

A NEW APPROACH TO TEXAS GROUNDWATER MANAGEMENT:
AN ENVIRONMENTAL JUSTICE ARGUMENT TO CHALLENGE
THE RULE OF CAPTURE

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Texas is the last remaining state to utilize the rule of capture, a doctrine based on English Common Law, as a means of regulating groundwater resources. Many of the western states originally used the rule of capture to regulate their groundwater resources, but over time, each of these states replaced the rule of capture with other groundwater laws and regulations. The Texas Water Development Board (TWDB) State Water Plan, *Water for Texas—2002*, warned Texans if current water usage and laws do not change, there will be an unmet need of 7.5 million acre-feet of water annually by 2050. This caused individuals in state and local government to begin asking the question, “How are we going to meet our future water needs?” In the search for a solution to the water shortage problem people have divided themselves into two groups: one wants to consider the implementation of water conservation measures to reduce per capita water use in order to meet future demands; while the other group wants to spend millions of dollars to build reservoirs and dams along with laying thousands of miles of pipeline to move water around the state. The fact that Texas has yet to come up with a definitive answer to their water shortage peaked my curiosity to research what caused the State of Texas to get to a point of having a shortage of fresh water and then look at possible solutions that incorporate water conservation measures.

In my thesis I present a historical overview of the rule of capture as Texas’s means of groundwater management in order to illustrate the role it played in contributing to the water shortage Texans now face. I also take a historical look at the environmental justice movement, a grass-roots movement by environmentalists and Civil Rights activists working together to guarantee the rights of low-income and minority communities to clean and healthy environments, focusing on several acts and policies enacted by the federal government as a direct result of this movement. I then demonstrate how the rule of capture is in conflict with these acts and policies along with being in violation of both state and federal regulations in an attempt to establish a sound argument as to why we need to replace the rule of capture not only from an environmental standpoint, but from a legal standpoint as well. After considering groundwater legislation in other states, I offer a possible alternative to the rule of capture as part of the solution to the approaching shortage of Texas’s fresh water supply. The implementation of new laws, regulations and conservation measures will help conserve water for future Texans, but we must also consider a change in our relationship to water along with the attitudes and ideas that resulted in a water shortage not only in Texas, but on a global scale if we truly want to solve our future water crisis.

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CHAPTER I

INTRODUCTION

Water is the lifeblood of all living things on Earth. Without it, life on Earth as we know it would cease to exist. Why then, do we place so little value on water, acting as if it is a resource that we can simply make more of when we run out of the current supply? When asked where water comes from, most people reply “from the faucet.”¹ How have we become so removed from water? Our relationship to this natural resource has become so depersonalized that water has become a manufactured product rather than a finite natural resource. To my astonishment, when asked, many people believe that every time it rains nature is “making more water.” They have forgotten what they learned in their elementary school science class; although water may change its form in nature from solid to liquid to gas, there is never any more or less water on Earth. Society does not make the connection that as we pollute our water and dry up our rivers and aquifers nature is not making more to replace what we have used. People cannot fathom the idea that we could run out of fresh water supplies. “We’d like to believe there’s an infinite supply of fresh water on the planet, and many of us have used water as if it would never run out. But the assumption is tragically false. Available fresh water amounts to less than one-half of one percent of all water on Earth. The rest is sea water, frozen in the polar ice, or water stored in the ground that is inaccessible to us.”² To better illustrate just how little water on the Earth is available fresh water, just imagine that, “if all the Earth’s water fit in to a gallon jug, available fresh water would equal just over a tablespoon.”³ When staring at the vast oceans it is

¹ Robert L. Cook, “Water,” *Texas Parks and Wildlife*, July 2002, p. 5.

² Maude Barlow and Tony Clarke, *Blue Gold: The Fight to Stop the Corporate Theft of the World’s Water* (New York: The New York Press, 2002), p. 5.

³ “Water Facts: Did You Know...” *Water Partners International*, March 2005, <http://www.water.org/crisis/waterfacts.html>.

hard to convince people that we are facing a major water crisis in the not so distant future. They are forgetting one important fact—ocean water is not drinking water and the process of desalination is a very costly process that uses a tremendous amount of energy. “Desalination is not the panacea for the world’s water crisis. It is prohibitively expensive, so at least for the foreseeable future, it is available only to wealthy countries. Even if costs fall, however, desalination is highly energy intensive; it cannot be done without injections of massive amounts of fossil fuels, which would just add to global warming—already an enemy of the world’s fresh water supplies.”⁴ Nuclear energy can be used as an alternative to fossil fuels in the operation of desalination plants; however, most individuals are opposed to the construction of power plants in their communities. We simply run in to the NIMBY (Not In My Back Yard) argument when attempting to find a location for any type of large power plant. Everyone wants the advantages the new desalination plant would bring them, but no one wants the actual plant located in or near their communities. In addition, desalination also produces a lethal by-product. For every gallon of seawater processed, only one-third becomes fresh water. The remaining two-thirds is a highly saline brine that, when dumped back into the ocean at high temperatures, is a major source of marine pollution. For centuries we have been taking water for granted, but with the expected population growth the daunting fact we can no longer ignore is that if we do not take action now we will be facing a major water shortage in the not-so-distant future. “Quite simply, unless we dramatically change our ways, between one-half and two-thirds of humanity will be living with severe fresh water shortages within the next quarter-century.”⁵

⁴ Barlow and Clarke, *Blue Gold*, p. 213.

⁵ *Ibid.*, p. xii.

CHAPTER II

WATER REGULATION IN TEXAS

History

In the State of Texas there are different laws and rules governing groundwater and surface water. While surface water is highly regulated and considered to be the property of the State; groundwater is controlled by little more than a Supreme Court decision made in 1904 and is considered the property of the landowner. Almost 100 years later, it may seem obvious to most of us the importance of groundwater to irrigation, drinking water, and livestock; yet the State of Texas has failed to adopt a law regulating the use of groundwater on a statewide basis. Christopher Brown's article in *Groundwater in Brief*, states, "Texas stands alone as the only state retaining the rule of capture, which relies on the fiction that surface and groundwater are independent of one another."⁶ In 1904 W.A. East brought suit against Houston & Texas Central Railroad Company for the alleged destruction of the plaintiff's well by the defendant in Texas District Court.⁷ The plaintiff filed an appeal and the Texas Supreme Court heard the case on 13 June 1904. The supreme court upheld the original ruling in favor of the defendant, Houston & Texas Central Railroad Company, citing the rule of capture as their basis for finding in favor of the defendant.⁸ This Texas Supreme Court case is paramount to groundwater rights in Texas because it remains the ruling factor in how groundwater is regulated in Texas and the basis upon which rulings are made in all groundwater cases brought before the Texas judicial system. In the original 1904 case, East claimed the well on his land had supplied his family with an adequate supply of water for household purposes until the Houston & Texas Central Railroad Company

⁶ Christopher Brown, "A New Chapter for Texas: The Rule of Capture, Groundwater Conservation Districts, and *Sipriano v. Great Spring Waters of America*," *Groundwater In Brief*, March 1999, p. 3.

⁷ *Houston & Texas*, 81 S.W. 279 (Tex. 1904).

⁸ *Ibid.*

dug a well twice as deep as his on adjacent property. East claimed that when the railroad company dug their well and began pumping 50,000 gallons of water per day from their well, his dried up.⁹ As a result East was suing for damages incurred by himself and his family. Based on previous court cases the supreme court decided the railroad company was not liable to East. The supreme court stated 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.”¹⁰ The supreme court went on to further explain that:

because the existence, origin, movement and course of such waters [groundwater] and the causes which govern and direct their movements, are so secret, occult, and concealed that an attempt to administer any set of legal rules in respect to them would be involved in hopeless uncertainty, and would, therefore, be practically impossible.¹¹

It was the general lack of knowledge of aquifers and their interrelatedness to surface water in 1904 that made it impossible for the supreme court to create a law to protect the overuse of groundwater. “As Frank Trelease has pointed out, ‘It was in the light of this scientific and judicial ignorance that the overlying landowner was given total dominion over his property that is, a free hand to do as he pleases with water he found within his land, without accountability for damage.’”¹² Today groundwater is no longer “secret and occult” and the effects of unlimited pumping from aquifers have long been established by the scientific community; yet this ruling, as stated here, is what currently governs groundwater in the State of Texas.

⁹ Ibid.

¹⁰ Ibid.

¹¹ Ibid.

¹² Anderson and Snyder, *Water Markets*, p. 166.

There are four other items to note when considering the regulation of water in the State of Texas. The first important detail to remember when considering Texas groundwater regulation is the 1917 Amendment to the Texas Constitution. In 1917:

the citizens of Texas enacted section 59, Article 16 of the Texas Constitution, which states, ‘The conservation and development of all the natural resources of this State . . . and the preservation and conservation of all such natural resources of the State are each and all hereby declared public rights and duties; and the Legislature shall pass all such laws as may be appropriate thereto.’¹³

This constitutional amendment essentially makes groundwater regulation a function of the Texas legislature. The reason this change is a significant fact regarding groundwater regulation is that in essence it ensures that no court in the State of Texas can overturn the rule of capture. Since the citizens of Texas put the power of groundwater regulation in the hands of the legislature, it leaves little room for even the supreme court to overturn the rule of capture or make any decision that would contradict the rule of capture.

The second item to note is the first important addition to groundwater regulation in the State of Texas since the 1904 supreme court decision. In 1997, the Texas legislature created Section 36.002 of the Texas Water Code to allow for the creation of groundwater conservation districts. “Section 36.002 of the Texas Water Code states that the ownership of groundwater is recognized, and nothing in the law should deprive landowners of that right, except as that right may be limited or altered by the rules of a groundwater conservation district.”¹⁴ At first, the portion of the water code sounds very powerful; however, it is important to remember that ground water conservation districts are not mandated by this code, nor are they defined by this code. The code is simply stating that a landowner’s right “may be limited” by ground water

¹³ Judon Fambrough, “Who Owns Groundwater?” *Tierra Grande* 7 (April 2000): 1.

¹⁴ “Groundwater Regulation,” *South Plains Groundwater News* 9 (October 2001): 1.

conservation districts. The language in Section 36.002 still strongly relies back on the rule of capture as the basis for groundwater regulation. It is important to realize that Section 36.002

carefully affirms the rule of capture, subject to the regulatory powers available to the districts. The ownership and the rights of owners of the land and their lessees and assigns in groundwater are hereby recognized, and nothing in this code shall be construed as depriving or divesting the owners or their lessees and assigns of the ownership or rights, subject to rules promulgated by the district.¹⁵

The formation of groundwater conservation districts has occurred in Texas; however, “they are too slow and they lack real power.”¹⁶ Many Texans believe groundwater conservation districts are little more than lip service by the Texas Legislature. In 1999, the reason for this belief became clear:

Although Senate Bill 1 encouraged the creation of groundwater conservation districts, many citizens wonder if this recommendation was a token gesture. When 13 areas with significant groundwater interests sought to create conservation districts through legislation in the 1999 session of the Texas Legislature, Senator Buster Brown killed each of the 13 bills. Brown was the author of SB1 and is the chair of the powerful Committee on Natural Resources, which has jurisdiction over water issues.¹⁷

Thirdly, we must remember since there is no law mandating the creation of groundwater conservation districts, there remain many areas in Texas where none exist. As a result, groundwater is essentially unregulated in these areas. This lack of state-wide regulation allows the continued overpumping of the aquifers in Texas.

Finally, the fourth and perhaps the most important point to consider is that the rule of capture is not a method of groundwater regulation. If we look back at the supreme court ruling in 1904, the judges stated that they could not make a judgment on groundwater regulation because its movements were “secret and occult.” Instead, the rule of capture, “is a tort liability

¹⁵ Brown, “A New Chapter for Texas,” p. 8.

¹⁶ Wendy M. Block and Frederick S. Richardson, “A Case of the Blues: The Inequity of Groundwater Regulation in Texas,” *Planning Forum* 7 (2001): 48.

¹⁷ *Ibid.*, p. 47.

rule that protects a landowner from getting sued for pumping groundwater regardless of the impact his pumping may have on neighboring landowners.”¹⁸

Simply reading the supreme court judges’ ruling is enough to make most people question why the State of Texas has not adopted a more current and accurate law for groundwater. If nothing else, it is obvious that groundwater is no longer “secret and occult.” Scientists have an increased understanding of groundwater and are able to calculate the rate at which groundwater is pumped from aquifers and the rate at which it is recharged. In fact the Texas Water Development Board shows that in 1990 we pumped 8.56 million gallons of water from the six major aquifers in Texas and in 1995 we pumped 9.15 million gallons, and the annual recharge rate for all six aquifers combined is only 3.92 million gallons.¹⁹ With a growing population in the State of Texas it does not take a mathematician to see that we are using groundwater at a much faster rate than Mother Nature can replace it. This fact alone should unite both environmentalists and non-environmentalists alike in an effort to develop a law that will regulate groundwater in Texas in order to ensure there will be groundwater for future generations of Texans.

Texas uses more groundwater per day than any other state with the exception of California. Often times we hear Texans commenting on what a dire situation those people in Los Angeles are in due to predicted shortages of fresh water. The irony of these comments is that Texans are not far behind these “poor” Californians. Located beneath the Texas Panhandle, the Ogallala Aquifer is the source of the well water that supplies many people with their household water and water for irrigation and livestock. For these people, who rely so heavily on groundwater from the Ogallala Aquifer, the alarming fact is that “water levels in much of it have

¹⁸ “Groundwater Regulation,” p. 1.

¹⁹ “Water Quantity in Texas,” *Texas Environmental Profiles*, http://www.texasep.org/html/wqn/wqn_4grw.html.

declined two feet a year; the annual natural recharge may be so little as one-tenth an inch.”²⁰

The Panhandle is not the only area in Texas that is facing water shortages. “As soon as 2010, Texas cities could lack up to 15 percent of their water need if no new water development were to occur. This would translate into an annual loss to the Texas economy of \$25 to \$40 billion.”²¹

With increasing populations, most of the State will find themselves without groundwater by 2050, unless the Texas State Legislature does something to prevent the depletion of the nine major and sixteen minor aquifers. According to the newly adopted Texas Water Development Board (TWDB) State Water Plan, *Water for Texas—2002*, almost 900 Texas cities will not have enough water from current sources to meet their needs in 2050. Despite all of these alarming statistics, there remain individuals in the state of Texas who believe the rule of capture should continue to regulate groundwater. These individuals seem to ignore the fact that the rule of capture encourages the wasteful and excessive use of groundwater. With the current and projected water shortages in Texas, continuing to operate under the rule of capture ensures that Texans will not have enough clean water to meet their future needs. In the book *Water Markets* by Anderson and Snyder, they explain the inherent flaws in the rule of capture that lead to excessive use of groundwater.

If there is open access to pumping from an aquifer, a race to the pump house, where groundwater is pumped early and fast, results for three reasons. First, the classic ‘tragedy of the commons’ occurs because of the rule of capture. In that setting, groundwater not pumped will be used by others. Hence there is little incentive to conserve for the future. Second, not only is conserved water unlikely to be available in the future, it will cost more to pump if the water table declines as a result of overdraft. To avoid higher pumping costs again users have an incentive to pump now rather than later. Finally, where the aquifer is permeable and the lateral movement of water is rapid, pumping at one location can have a direct impact on the water table and water pressure at nearby locations.²²

²⁰ Kelton, “The Hidden Lake,” p. 36.

²¹ Brown, “A New Chapter for Texas,” p. 2.

²² Anderson and Snyder, *Water Markets*, p. 165.

The point Anderson and Snyder are making is that the rule of capture creates an atmosphere in which a landowner feels driven to get as much water as he or she can as quickly as possible before a neighboring landowner gets to it first. The rule of capture sets up a “use it or lose it” scenario for groundwater. For a state that is facing water shortages, it would seem reasonable to adopt a water law that encourages conservation rather than continue to operate under a hundred-year-old supreme court ruling that encourages the excessive use of groundwater.

Misconceptions

If Minnesota is the land of the 1000 lakes, then Texas should be the land of the 1000 reservoirs since we have only one *natural* lake and that is at times debatable. People look around and see all the reservoirs in Texas and cannot comprehend that we would not have enough fresh water for future generations. They reason that if we dry up the existing reservoirs, we will just build more dams. If only it were that simple. What people fail to realize is that 57 percent of our water comes from groundwater, not reservoirs that capture rainwater and divert surface water.²³ They also fail to realize that until Senate Bill 1 was passed in 1997, which mandated that environmental impacts be conceded in the water planning process, little if any attention was given to the environmental impacts of water supply projects.²⁴ Although Senate Bill 1 was certainly a step in the right direction, it may have been too little too late. “The vast majority of Texas water rights were apportioned before this bill was passed.”²⁵

Another common misconception regarding groundwater is that it is completely separate from surface water, and therefore has no impact on surface water. Texas law helps to further this fallacy since it treats surface water and groundwater so differently in the State of Texas. Texas is

²³ McKinney, “Water for the Future,” p. 25.

²⁴ *Ibid.*, p. 26.

²⁵ *Ibid.*, p. 28.

not alone in its separate treatment of groundwater and surface water. In fact, “a majority of state water law systems ignore the physical connection that exists between most groundwater and surface water. Instead, states operate separate institutional systems for surface-water rights and ground-water rights. The difficulty of determining the connection between groundwater and surface water has caused states to ignore this fundamental characteristic of water resources in their allocation and management schemes.”²⁶ A perfect example of how groundwater and surface water are linked occurs in San Antonio, Texas. “Regions of the Edwards Aquifer supply six downstream river basins that provide water for residents all the way to the Gulf of Mexico. The Guadalupe River basin alone relies on the Edwards Aquifer for 21-32 percent of its annual flow and supports approximately 80,000 jobs.”²⁷ Not only is the disappearance of groundwater in Texas an important environmental issue, it is also an important economic issue for Texans. The facts are laid before us regarding the looming water crisis for Texas. Whether for environmental or economic reasons we must ask ourselves if rules now in place are enough to ensure water for the future of Texas. It seems obvious that the answer is no, and the Texas State Legislature must consider an alternative to the rule of capture.

Court Challenges

The 1904 decision by the supreme court in the *Houston & Texas Central Railroad Company v. W.A. East* has not gone unchallenged over the years. Every time a case has appeared before either the Texas District Court or the Texas Supreme Court the judges have chosen to uphold the rule of capture. In 1955 the supreme court upheld the rule of capture and supported the policy of judicial nonintervention in groundwater cases. In the 1955 case, *City of*

²⁶ Anderson and Snyder, *Water Markets*, pp. 169-70.

²⁷ Brown, “*A New Chapter for Texas*,” p. 2.

Corpus Christi v. City of Pleasanton the supreme court ruled that, “[p]ercolating waters are regarded as the property of the owner of the surface who may, ‘in the absence of malice, intercept, impede, and appropriate such waters while they are on his premises, and make whatever use of them he pleases, regardless of the fact that his use cuts off the flow of such water to adjoining land, and deprives the adjoining owner of their use.’”²⁸ Once again in 1989 the *Denis v. Kickapoo Land Company* case brought the rule of capture under fire. This lawsuit alleged that the Kickapoo Land Company’s well, dug adjacent to Kickapoo Creek, was taking water from a spring that fed the creek and supplied water to creek users and a nearby community. The Austin Court of Appeals once again relied on the 1904 decision and ruled in favor of the Kickapoo Land Company. Despite the fact that the Kickapoo Land Company’s well extracted 700 to 800 gallons of water per minute—approximately 576,000 gallons in a 12-hour period and effectively eliminated an entire community’s water supply, the court felt this rate was a lawful use when applying the rule of capture.²⁹ Not even an entire community losing its water supply is enough to convince the Texas State Legislature that groundwater policies are outdated and inefficient. Finally the latest case, *Bart Sipriano, Harold Fain, and Doris Fain v. Great Spring Waters of America, Inc. a/k/a Ozarka Natural Spring Water Co. a/k/a Ozarka Spring Water Co. a/k/a Ozarka*, heard before the supreme court of Texas on 6 May 1999, once again upheld the rule of capture. This case represents the growing animosity of individual landowners against large corporations when it comes to groundwater issues in the State of Texas as a direct result of the Texas Supreme Court continuing to uphold the rule of capture. In this case, three Henderson County residents, Mr. Sipriano and Mr. and Mrs. Fain, are suing Ozarka for negligently draining their water wells. The Henderson County residents claim that when Ozarka began pumping

²⁸ Ibid., p. 3.

²⁹ Ibid.

90,000 gallons of groundwater per day, seven days a week in 1996 near Sipriano's land that his wells were severely depleted.³⁰ Once again the Texas Supreme Court unanimously decided to uphold the rulings of the lower courts and found in favor of Ozarka based on the fact that they were not violating any laws and were acting completely within their legal rights under the rule of capture. The supreme court further attempted to justify their decision by stating that

It would be improper for courts to intercede at this time by changing the common-law framework within which the Legislature has attempted to craft regulations to meet this state's groundwater-conservation needs. Given the Legislature's recent actions to improve Texas's groundwater management, we are reluctant to make so drastic a change as abandoning our rule of capture and moving into the arena of water-use regulation by judicial fiat. It is more prudent to wait and see if Senate Bill 1 will have its desired effect, and to save for another day the determination of whether further revising the common law is an appropriate prerequisite to preserve Texas's natural resource and protect property owner's interest.³¹

In reading the supreme court's decision it is evident that they carefully avoided the issue of whether or not the rule of capture is an appropriate way to regulate groundwater in Texas, and instead focused on the 1917 constitutional amendment that gave the Texas Legislature the power to regulate groundwater. The supreme court carefully bowed out of any responsibility to consider what would be in the best interest of Texans in regard to groundwater use. It is also interesting to note that the supreme court wants to take a wait and see attitude and delay this decision for "another day." We have been waiting 100 years for a law to replace the rule of capture in Texas and with current statistics reporting the rapid depletion of aquifers, I think we have seen what will happen if we continue to operate under this rule. The supreme court is very clear in wanting to postpone their decision, but it fails to tell us when this "another day" will come. Perhaps it will come too late to do anything to save groundwater in Texas; after all the rule of capture has been challenged time and time again and it still stands strong as the ultimate

³⁰ *Bart Sipriano, Harold Fain, and Doris Fain v. Great Spring Waters of America, Inc. a/k/a Ozarka Natural Spring Water Co. a/k/a Ozarka Spring Water Co. a/k/a Ozarka.* 1 S.W.3d 75, 42 (May 1999).

³¹ *Ibid.*

rule for groundwater regulation in the State. The question is: How much more does the legislature or the supreme court need to see in order to be convinced that the rule of capture is inequitable and is an insufficient means to regulate groundwater in Texas? The answer should be evident from this history of cases. Groundwater reform is needed in order to protect individual landowners and ecosystems in the areas that are being over pumped.

CHAPTER III RAMIFICATIONS OF THE RULE OF CAPTURE

State Water Plan, *Water for Texas—2002*

The state of Texas expects its population to double from 20 million in 2000 to 40 million by 2050.³² According to the TWDB State Water Plan, *Water for Texas—2002*, if current water usage and regulations do not change, it is estimated that Texans will have an unmet need of 7.5 million acre-feet of water annually by 2050.³³ This alarming statistic causes one of two reactions: water conservation measures must be instituted, or we must build more dams, divert more rivers and construct more reservoirs to meet the demands of the growing population. Obviously these two reactions are in complete opposition to one another: the first encourages a per capita reduction in water usage while the second supports the misconception that we can “make more water” and do not have to reduce the current per capita amount we are using. I would suggest, however, that although conservation is important, the State of Texas is failing to address the reason we have a looming water shortage—the rule of capture, a doctrine based on English common law that currently regulates groundwater. Since its adoption by the Texas Supreme Court in 1904, the rule of capture has dictated the use of groundwater by landowners.³⁴ Groundwater includes water percolating through soil and rock, underground flow in confined channels, artesian water, and stream underflow. Simply stated, the rule of capture allows landowners to pump as much groundwater as they wish, as long it is being used for a purpose, regardless of how it impacts neighboring landowners.³⁵ Even without consulting scientific studies, it is obvious that with an exploding population and unrestricted groundwater usage;

³² Larry McKinney, “Water for the Future,” *Texas Parks and Wildlife* 60, no. 7 (July 2002): 23.

³³ *Ibid.*

³⁴ *Houston & Texas & Central Railway Co. v. East*, 81 S.W. 279 (Tex. 1904).

³⁵ Elmer Kelton, “The Hidden Lake,” *Texas Parks and Wildlife* 60, no. 7 (July 2002): 32.

Texas is undoubtedly facing water scarcity issues in the near future. Continuing to operate under a 100-year-old law adopted at a time when scientists did not understand how aquifers functioned seems to make a mockery of any attempt to conserve water to ensure that there will be plenty for future generations of Texans.

In order to replace the rule of capture, a change in the fundamental beliefs of policy makers regarding groundwater regulation needs to occur. This change is evidenced by the solutions presented in the State Water Plan, *Water for Texas—2002*. In this plan, the Texas Water Development Board presents rather alarming statistics regarding future water shortages and lists possible solutions to avoid not having enough water for all Texans. Included in their suggestions to meet the future water needs of Texas is the development of eight major reservoirs (5,000 acre-feet of storage capacity) and 10 minor reservoirs (less than 5,000 acre-feet of storage capacity) with a price tag of \$3.05 billion dollars.³⁶ The purpose of the major reservoirs is not to supply water to the local area. The plan is to transfer the water via pipes to meet the water demands of major metropolitan areas. This solution, just like the rule of capture, encourages excessive use of water and ignores the fact that the water is diverted away from its natural course down creeks and rivers and is held back behind dams in reservoirs with little, if any, concern for the environmental impact doing so has on the people and wildlife depending on this water flowing down its intended course. Also, this solution does not take into consideration the people and wildlife whose land is now flooded to provide water for people that live hundreds of miles away. As Susan Kaderka from the National Wildlife Federation explains, “Unfortunately, these projects illustrate that water planners are relying largely on outdated concrete-and-steel approaches to supplying water that threaten to send our hard-earned money and the natural

³⁶ “State Water Plan, Water for Texas—2000,” *Texas Water Development Board*, January 2001, http://www.twdb.state.tx.us/publications/reports/State_Water_Plan/2002/FinalWaterPlan2002.htm.

heritage of Texas down the drain.”³⁷ Possibly the most startling statement in the entire report, which illustrates the water policy makers in Texas are still using the rule of capture principle to manage groundwater, reads: “For many, the demand on groundwater has raised the question of management goals: Should aquifers be managed on a sustainable basis or on the basis of eventual depletion? Sustainability may be chosen as the appropriate management philosophy for some aquifers, but in all likelihood it will not be selected for areas such as El Paso and the High Plains where management at sustainable levels would have enormous economic dislocations.”³⁸ It would be interesting to know where the TWDB plan expects El Paso and the High Plains to obtain water once the aquifer is depleted. These areas are extremely dry and are in no way sustainable based on annual rainfall levels. Sadly enough, their answer would probably include building a reservoir hundreds of miles a way and spending millions of dollars to pipe water to El Paso. When the TWDB offers solutions that meet 66.3 percent of the total water needed by building reservoirs at a cost of \$3.05 billion while suggesting that only 13.5 percent of the water needed be met by water conservation efforts that will save taxpayers \$2 million, it is evident that a change in attitude is needed.³⁹ “We’ve got to find a way to supply water for human needs without drying up our streams and rivers and without wasting billions of dollars. That means looking at how we can use water more efficiently, and not just assuming we can pump, divert or capture all the water we might want.”⁴⁰ Continuing to operate under the rule of capture that encourages a “use it or lose it” attitude only helps to ensure the projected unmet need of water in 2050 will become a reality.

³⁷ National Wildlife Federation, Press Release, Austin, Texas, 16 October 2001.

³⁸ “State Water Plan, Water for Texas—2002.”

³⁹ Ibid.

⁴⁰ National Wildlife Federation.

Law of the Biggest Pump

Even more troubling than the solutions provided to the future water shortage in the State Water Plan is the reality that there are legislators and their constituents who are demanding the rule of capture be adopted as a law to regulate groundwater. One such example is a bill that was brought before the Texas Senate. “State Senator Kip Averitt, R-Waco, authored the bill that would codify the so-called ‘rule of capture.’”⁴¹ Averitt’s reasoning for authoring this bill is that the, ““Courts have been saying for 100 years that it’s [groundwater regulation] the Legislature’s responsibility and I’m afraid at some point in time, like school finance, the courts will do something about it””⁴² Averitt’s bill is a giant step in the wrong direction for Texas. Instead of moving towards sound regulation and distribution of groundwater, Averitt’s bill would codify the “rule of the biggest pump.” With dwindling aquifers it seems ludicrous that the State of Texas would even entertain the idea of placing the power in the landowner’s hands to pump as much water as they see fit without any limitations or consideration for surrounding landowners, wildlife or the sustainability of the land. Groundwater supplies will simply not last if we allow landowners to pump as much water from aquifers as they desire without any consideration for the aquifer’s recharge rates. Codifying the rule of capture blatantly “favors powerful economic interests at the expense of small users and the environment.”⁴³ Essentially, Texas would be adopting a law that allows an individual’s financial status to regulate their access to groundwater. This would be a giant step backwards to both ensuring there is enough water to meet future needs, and to preserving and protecting the sustainability of natural resources in Texas.

⁴¹ Richard L. Smith, “Averitt Bill to Tackle ‘Rule of Capture’ on Groundwater,” *Waco Tribune*, 24 March 2003, news section.

⁴² Ibid.

⁴³ Block and Richardson, “A Case of the Blues,” p. 46.

Despite the number of cases heard before the Texas Judicial system regarding groundwater issues, the rule of capture is still the overriding factor in the regulation of groundwater in the State of Texas. Although the Legislature has attempted to take steps in the right direction with the creation of Groundwater Conservation Districts, the rule of capture still remains the only statewide regulation for groundwater in Texas. If one hundred years of court cases have failed to persuade the State of Texas to replace the rule of capture; then a different approach to convince the legislature that the rule of capture is outdated and environmentally unjust must be considered.

Developing a compelling argument and providing a sound legal basis as to why the rule of capture should no longer regulate groundwater in Texas will require more than just creating and presenting alternative policies to the Legislature. If a case can be created establishing that the rule of capture violates either state or federal laws; then the Texas Legislature will have to replace the rule of capture with new groundwater regulation. I believe such an argument can be developed by using the principals of environmental justice to challenge the legality of the rule of capture. In order to develop this argument it will first be necessary to take a historical look at the development of the environmental justice movement. It will then be necessary to investigate the fundamental principals of environmental justice, as defined by the EPA, to determine if the rule of capture conflicts with existing legal principals. If it can be shown that the rule of capture is in violation of these principals, then legally the State of Texas must repeal the 1904 Supreme Court decision and develop a new law for groundwater regulation. Perhaps the time has come for the Legislature to follow the directive of the 1917 amendment to the Texas Constitution instructing them to ensure the “preservation and conservation of all such natural resources in the State of

Texas” and replace the rule of capture with environmentally sensitive groundwater regulation that encourages conservation.⁴⁴

⁴⁴ Fambrough, “Who Owns Groundwater?” p. 1.

CHAPTER IV

THE ENVIRONMENTAL JUSTICE MOVEMENT

History

The environmental justice movement, which began in the early 1980s as a grass-roots movement by environmentalists and civil rights activists working together to guarantee the rights of low-income and minority communities to clean and healthy environments, has grown into a well organized political movement recognized by the federal government. What was once considered to be a radical leftist movement is now a respected movement that is influencing environmental thinking and policy making both in Washington D.C. and internationally. The political history of the environmental justice movement began in a small, rural, low-income, predominantly black community in Warren County, North Carolina, in 1982.⁴⁵ The State of North Carolina decided to locate a polychlorinated biphenyl (PCB) disposal landfill facility in Warren County which sparked strong opposition from local communities.⁴⁶ Although unsuccessful at blocking the PCB disposal landfill facility, the strong opposition by local citizens, grass-roots organizations, regional and national civil rights groups and politicians “resulted in a series of studies investigating the association between environmental risks and population distribution by income and race.”⁴⁷ The first study was conducted by the United States General Accounting Office (GAO) at the request of District of Columbia Congressman, Walter Fauntroy, who was arrested during protests in Warren County, North Carolina. The GAO studied eight southern states (EPA Region VIII—Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee) to determine the correlation

⁴⁵ Ibid., p. 1.

⁴⁶ Ibid.

⁴⁷ Ibid., pp. 1-2.

between the location of hazardous waste landfills and the racial and economic status of the surrounding communities. The report was published in June 1983 and concluded that three out of every four landfills were located near predominantly minority communities.⁴⁸ Another influential study of toxic waste sites was conducted in 1987. This study, conducted by the United Church of Christ Commission for Racial Justice, resulted in the release of a report titled, *Toxic Wastes and Race in the United States*, which “found that minorities and the poor bear a disproportionate burden of these waste sites in their neighborhoods, and ‘race proved to be the most significant among variables tested in association with the location of commercial hazardous waste facilities.’”⁴⁹ These studies fueled grass-roots organizations throughout the U.S. who began putting pressure on the EPA to address the issue of environmental justice. In July 1990, the EPA created its Environmental Equity Workgroup to address the issues raised by both studies and by the growing environmental justice grass-roots movement.⁵⁰ After two years of reviewing the concerns raised by the studies and the grass-roots organizations, the EPA workgroup released a two-volume report in June 1992 titled, *Environmental Equity: Reducing Risk for All Communities*.⁵¹ In November of the same year, the EPA established an Office of Environmental Equity, later renamed the Office of Environmental Justice.⁵² The next major step forward for the environmental justice movement came on 4 November 1993 when the EPA announced the creation of a National Environmental Justice Advisory Council. Eleven years later, on 11 February 1994, President Bill Clinton made a major contribution to the environmental justice movement by issuing Executive Order 12898, “Federal Actions to Address Environmental

⁴⁸ “Chapter 13: Environmental Justice,” *Office of Information Technology: UMass Amherst* 2005, <http://www-unix.oit.umass.edu/~envhl567/chapters/chapt13.pdf>.

⁴⁹ Liu, *Environmental Justice Analysis*, p. 2.

⁵⁰ *Ibid.*, p. 3.

⁵¹ *Ibid.*, p. 4.

⁵² *Ibid.*

Justice in Minority Populations and Low-Income Populations” ordering each federal agency to ‘make achieving environmental justice part of its mission’⁵³ Although the executive order only required each federal agency to make environmental justice part of its mission, the EPA decided to make it one of their top priorities. “In April of 1995, the U.S. Environmental Protection Agency released the document titled “Environmental Justice Strategy: Executive Order 12898.”” An important part of the document is that the EPA agreed to work with other federal agencies as an advocate for environmental justice. It is important to note that Executive Order 12898 is not the creation of a law or policy for environmental justice, but rather it addresses environmental justice within the existing framework of current laws and regulations. “Two laws that are very important for addressing environmental justice are the National Environmental Policy Act (NEPA) of 1969 and Title VI of the 1954 Civil Rights Act.”⁵⁴ The Council on Environmental Quality (CEQ), which oversees the federal government’s compliance with NEPA and the EPA, called these two existing laws to the forefront of the environmental justice debate. In December 1997, the CEQ issued “Environmental Justice Guidance under the National Environmental Policy Act” and in February 1998, the EPA issued “Interim Guidance for Investigating Title VI Administrative Complaints Challenging Permits.”⁵⁵ Although the executive order was a major step forward for the environmental justice movement, the fact that the order was based on existing laws not created specifically for addressing environmental justice concerns cannot be ignored. The executive order is addressing a new frontier in the legal realm by using old laws created to address different issues. Liu explains the inherent problems with using NEPA to address environmental justice concerns: “Notwithstanding these environmental justice considerations in the NEPA process, the power of NEPA to address environmental justice

⁵³ Ibid., p. 5.

⁵⁴ Ibid., p. 6.

⁵⁵ Ibid.

concerns has its limitations. As the CEQ guidelines point out, ‘the Executive Order does not change the prevailing legal thresholds and statutory interpretations under NEPA and existing case law.’”⁵⁶ Another problem inherent with using NEPA to address environmental justice issues is the scope of NEPA’s enforcement. “NEPA’s role is also limited for its future dimension, only dealing with the proposed actions and decisions of federal governments.”⁵⁷ The problem created by this limitation of NEPA is that an environmental justice issue can only be addressed in a court of law if it is a proposed action, not an existing or present issue. For example, if a town proposes to build a toxic waste disposal plant in City X, then NEPA could be used to fight the building of this toxic waste dump in City X. However, if the toxic waste dump already exists or if it existed in the past, then NEPA offers no guidelines or legal support for addressing possible environmental injustices. Due to the limitations of NEPA, environmental justice advocates must rely on Title VI of the 1964 Civil Rights Act to address past and present environmental concerns. Title VI is much broader in its scope of dealing with these issues than is NEPA.⁵⁸ “On July 14, 1994, Attorney General Janet Reno issued a memorandum reiterating that ‘administrative regulations implementing Title VI apply not only to intentional discrimination, but also to policies and practices that have a discriminatory effect.’”⁵⁹ This is an important interpretation of Title VI for environmental justice since it can be difficult to prove intention in a court of law. It is not to say that proving an action has a discriminatory effect is easy, but it removes the obstacle of trying to prove to a judge or jury that a person or entity’s actions are purposefully discriminatory. Janet Reno’s memorandum also introduces another important factor when looking at environmental justice issues—distributive justice. Principles of

⁵⁶ Ibid. p. 7.

⁵⁷ Ibid.

⁵⁸ Ibid.

⁵⁹ Ibid., p. 8.

distributive justice are normative principles (meaning they tell us what ought to be, not what is) and are designed to allocate goods in limited supply relative to demand. Focusing on the effect of an action leads us to look at how justice is being distributed to those the action is effecting. There are many conflicting theories about distributive justice, but if one were to take the strict egalitarianism approach when considering an environmental justice issue, then it could be argued that locating three toxic waste dumps in an area of town with high minority and poverty rates and locating none in the area of town with low minority rates and high wealth is not distributing justice equally. The action may have not been intentional, but the effect is discriminatory, and would be a violation of Title VI, as explained in Reno's memorandum. When considering an environmental justice issue and the effects a certain action may have on a group of people, Title VI gives us the legal ability to argue what ought to happen in order to be just in our distribution of negative environmental impacts. As Liu explains, "any policies, program, projects, and plans, without careful analysis of their distributional impacts, could be and have been challenged."⁶⁰ Since environmental justice is about "the fair distribution of good and bad environments to humans"⁶¹ it is of paramount importance that environmental justice polices address the issue of distributive justice in order to be effective.

Distributive Principles of Environmental Justice

Historically speaking, environmental justice is primarily focused on negative environmental impacts and how they are allocated or distributed among different communities. However, I believe environmental justice can and should be broader in its scope. It should not only continue to address how negative impacts on the environment should be distributed, but it

⁶⁰ Ibid., p. 9.

⁶¹ Nicholas Low and Brendan Gleeson, *Justice, Society and Nature: An Exploration of Political Ecology* (New York: Routledge, 1998), p. i.

should also address how natural resources should be distributed among people to ensure a fair and equitable distribution of all things both good and bad. This argument aside, in order to fully understand the environmental justice movement it is important to look at the issue of distributive justice as it currently pertains to the movement. In chapter five of Low and Gleeson's book, *Justice, Society and Nature: An Exploration of Political Ecology*, they follow the traditional route of looking at hazardous environmental impacts and how they are distributed among people. "This, in a sense, is our most dramatic injustice to nature—the production of environmental risks which now imperil the globe and all life within it. Moreover, these new hazardous substances, and the land uses associated with their production, storage and destruction, must be allocated socially and geographically, adding a new urgency to struggles for fairness in the distribution of environmental goods and bads."⁶² When the environmental justice movement began in the 1970s it was a direct result of these "environmental bads" being unjustly distributed to areas in the United States with high levels of poverty and high concentrations of minority populations. The impetus for the creation of an environmental justice movement resulted in the primary goal of the movement to focus on the introduction of hazardous materials in these communities. This type of environmental injustice has been deemed "environmental racism." The opposition to environmental racism began with grass-roots efforts in the 1970s that opposed the racially discriminatory distribution of hazardous wastes and polluting industries.⁶³ By 1990 the environmental justice movement broadened its focus to more than environmental racism. This change became evident at the First National People of Colour Environmental Leadership Summit in Washington, D.C. held in 1991. "The summit adopted seventeen principles of environmental justice which extended the movement's focus on race to include other concerns, such as class

⁶² Ibid., p. 103.

⁶³ Ibid., p. 107.

and non-human species. . . . the movement has now transcended, without abandoning, its concern with communities of colour to include others (regardless of race or ethnicity) who are deprived of their environmental rights, such as women, children and the poor.”⁶⁴ The environmental justice movement has expanded its scope in terms of who it is addressing; however, it has not expanded its scope as to what it is addressing. As defined clearly in the objectives of the summit held in 1991, it is still crystal clear that the environmental justice movement is solely focused on “environmental bads.” In other words, “the movement has tended to pursue ‘environmental equity,’ meaning the equitable distribution of negative externalities.”⁶⁵ This focus of the movement follows the ideas of egalitarian distributive justice, meaning that all “negative externalities” should be distributed equally among a given population. In 1991, the City of New York went so far as to adopt a ‘fair share’ policy as law. “The City of New York introduced ‘fair share criteria’ into planning regulations in an ‘attempt to foster an equitable distribution of public facilities throughout the city.’”⁶⁶ Inherent problems in this type of equalitarian distributive justice are: (1) who defines what equally distributed means, and (2) who determines at what scale we apply this rule? When determining the location of a toxic waste dump should only its effects on the people in the neighborhood where it is located be considered; or should its effects on all people in the city, the state etc. be considered when determining equitable distribution? As Goldman points out in *What is the Future of Environmental Justice*, “As more communities try to block sites and prevent pollution in their backyards, those with the least political and economic power will be left with an even greater

⁶⁴ Ibid., p. 108.

⁶⁵ Ibid., p. 112.

⁶⁶ Ibid., p. 115.

share of the toxic residues from our modern society.”⁶⁷ The point Goldman is making with this statement is an answer to my question about who will define equally distributed. The answer is the rich, the powerful or the educated, not the poor, the minority or the uneducated class, which is exactly the group of people the environmental justice movement is trying to protect. Dobson further expounds on this idea in his book *Justice and the Environment* when he states:

the environmental justice belief that the ‘environment’ is no more—and certainly no less—than a particular form of the goods and bads that society must divide among its members. The movement points out that the principle upon which distribution of these goods and bads takes place is that of ‘ability to pay’—that is, those who can afford protection will buy it, in the form for example, of living on land known to be uncontaminated. Note that ‘environmental justice’ does not here mean ‘justice to the environment,’ but refers rather to a just distribution of environmental goods and bads among human populations.⁶⁸

It appears then that the environmental justice movement is concerned with the equitable distribution of “environmental bads,” but can we not reword this primary goal of the movement to be: “How do we ensure the equal distribution of environmental goods, i.e., clean drinking water, uncontaminated lands, clean air etc.?” instead of “How do we ensure equal distribution of toxic waste, contaminated lands, biohazards, etc.?” Do we not want to ensure that everyone has an equal right to a healthy environment, not just that all “environmental bads” are distributed equally? For example, if we consider one of the alternative terms for the rule of capture, “Rule of the Biggest Pump,” it immediately becomes evident who has access to water in the aquifers is determined by one’s economic power. Instead of the water in the aquifers (an environmental good) being equally distributed among all landowners, the rule of capture ensures the person(s) with the greatest economic advantage who, for that reason, can build the “biggest pump,” will have access to more water. Letting economic livelihood dictate the amount of water allocated to

⁶⁷ Ben Goldman, from *What is the Future of Environmental Justice?* quoted in Low and Gleason, *Justice, Society and Nature*, p. 113.

⁶⁸ Andrew Dobson, *Justice and the Environment: Conceptions of Environmental Sustainability and Theories of Distributive Justice* (New York: Oxford University Press, 1998), p. 20.

each member of a community is clearly a violation of distributive justice—one of the core principles of the environmental justice movement. The only difference between this example and a typical example utilized by the environmental justice movement is instead of focusing on an unjust concentration of an “environmental bad” in one community, we are focusing on the lack of distribution of an environmental good to an entire community. Dobson explains that “the movement is principally, and quite properly, a movement for human justice in which the environment is no more (and no less) than the missing word in the social justice question ‘the distribution of _____?’”⁶⁹ As we have seen thus far, the blank is always filled in with some “environmental bad,” whether it is toxic waste disposal sites, nuclear power plants, or the location of an industrial site that produces toxic by-products as part of its production of materials. The question is never “the distribution of environmental goods.” I do not mean to suggest that the environmental justice movement is not asking valid and important questions, I would like to suggest that just as the movement broadened the scope of its audience in 1991, it is now time for it to broaden the scope of what it addresses in order to ensure that all persons live in a healthy environment with equal access to natural resources.

⁶⁹ Ibid., p. 25.

CHAPTER V

THE ENVIRONMENTAL JUSTICE ARGUMENT

Water: A Right or a Need?

An important issue that must be considered in order to establish that the rule of capture violates the principles of the environmental justice movement is to decide whether water is a human need or a human right. As humans do we have a right to water, or simply have a need for water in order to survive? There is little argument required to convince people that humans need water. It is a scientific fact that all living things require water to survive. Humans need four to five gallons of water per week to survive.⁷⁰ In fact a person can live without food for approximately one month, but less than a week without water. “Water, after oxygen, is the second most important substance for human health. Water is a universal solvent and transport medium, and because of that it is the basis of all biological processes in the human body.”⁷¹ The argument becomes problematic when trying to convince someone that humans have a right to water. Is the right to water one of our inalienable rights guaranteed to us by the Constitution, or is it an even more fundamental human right? Do all humans, in all places, have a right to water? Or to speak in the language of duties rather than rights; do we have a duty to ensure that all humans have their basic need for water met in order to ensure their survival? In the book, *Blue Gold*, Barlow and Clarke consider this very issue as they explore our current relationship with water. Barlow and Clarke explain:

Water, according to the World Bank and the United Nations, is a human need, not a human right. These are not semantics; the difference in interpretation is critical. A human need can be supplied in many ways, especially for those with money. But no one can sell a human right. We believe that access to clean water for basic needs is a

⁷⁰ “Water Facts: Did You Know....”

⁷¹ “Lenntech: Water Health FAQ,” *Lenntech Water Treatment & Air Purification Holding B.V.*, 2005, <http://www.lenntech.com/Water-Health-FAQ.htm>.

fundamental human right; this vital resource cannot become a commodity sold to the highest bidder.⁷²

It is important to consider the full ramifications of defining water as a human need and not a human right. If water is considered a commodity that can be privately owned, bought and sold then it follows that those with more money to buy water will naturally have access to more water than others. It also follows that if someone is poor and cannot afford water, then they will not have their human need met and will simply go without water. Logically, of course, it follows that the person who cannot afford this human need will perish. According to Donald Worster, “water has now become a commodity that is bought and sold and used to make other commodities that can be bought and sold and carried to the marketplace. It is, in other words, purely and abstractly a commercial instrument.”⁷³ Consider this argument under the rule of capture. If Landowner A is wealthy and lives over Aquifer X, then he or she can drill a deep well and pump as much of the water out of Aquifer X as desired without regard to neighboring landowners. Landowner B is poor and lives next to Landowner A. Landowner B’s well quickly runs dry and he or she cannot afford to dig a deeper well to supply his or her family and crops with water. Landowner B’s crops dry up and shortly thereafter so does his or her bank account. Under the rule of capture, Landowner B cannot take any legal action against Landowner A. Landowner B’s human need for water is not met, so Landowner B without access to clean water perishes. Landowner A did not have a duty to supply Landowner B with water under the idea that water is a human need, not a human right, and Landowner B did not have a right to clean water so there was no moral or legal directive for anyone or any institution to step in and ensure Landowner B had his or her basic human need met. The rule of capture causes water to be

⁷² Barlow and Clarke, *Blue Gold*, pp. xii, xiv.

⁷³ Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Oxford University Press, 1985), p. 52.

viewed as a commodity, which results in wealth dictating who will have access to water. Given this simplified scenario, does defining water as a human need seem sufficient? If the rule of capture can function in this manner, is it environmentally just to define water as a human need? If the answer is no, then we must consider the argument that water is a basic human right. If water is a basic human right, should we allow water to be privately owned and controlled by individual landowners? If the environmental justice movement supports the belief that everyone should have access to clean water, and the rule of capture favors the wealthy, then it is evident these two principles are in direct opposition. As Donald Worster explains, “capitalism has created over the past one hundred years a new, distinctive type of hydraulic society, one that demonstrates once more how the domination of nature can lead to the domination of some people over others.”⁷⁴ In this case it is the domination of the wealthy over the poor and the domination of corporations over individuals. On the other hand, it is unreasonable to conclude that water should never carry a monetary price tag for its use. If it was simply given to all of us for free, it would lead to the over use of water worldwide. Humans are much too greedy and wasteful to even suggest that we would not waste water if it carried no price tag for its use. What is being argued here is that if we allow laws such as the rule of capture to dictate groundwater use, then we are treating water simply as a human need and allowing wealth and location to dictate who gets access to water and in what quantities. If we consider water to be a human right, then we are forced to consider the implications of our actions on one another when using water. Individuals must consider the impact their water use has on their neighbors, their community and society as a whole.

Because the use of water must carry a price tag, wealth will always dictate that an affluent individual will have access to a greater amount of water than a poor person, but if we

⁷⁴ Ibid., p. 50.

consider access to clean water a right, then wealth will not allow for such access to clean water that will leave nothing for the poor person. The poor person would still have access to enough clean water for survival. Wealth would simply allow for access to clean water above and beyond what is needed for survival. Barlow and Clarke argue that:

the antidote to the commodification of water is its decommodification. Water must be declared and understood for all time to be common property. In a world where everything is being privatized, citizens must establish clear parameters around these areas that are sacred to life or necessary for social and economic justice. Equal access to water is absolutely central to both life and justice.⁷⁵

The question here is whether we really want to turn a human right into nothing more than a commodity to be bought and sold in the framework of a capitalist society. If we make water simply a commodity to fulfill a human need, then we are increasing the monetary value of water, but at the same time decreasing its intrinsic value. Worster explains that water in a capitalistic state has no intrinsic value, no integrity that must be respected. Water is no longer valued as a divinely appointed means for survival, for producing and reproducing human life, as it was in local subsistence communities.⁷⁶ This is also a very anthropocentric view of water.

Traditionally our anthropocentric view of the environment has led to its degradation. It is arrogant to value water as a commodity for humans when all life on Earth needs water to survive. As Barlow and Clarke simply state it, “If water is privatized, who will buy it for Nature?”⁷⁷

National Environmental Policy Act

In an attempt to determine if the rule of capture is indeed in violation of the Federal Government’s environmental justice initiatives, it is important to further explore the National Environmental Policy Act (NEPA) of 1969. The purpose of NEPA is to “declare a national

⁷⁵ Ibid., p. 208.

⁷⁶ Ibid., p. 52.

⁷⁷ Barlow and Clarke, *Blue Gold*, p. xiii.

policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.”⁷⁸ NEPA further goes on to state under Title I, Section 101b six ways in which to fulfill the intended purpose of NEPA. The six items are as follows:

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
4. preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;
5. achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.⁷⁹

It is important to remember, as stated earlier, that NEPA has no authority over past and present actions against the environment, but instead refers to future or planned activities that may be deemed to have negative environmental impacts. This raises an interesting question as to whether or not an existing law or rule could be challenged using the verbiage of NEPA as an attempt to overturn or replace the existing law or rule. It seems that NEPA can be used in challenging the legality of the rule of capture since this rule will continue to dictate groundwater usage for the future of all Texas until another rule or law governing groundwater replaces it.

⁷⁸ “The National Environmental Policy Act of 1969,” *Council on Environmental Quality*, <http://ceq.eh.doe.gov/nepa/nepanet.htm>.

⁷⁹ *Ibid.*

NEPA cannot be used to seek retribution for past or present groundwater issues, but NEPA can be used to argue whether or not the rule of capture's goal in dictating future groundwater use is in violation of the act.

First, we should examine the purpose of NEPA to determine whether or not the rule of capture violates the overall intent of this act. Although we are only dealing with future implications of the rule of capture, it is necessary to refer to historical cases involving the rule of capture to see if it supports NEPA or conflicts with NEPA's purpose. If indeed we do find that it conflicts with NEPA, then it can be inferred that it will continue to do so in the future. NEPA's purpose reads that two of its goals are to promote harmony between "man" and "his" environment and to eliminate or prevent damage to the environment. If we consider the court cases involving groundwater issues from the plaintiff's perspective, it is arguable that these individuals are no longer living in harmony with their environment. Consider an individual landowner who has been using a well on his or her property for years for household and agricultural purposes. One day an adjacent landowner digs a bigger, deeper well and depletes the first landowner's well to the point that he or she no longer has fresh water on a daily basis. The first landowner who was living in harmony with the environment by using only the groundwater needed to survive and not overpumping the aquifer is now no longer living in harmony with the land since an essential component to survival, water, is no longer available to him or her. It can also be argued that the second landowner is not living in harmony with his or her environment since he or she is pumping the groundwater at such great rates as to be exploiting the aquifer by decreasing it at a rate greater than it can be replenished. Driving through East Texas one will find billboards saying, "Keep Ozarka Out!" The local landowners in East Texas fear Ozarka will buy up neighboring property and build big powerful wells, drying

up the wells of existing landowners. Currently these landowners are living in harmony with the environment and each other, but they are very aware of the outcome of court cases such as *Sipriano v. Ozarka*. In this case the court used the rule of capture to uphold the right of Ozarka to pump unlimited amounts of water out of the aquifer even though it was causing existing landowners to be driven off their land. Essentially Ozarka's rapid rate of pumping caused the landowner's wells to dry up, making it not only impossible for these people to survive on their land but also making the land worthless.

The second goal of NEPA is to eliminate or prevent damage to the environment. If we consider an area of Texas where there is no groundwater conservation district and the aquifer is only regulated by the rule of capture, it immediately seems evident that in such an area there is a high probability of environmental damage occurring. Because groundwater is intimately linked with surface water, the depletion of an aquifer can have far-reaching effects on the surrounding ecosystem. Springs, creeks and rivers can potentially dry up if the level of the aquifer is depleted to such an extent that the groundwater no longer reaches the surface water in a given area.

Another environmental harm that can be caused by the depletion of an aquifer is the subsidence of the land above the aquifer. Areas throughout Texas have suffered from subsistence; especially drought prone areas such as West Texas. The argument here is that in an area without a groundwater conservation district there is nothing to prevent a landowner from pumping large quantities from an aquifer leading to negative environmental impacts on the land above the aquifer. Overpumping can negatively alter ecosystems, which is in direct conflict with the purpose of NEPA to eliminate or prevent damage to the environment. While it is not absolutely certain such damage will occur, continuing to operate under the rule of capture allows for the potential of overpumping of an aquifer causing the land to subside. Historical evidence

seems to suggest this scenario, in direct opposition to the purpose of NEPA, is a realistic possibility in the future. Since the rule of capture allows this violation of NEPA, it seems imperative that an alternative method for managing groundwater be adopted in areas without a groundwater conservation district. It is possible that this same scenario could happen in an area where there is a groundwater conservation district since the rule of capture is still the overriding authority on groundwater usage, but for the sake of argument there is no doubt that it can happen in an area without a groundwater conservation district. Since NEPA is concerned with future possibilities of negative environmental impacts, the burden of proof does not lie in the fact that something is happening, but instead requires showing proof that something could potentially happen based on an existing rule or law. Since there is a large amount of both historical and scientific data showing what has occurred in Texas as a direct result of the rule of capture, it is not a difficult argument to show that the rule of capture directly violates the very intent of NEPA.

To further determine whether or not the rule of capture is in direct violation with NEPA, let us now look at the six items listed in section 101b under Title I. The first item calls for each generation to act as trustee of the environment for future generations. The implication here is that current generations are responsible for ensuring that there is an environment for future generations to enjoy which is not spoiled, ruined or harmful to the health and welfare of their existence. If the rule of capture allows landowners the possibility of drying up their neighbors wells and depleting the level of an aquifer to such an extent that it negatively effects surface water and causes subsidence of the land, then it hardly seems that it simultaneously supports the idea that such a landowner should act as a trustee of the environment for future generations— unless we accept that the trustee is expected to leave a degraded environment for future

generations. This, of course, is an illogical conclusion because a trustee is intended to act on behalf of future generations and look out for their best interests. The rule of capture is not promoting the best interests of future generations. Instead, it is focused only on the present interests of the current landowner without regard to the impact these interests might have on anyone else, present or future. In fact, this argument appears to work against all six items stated in section 101b under Title I of NEPA. Each of the six items comes into direct conflict with the rule of capture and its future implications if Texas continues to apply this rule to the regulation of its groundwater resources. Of particular interest is item four that calls for “an environment which supports diversity, and variety of individual choice.”⁸⁰ On both a state and national level Americans demand the right to individual choice. It is considered one of the fundamental freedoms that makes America such a great place to live. The rule of capture denies landowners the right to individual choice because it enables neighboring landowners to take the choice of groundwater usage away from each other. For example, consider the Sipriano case. Until Ozarka bought property adjacent to Sipriano’s land, the Sipriano family had the choice to use well water for household and agricultural purposes. In fact, they had the choice to live on their land because it was productive and provided suitable living conditions due to the availability of groundwater. Once Ozarka began pumping large quantities of water and dried up the Sipriano wells, this family no longer had the individual choice to live on their land and continue using the groundwater beneath their land. Ozarka took this choice away as a viable option for them as well as the many other Henderson County landowners whose wells also dried up. The Henderson County landowners lost, Ozarka won, and the rule of the biggest pump, a common description of the rule of capture, survived sending a message that the right to live on land and use the groundwater beneath that land is simply dictated by economics. The rule of capture inherently

⁸⁰ Ibid.

favors the wealthy and powerful, literally leaving the individual landowner “high and dry.”

After seriously contemplating the six items defined in section 101b under Title 1 of NEPA, I am hard pressed to find anything within the language of the rule of capture or within the historic legal implications of the rule of capture that coincide with the purpose and goals of NEPA. Thus it appears that there are grounds for an environmental justice argument against the rule of capture for the future implications of continuing to manage Texas’s groundwater under this Rule. Now it is necessary to consider if there are other possible arguments that address past and present issues related to the rule of capture, supporting the replacement of this rule with an alternative method for regulating groundwater.

CHAPTER VI

A CONSTITUTIONAL ARGUMENT

Fourteenth Amendment to the U.S. Constitution

The Fourteenth Amendment to the Constitution declares that no state shall “deprive any person of life, liberty or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.”⁸¹ The basis for many U.S. Supreme Court rulings on cases involving the violation of a person(s) civil rights is the declaration in this amendment that no state can deny anyone “equal protection of the laws.” The Constitution is open to constant interpretation and is used to challenge existing laws based solely on their constitutionality every day in the United States. Perhaps environmental justice is too convoluted to serve as a basis for an argument against the rule of capture; therefore, I would like to suggest that we consider an approach to challenge the constitutionality of the rule of capture using the Fourteenth Amendment and its protection of personal rights.

As stated before, water is necessary for all life on Earth. If the rule of capture allows one landowner to deny a neighboring landowner access to water under his or her land, is this act in violation of the right to life? It is important to remember the argument explained by Barlow and Clarke in *Blue Gold* that access to clean water is a fundamental human right.⁸² If we follow their argument to its reasonable conclusion then we must recognize that by denying an individual his or her right to water we are also denying his or her right to life.

In order to examine this possibility, it is necessary to consider a hypothetical example. In this example, we will look at a situation involving two neighboring landowners in a rural area.

⁸¹ Steve Mount. “Constitutional Topic: Martial Law,” *USConstitution.net*, 18 March 2005, http://www.usconstitution.net/consttop_mlaw.html.

⁸² Barlow and Clarke, *Blue Gold*, p. xiv.

This is a particularly appropriate example since 95 percent of the rural population in the United States depends on groundwater for domestic use.⁸³ Landowner X runs a small family farm in West Texas on land that his family has owned for one-hundred years. Landowner Y is a large corporation that bottles water and sells it to the public for profit and has owned the land for only six months. Landowner X gets all of his water from several wells that have existed on his property for years. These wells supply his family with all their water and provide water for his crops and a few head of cattle. Other than purchasing bottled water, Landowner X has no access to water via a public water system or otherwise. For one hundred years, through times of drought and times of excess rain, the wells on Landowner X's property have provided his family with all the water they need to live and survive in the harsh West Texas climate. Six months ago, Landowner Y came to town and purchased a particular large tract of land, knowing that an aquifer is located beneath the property. Land in West Texas is inexpensive and Landowner Y knew this purchase made for a great investment. The aquifer would provide extensive quantities of water to bottle for retail sales. Shortly after purchasing the property Landowner Y began drilling much deeper wells and using pumps more powerful than those on Landowners X's property. Landowner Y immediately began pumping vast quantities of water from the aquifer. In fact, Landowner Y's pumping rate far exceeded the recharge rate of the aquifer. Shortly after the pumping began, Landowner X's wells ran dry for the first time in one hundred years. Barely making enough profit from his small farm to survive, Landowner X certainly did not have the money or equipment to dig new, deeper wells. Landowner X decided to approach Landowner Y to inform him that the company's overpumping had dried up his wells and his family and farm's livelihood were at stake. Landowner Y listened to Landowner X's complaints but turned a deaf ear. Citing the rule of capture, the corporation stated it was doing nothing illegal in the State of

⁸³ Anderson and Snyder, *Water Markets*, p. 162.

Texas. This response left Landowner X with two choices: either move his family or die on the land that they loved. Landowner X could, for a short time purchase bottled water for his family, perhaps from the very company that was running him off his land; however, he simply could not afford to buy water for bathing, washing clothes, watering his crops, and for his cattle. As Landowner X's crops dried beneath the hot Texas sun and his cattle died from dehydration, so did his only source of income. Landowner X has the choice to move his family, but to where? His only training is in farming, and he does not even have a high school education. As Landowner X packs his few belongings and loads his family in their truck, Landowner Y is digging yet another well. Landowner Y has successfully displaced Landowner X purely for economic gain. In other countries we often consider it morally reprehensible when local people are driven from their land; yet in this scenario we have a law in Texas that allows just such a scenario to not only occur, but to occur legally. The question here is: is it constitutional? Federal law supercedes state law, so if we can show that the rule of capture is unconstitutional because of its implications, then the State of Texas must overturn the rule of capture and replace it with another means by which to regulate groundwater.

As U.S. citizens we do not have the right to take someone else's life unless we feel our life is being directly threatened. Taking someone's life under such circumstances is known as self-defense. If water is necessary for survival, then should Landowner Y be able to deny Landowner X access to groundwater? Landowner Y has the power to deny Landowner X access to water simply because of economics—Landowner Y has more money and can therefore build deeper wells and use more powerful pumps. This scenario is a perfect example of why the rule of capture is also called the “rule of the biggest pump.” Landowner Y is placing Landowner X and his family's life in jeopardy by drying up their wells; therefore, it logically follows that

Landowner Y is directly denying Landowner X's right to life. If we follow this argument to a possible conclusion, then we must consider the right of Landowner X to take action against Landowner Y. Given that Landowner Y is placing Landowner X and his family's life in jeopardy, Landowner X has the right to defend his family's lives. In an extreme extrapolation of this scenario, Landowner X could argue that he has a right to retaliate against Landowner Y using the justification of self-defense. This may seem to be carrying this scenario to an illogical and almost ridiculous conclusion, but we must take into account the absurdity of continuing to operate under the rule of capture.

The rule of capture allows Landowner Y to legally cause indirect harm to Landowner X and does not allow any judicial or legal means by which Landowner X can protect his land, his livelihood and his family. All other laws in the United States do not give us the right to intentionally or purposefully cause harm to other human beings, either directly or indirectly, except for the rule of capture. Given that this situation seems to be in complete opposition to any other legal or moral law we operate under in our country, then the preposterous justification of self-defense when defending the life of one's family against a powerful corporation may not seem to be such a ridiculous argument. A landowner's economic status or geographic location should not allow him/her to trump another landowner's basic inalienable right to life, i.e. their right to access clean water from an aquifer.

In the United States neither power nor wealth affords an entity or person the authority to take away basic rights as guaranteed by the Constitution. In addition rights are not guaranteed based on the quality of one's geographic location. Whether or not someone lives in the most impoverished or wealthiest community does not alter his or her inalienable rights as a United States citizen. Although it may be argued that this example is unlikely to occur, it is important to

remember that the frequency with which such a scenario could occur is not what is important. What is important is to determine whether or not the rule of capture allows one landowner to deny another landowner access to water, thereby denying that landowner his or her basic right to life. If, as shown here, the rule of capture allows for a violation of a person's basic right to life, then logically it would follow that the rule of capture is unconstitutional.

No-Injury Rule

Another important factor in the argument as to whether or not the rule of capture is unconstitutional is the no-injury rule. The no-injury rule protects landowners from being harmed as a result of a neighboring landowner using too much water. The no-injury rule is applied in cases where either a transfer in water rights or a change in water use occurs and adversely affects a third party.⁸⁴ In the scenario given above, Landowner X would be the third party because Landowner Y purchased the land from a previous landowner with the intent to withdraw water from the aquifer. This purchase by Landowner Y not only caused a transfer in water rights, but it also caused a change in water use. Landowner X became adversely affected because the sale of the land and the change in water usage on this land made Landowner X the third party.

The possibility of third-party impairment prompted all western states to implement judicial or administrative procedures that must be followed before water use can be altered or water rights transferred. Although procedures vary from state to state, they typically allow changes or transfers only if there is no injury to other water rights holders. This standard is known as the no-injury rule . . . and Alaska, Arizona, California, Idaho, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington and Wyoming have adopted this rule.⁸⁵

This no-injury rule recognizes the potential impairment of a landowner and requires that no harm come to a landowner as a direct result of how a neighboring landowner is using groundwater or

⁸⁴ Ibid., p. 82.

⁸⁵ Ibid., p. 83.

surface water. Although this rule sounds important and a step in the right direction for ensuring equal access to water, it is at the same time in direct conflict with the rule of capture. The no-injury rule seems to make sense on a moral, ethical and constitutional basis. One landowner does not have the right to adversely affect another landowner by altering the usage of a water source that is shared by many individuals. In fact, it was this very argument, the adverse affect upon neighboring landowners that was used to overturn the use of the rule of capture to regulate oil and gas resources in the State of Texas. As explained in the journal *Environmental Law*, “Existing users are not protected against installation of a well on an adjacent plot of land or against withdrawal of water from that well at a rate great enough to lower the water table below the well intakes of surrounding landowners. Indeed, it was this type of unrestricted extraction that ended the rule of capture for oil and gas in Texas.”⁸⁶

It appears that Texas has two rules on the books that are in direct conflict with each other. The rule of capture holds that one landowner cannot be held legally responsible for adversely affecting a neighboring landowner by withdrawing water from a groundwater source, while the no-injury rule claims a third-party may not be adversely affected by a change in use or a transfer in water rights. The no-injury rule seems to adhere to the First Amendment which guarantees everyone the right to life, while the rule of capture seems to give permission to any landowner to deny a neighboring landowner’s right of access to clean water, denying his or her right to life.

When considering these different arguments, whether driven by environmental justice or the United States Constitution, they all seem to point to the same answer: the rule of capture is simply outdated, unjust and incapable of regulating groundwater in a manner that will ensure

⁸⁶ Todd H. Votteler, “The Little Fish that Roared: The Endangered Species Act, State Groundwater Law, and Private Property Rights Collide Over the Edwards Aquifer,” *Environmental Law*, Winter 1998, p. 36.

enough water for future generations of Texans. The increasing demand for water in the state of Texas fueled by a growing population makes the need for an effective means to deal with groundwater issues paramount to the state's future. Whether the argument for replacing the rule of capture comes from an economic, moral, ethical or environmental viewpoint, the conclusion is the same: the rule of capture is fundamentally flawed. If it remains Texas's guiding principle for groundwater management the water levels in aquifers will continue to be depleted to a point where accessing the groundwater will not be economically viable for future Texans.

CHAPTER VII

RELATIONSHIP OF GROUNDWATER TO SURFACE WATER

Another fundamental problem with groundwater regulation in the State of Texas is the fact that it is dealt with as a completely separate issue from surface water. Texas law does not recognize the intimate interaction between groundwater and surface water and instead treats them as completely independent of each other. In terms of current scientific advancements, we know they are not. Both surface and groundwater are a part of the larger life cycle of water as it changes from solid to liquid to gas and back again. At the time the rule of capture was adopted, scientists did not understand that groundwater and surface water were linked to each other. As noted before in the discussion of the Texas Supreme Court case that adopted the rule of capture the supreme court justices stated that, “because the existence, origin, movement and course of such waters [groundwater] and the causes which govern and direct their movements, are so secret, occult, and concealed that an attempt to administer any set of legal rules in respect to them would be involved in hopeless uncertainty, and would, therefore, be practically impossible.”⁸⁷ It logically follows that continuing to operate under the rule of capture perpetuates the false belief that the scientific community does not understand how groundwater functions and that there is no known connection between groundwater and surface water.

There are many examples of the connection between aquifers and springs and rivers in the State of Texas. In many instances the numerous aquifers in the State of Texas recharge springs that then in turn recharge many rivers that flow in the state. Not only does the water in the aquifer provide necessary water for human consumption via commercial, industrial and residential uses, but it also ensures there is adequate water in spring and rivers to sustain the

⁸⁷ *Houston & Texas*, 81 S.W. 279 (Tex. 1904).

variety of wildlife in the water and to provide a source of drinking water used by other wildlife. Votteler writes, “the Edwards Aquifer is the sole source of water for San Antonio, Texas. The Aquifer contributes surface water flow in the Guadalupe River through Comal and San Marcos Springs, both of which are home to endangered aquatic species, including the fountain darter.”⁸⁸ The Edwards Aquifer should not be depleted because it is the sole source of drinking water for San Antonio and because there is a direct relationship between the level of water in the aquifer and the level of water in the Comal and San Marcos Springs and the Guadalupe River. The Guadalupe River is an important source of irrigation for many farms in West and South Texas and Mexico and it also serves as a source of recreation for many Texans throughout the spring and summer. The livelihood of many farmers and water rafting and tubing companies depend on the level of the water in the Guadalupe. If the groundwater source is depleted, then the level of flow in the Guadalupe will also decrease. The lack of water available for recharge of the Guadalupe would have a tremendous economic impact on many areas in central, south and west Texas. As Votteler notes, “during years of drought the Edwards Aquifer plays an extremely significant role in recharging these springs and the Guadalupe River. “During droughts, springflow from the Edwards Aquifer can become almost the sole source of flow downstream into the Guadalupe River.”⁸⁹ This fact is very significant because during years of drought the wells over aquifers are pumping more water for residential use and for irrigation. This overpumping causes the level of the aquifer to drop and without rainfall the aquifer is not recharged. As a result, as the level of the aquifer drops, the amount of water flowing to the springs and rivers decreases. The combination of drought and an overpumped aquifer creates a scenario with tremendous environmental and economic impacts. Operating under the rule of

⁸⁸ Votteler, “The Little Fish that Roared,” p. 1.

⁸⁹ Ibid., p. 4.

capture not only denies the connection between aquifers, springs and rivers but it also provides no means by which to ensure the aquifers are not pumped at a rate greater than they can be recharged. Denying the obvious connection between ground and surface water also causes legal complications in the State of Texas. Since Texas has much stricter laws governing surface water than it does groundwater, the issue becomes complicated when considering that much of the surface water originates as groundwater. If laws in the State of Texas protect a river, but much of this water comes from an aquifer and the water in the aquifer is not protected, then how in reality is the surface water really protected? An example of this complication continues to be the impetus for legal battles in the San Antonio area.

As water from the Aquifer flows from Comal and San Marcos Springs, its legal character is transformed as it changes from groundwater to surface water in the Guadalupe River Basin east of San Antonio. Permits issued by the State to surface water rights holders downstream on the San Marcos, Blanco, and Guadalupe Rivers are based in part on flows from the Aquifer. According to the Guadalupe-Blanco River Authority increased pumping in the Edwards Aquifer region depletes the discharge of water at the springs, interfering with established surface water rights of users in the downstream counties in the Guadalupe River Basin. The different legal systems governing ground and surface water in the Aquifer region have complicated water resource planning and made a solution to periodic shortages elusive.⁹⁰

If Texas continues to operate under the rule of capture ignoring the relationship of groundwater to surface water, there will never be an agreeable solution to such legal complications. A law that simply denies the impact that groundwater has on surface water also negates the value of laws that regulate surface water. Without developing comprehensive water laws and governing agencies in Texas that recognize the relationship of ground and surface water to one another, we are ensuring a bleak future for Texas by guaranteeing that there will not be enough water in the State of Texas to supply the exponential population growth in this state. As John Ashworth, Associate, LBG Guyton and Associates, explained during his presentation at the Environmental

⁹⁰ Ibid., p. 12.

Defense third annual State-Wide Water Conference, “In Texas and elsewhere there are different laws governing surface water and groundwater, and there are different entities managing each resource separately with little or no coordination of supply source concerns. But from a hydrological point of view, these two resources are often interrelated and where appropriate should be viewed as a single resource.”⁹¹ The Edwards Aquifer is just one example of an aquifer in Texas that provides water for springs and rivers. In fact, all aquifers in Texas provide water for spring and/or rivers, but in each example the scenario mimics the example of the Edwards Aquifer. Depleting the water level in these aquifers has far-reaching impacts that the Texas Supreme Court Justices could never have imagined in 1904. To point our finger at their decision and blame these Supreme Court Justices for the current situation is unfair. What is unfathomable is why, one hundred years later, Texas has not overturned this decision and replaced the rule of capture with a more up-to-date law that will protect the precious water resources in the State. We should be pointing fingers at ourselves in admonishment for continuing to operate under the rule of capture. If forty-nine other states have adopted alternative water laws and even Texas has recognized the shortcomings of the rule of capture and its inability to regulate oil and gas, does it not follow logically that Texas should develop a new set of laws governing ground and surface water?

⁹¹ John Ashworth, “Groundwater/Surface Water: The Underlying Connections.” (paper presented at the annual statewide water conference: Texas Groundwater, Yours, Mine Ours?, Austin, Texas, 7 March 2003).

CHAPTER VIII

ALTERNATIVE APPROACHES TO WATER REGULATION

Water Doctrines in other States

The question we must now ask ourselves is what groundwater regulations should the State of Texas adopt if we overturn the rule of capture? Do any states currently have groundwater policies on the books that are more equitable and are structured to better protect groundwater resources for the future? Looking to the eastern states for an answer is not a viable option due to the extreme differences in climate, namely rainfall amounts; however, there are several different types of groundwater regulations used by other states in the U.S. whose climates are more similar. Arizona, Florida and Nebraska operate under the “Reasonable Use” doctrine; Colorado, Idaho, Kansas, Nebraska, Nevada, New Mexico, North Dakota, Montana, Oregon, South Dakota, Utah, Washington and Wyoming operate under the “Prior Appropriation” doctrine and California uses the “Correlative Rights” and “Public Trust” doctrines to manage groundwater.⁹² First, it is necessary to gain a basic understanding of these existing groundwater doctrines in order to determine whether or not they will work for the State of Texas. It might be the case that Texas does not want to adopt any of these alternatives, but instead wants to create its own system unique to the State of Texas. It has become evident, however, that if Texas wants to ensure water for future generations, it must replace the rule of capture with groundwater regulation that recognizes the need to limit extraction of groundwater to avoid the overpumping of aquifers.

The first groundwater doctrine we will discuss is reasonable use. This doctrine states that the landowner is allowed to use as much groundwater as he or she chooses as long as the use is

⁹² Ronald Kaiser, “State Experiences with Groundwater Management,” *Texas Water Resources Institute*, 14 November 2004, <http://texaswater.tamu.edu/Resources/TexasGroundwater.ppt>.

reasonably related to the overlying land, meaning it cannot be sold or transported, and it does not adversely affect his or her neighboring landowners.⁹³ The advantage this doctrine has over the rule of capture is that it requires landowners to consider the needs of the surrounding property owners when withdrawing water from the aquifer. It is, however, the only advantage the reasonable use doctrine has over the rule of capture. One inherent problem with this doctrine is who defines reasonable use? What one individual considers reasonable use may not be reasonable use to another individual or entity. Another problem with this doctrine is that it requires an individual or entity to “consider the needs of surrounding property owners” while failing to define how it should be done. This doctrine also neglects to define what those needs are.

The next type of groundwater regulation is the doctrine of prior appropriation. It is also known as the “first in kind, first in right” doctrine. It “maintains that the first landowner to beneficially use or divert water from a water source is granted priority of right.”⁹⁴ “An entity claims the right of prior appropriation by filing a claim in accordance with the laws of the state.”⁹⁵ This idea supports the belief that it is better for one user to have the amount of what he or she needs rather than to distribute it arbitrarily among many users. An entity can lose their prior rights by either non-use or abandonment, at which point another entity can then file for the right of prior appropriation. Some states combine this right with others to ensure that the water is being used for beneficial purposes and that the water is being put to reasonable use. Many things in society function on a “first come, first serve” basis, but does this approach seem like a

⁹³ “Arizona Water Information: Statutes and Rule,” *Arizona Department of Water Resources*, 22 April 2005, <http://www.water.az.gov/adwr/Content/WaterInfo/default.htm>.

⁹⁴ *Water System Council*, http://www.watersystemscouncil.org/VAiWebDocs/WSCDocs/1836033_IN_WHO_OWNS.PDF.

⁹⁵ Dan Lim, “Water Rights,” *Flash Learning Games at the University of Minnesota*, <http://sunny.crk.umn.edu/courses/NatR-Holder/SOIL&H20/Handouts/WaterRights.doc>.

practical way to allocate groundwater in Texas? It does not seem that this doctrine helps to avoid the problems of overuse unless it is combined with some other regulation limiting the amount the first owner extracts from the aquifer. Another inherent problem with this doctrine is it encourages a “use it or lose it” attitude. If water conservation is the goal, then adopting a policy that causes a landowner to lose his/her water rights through non-use seems counterintuitive to the goal of ensuring enough water for all Texans, present and future.

The third type of groundwater doctrine found in the United States is known as correlative rights. It “maintains that the authority to allocate water is held by the courts.”⁹⁶ This doctrine allows all landowners to have co-equal, or correlative rights to the reasonable and beneficial use of the groundwater and at the same time supports the concept that adjoining lands can be served by a single aquifer. Placing the authority to allocate water in the hands of the courts helps to avoid the problem of over withdrawal of the aquifer. This approach permits the courts to keep updated records on how much water from the aquifer is allocated at any given point in time, along with a current list including contact information of everyone who has requested water allocations. Not only can the courts consider both public and private interests, but it is possible for the courts to take into account both human and non-human interests when determining who receives withdrawal permits and maximum allocation amounts. One potential problem that placing the authority of water allocation in the hands of the courts could cause is the unfair advantage that a large company or wealthy individual would have over a small landowner. If a dispute arises between a large company or wealthy individual and a small landowner, there will be a distinct advantage in the courtroom for the wealthier, more powerful party. There are many instances in the legal system when the wealthier, more powerful party wins the case before the

⁹⁶ *Water Systems Council.*

court simply because it is able to hire better, more skilled attorneys. It does not seem equitable to adopt a water doctrine with the potential to lead to such a scenario in a court of law.

The fourth groundwater management strategy, the public trust doctrine, holds that certain resources are above private ownership and reside in the trust of government for the benefit of the people. It is the duty of government to administer these resources to the highest public interest.⁹⁷ By adopting the public trust doctrine in addition to other groundwater laws, aquifers in the State of California are automatically placed in trust of the government. Since this automatically negates the possibility of adopting a groundwater law, such as the rule of capture, which gives landowners private ownership of any water beneath their land, California avoids the possibility of their groundwater supplies being depleted for the best interest of one party. Another benefit of this doctrine is that it gives the government the authority to revoke existing rights in order to prevent violation of the public trust. The public trust doctrine is a movement away from thinking about groundwater as a private commodity that we can buy and sell and whose value is derived solely from the price per gallon. This approach represents a shift away from a “strictly utilitarian, divide-and-conquer approach to water management and toward an integrated, holistic approach that views people and water as related parts to the greater whole.”⁹⁸ Adopting this doctrine, in addition to other groundwater policies, supports the belief that we should solve future water shortages through conservation and preservation of existing natural sources of water, rather than relying on technology to create more water when we have used up and polluted the current supply. Adopting this doctrine is a very important first step in a change we must make from thinking groundwater as a renewable resource that can be managed and owned toward realizing “water is the basis of life, and our stewardship of it will determine not only the

⁹⁷ “California Water Rights and the Public Trust Doctrine,” *Waterscape International Group*, 2 February 2005, http://www.waterscape.org/pubs/factsheet_waterrights/FS_CaliforniaWaterRights.htm.

⁹⁸ Sandra Postel. *Last Oasis: Facing Water Scarcity* (New York: W.W. Norton & Company, 1997), p. 185.

quality but the staying power of human societies.”⁹⁹ Although I believe adopting a public trust doctrine for the protection of groundwater resources is the best long-term sustainable solution to future water shortages, I believe adopting this doctrine in Texas would be difficult because of certain attitudes held in common by the majority of Texans.

Alternatives for Texas

When considering these different approaches to governing groundwater use in the United States as potential possibilities to replace current groundwater regulation in Texas it is also important to consider the political climate of Texas and current social ideals as they relate to land use and land ownership. Texans have a very strong sense of property rights and to consider legislation that takes ownership of water rights out of a landowner’s hands would quickly fail when put to a popular vote. Another common belief held by most Texans is that they do not like “big brother” governing their lives. The preference is for local government to legislate and have authority over local issues. It is also necessary to consider current attempts made by the state of Texas to manage groundwater. Several areas have created groundwater conservation districts in attempt to curtail overuse of certain aquifers, namely the Edwards Aquifer. After carefully contemplating these different issues and examining the different types of groundwater regulations in the United States, it seems most appropriate and beneficial to adopt a form of the correlative rights doctrine. Block and Richardson write,

The first necessary step is the passage of a legislative act to overturn the rule of capture. Once a popular doctrine across the western United States, Texas remains the last state to recognize the rule of capture. A constitutional amendment is not necessary. The Texas Supreme Court has repeatedly stated that the 1917 amendment to the Texas Constitution clearly authorizes the Legislature to create water policy by statute.¹⁰⁰

⁹⁹ Ibid.

¹⁰⁰ Block and Richardson, “A Case of the Blues,” p. 49.

In states that currently operate under the doctrine of correlative rights the decision is left up to the courts, which as stated before could raise some potential equity issues. Perhaps instead of leaving the decision of water rights in the hands of the courts, Texas places the decision-making power in the hands of the groundwater conservation districts. Currently, there are only a few such districts in existence. If a “groundwater conservation task force” were created as a government agency, this task force could be responsible for creating groundwater conservation districts throughout the state, as well as the creation and implementation of various water conservation measures. One of the first goals of this Task Force could be to create groundwater conservation districts for the entire State of Texas. Once each district is created, then a committee or board will be elected or appointed to be responsible for running each district. The district committees will be responsible for tracking and issuing groundwater withdrawal permits, keeping records of withdrawal and recharge rates, water quality testing and any other responsibilities necessary to meet both local and regional conservation goals created by the local district and/or the task force. Each year the local district will evaluate the amount of water available for extraction from the aquifer in order to ensure the water levels do not drop to a point that causes a detrimental impact on the environment. In *A Case of the Blues*, the authors suggest a similar idea when they state, “in the case of groundwater, each groundwater conservation district should be authorized to permit (or halt) the transfer of groundwater out of its boundaries. Through the permitting process, the groundwater conservation district should work with interested parties to ensure that the water distribution is equitable and mindful of regional water needs.”¹⁰¹ The groundwater conservation districts could also be responsible for conflict resolution. If an issue or dispute arises at the local level or between two neighboring conservation districts, then the dispute would be taken on appeal to the task force. The task force

¹⁰¹ Ibid.

would serve as the governing authority and would make its decision based on the best interests of the conservation district as a whole. Texas courts are already overburdened with cases and many times do not have enough time to devote to current case loads. By creating a task force, conservation districts and committees, Texas would be putting the future of their groundwater in the hands of individuals specifically dedicated to the cause of groundwater conservation. This type of groundwater regulation would also avoid the complaints of environmental justice advocates because each person would come to the playing field on equal ground. If fees for permits are based on a sliding scale exponentially related to the amount of water the party is requesting to withdraw, then the law does not give an unfair advantage to the wealthy and/or powerful. By taking into consideration the good of the aquifer, the land and all the inhabitants when making the decision on withdrawal limits of each aquifer in Texas, the law will act in accordance with ideals of environmental ethics. Instead of only considering human needs, this law will be grounded in environmentally sound management of aquifers by taking the needs of all living and non-living things into consideration which will help to ensure water for future generations. In *Texas Groundwater and the Rule of Capture* Block and Anderson explain that

this necessary balance can be achieved by adopting for all aquifers in the state a sustainable-yield management goal, which means that average withdrawals should not exceed long-term recharge. To advance this goal the state should require that current and future Groundwater Districts set sustainable-yield caps on pumping and issue permits consistent with those caps.”¹⁰²

Both the concepts of balance and flexibility are important when considering the new groundwater law since nature is both interdependent and dynamic.

Developing, adopting, and enforcing any new law that impacts all sectors in society is usually a long and involved process regardless of what the law is attempting to regulate. As

¹⁰² “Issue Paper 4: Texas Groundwater and the Rule of Capture,” *Texas Water Matters: Texas Living Waters Project*, 2005, http://www.texaswatermatters.org/pdfs/water_planning_committee4_new.pdf, p. 1-2.

many sources have noted the “potential consequences of not taking action include the lowering of local groundwater levels, reduction in essential baseflow to rivers and streams, and diminished springflows.”¹⁰³ After considering the current groundwater regulation in Texas, it is evident that our state must take immediate action if we are to protect our aquifers and ensure there is enough groundwater for all of Texas, present and future. The response of the Texas Legislature to the impending groundwater shortage is the announcement of a ten-year plan to study the rule of capture in order to determine if Texas needs to replace current groundwater regulation. It appears their theory is that if we have had 100 years to study the ramifications of the rule of capture, why not take ten more? Clearly the answer should be to focus on the development of groundwater regulation that will ensure enough water for Texas rather than determining the effectiveness of a policy that guarantees the State of Texas will endure a future water shortage.

¹⁰³ Ibid., p. 1.

CHAPTER IX

CONCLUSION

In 2002, the Texas Water Development Board alerted Texans that if we did not change our current laws a severe shortage of water would occur by 2050. Three years later this impending water crisis is still a reality; yet the State of Texas has taken no action toward replacing current groundwater regulation. The rule of capture, which allows landowners to pump an unlimited amount of water from aquifers, is still the only statewide rule we have to manage groundwater. Using the rule of capture is a part of the same approach to groundwater management that believes the answer to any water shortage is to dam a river and build a new reservoir to meet the needs of the increasing population. With Texas's population exponentially increasing we need to realize that the belief that there is always more land and always more water is simply not true. We are coming to a point where we have polluted and destroyed so much of our natural environment that if we do not begin to practice conservation then we are essentially making the choice to use up what we have until it is gone. After reading the State Water Plan, *Water for Texas—2002* and examining the TWDB's solutions to the future water shortage, including their suggestion that El Paso and the High Plains use all the available water in the aquifer; it appears that is just what they want us to do—"use it up, we'll divert more." The TWDB suggestion that we find "more sources of water" as a solution to the future water shortage continues to rely on the faulty logic of believing we can "make more water," and simply ignores the fact that "more water" cannot be made. The building of eighteen new reservoirs is not making more water available to Texans; instead, it is simply moving water from one location to another, creating the illusion that suddenly Texans have more water available for their use. The shortage of a non-renewable resource should automatically encourage the implementation of

conservation measures and reduction in per capita use to extend the life of current supplies. Changing current groundwater regulation is imperative, but policy makers must also come to the realization that we cannot create more water sources to meet the growing demand. Instead, we must implement water conservation measures that preserve and protect groundwater sources.

After clearly illustrating that the rule of capture is in direct conflict with NEPA, the core principles of the environmental justice movement, and the no-injury rule as well as violating our right to life as guaranteed by the Fourteenth Amendment of the Constitution, it is apparent the rule of capture must be replaced. Continuing to allow the rule of capture to regulate groundwater will not only work to counter any water conservation efforts made by the State of Texas, but it will also be a legislative embarrassment to try and claim that this antiquated English Common Law will hold any credibility in court. Unlike when the original supreme court decision was handed down setting the precedent for the use of the rule of capture to regulate groundwater use in Texas, aquifers are no longer an enigma. Scientists and environmentalists alike understand that aquifers are intimately linked to surface water supplies. To ignore the increased understanding of aquifers by continuing to rely on this supreme court decision to regulate Texas groundwater is simply outdated and environmentally irresponsible.

What people must understand is that although water is a renewable resource, it is *only* renewable when the correct ecological processes are allowed to occur in nature. When we pollute our lakes and dam our creeks and rivers we are altering the natural ecological processes that occur to make water renewable. We must realize that if we do not want the day to come when our wells and water faucets run dry, then we must take the necessary steps *now* to preserve and protect our water ecosystems. Postel writes:

Water has two fundamental traits that distinguish it from any other resource. First, it is a prerequisite for life . . . and . . . second, there are no substitutes for water in most of its

uses. Together these attributes lend an overarching ethical dimension to our individual and collective decisions about water—one that says enough water should be provided to sustain all people and living systems before some get more than enough.¹⁰⁴

Postel's statement supports the basic principles of the environmental justice movement, which direct us to ensure every person has access to a clean, healthy environment. Dried-up lakes, rivers, creeks and aquifers are in no way a part of the definition of a clean, healthy environment. How can Texas justify continuing to regulate its groundwater supplies using the rule of capture when it encourages excessive use and allows individuals to pump out as much groundwater as they desire, even if it means denying their neighboring landowners access to clean water? The fact that humans have a fundamental right to have access to clean water for basic needs coupled with the federal directive to follow the principles of the environmental justice movement should be reason enough to overturn the rule of capture. It is time that representatives from state and local governments sit down together and develop a set of groundwater regulations, including conservation measures, to replace the rule of capture and provide a real solution to groundwater regulation in Texas.

¹⁰⁴ Sandra Postel, *Pillar of Sand: Can the Irrigation Miracle Last?* (New York: W.W. Norton & Company, 1999), p. 261.

REFERENCES

- Anderson, Terry L. and Pamela Snyder. *Water Markets: Priming the Invisible Pump*. Washington D.C.: Cato Institute, 1997.
- “Arizona Water Information: Statutes and Rule.” *Arizona Department of Water Resources*. 22 April 2005, <http://www.water.az.gov/adwr/Content/WaterInfo/default.htm>.
- Ashworth, John. “Groundwater/Surface Water: The Underlying Connections.” Paper presented at the annual statewide water conference: Texas Groundwater, Yours, Mine Ours?, Austin, Texas, March 7, 2003.
- Barlow, Maude and Tony Clarke, *Blue Gold: The Fight to Stop the Corporate Theft of the World’s Water*. New York: The New York Press, 2002.
- Bart Sipriano, Harold Fain, and Doris Fain v. Great Spring Waters of America, Inc. a/k/a Ozarka Natural Spring Water Co. a/k/a Ozarka Spring Water Co. a/k/a Ozarka*. 1 S.W.3d 75, 42 (May 1999).
- Block, Wendy M. and Frederick S. Richardson, “A Case of the Blues: The Inequity of Groundwater Regulation in Texas,” *Planning Forum* 7 (2001): 48.
- Brown, Christopher. “A New Chapter for Texas: The Rule of Capture, Groundwater Conservation Districts, and *Sipriano v. Great Spring Waters of America*.” *Groundwater in Brief* March 1999: 3.
- “California Water Rights and the Public Trust Doctrine.” *Waterscape International Group*. 2 Feb. 2005, http://www.waterscape.org/pubs/factsheet_waterrights/FS_CaliforniaWaterRights.htm.
- “Chapter 13: Environmental Justice.” *Office of Information Technology: UMass Amherst*. 2005, <http://www-unix.oit.umass.edu/~envhl567/chapters/chapt13.pdf>.
- Cook, Robert L. “Water.” *Texas Parks and Wildlife* July 2002: 5.
- Dobson, Andrew. *Justice and the Environment: Conceptions of Environmental Sustainability and Theories of Distributive Justice*. New York: Oxford University Press, 1998.
- Fambrough, Judon. “Who Owns Groundwater?” *Tierra Grande* 7(April 2000): 1.
- “Groundwater Regulation.” *South Plains Groundwater News*. 9 (October 2001): 1.
- Houston & Texas & Central Railway Co. v. East*, 81 S.W. 279 (Tex. 1904).

- Kaiser, Ronald. "State Experiences with Groundwater Management." *Texas Water Resources Institute*. 14 November 2004, <http://texaswater.tamu.edu/Resources/TexasGroundwater.ppt>>.
- Kelton, Elmer. "The Hidden Lake." *Texas Parks and Wildlife* July 2002: 30-39.
- "Lenntech: Water Health FAQ." *Lenntech Water Treatment & Air Purification Holding B.V.*, 2005, <http://www.lenntech.com/Water-Health-FAQ.htm>..
- Lim, Dan. "Water Rights." *Flash Learning Games at the University of Minnesota*. 17 February 2004., <http://sunny.crk.umn.edu/courses/NatRHolder/SOIL&H20/Handouts/WaterRights.doc>.
- Liu, Feng. *Environmental Justice Analysis: Theories, Methods and Practice*. Boca Raton: Lewis Publishers, 2001.
- Low, Nicholas and Brendan Gleeson. *Justice, Society and Nature: An Exploration of Political Ecology*. New York: Routledge, 1998.
- McKinney, Larry. "Water for the Future," *Texas Parks and Wildlife*, July 2002: 21-28.
- Mount, Steve. "Constitutional Topic: Martial Law," *USConstitution.net*, 18 March 2005, http://www.usconstitution.net/consttop_mlaw.html.
- "The National Environmental Policy Act of 1969." *Council on Environmental Quality*. 21 May 2003, <http://ceq.eh.doe.gov/nepa/nepanet.htm>.
- National Wildlife Federation. Press Release. Austin: 16 Oct. 2001.
- Postel, Sandra. *Last Oasis: Facing Water Scarcity*. New York: W.W. Norton & Company, 1997.
- *Pillar of Sand: Can the Irrigation Miracle Last?* New York: W.W. Norton & Company, 1999.
- Smith, Richard L. "Averitt Bill to Tackle 'Rule of Capture' on Groundwater." *Waco Tribune* 24 Mar. 2003: News section.
- "State Water Plan, Water for Texas—2002." *Texas Water Development Board*. 2001 January, http://www.twdb.state.tx.us/publications/reports/State_Water_Plan/2002/FinalWaterPlan2002.htm.
- Votteler, Todd H. "The Little Fish that Roared: The Endangered Species Act, State Groundwater Law, and Private Property Rights Collide Over the Edwards Aquifer." *Environmental Law*, Winter 1998: 36.

“Water Facts: Did You Know...” *Water Partners International*. 12 March 2005
www.water.org/crisis/waterfacts.html.

“Water Quantity in Texas.” *Texas Environmental Profiles*. 15 April 2005,
http://www.texasep.org/html/wqn/wqn_4grw.html.

“Well Care Information for you About Who Owns the Water.” *Water System Council*.
22 April 2005, http://www.watersystemscouncil.org/VAiWebDocs/WSCDocs/1836033IN_WHO_OWNS.PDF.

Worster, Donald. *Rivers of Empire: Water, Aridity, and the Growth of the American West*. New York: Oxford University Press, 1985.