the harm caused others. Diffuse surface water was regarded as a "common enemy",

. . . which each proprietor may fight off as he is able or as he will, either by retention, diversion, repulsion, or alternated transmission, so that no cause of action arises from such interference even if some injury occurs causing damage.³⁷

The "common enemy" rule was subject to several modifications in Wisconsin and it can be seen from the above definition that the emphasis of the law was on attempts to expel rather than use such water. The "common enemy rule" prevailed in Wisconsin until the 1974 decision of State v. Deetz.³⁸

In this decision the court adopted the reasonable use rule as codified in the Second Restatement of the Law, Torts. Today, liability will attach to a property owner for damages caused by his diverting surface waters onto the property of others if his

action is either "intentional and unreasonable" or unintentional and otherwise actionable under principles governing liability for negligent or reckless conduct, or for abnormally dangerous conditions.³⁹

Prior Appropriation Doctrine

The riparian doctrine met the needs of Wisconsin and other Eastern states but was not accepted in the arid West where the doctrine of prior appropriation developed. In an area where water was scarce and acute water needs existed for growth and development, a water rights doctrine based on riparian land ownership would have made development of valuable nonriparian land difficult if not impossible. As a result of the need to use available water for the best result the prior appropriation doctrine developed. This doctrine provided that water rights were acquired by taking water and converting it to a beneficial use. Unlike the riparian doctrine, ownership of land was immaterial to water rights. Water rights could be lost by nonuse and water could be used off of riparian land. Conflicts between competing users were resolved on a basis of first in time, first in right. In prior appropriation jurisdictions water rights are public initially and do not become private rights until after appropriation for a beneficial use.

The appropriation doctrine has been modified from state to state in various ways but in the beginning, the method of acquiring water rights merely required an intent to divert water for a beneficial use and the act of so doing. The water right was perfected when the water was actually diverted to the beneficial use. The

first beneficial user had a superior right to a later user.

The prior appropriation doctrine has now evolved to the point where most western states require appropriators to apply for permits. An appropriator is required to avoid waste and some states, such as Colorado,⁴⁰ have established a priority of use whereby some uses of water are given preference over other uses of water.

The prior appropriation doctrine has no application in Wisconsin but is briefly discussed here to show the full scope of development of surface water law based upon the physical location and condition of water.

Surface water doctrines are important to the study of groundwater because the Courts have applied doctrines of watercourses to groundwater when it appeared that it was essentially like a watercourse. When this is desirable in the sense that surface and groundwater are hydrologically interconnected the courts made the application for the wrong reason. The application of surface water doctrines to groundwater was not based on the hydrologic interconnection but on the somewhat mythical basis of beds, banks and defined channels.

III. GROUNDWATER DOCTRINES

Early groundwater law and doctrines developed almost entirely before the science of hydrology came of age. As a result the hydrologic cycle has had little influence on its development until recent years. From a purely practical standpoint, and foregoing a hydrologic definition, groundwater is not a particular type or class of water but is merely water which is beneath the surface of

the earth. Like all water, it is the result of the operation of the hydrologic cycle.

Generally, groundwater is divided into two classes in most jurisdictions,⁴¹ underground streams and percolating water. Underground streams are those which move in defined or definite channels and rights to use such water are treated essentially the same as a surface stream's whether in a riparian or appropriation jurisdiction. "Percolating waters are those which seep, ooze, filter and otherwise circulate through the subsurface strata without definite or defined channels."⁴² In most states it is presumed that groundwater is percolating until it is shown that the waters flow in a definite channel. There are four basic groundwater doctrines in use today, the English rule, the reasonable use, correlative rights and appropriation.

ENGLISH RULE

The English or common law rule grew out of the idea that the ways of groundwater were too unpredictable and mysterious to regulate rights of competing parties to such water. A landowner's right to percolating water under his land was set forth in the English case of Acton v. Blundell, in 1843:

That the person who owns the surface may dig therein, and apply all that is there found to his own purposes, at his free will and pleasure; and that, if, in the exercise of such right, he intercepts or drains off the water collected from the underground springs in his neighbor's well, this inconvenience to his neighbor falls within the description of *damnum absque injuria*, which cannot become the ground of an action.⁴³

Under the English rule percolating waters are considered the property of the owner of overlying land. The landowner may make whatever use of the water he desires despite the fact that his use may cut off the flow of such waters to adjoining users and deprive them of their use. An owner of land could use all percolating water he could extract from the land, for whatever purposes he needed it, whether on or off the land. The English rule developed before the science of hydrology came of age. It was assumed that percolating water was a part of the land in which it was found and a landowner owned the water in the same way he owned other minerals. Today it is doubtful that a hydrologist would agree that the ways of groundwater are unknown, mysterious or unpredictable. Initially, the English rule was adopted by many states but in the course of time it was modified by the reasonable use or American rule, due to the harsh results which often arose under the English rule.

REASONABLE USE

Under the reasonable use doctrine, limitations were put on the right of a landowner in his use of percolating waters. He could not act maliciously, waste the water, or be negligent in its use. He was required to act reasonably. This rule gives the landowner the right to use the percolating water but in exercising his right he has a duty to act reasonably and use the water on the land from which it is withdrawn. The question of what is a reasonable use is incapable of general definition and must be determined on all facts and on a case-by-case basis. Generally, uses which are excessive, wasteful, negligent, or which serve no useful purpose

but pollute the groundwater are found to be unreasonable.

CORRELATIVE RIGHTS

The reasonable use doctrine was further modified by the doctrine of correlative rights. Prior to 1903, California applied the English rule of absolute ownership to controversies involving percolating waters. The English rule was repudiated in the case of Katz v. Walkinshaw⁴⁴ in which the California Supreme Court adopted the rule of correlative rights. The chief features of this doctrine are that all landowners overlying a common source of percolating water have a co-equal right of reasonable use on their overlying lands. In times of sufficient supply, each owner may withdraw water to meet his needs, but when a shortage occurs, each owner is limited to the quantity of water needed to meet his reasonable needs subject to the equal rights of all other overlying owners.⁴⁵ Surplus water over and above reasonable requirements of the overlying owners may be used off of the overlying land. The correlative right is an incident of land ownership and the rights cannot be lost by nonuse.⁴⁷

The doctrine of correlative rights and reasonable use are very similar and some authors claim the correlative rights doctrine is merely an extension and refinement of the rule of reasonable use. If the doctrine of correlative rights were literally applied, each landowner would get a right to use percolating water in proportion to the relation his land bears to all other overlying land. If **A** owned 10 acres of land overlying a 100 acre aquifer he would be entitled to 10% of the water in the aquifer. If this doctrine were

strictly applied, the courts would permit A to develop and use only 10% of the water, even though no other landowners used or planned to use their portion of the water. If, however, A's use of the water were reasonable and beneficial it seems doubtful that the court would prohibit A from using more than 10% of the water. Most courts would hold a view of correlative rights which would not permit the other landowners to take action against A for making use of water to which they have a right but chose not to develop. From a reasonable use standpoint the Court would hold that A's use is reasonable and does not interfere with any uses of other landowners (they are making no use). In such situations it appears that there may be little difference between the two doctrines in terms of the results they produce. However, where competition for percolating water is keen, the correlative rights doctrine has a means of allocation of the water while the reasonable use rule would require a balancing of one use against another.

APPROPRIATION

The appropriation doctrine is applied to groundwater in most Western states. The doctrine does not differ with respect to surface or groundwater and it is generally declared to be the prevailing law in a state constitution or statute which states that all waters, whether surface or underground, belong to the people of the state and are subject to appropriation for beneficial uses.⁴⁸

IV. WISCONSIN GROUNDWATER LAW

JUDICIAL DECISIONS

Huber v. Merkel

For over 70 years the controlling groundwater case in Wisconsin was Huber v. Merkel⁴⁹ in which the Wisconsin Supreme Court adopted the English absolute ownership rule. Huber and Merkel were neighboring farmers who lived over an aquifer which supplied water to some 15 farms through approximately 30 artesian wells. There was sufficient water for all users as long as wells were capped when not in use. Merkel had two wells on his land and despite a well-capping statute enacted in 1901, he maliciously allowed his wells to run at full capacity at all times and wasted the water. Merkel had no intention of using the water, his only purpose was to stop his neighbors' wells from flowing and he was successful. Huber sought an injunction requiring Merkel to cap his well and claimed that Merkel's actions were a nuisance. The trial court held that Merkel could use water for his domestic and farm use but was prohibited from wasting the water. On appeal the Wisconsin Supreme Court found for Merkel stating:

. . . If the waters simply percolate through the ground, without definite channel, they belong to the realty in which they are found, and the owner of the soil may divert, consume, or cut them off with impunity. If, on the other hand, the subterranean waters flow in a defined channel, the rules which govern the use of surface streams apply; but the presumption is that the waters are percolating waters until it is shown that they are supplied by a definite, flowing stream.⁵⁰

In dealing with the question of Merkel's malicious intent the court found:

. . . it seems clear that it must be held that the appellant had a clear right at common law, resulting from his ownership of land, to sink a well thereon, and use the water therefrom as he chose, or allow it to flow away, regardless of the effect of such use upon his neighbors' wells, and that such right is not affected by malicious intent.⁵¹

This case has been severely criticized by other jurisdictions, text writers, and by dissenting justices of the Wisconsin Supreme court.⁵² This case stood for the proposition that not even malice could affect a landowner's absolute right to the use of groundwater. The holding in Huber v. Merkel has been called "one of the most extreme applications of the English view of absolute ownership of groundwater. . ."⁵³ The court in Huber followed the common law which held in awe the mysterious, unpredictable, and unknowable forces at work beneath the surface of the earth which made it impossible to adequately and fairly promulgate rules governing such water. However, while the common law was based on a limited knowledge of the movement and occurrence of groundwater, the court in Huber possessed a fairly accurate and complete knowledge of the facts concerning the resource. The court stated:

. . . scientific knowledge on the subject of artesian wells in general and the artesian wells of Wisconsin in particular is now so complete and certain as to leave no room for doubt, and of such facts courts may take judicial notice.⁵⁴

Thereafter, the court went on to describe an artesian well in a detailed and knowledgeable manner. The court appears to have been fully aware of the movement of the water and the geology of the

area and yet made no attempt to arrive at a decision which reflected these facts. In citing its reason for following the common law doctrine the court declared:

In this state, both by the Constitution and judicial decision, it is settled that those parts of the common law which were in force at the time of the adoption of the Constitution and were not inconsistent therewith, remained in force until changed by the Legislature.⁵⁵

In dealing with the well capping statute the court held that the only way to change the law by legislative action was pursuant to an exercise of the power of eminent domain or the police power. Clearly, the power of eminent domain was not involved, and in holding the statute to be an invalid exercise of the police power the court said:

It does not even pretend to conserve any public interest, its purpose is to promote the welfare of one citizen, by preventing his neighbor from using his own property.⁵⁶

It is difficult to reconcile this view of the court with the fact that in protecting Merkel's absolute right to use groundwater, he, in his exercise of that right, was able to prohibit Huber and others from using their property and exercising their rights to groundwater. This was the law of the jungle, Huber was legally defenseless, his only recourse being to drill a deeper well and do unto Merkel.

The court also distinguished between Indiana statutes which prohibited the waste of natural gas and the Wisconsin well capping statute. The court, in reviewing the Indiana cases cited the large population and industries which relied on natural gas for fuel, as well as the use of the gas for heating state buildings. The court concluded that the gas supply was limited and a proper subject of

the police power since if it were properly conserved and protected it would last many years and "increase" the comfort and happiness of the people at large." If this was true of natural gas, how much more so is it true of water? Groundwater, the court said was "constantly being renewed," and apparently this served as the basis for the distinction between the two statutes. There could be no application of such a statute to percolating water in Wisconsin as it would be an invalid exercise of the police power. The utter waste of a valuable resource did not concern the court in water-rich Wisconsin; meanwhile, Huber's well was dry.

One must wonder if, after rendering the Huber decision, the court members returned to their Madison homes to enjoy hot showers and relax with a scotch and water, ironically supplied by groundwater. Did they experience an "increase" in their "comfort and happiness"? In Wisconsin it was clear, the Hubers of the state would have to look out for themselves.

Shortly after this decision was rendered H. P. Farnham issued one of the most searing criticisms of it.

There is absolutely no principle on which that decision can be founded. It is opposed to good morals, good sense, and all common law principles which are analogous subjects, and the later and better cases are beginning to recognize correlative rights in percolating waters and confine landowners to a reasonable use of it.⁵⁷

Fond Du Lac Cases

The Huber decision continued to be the law in Wisconsin for over 50 years and did not trouble the court again until 1956 in the "Fond Du Lac cases".⁵⁸ Both cases grew out of the same incident.

The city of Fond Du Lac was faced with growing population and a projected water shortage. After conducting surveys to establish the availability of groundwater the city purchased four acres of land in the Town of Empire to sink a test well and also obtained options to purchase 1100 additional acres, some of which was located in the town. Residents of the town were concerned that large city consumption of groundwater would cause the water in their wells to be lowered.

The town reacted with ordinances which required town board approval to drill wells with a casing in excess of 6 inches or to sell or use water from town wells on other than premises in the town from which the water was withdrawn. The ordinances were dealt with in the Empire case, the city seeking to have the ordinances declared invalid.

The Menne case was brought by well owners in the town and surrounding areas whose wells might be affected by the city wells. An injunction was sought against the city on the ground that the city wells would cause irreparable harm to their water rights. It was contended by the town residents that the city wells would make it necessary to sink deeper wells and add more powerful pumping equipment.

The Supreme Court held the ordinances invalid in the Empire case because the water supply of the State is a matter of statewide concern, and the interest of the people of the State generally is paramount to the interests of the people of the Town of Empire. The ordinances were held to be in conflict with State law which permitted municipalities to acquire water sources and

necessary transmission lines beyond their corporate limits.⁵⁹

While invalidating the town ordinances, the court did state that water use regulations on a statewide basis might be upheld:

The legislature has further shown its interest in the matter by appropriating money for a study of the subject by a groundwater working group of the natural resources committee of state agencies. Other studies are being made by the United States geological survey and the University of Wisconsin. Presumably, when the legislature receives what it considers to be sufficient information, it will enact laws that will permit some state agency to regulate the use of subterranean and other waters.⁶⁰

The Menne case was decided with the Court rejecting the reasonable use rule and reaffirming the English absolute rights doctrine set forth in Huber v. Merkel. The court refused to engage in judicial legislation claiming that change in the law, if made, should come from the legislature. The court noted, as the Huber court had, that unless changed by the legislature, common law in force at the time the Constitution was adopted and not in conflict with the Constitution remained in force. This was done while the court stated that "common law was confused in 1903." The court also was aware of the criticism that the Huber decision had drawn. Once again, faced with the issue of conflicts involving competing users of groundwater the court reaffirmed Huber. Despite a damning dissent by Justice Fairchild, the court did nothing.⁶¹

State v. Michel's Pipeline Construction, Inc.

The English absolute rights doctrine set out in Huber remained the law in Wisconsin until 1974 when the Supreme Court decided State v. Michel's Pipeline Construction, Inc.⁶² The case arose when the Sewer Commission of Milwaukee County contracted

with the Pipeline Company for the construction of a 60 inch diameter sewer under land owned by Milwaukee County. The county granted a 20 foot easement to the Sewer Commission for the installation of the sewer. Dewatering the soil to a depth sufficient for tunneling was required to install the sewer and this lowered the groundwater table from which neighboring landowners drew their water from private wells. The neighboring landowners complained that the dewatering caused some wells to dry up and decreased the capacity and quality of others. It was also alleged that the dewatering of the soil caused subsidence of the soil which resulted in cracked driveways and basement walls. The State sought to have the defendants construct the sewer so as to not create a nuisance and to eliminate or ameliorate the hardships imposed on the neighboring landowners. At the trial court level it was held that Huber v. Merkel applied and there could be no cause of action for interference with groundwater in Wisconsin.

On appeal, the Supreme Court outlined many of the criticisms of the Huber decision⁶³ and in discussing that portion of the decision which provided that even malice could not divest a landowner of his absolute right to the use of groundwater, the court stated:

It is generally conceded that this aspect of the case was probably a misstatement or at least an extension of the cases which had applied the common law or "English rule" up to that time.⁶⁴

The court traced the common law rule and stated that its basis was the belief that the ways of groundwater were too mysterious and unknowable to establish laws regulating the rights to such waters. However, the court pointed out:

Even in 1903, when the Huber v. Merkel case was written, the awe of mysterious unknowable forces beneath the earth was becoming an outmoded basis for a rule of law.⁶⁵

The court declared that today, hydrology had advanced to where it was possible to establish a cause and effect relationship between withdrawing groundwater and the level of a water table in an area and adjudicate liability in accord with due process.⁶⁶ The court further determined:

It makes very little sense to make an arbitrary distinction between the rules to be applied to water on the basis of where it happens to be found. There is little justification for property rights in groundwater to be considered absolute while rights in surface streams are subject to a doctrine of reasonable use.⁶⁷

In overturning Huber v. Merkel, the court said that "stare decisis"⁶⁸ was not an inflexible restraint but only a cautionary rule and that the proposed change in the rule is not confiscatory in nature, but merely brings groundwater in line with the general limitation on all use of property.⁶⁹ The court also noted:

. . . the basic inconsistency in saying that a person has a property right in underground water that cannot be taken without compensation, for, when he exercises that right he is actually taking his neighbor's property without compensation.⁷⁰

The court overruled Huber by finding "it necessary to adopt a rule of law more in harmony with present scientific and legal principles."⁷¹

After overruling Huber the court turned its attention to a review of the groundwater doctrines of English absolute rights, reasonable use and correlative rights. The court rejected all of them as unsuitable stating, "Wisconsin chooses not to adopt any of the three rules here discussed."⁷² Instead, the court adopted the rule set forth in Tentative Draft No. 17 of the Restatement of Torts, as proposed on April 26, 1971:

Section 858A. Non-Liability for use of Groundwater
Exceptions:

A possessor of land or his grantee who withdraws groundwater from the land and uses it for a beneficial purpose is not subject to liability for interference with the use of water by another, unless,

- (a) The withdrawal of water causes unreasonable harm through lowering the water table or reducing artesian pressure,
- (b) The groundwater forms an underground stream. . .
- (c) The withdrawal of water has a direct and substantial effect upon the water of a water course or lake;⁷³

The court also quoted the analysis of Section 858A:

The rule adopted in this topic can be described as the American rule with its protection broadened. It gives more or less unrestricted freedom to the possessor of overlying land to develop and use groundwater and it permits the grant and sale of groundwater to persons who need water but do not possess the land overlying it. It does not attempt to apportion the water among users except to the extent that the special conditions of underground streams and interconnected ground and stream water permit it to be done on a rational basis. It gives the protection of the American rule to owners of small wells harmed by large withdrawals for use elsewhere, but extends that protection in proper cases to harm done by large withdrawals for operations on overlying lands.⁷⁴

The court adopted a rule which "preserved the basic expression of the rule of nonliability to use groundwater beneath the land", formulated exceptions regarding unreasonable harm, "by giving protection to owners of small wells harmed by large withdrawals for use elsewhere", "and extended that protection in proper cases to harm done by large withdrawals for operations on overlying lands."⁷⁵

The court stated that reasonableness and unreasonable harm will vary depending upon prevailing conditions. With the decision in State v. Michel's Pipeline Construction, Inc., Wisconsin was removed from the small minority of states clinging to the English rule.

Classifications of Groundwater

As indicated earlier, Wisconsin law dealing with groundwater involves three divisions of groundwater, underground streams, percolating water, and springs. If it is determined that groundwater is an underground stream then it is subject to the reasonable use doctrine like surface water. The presumption is that all groundwater is percolating and that one who alleged the existence of an underground stream must prove it. Many authors and scientists, however, believe the underground stream is a myth which is incapable of proof:

To conceive of "underground streams" and to apply riparian law rather than groundwater law to them is to demonstrate an ignorance of the intimate interrelationship between the large and small openings through which groundwater moves in the zone of saturation. The large openings, caverns and caves, for example, are not independent "streams"; they are an integral part of the water-holding and water-conducting network. In any event, and as a practical matter, courts place a heavy burden of proof upon one claiming that an "underground stream" exists below the surface of his soil, a burden he is not likely to be able to meet in the light of modern day hydrological knowledge. So, as indicated earlier, underground streams are of no real importance in Wisconsin's groundwater law.⁷⁵

Percolating water is now subject to the "American rule with its protection broadened", as set out in the Michel's decision.

The Wisconsin courts have never decided a conflict with regard to a spring. Until the Michel decision, rules governing a spring depended upon the origin of the spring. If it was determined that the source of the spring was an underground stream the reasonable use doctrine would apply. If, however, the source was percolating water, then absolute ownership would apply. After per-

colating groundwater reached a point of discharge on the surface, the reasonable use doctrine would probably apply.

With the English absolute rights doctrine abolished in Wisconsin it appears that should a conflict arise involving a spring the "broadened American rule" would apply, as the court, if it takes its hydrology seriously, will not find the source of a spring to be an underground stream, but percolating water.

STATUTORY GROUNDWATER LAW

Well Capping Statute

In the area of statutory law the Wisconsin Legislature has done very little to regulate the use of groundwater. In 1901 the Legislature enacted a statute to regulate the artesian water supplies which provided:

Section 1. Where there are two or more artesian wells in any vicinity or neighborhood, one or more of which are operated or used by any person or owner, the person or owner of such well shall use due care and diligence to prevent any loss or waste or unreasonable use of any water therein contained or flowing from the same, as would deprive or unnecessarily diminish the flow of water in any artesian well, to the injury of the owner of any other well in the same vicinity or neighborhood.

Section 2. Any person who shall needlessly allow or permit any artesian well owned or operated by him, to discharge greater quantities of water than is reasonably necessary for the use of such person so as to materially diminish the flow of water in any other artesian well in the same vicinity, shall be liable for all damages which the owner of any such well shall sustain.⁷⁷

This was the "well capping" statute which was declared by the court in Huber to be an invalid exercise of police power which did not conserve a public interest but promoted the welfare of one citizen

by restricting the use that a neighbor may make of his property. With the invalidation of the well-capping statute, no attempts were made to regulate use of groundwater between parties until 1945.

High Capacity Well Statute

By this time the problems of increasing population and demands on the groundwater source were becoming evident as the heavy pumping in many areas caused a decline in groundwater levels. The result of this problem was the enactment of a high-capacity well law, which provided that a permit from the State Board of Health be obtained by anyone building a new or reconstructed well or well field which would have a capacity in excess of 100,000 gallons a day.⁷⁸ The only ground upon which an application for a permit could be denied was that the well would "adversely affect or reduce the availability of water to any public utility in furnishing water in or to the public."⁷⁹ This statute did not regulate rights to groundwater between competing private users and interference with a private owner or nonpublic utility was not a ground for denying the permit. It does, however, represent an infringement on private rights to use water since a private party could not sink a high capacity well if it would interfere with a public utility.⁸⁰

According to a report by the Natural Resources Committee of State Agencies, the Board of Health has never denied a permit for a well under this statute but has issued conditional permits. In addition, the statute has been construed by the Board of Health to have no application to a dug pit as this is considered not a well within

the meaning of the statute. Several attempts were made to change the definition of wells to include pits but were unsuccessful. The administration of the high capacity well law was passed to the Department of Resource Development in 1966,⁸¹ and in 1967 its administration became the responsibility of the Department of Natural Resources.⁸²

Other Statutes

The Wisconsin statutes also provide that the Department of Natural Resources is charged with publishing and enforcing:

. . . minimum reasonable standards and rules and regulations for methods to be pursued in the obtaining of pure drinking water for human consumption and the establishing of all safeguards deemed necessary in protecting the public health against the hazards of polluted sources of impure water supplies intended or used for human consumption, including minimum reasonable standards for the construction of well pits. It shall have the general supervision and control of all methods of obtaining groundwater for human consumption including sanitary conditions surrounding the same, the construction or reconstruction of wells and generally to prescribe, amend, modify or repeal any rule or regulation theretofore prescribed and shall do and perform any act deemed necessary for the safeguarding of public health.⁸³

Pursuant to such authority the Department has regulated well construction and pump installation,⁸⁴ public wells,⁸⁵ water works,⁸⁶ and operators.⁸⁷ While Chapter 162 of the Wisconsin Statutes relating to pure drinking water and the attending regulations deal with groundwater they are concerned not with the determination of rights between competing users but with public health and safety.

In addition to the above, the Legislature has enacted a statute regarding groundwater in the form of springs which provides:

(1) The general public shall have the right to use and take water from any spring, creek or running water that may be found running in or across the limits of any public highway, provided that his section shall not interfere with the tunneling or piping of water for the purpose of draining or improving lands on either side of such highway.

(2) Any person who shall wantonly interfere with the free use of the water from any spring or in any creek or stream running across or in any highway shall be guilty of a misdemeanor and be liable to any person damaged thereby for all damages sustained.⁸⁸

V. GROUNDWATER PROBLEMS

In order to determine the type of legislation required to regulate groundwater for maximum beneficial use, it is necessary to examine problems concerning the resource. As previously indicated, law arises out of the needs of society whether real or imagined. What then are problems affecting the groundwater resources that should be addressed by any legislation on the subject?

QUALITY

Contamination is a basic problem for a water resource but in Wisconsin, with limited local exceptions, groundwater is of good quality. However, while it is presently of good quality, it is coming under increasing stress. Recent chemical analysis of public drinking water supplies indicated that of 53 groundwater supplies sampled, only one contained elements in excess of maximum standards.⁸⁹ According to Laboratory of Hygiene statistics quoted in the Natural Resources Council of State Agencies report of 1973, 5.2% of 1969-1970 samples of public groundwater were bacteriologically unsafe.⁹⁰ The most common chemical contamination problems on a statewide basis are the high levels of iron, manganese and hardness in public well supplies.

The problems of water quality of private groundwater systems is not well documented as very little information is available since Wisconsin has no regular program for analysis of these wells.⁹¹

One of the greatest threats to groundwater quality is inadequate septic tank disposal systems. It has been shown that septic systems contribute significant amounts of nutrients to groundwater.⁹² One of the problems the State faces with respect to septic systems is the unsuitability of the soil in many areas to absorb liquid wastes. According to the NRCSA, every county in the State has unsuitable soils which will not support septic systems to meet the criteria of the State code. The NRCSA also cited the pressure put on the DNR by landowners, land developers and local officials, to accept alternate methods of disposal for which no facts exist upon which to prove their efficiency or effectiveness. The septic tank problem is further complicated by the granting of variances by county officials despite the fact that specific sites are not suitable for absorption of liquid wastes.⁹³

With the increase of population, greater problems with respect to solid waste disposal are becoming apparent. The problem is where can the site for such disposal be located and what are the hydrologic implications? The sanitary landfill and dump site are the most widely used waste disposal methods in Wisconsin. As of 1972, 1430 licenses were issued not counting small sites such as on farms.⁹⁴ The potential for groundwater and surface water pollution from such sites is great and authorization for a site should be granted only after a thorough study of the nature of the

hydrology and geology of an area. Such factors as the extent and characteristics of surface deposits, the position of the site in the groundwater flow and the depth to the water table are factors which require careful evaluation on the selection of a disposal site.⁹⁵

Rural well waters in certain areas of the State have relatively high nitrate contents, and research indicates that farm animal wastes are a probable source of the contamination. Wisconsin farm animals produce an estimated 160,500 to 210,500 tons of manure per day. "This waste is roughly equivalent to that of a human population of 50-70 million people if a similar rule of thumb is used."⁹⁶ One of the basic problems confronting groundwater quality with respect to waste disposal sites, whether liquid or solid, is the fact that site selection is primarily influenced by such factors as economics and convenience rather than hydrologic considerations.

The interrelation of groundwater and surface water is becoming increasingly understood and the possibility that contaminated water may pass in either direction between a stream and adjacent ground must be recognized. In some instances, faulty sewers permit the intrusion of groundwater into the sanitary sewer main.⁹⁷ In recent years methods of disposal of wastes on land by means of irrigation and lagooning systems to eliminate discharge have been developed. However, study is necessary to determine the effects of such practices on the groundwater resource. In addition to any facts on potential for pollution, there is a lack of adequate knowledge regarding the characteristics of industrial wastes as well as

the raw materials which are used by industry from which the waste results.

The hazard to groundwater by improper treatment of discharged effluent is important because of the high vulnerability of shallow aquifers to pollution. This particularly is true where unconsolidated aquifers are in hydrologic connection with a stream and well withdrawals induce surface water to enter the aquifers. If we are to manage our water resources efficiently we must protect shallow aquifers. Economically such aquifers are most desirable for water supplies because they are close to the surface. Yet the very fact that makes them desirable also makes them highly susceptible to contamination by man's use of the land surface.

The quality of groundwater will vary from area to area depending upon geologic and climatic conditions as well as man's influence through his use of the land. The groundwater quality problems which have been briefly discussed here are chiefly hydrologic in nature. They arise by virtue of man's use or abuse of the environment and the resources within that environment. To date Wisconsin is fortunate in having a good quality groundwater resource. Encouraging as that may be, however, it must be recalled that groundwater moves slowly beneath the surface of the earth. While local incidents of contamination are infrequent at the present time, they may be the first signs of chronic pollution which has been undetected for years. Once groundwater contamination is discovered it must be corrected and there is no indication that such correction will be easy. It is essential that the principles and occurrence of groundwater contamination be understood by the public, the legislature and

the courts. Thus far, not only are the hydrologics of groundwater pollution not understood but often local officials do not even anticipate the end result of many common waste disposal practices.

QUANTITY

It has been estimated that there is 900 cubic miles of groundwater beneath the state of Wisconsin.⁹⁸ Overall, quantity is not a problem. In some urban areas such as Milwaukee and Fond Du Lac, however, closely spaced wells and high pumpage rates have caused water levels to be lowered by several hundred feet.⁹⁹ Heavy pumpage in the Chicago area has also lowered water tables in the southeastern region of the State. The problem of quantity in these areas is caused by the tremendous demand on the water resource created by heavily populated and industrialized cities.

Central Wisconsin has been called a water poor area due to the geologic formations of the area which are not capable of storing a large amount of water.¹⁰⁰ While the hydrologic and geologic conditions in the Central Wisconsin area differ from those in the urban areas of southeast Wisconsin, the plight of both areas is the same, potential water shortages. These shortages may be caused by huge demand which lowers water tables in one and by a lack of sufficient underground water-bearing geologic formations in the other.

In urban areas, plans are required to assure that water requirements are met consistent with efficiency from the viewpoint of both economy and quality. In water-poor areas more must be learned of the relationship between ground and surface waters to insure

that water needs are met by conjunctive use of both surface and groundwaters.

STATE v. MICHEL'S PIPELINE CONSTRUCTION CO., INC.

As previously indicated, the Wisconsin Supreme Court adopted the rule set forth in Tentative Draft No. 17 of the Restatement of the Law Second, Torts, /to govern groundwater.¹⁰¹ In doing so, the court overruled Huber v. Merkel¹⁰² which set out the English absolute rights doctrine. With the adoption of the new rule, what problems facing efficient management of groundwater were resolved and which remain?

What the Decision Does

Adopts "Broadened American Rule"

Under the rule of Huber, a landowner could pump groundwater from his well in any amount, for any purpose, even to the extent of ruining his neighbor's well by draining water from beneath his neighbor's land. With the adoption of the "broadened American rule" of Tentative Draft No. 17, liability would attach if the withdrawals caused unreasonable harm to a neighbor through lowering the water table or reducing artesian pressure.

Under the "broadened American rule", a landowner making use of groundwater, even a reasonable use, is liable for unreasonable harm caused to a neighbor. Previously, under Huber, the use made of water, even malicious waste, was immaterial to the absolute right of a landowner to make any use of the resource he chose. The pre-

sent rule requires that a beneficial use be made of the water in order to excuse a user from liability. It further provides that even if the use is beneficial, liability will attach if the beneficial use causes unreasonable harm.

This rule abolished the English absolute rights rule, but in doing so went beyond the rule of reasonable use. Under reasonable use, if a landowner made a reasonable use of the groundwater he was not liable for any harm caused to wells of adjoining property owners. The primary obligation placed on the user was that his use of the resource be "reasonable".

A landowner was unprotected against the large processing plant on adjoining land which made reasonable use of groundwater and dried up his well in the process. The reasonable use rule in addition to requiring that a use be reasonable, also required such use of water to be on the land from which it is withdrawn. This provided protection from municipalities and public utilities which purchased land to sink wells and transport the water extracted back to the city for use. While this did protect the well of the private landowner from municipal pumpers, it had the effect of restricting the efficient use of water and prohibiting access to water of those who were not overlying landowners.

Facilitates Development of Groundwater Potential

The "broadened American rule" gives more or less unrestricted freedom to the possessor of overlying land to develop and use ground water, and it permits the grant and sale of groundwater to

persons who need water but do not possess land overlying it.¹⁰³

This is essential for proper development of the resource in an efficient and economic manner which will promote effective groundwater management.

Address Problem of Groundwater Access

The "broadened American rule" deals with the problem of access to groundwater which was inherent in a rule of law which required the use of water on the land from which it was pumped. The decision recognizes the need for groundwater use off the land from which it is extracted if the resource is to be efficiently developed. The court went further, however, and addressed the problem of access to groundwater in a fundamental economic sense. If A and B are neighboring farmers using groundwater and A sinks a second well which causes a lowering of the water in B's well, increasing B's pumping costs, the court has said that the placing of the burden of costs on one party or the other would be determined by reasonableness. Again the criteria of reasonableness is a definitional problem, but the court recognized that groundwater which is not economically exploitable by an overlying landowner is an exhausted resource for all practical purposes.

What the Decision Doesn't Do

Apportion Water

The broadened American rule of Michel's does not answer the question of how much water an overlying landowner is permitted to

use. The case does not attempt to apportion water among users.

In the Analysis of the rule it is stated:

It does not attempt to apportion the water among users except to the extent that the special conditions of underground streams and interconnected ground and stream water permit it to be done on a rational basis.¹⁰⁴

The court states that "the formulation of the exception to this basic rule recognizes that there is usually enough water for all users so that apportionment is not necessary."¹⁰⁵ Fortunately for Wisconsin, it is basically true that there usually is enough water for all, but such rule does not take into consideration that there are areas of the State where water is not in abundant supply.¹⁰⁶ The rule does give the court a basis upon which to apportion water among competing users. It is, however, questionable whether courts are able to handle the complex fact presented by situations requiring the allocation of water in large groundwater basins. Nevertheless, one of the most difficult problems facing a water user is the quantity of water that is available for use and it should be faced by the courts. Problems attending quantity are the quality of the water and its availability when needed. For example, a farmer, during the growing season needs a sufficient amount of water of proper quality. Failure to obtain the proper amount of water of sufficient quality during this critical period has led to crop losses amounting to millions of dollars. It is insufficient to state that there is "usually enough water available." Effective groundwater regulation must undertake the task of apportioning and defining rights and duties in the use of the resource.

Abolish Classes of Groundwater

In setting forth exceptions to the "broadened American rule" the Tentative Draft No. 17 states that a landowner is not subject to liability for withdrawals for beneficial use which interferes with another's use of the water unless, "(b) The groundwater forms an underground stream. . ." ¹⁰⁷ The rule adopts the idea of an underground stream, an idea which has been discredited from a hydrologic standpoint for many years. In virtually all jurisdictions the presumption exists that groundwater is percolating and yet the myth of the underground stream remains. As stated by Professor Jacob H. Beuscher, noted water law authority from the University of Wisconsin Law School, in his testimony before the State Water Resources Committee in 1958,

To conceive of "underground streams" and to apply riparian law rather than groundwater law to them is to demonstrate an ignorance of the intimate interrelationship between the large and small openings through which groundwater moves in the zone of saturation. The large openings, caverns and caves, for example, are not independent "streams"; they are an integral part of the water-holding and water-conducting network. In any event, and as a practical matter, courts place a heavy burden of proof upon one claiming that an "underground stream" exists below the surface of his soil--a burden he is not likely to be able to meet in the light of modern day hydrological knowledge. So, as indicated earlier, underground streams are of no real importance in Wisconsin's groundwater law. ¹⁰⁸

To date, the Wisconsin Supreme Court has never distinguished between artesian or percolating waters, nor has it ever found the existence of an underground stream in a controversy involving groundwater. To persist in the belief of underground streams in the face of hydrologic fact to the contrary merely prolongs

the artificial legal distinctions of groundwater and serves to confuse the law in an area of vital public concern.

Provide Certainty of Result

The "broadened American rule" causes liability to attach only in cases of "unreasonable harm". As is always the case, what is reasonable or unreasonable will vary from area to area depending upon the given circumstances. The rule would resolve the question of who is required to pay for the increased costs of pumping caused by the installation of more powerful pumps and deepening of wells resulting from the lowering of the water table by determining the reasonableness of placing the burden on one party or the other.

The present rule in Wisconsin does not provide for certainty of result in litigated matters, as the standard of reasonableness will vary from region to region depending upon the conditions there prevailing. A use determined to be reasonable in one area may be patently unreasonable and the cause of great harm in another. While the rule does not provide for certainty of result, it does provide flexibility which is necessary to meet the requirements of managing the groundwater resources. The English absolute rights doctrine was Wisconsin's long love affair with a rule that provided a certain result in groundwater controversies but the result was an unsatisfactory one. There are arguments to be made on both sides of the issue of certainty of result in groundwater litigation. However, the author believes that in

order to facilitate the development of the resource from a management standpoint the courts must make an attempt to provide results which are consistent with hydrologic facts, and therefore predictable. Merely providing for parceling out of expenses caused by increasing pumpage costs based on reasonableness will not result in efficient management or development of the resource.

STATUTORY PROBLEMS

Since the enactment of the High Capacity Well statute in 1945, it has been the source of some inconsistency in Wisconsin water law. The statute presently provides:

No wells shall be constructed, installed or operated to withdraw water from underground sources for any purpose where the capacity and rate of withdrawal of all wells on one property is in excess of 100,000 gallons a day without first obtaining the approval of the department. If the department finds that the proposed withdrawal will adversely affect or reduce the availability of water to any public utility in furnishing water to or for the public it shall either withhold its approval or grant a limited approval under which it imposes such conditions as to location, depth, pumping capacity, rate of flow and ultimate use so that the water supply of any public utility engaged in furnishing water to or for the public will not be impaired. The department may issue such general or special orders as it deems necessary to insure prompt and effective administration of this paragraph.¹⁰⁹

As can be seen, the only ground for denial of a permit is a determination that the proposed well would adversely interfere with the availability of water to any public utility in furnishing water to the public.

Should a private landowner wish to sink a high capacity well he must apply to the Department of Natural Resources (DNR) for a permit. The Department, on the basis of an investigation deter-

mines whether the well will adversely affect a public utility. The statute provides that the Department may deny, approve, or grant limited approval to the permit. In granting limited approval the Department may set conditions such as well location, depth, pumping capacity, rate of flow and the ultimate use of the water. If a landowner is denied a permit to sink a high capacity well he may excavate a pit on his land of sufficient depth to reach the groundwater table and pump. Pits have been determined not to be wells within the definition of the statute, and thus require no permit.

If, however, the groundwater pumped from the pit was not used for a beneficial purpose or caused unreasonable harm to the wells of adjoining landowners then liability would attach under the rule outlined in State v. Michel's Pipeline Construction Co., Inc.¹¹⁰ Still, the fact remains that a person denied approval to construct a high capacity well can circumvent the statute very easily and throw the issue of unreasonable harm to the courts while he continues pumping.

Many of the inconsistencies created by the high capacity well statute have been corrected by the adoption of the "broadened American rule" in the Michel's case. For instance, previously, a city could sink a high capacity well and be assured of a permit if it did not adversely affect another public utility. The fact that such well could endanger wells on adjoining land used for domestic or industrial use was immaterial. With the event of Michel's, however, the public utility would be liable for any unreasonable harm to the wells on adjoining lands.

Interestingly, when the High Capacity Well Statute was passed in 1945 it declared in Section 144.03(6):

. . . that the public health, comfort, welfare and safety requires the regulation by the state of the use of subterranean waters of the state in the manner provided in this section.¹¹¹

The statute placed restraints on the private use of groundwater. It protected a public utility from interference by a private well but there was no reciprocal protection for a private well. Thus, in the age of Huber v. Merkel there existed a law which prohibited a landowner from sinking a well and making use of the groundwater as he saw fit. The Legislature, through the use of the police power, limited the absolute right of an overlying landowner to use groundwater by authorizing the denial of a permit if the well would interfere with a public utility.

STATEWIDE APPLICABILITY OF THE LAW

In addition to separate judicial and statutory problems with existing Wisconsin groundwater law, the two problems at times combine to create a single problem. At present, groundwater laws apply on a statewide basis, no effort has been made to establish regulations which take into consideration the variety

of factors influencing groundwater in different areas of the State such as recharge rates, rates of demand or area geology. Our present statutory and judicial law is generalized in character and applies similarly throughout the State despite varying local conditions. It can be argued that the high capacity well statute gives discretion to the DNR in deciding to approve or deny a well permit and the decision will consider local conditions. But this discretion is narrow and the statute easily circumvented. From a judicial standpoint the Michel's decision requires that "unreasonable harm" be determined based upon the facts and circumstances, but this determination is made only after conflicts arise.

CLASSIFICATION OF WATER

Distinctions in the classification of groundwater presents another problem for Wisconsin groundwater law. The classification works well in theory, but in practice it ignores the fact that all water is part of the same cycle. To prepackage the law so that one may read the rules by selecting the proper carton ignores the absurdity of applying one set of laws to water flowing underground and another set the moment the same water becomes an underground stream or reaches a discharge point. Distinctions with no basis in physical fact but which must be established to meet evidentiary burdens of proof to prevail before a court or hearing examiner are arbitrary. Hydrologic opinion is unanimous that distinctions between percolating water and underground streams are without foundation in the physical universe.

Such hydrologically incorrect distinctions will be a major stumbling block to a law which can serve as a tool for groundwater management designed to promote the efficient and economical development of the resource. It should also be noted that not only are distinctions in regard to groundwater a problem but on a larger scale, the distinction between groundwater and surface water must, for the same reasons, be eliminated.

VI. OTHER STATES' RESPONSES TO PROBLEMS

As was mentioned earlier, the problems Wisconsin is experiencing with regard to groundwater are not unique. The problems of groundwater administration are fairly common and are similar in both riparian and prior appropriation jurisdictions. The basic questions of where may I sink a well, how much water can I withdraw, and of what quality are not resolved with certainty in any jurisdictions. However, in order to determine if an answer may be found for Wisconsin groundwater problems an examination of the water law of other states might be profitable.

The objectives of statutes and regulations governing groundwater vary greatly in detail and scope from state to state, and statutes dealing with water and water pollution are primarily concerned with surface water. While the laws of various states were examined with respect to groundwater it must be remembered that in most states local government units have authority to regulate the resource, and the scope of this paper does not permit the examination of such ordinances or rules. In addition, the question of the effectiveness of the state laws with respect to enforcement

has not been evaluated.

QUALITY

According to a study completed in 1973, only 13 states had water laws dealing in detail with measures to protect groundwater against pollution.¹¹² However, numerous laws and regulations of states affect groundwater pollution.

Most state statutes dealing with water quality are primarily concerned with surface water pollution and with the administrative organization of an agency which is given authority to enact and enforce regulations controlling water quality. In such legislation most states define "waters of the state", to which the laws apply. The definition in Wisconsin reads as follows:

"Waters of the State" includes those portions of Lake Michigan and Lake Superior within the boundaries of Wisconsin, and all lakes, bays, rivers, streams, springs, ponds, wells, impounding reservoirs, marshes, watercourses, drainage systems and other surface or groundwater, natural or artificial, public or private, within the state or its jurisdiction.¹¹³

The provisions of the Wisconsin definition are similar to those found in most state statutes, although some states provide exceptions to the definition.¹¹⁴

Virtually every state has regulations or statutes which deal with solid waste disposal. Most states require permits, registration and regulation of disposal siting and operation.¹¹⁵ However, not all states recognize the possibility of groundwater pollution in their statutes or refer to it in only general terms. While most of the states require a permit for disposal of wastes on public land, disposal on private land is allowed without a per-

mit if no public health hazard results.¹¹⁶

Septic tanks are also subject to regulation by most states and the regulations require permits for installation, with the permit systems used to regulate the placement of septic tanks in pollution prone areas.

In the area of well construction and regulation, statutes are generally concerned with licensing drillers and with the construction of water wells. The regulation varies from state to state and it appears that, though public water supplies are regulated, little regulation exists for private and industrial wells.

Several states have statutes governing the construction and operation of waste disposal wells, or injection wells.¹¹⁷ Missouri and Oklahoma prohibit waste disposal wells altogether, while Colorado permits such wells but allows no discharge of waste until it has been established beyond a reasonable doubt that there will be no pollution. Florida statutes require a permit for the construction and use of a waste well or drainage well and inventories of all water supply wells, and details of construction of the wells are required on wells within a one mile radius of the disposal well.

Only one state, New York, has a statutory system of classification for groundwater. The purpose of this system of classification is to prevent groundwater pollution and protect groundwaters for use as potable water. The classifications are:

1. Class GA; fresh groundwater best used as sources of potable water supply.
2. Class GSA; saline groundwater of possible use for conversion to fresh potable water.
3. Class SSB; saline water having a chloride content greater than 1,000 mg/l or a total dissolved-solids

content greater than 2,000 mg/l.¹¹⁸

Any discharge of treated sewage, industrial waste, treated effluents, toxic waste or other polluted effluent which might impair the specified use of the groundwater is prohibited.

As can be seen, most states concerned with the problem of groundwater quality have taken steps to regulate the uses of land which pose a threat to groundwater. It is clear from the statutes of other states that the general legislative trend toward resolving the problem of groundwater quality lies not only with enacting laws which deal directly with the resource itself, but in controlling land use which is often a causal factor in groundwater contamination.

QUANTITY

Several states have taken steps to insure that groundwater is available to users in an amount sufficient to make an efficient and economical use of the resource.

In California the doctrine of correlative rights has developed. It provides that all overlying owners have co-equal rights to the reasonable use of groundwater on their overlying lands; that surplus water above reasonable requirements may be used off the overlying land; that common supplies are apportioned to overlying owners based upon reasonable need if a shortage exists; and that rights in groundwater physically connected with a surface water source are correlated with other use rights that pertain to the common supply. This rule was adopted in the case of Katz v. Walkinshaw.¹¹⁹ Application of this rule allows apportionment of

the resource between users in times of shortages. An apportionment of percolating water was made in an area where resource was overdrawn in the case of Pasadena v. Alhambra.¹²⁰ In this case the California Supreme Court determined the "safe annual yield" of a groundwater basin and apportioned the supply of water among the water users to the extent of each user's maximum annual use in the 5-year prescriptive period preceding the suit. The court determined that the "safe annual yield" of a basin was the amount of water a basin would yield in perpetuity.

Due in part to the flexible approach shown by the court in apportioning groundwater among users and the increasing pressure being put on groundwater supplies in water-poor southern California, where aquifers were endangered by increased demand which threatened damage to the aquifers by salt water intrusion and exhaustion, the Legislature passed several laws facilitating groundwater basin management.

The Legislature has enacted statutes regulating the use of underground water, by creating underground water basin management programs.¹²¹ These grant authority to the water resources control board to enjoin harmful pumping¹²² and give the board the duty of recording all groundwater extractions in southern California.¹²³

In addition to the California method of insuring groundwater users a quantity sufficient to meet their reasonable beneficial needs, other states have laws which protect a user's quantity to a lesser degree and with less sophistication.

The Colorado Constitution provides for preferences in the use of water and states that when the waters of a natural stream are

not sufficient,

. . . those using the waters for domestic purposes shall have the preference over those claiming for any other purpose, and those using the water for agricultural purposes shall have preference over those using the same for manufacturing purposes.¹²⁴

While the Colorado Constitution refers to natural surface streams, the treatment of groundwater in Colorado requires the characterization of the resource as tributary to a natural stream or not tributary to a natural stream, that is, part of a natural stream or not part of a natural stream. It would seem that if the groundwater in question was determined to be tributary it would be subjected to preferences, and thus domestic users would be assured of some quantity while other users would have no such assurance.

It can be argued that all prior appropriation states provide for assured quantity of groundwater to the extent that a senior appropriator making beneficial use of water has a superior right to a junior appropriator, on the basis of first in time, first in right. The same can be said of the English absolute rights doctrine as well. An overlying landowner with the most powerful pump and the deepest well will be assured of a supply of groundwater. These doctrines, however, are of little assistance in the realm of enlightened water resource management which hopes to encourage maximum efficient and beneficial use of groundwater.

GROUNDWATER CLASSIFICATION

With respect to the groundwater classifications of underground streams and percolating water, the modern trend of the courts and legislatures appears to be away from such classifications.

In dealing with groundwater in Alaska, the state water code provides for no distinctions between underground streams and percolating water for the purpose of groundwater administration. The manner of perfecting a right to groundwater is the same as for surface water.¹²⁵

The Arkansas Supreme Court determined in Jones v. Oz-Ark-Val Poultry Co.¹²⁶ that the rule of reasonable use applies to groundwater without regard to any subclassification of groundwater.

Indiana has expressly refused to recognize such classifications both in case law and in statute. The Supreme Court refused to recognize the distinctions in 1864,¹²⁷ and the Indiana Legislature has defined groundwater and refused to accept any distinction.¹²⁸ For the most part, however, the great majority of states presume underground water to be percolating, yet provide for the classification of groundwater into underground streams and percolating waters.

While some states have been struggling with the problems of groundwater on a compartmentalized basis, states such as Delaware and Florida have approached the subject in a comprehensive manner which integrates surface and groundwater use.

DELAWARE

Delaware enacted a statute in 1966 which imposed broad substantive control over water use.¹²⁹ The act deals with water use, water and air pollution and use of submerged lands. The policy of the act declares that development, utilization and control of all water shall be directed to make a maximum contribution to the

public benefit,¹³⁰ and that the state, through its agencies should control the use of water so as to fully utilize, conserve and protect the water resources.¹³¹ The act also states the findings of the Legislature with respect to the development, use and control of the water, underwater and air resources of the state.¹³²

The findings of the Legislature declare: that the development, utilization and control of the water and other resources are vital to the people to insure supplies for beneficial uses;¹³³ that regulation of such resources is essential to insure beneficial uses;¹³⁴ that such regulation is required to produce beneficial uses and assure supplies for such uses;¹³⁵ that the resources must be protected and conserved to assure public recreation and conservation of wildlife and aquatic life;¹³⁶ and that protection, conservation and utilization of resources can be best realized if use of resources is restricted to beneficial uses and controlled by a State agency responsible for such resource development and utilization.¹³⁷

The legislative policy of the act is notable in three respects. It plainly states legislative objectives, makes numerous specific references to beneficial uses, and lists broad major beneficial uses.¹³⁸ The law does provide that riparian rights in existence before the law went into effect on July 1, 1966, are exempted, and thus preserves riparian rights in existence before that date.¹³⁹ The act does contain exceptions for domestic, agricultural and municipal uses, but these exceptions are small and seem to be quite circumscribed. It is clear that with the exceptions of pre-existing rights and limited exceptions, all water,

both surface and groundwater, is subject to state regulation.

The implementation of regulations under this statute are quite substantive as well as procedural. In a statement of administrative principles the regulations declare:

a. The water resources of the State are considered to be public waters and public wealth and the use of such water shall be allocated on the basis of equitable apportionment and reasonable beneficial use. Waters which flow vagrantly over land surface shall not be regarded as public waters and the owner of the land on which such waters fall or flow shall have the right to its use, provided that no damages result to other persons.

b. A right to a water allocation can only be acquired by a permit issued by the commission or by having been a reasonable beneficial use prior to the adoption of these regulations. No right to the use of water can be acquired by adverse use or adverse possession.

c. It is recognized by the commission that the water resources in and on the State of Delaware may be physically and hydrologically related and that where such a relationship exists approval of uses of such waters shall take into account this relationship.

d. The rights of the public regarding the water resources of the state are considered to be usufructuary upon approval by the commission. . .

e. Any nonwasteful use of the surplus water resources of the State shall be considered to be a reasonable beneficial and legal use. . .

f. The decision of the commission as to whether or not a use will be reasonably beneficial will be based in part on the results of special studies and compliance with the statewide comprehensive master water plan. . .

g. Allocations granted by the commission may be transferred subject to approval by the commission. . .

h. Permits issued shall be valid for a period not to exceed one year. . .140

These regulations could have been written in part by a lawyer, judge, economist, hydrologist, conservationist, businessman or bureaucrat. They plainly state the right of the public, how

private rights in water may be obtained and transferred, and how the water right is to be viewed legally. In addition, the regulations also make clear that the hydrologic cycle is part of the Delaware water law.

FLORIDA

Florida is a state which historically followed the riparian doctrine until the enactment of the Florida Water Resources Act of 1972.¹⁴¹ The legislature declared the policy of the Act was to provide for the management of water and land related resources and promote conservation, development and proper use of surface and groundwater.¹⁴²

Distinctions between groundwaters are abolished as groundwater is defined to mean "water beneath the surface of the ground, whether or not flowing through definite channels."¹⁴³ Water is defined as including surface and groundwater, diffused surface water, atmospheric moisture, artificial watercourses and impoundments, and all coastal waters within the jurisdiction of the state.¹⁴⁴ In Florida, the distinction and classification of water has given way to the hydrologic cycle. The law also provides that all waters of the state are subject to regulation under the Act¹⁴⁵ and further provides a statutory definition of "reasonable use."¹⁴⁶

The Act provides for the creation of water management districts formed as "nearly as practicable" to "hydrologically controllable" areas and which describe all water resources in such areas.¹⁴⁷ The Department is required to establish minimum flow

regulations for surface water and minimum water levels for groundwater within each district.¹⁴⁸ One of the most important powers the act confers upon the Department is the power to exercise supervisory authority over all such districts.¹⁴⁹ It is acknowledged that water problems will vary from area to area in the State in both "magnitude and complexity." Therefore, the Department is authorized to delegate to the governing boards of water management districts many powers of the Department to accomplish the purposes of the act.¹⁵⁰ The authority of the Department to delegate powers to the board of a district provides a highly adaptable approach to the management of the State's water resources. In this manner the law allows for possible local solution of a local water problem yet retains department responsibility for statewide water resource management.

In granting general supervisory power over the districts Section 373.026(7) provides:

The department may exercise any power herein authorized to be exercised by a water management district. The department shall review, and may rescind, modify, or approve, any policy, rule, regulation, or order of a water management district, except those policies, rules, or regulations which involve only the internal management of the district, to insure compliance with the provisions and purposes of this chapter.

The Florida Water Resources Act of 1972 has provided for a permit system for consumptive use which seems to abolish the doctrine of riparian rights in Florida. Unlike Delaware, which exempted water rights existing prior to the enactment of its water law, Florida put all water rights on the same level. The Florida act required all existing users to obtain permits within two

years of the implementation of the permit system. An existing user who fails to acquire a permit is considered to have abandoned his rights. The law gives no advantage to a pre-existing right over a future right. Thus, in effect, all private water rights are abolished. Without a permit from the Department or water district management board, no person may make any withdrawal, diversion, impoundment, or consumptive use of water.¹⁵¹

The section does, however, provide for an exemption for individual domestic users. Approval of a permit application requires that the proposed use be reasonable and beneficial, not interfere with a presently existing legal use, and be consistent with the public interest.¹⁵² If determined to be in the public interest, water may be used outside the overlying land or water shed from which it is taken.¹⁵³ Permits may be issued for a period up to 20 years, and the Department or water management district board is authorized to develop a reasonable system for classification of periods of duration.¹⁵⁴ The permits are issued for specific amounts of water, specific uses, subject to conditions, and may be modified and renewed, all subject to the prevailing public interest.

As has been indicated, all water users must apply for a permit to make use of the resource and failure to do so within the statutory time works as an abandonment of the water right. An existing user must be granted an initial permit within the 2-year statutory period if he makes application and his use is reasonable and beneficial under the statutory definition and is permitted under the common law of Florida.¹⁵⁵ If an existing user who fails to file a permit within the statutory time desires to re-establish

his abandoned use, he stands on the same footing as an applicant for a new use.

Wells are the objects of broad regulation under the Act,¹⁵⁶ but there are exceptions for temporary dewatering and dewatering processes.¹⁵⁷ Exemptions may be granted by the Department where undue hardship would result from compliance with the Act, provided such exemptions do not impair the intent and purpose of the Act.¹⁵⁸ An exemption is also granted a person who desires to construct a well 2 inches or under in diameter, if it is on his own property and intended only for use in a single family house.¹⁵⁹

Both Delaware and Florida are riparian jurisdictions but their respective approaches to water problems are distinct in that Delaware preserved riparian rights that existed prior to the enactment of its water law, while Florida abolished the riparian doctrine through a mandatory permit system. This system, with few exceptions, is applicable to all water users regardless of former water rights. The hydrologic cycle has been introduced into the water law of both states and the need for basing decisions on hydrologic fact has been recognized. The artificial legal distinctions with regard to ground and surface water have been abolished and the laws of both States provide for the integration of groundwater and surface water law. The states have declared water resources to be essential to the public and reduced or eliminated the private water rights which must meet the requirements of "public interest" and "reasonable-beneficial use." The questions of where may I sink a well and how much water may I use

are answered by permit systems. The permits may specify use, amounts of water, impose other conditions upon a user, be modified and are of limited duration. Important, too, each state places great emphasis, plainly stated statutory emphasis, on management, reasonable-beneficial use and public interest. It is felt this emphasis is essential.

VII. PROPOSALS FOR WISCONSIN

INTEGRATE SURFACE WATER AND GROUNDWATER LAW

The court in Lichell's stated that "it makes very little sense to make an arbitrary distinction between the rules to be applied to water on the basis of where it happens to be found."¹⁶⁰ This statement brings into focus one of the great problems with respect to water law, whether statutory or case law. Any water law which seeks to manage the water resources of the state must integrate surface and groundwater law. The problems of groundwater are the problems of all water and if we are to manage the water resources of the state for optimum benefit of all of the people we must learn to speak and act in terms of water and not groundwater or surface water. The Wisconsin courts appear, after some 70 years to have recognized that water is water, regardless of where it is found. This fact must be brought home to the legislature so that the state's water resources can be consistent with sound resource management practices and equity. To do this, the hydrologic cycle must become an integral part of Wisconsin water law.

ELIMINATE PRIVATE RIGHTS IN WATER

Any groundwater law should eliminate permanent private rights, and the right to use groundwater should be made usufructuary. The difficulty inherent in such a law is that riparian rights have been characterized as property rights which courts have held may not be taken away without due process of law. In Huber¹⁶¹ groundwater rights were characterized as "absolute property" of the overlying landowner who had an absolute right to divert the waters. The court moved away from the absolute right characterization in the "Fond Du Lac"¹⁶² cases and by implication at least, asked for legislation to regulate groundwater. In adopting the "broadened American rule" in Michel's,¹⁶³ the court said that the adoption of this rule was not confiscatory. In view of the "Fond Du Lac" cases and the decision of the court in Michel's, it would seem that legislation regulating groundwater which protected a public interest would be upheld as a valid exercise of the police power and not an invalid taking of private property. Assuming the doctrine of police power has any meaning, it would be difficult to argue that regulation of groundwater is not a matter of vital public interest within the definition of police power in view of present and projected demands on the groundwater resource.

PERMIT SYSTEM

To accomplish the abolition of permanent private rights in groundwater a permit system should be developed which requires all users to obtain a permit to divert groundwater. The issuing authority should be given the authority to set conditions on the permit such as location of the well, depth, well capacity, rate of flow and ultimate use. Permits for diversion of groundwater should be granted only upon determination that the proposed use is reasonable, beneficial, and not infringe on the interest of the public. Pre-existing rights should be given initial permits for diversion if such use is determined to be a beneficial and reasonable use. Pre-existing uses for which no permit is made within two years should be deemed abandoned and applications to revive such uses should be placed on the same footing as an application for new use.¹⁶⁴

SINGLE CENTRAL AGENCY

The authority to administer the law should be vested in a single centralized authority. At present, the Wisconsin Department of Natural Resources (DNR) is the agency responsible for the protection, maintenance and improvement of quality and management of the "waters of the state."¹⁶⁵ The DNR is currently administering a permit system which regulates diversions of surface water.¹⁶⁶ Failure to utilize the expertise of the DNR would be unfortunate as it would fragment the administrative control over a single indivisible resource at a time when ironically, legal distinctions

are being discarded. Existing Wisconsin statutory definitions of "waters of the State"¹⁶⁷ and the "powers and duties"¹⁶⁸ assigned to the DNR are sufficiently broad to permit the DNR administration of a groundwater permit system. At present, however, there have been proposals by legislators to split the DNR.¹⁶⁹

WATER MANAGEMENT DISTRICTS

In addition to granting authority to the DNR to develop and implement a permit system the law should empower the DNR to create water management districts which conform as nearly as practicable to a hydrologically controllable area. The basis for these areas could be the major drainage basins in the state or the major groundwater provinces. This is essential for the proper management of not only the groundwater resource but surface water as well. We must recognize that there is no uniform need for water or distribution of water supplies throughout the state and that if we are to make the optimum use of our water resources we must be able to plan for its use on the basis of the hydrologic and geologic area which the resource affects. This is not a difficult proposal to make as such authority to divide the state into regions already exists, and criteria for establishing the regions are given.¹⁷⁰ In looking at the regions established by the DNR pursuant to its authority, it appears, however, that while the criteria given list watersheds and river basins, among others, as factors to consider in establishing a region, it seems that the regions established by the DNR are set up with administrative and economic factors as a sole criteria.

WATER MANAGEMENT DISTRICT BOARDS

The authority to administer such districts should ultimately rest with the DNR but many DNR functions should be delegated to the boards of such districts. These boards should include considerable expertise in the area of water resources. At present the Wisconsin Statutes provide for such boards, but the boards are advisory, are required to meet at least semiannually and perform no substantive function in the actual management of water resources.¹⁷¹ If we recognize that local water problems differ, then it follows that the solutions differ. Possibly the answer to a local problem is best found by looking for a local solution. The DNR should be empowered to delegate authority to administer the permit program to local water management district boards but yet retain the power to directly effect water management in the districts. In this manner a flexible approach to a problem which varies in scope and complexity from area to area could be effected. The water management district board through authority delegated it from the DNR should be permitted to restrict extraction of groundwater from a basin to a "safe annual yield".¹⁷²

VIII. SUMMARY

In order to properly manage the groundwater resource it is essential that studies be undertaken to determine not only the existence and size of aquifers and water basins, but also the occurrence, and movement, as well as recharge and discharge rates which sources of supply are capable of sustaining. Knowledge of

such facts is essential to properly answer the questions of where can I sink a well and how much water may I withdraw?

While the proposals presented here are concrete, they allow for sufficient broadness so that further refinement is possible. A groundwater law should abolish private groundwater rights through the institution of a permit system administered by a central agency with authority to delegate necessary powers to water resource management boards, which are set up to direct the management of water resources in a hydrologically controllable area.

While the thrust of this paper has been toward proposals for a groundwater law it should be noted that such proposals would be easily adaptable to surface water. Indeed, the proposals should be incorporated into a water resources law for Wisconsin. Already the DNR administers a permit system for diversion of water from lakes and streams and this statute has been declared to be constitutional by the Wisconsin Supreme Court.¹⁷³ In answering the question of whether the statute was depriving a person of property without just compensation the court stated:

. . . we see sec. 30.18, Stats., as the state's exercise of its police power to protect public rights and to prevent harm to the public by uncontrolled diversion of water from lakes and streams. While the statute does not secure for the state a benefit not presently enjoyed by its citizens, it does seek to prevent the public harm of dry riverbeds replacing flowing streams.¹⁷⁴

If a permit system relating to diversion of surface water is a valid exercise of the police power, it would seem to follow that a groundwater permit system should likewise be so held by the court.

The time appears to have come in Wisconsin where the possibility of groundwater legislation is no longer something for scholars to write about but for legislators to act on. The Wisconsin Supreme Court has invited such legislation and implied it would be upheld in the "Fond Du Lac cases".¹⁷⁵ In Michel's¹⁷⁶ the absolute right of an overlying landowner to groundwater was abolished. Omernick v. State¹⁷⁷ established that a permit system which restricts the surface water rights of a riparian owner was a valid exercise of the police power.

The high capacity well statute,¹⁷⁸ since 1945 has restricted the right to use groundwater, even during a period of "absolute rights." The constitutionality of the statute has never been tested. If it had, presumably the court would recognize the need for regulating groundwater in the face of the needs created by growing population and increasing industrialization. The fact that population and industry were heavily dependent on groundwater would not have escaped the court, and a vital public interest would have been found making the statute a valid exercise of the police power.

This paper assumes as a basic premise that the water resources of the State are of vital concern to all of us and that no one would seriously dispute the need for the conservation and management of the State's resources. Should a dispute arise it would deal with the question of how the resources of the State can best be conserved and managed, not whether there is a need

to conserve and manage.

The proposals set forth in this paper are not intended to be the answer for every question in the area of water resource law or management. The scope of such a paper and limitations on time preclude such an undertaking. Basically this paper is an attempt to sort out some of the more frustrating problems with respect to water resources from a legal standpoint. The law of water must promote the efficient development and use of water. Legal decisions and statutes which retain artificial distinctions with regard to the water resource only hamper economic and efficient development of the resource.

Today in Wisconsin our problems with regard to groundwater are not nearly as visible as problems with surface water, fuel shortages or unemployment. For that reason, it is doubtful that regulation of groundwater will take place within the immediately foreseeable future. Laws must be enacted by legislators and they tend to focus attention on problems only after they become obvious calamities or are otherwise highly visible. Often political solutions to such problems are enacted under pressure of existing events and such solutions tend to be stopgap measures which provide only temporary relief leaving someone else to deal with the problem in the future. In dealing with problems of the ground water resource we are fortunate that for the moment, time is on our side. That will not always be the case if demands on the groundwater resource continue to grow. For the moment we

have the fleeting luxury of time, and it must be put to good use. Whatever solution is attempted with respect to the water resource, it must be one which is long term, which will anticipate problems, and yet provide for the efficient development of a resource which is of vital interest to the people of Wisconsin.

FOOTNOTES

¹Earl Finbar Murphy, Water Purity (Madison, Wis.: University of Wisconsin, 1961), p. 27.

²Department of Natural Resource Publication 7-3600, Wisconsin Lakes (1974), p. 1.

³C.L.R. Holt, Jr., K.B. Young and W.H. Cartwright, The Water Resources of Wisconsin: Wisconsin Blue Book (1964), p. 182.

⁴Ibid., p. 181. The rivers and approximate drainage areas in square miles are: Wisconsin (11,715), Chippewa-Flambeau (9,519), St. Croix (4,206), Black (2,493), Rock (5,569), Fox-Wolf (6,520), and Illinois-Fox (900).

⁵Ibid., pp. 180-181.

⁶Natural Resources Council of State Agencies, Managing Wisconsin's Natural Resources. An Intra-Agency Overview (Madison, Wisconsin, 1973), p. 48.

⁷Holt et al, Water Resources, p. 182.

⁸Natural Resources Council of State Agencies, p. 48.

⁹Ibid.

¹⁰Ibid., p. 52. By way of comparison, in 1959, 446 public water supplies drawing on groundwater served a population of 1,390,000, see Holt et al, p. 178.

¹¹Holt et al, Water Resources, p. 178.

¹²Natural Resources Committee of State Agencies, State Laws, Policies and Programs Pertaining to Water and Related Land Resources (Madison, Wisconsin, 1967), p. 59, citing U.S. Geological Survey Statistics, 1965.

¹³C. Richard Murray and E. Bodette Reeves, Estimated Use of Water in the U.S. in 1970, Geological Survey Circular 676 (Washington, D.C., 1972), p. 21.

¹⁴K.A. Mackikan and J.C. Kammerer, Estimated Use of Water in the U.S., 1960, Geological Survey Circular 456 (Washington, D.C., 1961), p. 15.

¹⁵Murray and Reeves, Use of Water in 1970, p. 24.

¹⁶Mackikan and Kammerer, Use of Water in 1960, p. 14.

- 17 Murray and Reeves, Use of Water in 1970, pp. 21, 23.
- 18 "Good Year Didn't Save Some Northern Resorts," Milwaukee Sentinel, October 15, 1975, p. 7, part 1.
- 19 In preparing the section of the paper dealing with the hydrologic cycle I have drawn heavily on R.C. Ward, Principles of Hydrology (London: McGraw-Hill Publishing Co., 1967), pp. 15-19, 238-302.
- 20 Leslie B. Mack, Groundwater Management in Developing a National Policy on Water (National Water Commission, Arlington, Va., 1971), p. 1.
- 21 Holt et al, Water Resources, p. 180.
- 22 Ward, Principles of Hydrology, p.
- 23 Ibid.
- 24 Holt et al, Water Resources, p. 187.
- 25 Natural Resources Council of State Agencies, Managing Wisconsin's Natural Resources, p. 48.
- 26 Charles E. Corker, Groundwater Law, Management and Administration, Report No. NWC-1-76-026, (Arlington, Va.: National Water Commission, 1971), p. 7.
- 27 Stanley M. Greenfield, "E.P.A.'s Role in Ground Water Protection," National Ground Water Quality Symposium Proceedings (Denver, Colorado: Aug. 25-27, 1971).
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- 29 Mohr v. Gault, 10 Wis. 455 (1860), Kimberly and Clark Co. v. Hewitt, 75 Wis. 371, 44 N.W. 303 (1890), McEvoy v. Gallagher, 107 Wis. 331, 83 N.W. 633 (1900).
- 30 Harold H. Ellis, et al, Water-Use Law and Administration in Wisconsin (Madison, Wis.: Department of Law, University Extension, The University of Wisconsin, 1970), p. 22.
- 31 74 Wis. 652, 657, 43 N.W. 660, 661 (1889).
- 32 Mabie v. Madison, 17 Wis. 1 (1863).

³³Some factors used in determining "reasonable use" have been set out in *Timm v. Bear*, 29 Wis. 254,265 (1871). Included are such factors as the subject of the use, manner of application, objective and necessity of use, previous use, impact of improvements on the stream, stream size, velocity, volume and fall of the water.

³⁴39 Wis. Op. Atty. Gen. 564,566 (1950). This opinion also lists considerations for determination of "reasonable use".

³⁵*Case v. Hoffman*, 84 Wis. 438,54 N.W. 793 (1893).

³⁶*Fryer v. Warne*, 29 Wis. 511 (1872).

³⁷*Borchesenius v. Chicago, St. Paul, Minneapolis and Omaha R. Co.*, 96 Wis. 448,450,71 N.W. 884 (1897).

³⁸*State v. Deetz*, 66 Wis. 2d 1, 224 N.W. 2d 407 (1974).

³⁹ibid., p. 2.

⁴⁰Colo. Const. Art XVI, sec. 6 provides that domestic use takes precedent over any other purpose and agricultural use takes precedent over manufacturing.

⁴¹93 C.J.S. Waters sec. 91 (1956).

⁴²*United Fuels Gas Co. v. Sawyers*, 259 S.W. 2d 466,467,38 ALR 2d 1261.

⁴³12 Mees & W. 324 (1843) cited in *Corpus Christi v. Pleasanton*, 154 7 ex. 289,276 S.W. 2d 798, p. 294.

⁴⁴141 C. 116, 70 P. 663, 74 P. 766 (1903).

⁴⁵*Pasadena v. Alhambra*, 33C 2d 908,207 P. 2d 17 (1949).

⁴⁶*Hillside Water Co. v. Los Angeles*, 10C 2d 677,76 P. 2d 681 (1938).

⁴⁷*Hudson v. Daily*, 156C 617,105 P. 748 (1909).

⁴⁸See for example Nev. Rev. Stat., sec. 534.020, New Mexico Const., art. XVI.

⁴⁹117 Wis. 355, 94 N.W. 354 (1903).

⁵⁰ibid., p. 357.

⁵¹ibid., p. 363.

⁵²State v. Michel's Pipeline Construction Co., Inc., 63 Wis. 2d 278, 217 N.W. 2d 339 (1974).

⁵³A Summary Digest of State Water Laws, ed. by Richard L. Dewsnup, and Dallin W. Jensen (National Water Commission, Arlington, Va., 1973), p. 806.

⁵⁴Huber v. Merkel, p. 355.

⁵⁵Ibid., pp. 364-365.

⁵⁶Ibid., pp. 366-367.

⁵⁷3 H.P. Farnham, The Law of Waters and Water Rights, sec. 938, p. 2718 (1904), cited in State v. Michel's, 63 Wis. 2d 278, 290, 217 N.W. 2d 339, 344 (1974).

⁵⁸City of Fond Du Lac v. Town of Empire, 273 Wis. 333, 77 N.W. 2d 699 (1956), Menne v. City of Fond Du Lac, 273 Wis. 341, 77 N.W. 2d 703 (1956).

⁵⁹Wis. Stats. sec. 144.03, 66.066 (1) (a) (1953).

⁶⁰Empire Case, p. 338.

⁶¹Menne Case, pp. 345-346.

⁶²63 Wis. 2d 278, 217 N.W. 2d 339 (1974).

⁶³Ibid., p. 289-290, Ibid., NW 2d p. 344.

⁶⁴Ibid., p. 290, Ibid., NW 2d, p. 345.

⁶⁵Ibid., p. 291, Ibid., NW 2d p. 345.

⁶⁶Ibid., p. 292, Ibid., NW 2d p. 345.

⁶⁷Ibid.

⁶⁸"Stare Decisis" is a policy of courts to abide or adhere to decided cases where facts are substantially the same. The policy is grounded on the basis that following precedent will provide certainty and security of result under which rights may develop.

⁶⁹Michel's, 63 Wis. 2d 278, 296, 217 NW 2d 339, 347.

⁷⁰Ibid., p. 298, Ibid., NW 2d 348.

⁷¹Ibid.

⁷²Ibid., p. 301, Ibid., NW 2d p. 350.

73 Ibid., pp. 302-303, Ibid., NW 2d pp. 350-351.

74 Ibid., p. 302, Ibid., NW 2d p. 350.

75 Ibid., p. 279, Ibid., NW 2d p. 340.

76 J.H. Beuscher, Wisconsin's Law of Water Use Today, Report to the Water Resources Committee, Madison, Wis., January 28, 1958 (Madison, Wis.: State Capitol Wis. Legis. Council, 1958), p. 11.

77 Ch. 354 Sec. 1-2 [1901] Wis. Laws 502.

78 Ch. 303 [1945] Wis. Laws 479.

79 Ibid., Sec. 144.03 (S).

80 Natural Resources Committee, State Laws, Policies and Programs, p. 16.

81 Ch. 614 [1965] Wis. Laws 1089.

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83 Wis. Stats. 162.01 (1973).

84 Wis. Adm. Code, Ch. NR 112 (1972).

85 Ibid., Ch. NR 108.

86 Ibid., Ch. NR 111.

87 Ibid., Ch. NR 114.

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89 Robert Baumeister, Chemical Analysis of Selected Public Drinking Water Supplies, Technical Bulletin No. 53, LNR (Madison, Wis., 1972).

90 Natural Resources Council, Managing Wisconsin's Natural Resources, p. 47.

91 Ibid.

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93 Natural Resources Council, Managing Wisconsin's Natural Resources, p. 57.

⁹⁴Alexander Zaporozec, Hydrologic Evaluation of Solid Waste Disposal in South Central Wisconsin, Technical Bulletin No. 78 (DNR, Madison, Wis., 1974).

⁹⁵Ibid., p. 28.

⁹⁶Natural Resources Council, Managing Wisconsin's Natural Resources, p. 81.

⁹⁷Ibid., p. 21.

⁹⁸Ibid., p. 48.

⁹⁹Ibid., p. 49.

¹⁰⁰E.A. Bell and M.G. Sherrill, Water Availability in Central Wisconsin-An Area of Near Surface Crystalline Rock, Geological Survey Water Supply Paper 2022 (U.S. Govt. Printing Office, Washington, D.C., 1974).

¹⁰¹State v. Michel's, supra note 52.

¹⁰²Supra note 49.

¹⁰³State v. Michel's supra note 52, p. 302.

¹⁰⁴Supra note 74.

¹⁰⁵Ibid., p. 303, Ibid., NW 2d 351.

¹⁰⁶See Bell and Sherrill supra note 100.

¹⁰⁷State v. Michel's, p. 303.

¹⁰⁸Beuscher, Wisconsin's Law of Water Use Today, p. 11

¹⁰⁹Wis. Stat. sec. 144.025 (2) (e) (1973).

¹¹⁰Supra note 52.

¹¹¹Ch. 303 [1945] Wis. Laws 479.

¹¹²Fritz Van der Leeden, Groundwater Pollution Features of Federal and State Statutes and Regulations, Report for General Electric Company, July, 1973 (Office of Research and Development U.S. Environmental Protection Agency, Washington, D.C.), p. 1.

¹¹³Wis. Stats. sec. 144.01 (1) (1973).

114 Private ponds, farm ponds, industrial ponds are excluded in Indiana (Indiana Stat. Ch. 214, sec. 16 (1971), West Virginia Code sec. 20-5A-2 (e) (1971)). Landlocked and privately owned lakes are excluded in Mississippi, private waters not joining natural surface or underground waters are excluded from the definition in North Dakota, Ohio, and Oregon.

115 See compilation of such laws in Environmental Reporter, State Solid Waste-Land Use Laws (Bureau of National Affairs, Washington, D.C., 1974).

116 California, Colorado, Kansas, Iowa, Montana, North Carolina, Tennessee and Washington-see Environmental Reporter, supra note 115.

117 Arizona, California, Colorado, Florida, Kansas, and Pennsylvania.

118 McKinney's New York Laws ECL 15-1501 (1973).

119 Supra note 44.

120 33 Cal. 2d 908, 207 P. 2d 17 (1949).

121 California Water Code sec. 301-311 (1972).

122 Ibid., sec. 2020 (1972).

123 Ibid., sec. 4999-5008 (1972).

124 Colo. Const. Art. XVI, sec. 6.

125 Alaska Statutes sec. 46.15.060 (5) (1971).

126 228 Ark. 76, 306 S.W. 2d 111 (1957).

127 City of Greencastle v. Hazelett, 23 Ind. 186 (1864).

128 Burns Indiana Stats. Ann. sec. 13-2-1-4 27-1407 (1973).

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131 Ibid., sec. 7-6001 (b) (2) (1974).

132 Ibid., sec. 7-6001 (a).

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136 Ibid., sec. 7-6001 (a) (4).

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139 Richard L. Dewsnup, Dallin W. Jensen, ed: Summary Digest of State Water Laws, p. 191, citing 55 Del. Laws, Ch. 442, sec. 11. The editors state that this provision of the Act is not codified.

140 Ibid., p. 193, Citing Delaware Adm. Code, sec. 201 (19).

141 Ch. 72-299 [1972] Laws of Fla., compiled as Fla. Stats. sec. 373.013-373.016 (1972).

142 West's F.S.A. sec. 373.016 (2) (1974).

143 Ibid., 373.019 (10).

144 Ibid., 373.019 (9).

145 Ibid., 373.013.

146 Ibid., 373.019 (5).

147 Ibid., 373.069 (2).

148 Ibid., 373.042.

149 Ibid., 373.026 (7).

150 Ibid., 373.016 (3).

151 Ibid., 373.219 (1).

152 Ibid., 373.223.

153 Ibid., 373.223 (2).

154 Ibid., 373.236 (1).

155 Ibid., 373.226.

156 Ibid., 373.303-339.

157 Ibid., 373.306.

158 Ibid., 373.326 (1).

159 Ibid., 373.326 (2).

160 State v. Michel's, supra note 52.

161 Huber v. Merkel, supra note 49.

162 Supra note 58.

163 Supra note 52.

164 Such permit system should be modeled after Florida's or Delaware's.

165 Wis. Stats. sec. 144.026 (1) (1973).

166 Wis. Stats. sec. 30.18 (1973).

167 Supra note 113.

168 Wis. Stats. sec. 144.025 (2).

169 Recently, the DNR has received severe criticism for the manner in which it has been performing its duties. Legislative proposals have been made to separate conservation and environmental protection functions of the DNR. The proposed separation would be to restore public confidence in the DNR." "Proposed Split in DNR," Milwaukee Sentinel, Aug. 28, 1975, p. 5, part 1.

170 Wis. Stats. sec. 144.025 (4) (1973).

171 Wis. Stats. sec. 144.025 (5) (1973).

172 "The ratio at which water can be withdrawn from a groundwater basin without depleting the supply to such an extent that undesirable effects result. It depends upon the ratio of recharge, change in water quality, and economics." Resource Conservation Glossary, Soil Conservation Society of America, 1970.

173 Omernick v. State, 64 Wis. 2d 6, 218 NW 2d 734 (1974).

174 Ibid., p. 21.

175 Supra note 58.

176 Supra note 52.

177 Supra note 172.

178 Wis. Stats. sec. 144.025 (2) (3) (1973).

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