St. Mary's Law Journal

Volume 22 | Number 2 Article 5

1-1-1990

The Stagnation of Texas Ground Water Law: A Political v. Environmental Stalemate.

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COMMENT

THE STAGNATION OF TEXAS GROUND WATER LAW: A POLITICAL V. ENVIRONMENTAL STALEMATE

Karen H. Norris

I. INTRODUCTION

Texas law firmly establishes that ground water belongs to the owner of the overlying surface estate.[1] This property right has been jealously guarded by

1. TEX. WATER CODE ANN. § 52.002 (Vernon Supp. 1990). *See, e.g.*, Smith-Southwest Indus. v. Friendswood Dev. Co., 576 S.W.2d 21, 25-26 (Tex. 1978) (Texas follows English rule giving landowner absolute ownership of ground water); Bartley v. Sone, 527 S.W.2d 754, 760 (Tex. Civ. App.—San Antonio 1974, writ ref'd n.r.e.) (Texas landowners own water under surface of their property); Pecos County Water Control & Improvement Dist. v. Williams, 271 S.W.2d 503, 506 (Tex. Civ. App.—El Paso 1954, writ ref'd n.r.e.) (landowner owns all underlying ground water). Texas landowners have enjoyed this property right since 1903. Tyler, *Underground Water Regulation in Texas*, 39 TEX. B.J. 532, 532 (June 1976).

Texas landowners who have successfully avoided any legislative or judicial action intended to limit ground water pumpage.[2] Today, however, the rapidly increasing Texas population coupled with the scarcity of water resources has created an urgent need for regulation of ground water pumpage.[3] This comment recognizes the immediate need for legislative or judicial action and, after examining the various doctrines of ground water regulation and their implementation in other western states, suggests some viable solutions for Texas.

II. THE EVOLUTION OF TEXAS SURFACE WATER LAW

Due in part to its mixed heritage of English, Spanish, and Mexican laws, Texas surface water regulation has developed into a unique body of law.[4] The evolution of surface water law in Texas can be studied as a three-stage progression of increasing state control.[5] The first stage of surface water law, riparian rights, came from the English common law formally adopted by Texas in 1840.[6] The English based their system on the ancient Roman law of the Institutes of Justinian.[7] The riparian system recognized a distinction

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2. Tyler, *Underground Water Regulation in Texas*, 39 TEX. B.J. 532, 538 (June 1976). When creating underground water conservation districts, the legislature was careful to reserve ownership of ground waters for landowners. *See* TEX. WATER CODE ANN. § 52.002 (Vernon Supp. 1990) (surface owner owns ground water beneath his property).

3. *See* TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 3-3 (July 1990) (Texas Water Plan assessing current and future water resources, suggesting solutions). The Texas population is predicted to double in the next fifty years. *Id.*

4. *See* H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 19-20 (1949) (discussing effects of Spanish, Mexican, and English laws on Texas water law). *See generally* W. HUTCHINS, THE TEXAS LAW OF WATER RIGHTS (1961) (discussing effects of foreign water law).

5. *See* Baade, *The Historical Background of Texas Water Law - A Tribute to Jack Pope*, 18 ST. MARY'S L.J. 1, 11 (1986) (Texas first recognized riparian rights, then riparian rights mixed with state ownership ("dual system"), and finally, state licensing).

6. Act of Jan. 20, 1840, §§ 1-2, 1840 Tex. Gen. Laws 3, 2 H. GAMMEL, LAWS OF TEXAS 177, 178 (1898). *See* H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 4 (1949) (English common law adopted on January 20, 1840 by Fourth Congress of the Republic of Texas); Davenport & Canales, *The Texas Law of Flowing Waters with Special Reference to Irrigation From the Lower Rio Grande*, 8 BAYLOR L. REV. 138, 142-43 (1956) (Texas adopted English Common Law in 1840); Townsend, *Cancellation of Water Rights in Texas: Use It or Lose It*, 17 ST. MARY'S L.J. 1217, 1220 (1986) (discussing historical development of Texas surface water law).

7. *See In re* Contests of Laredo, 675 S.W.2d 257, 260 (Tex. App.—Austin 1984, writ ref'd n.r.e.) (Texas water law derived from Roman law); JUSTINIAN'S INSTITUTES 23-26 (P. Birks, G. McLeod trans. 1987) (describing Roman influence on English law). *See generally* H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 21-24 (1949) (discussing Roman water law recorded in the Institutes of Justinian).

between the ownership of water and the use of water.[8] Although there could be no property right in the surface water itself, landowners were vested with a right to use the water.[9] This right is known as a usufruct.[10] Only those landowners with property contiguous to flowing water were accorded usufructuary rights.[11] Actual ownership of the water was compared to the law of ferae naturae.[12] That is, only the capturer could be the true owner.[13]

Along with the adoption of the common law riparian system, Texas recognized the rights previously accorded to landowners by virtue of Spanish and Mexican land grants.[14] This recognition had a profound impact on the de-

8. *See Laredo*, 675 S.W.2d at 260 (Roman law distinguished use of water from ownership of water); H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 21 (1949).

9. *See* Baker v. Ore-Ida Foods, Inc., 513 P.2d 627, 631 (Idaho 1973) (Roman law considered streams and rivers to be in common ownership); *Laredo*, 675 S.W.2d at 260 (Roman law did not allow ownership of flowing water); H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 21-22 (1949) (riparian rights are for use of water only, not ownership).

10. *See, e.g., In re* Adjudication of Water Rights in Medina Watershed, 670 S.W.2d 250, 254 (Tex. 1984) ("usufruct" is right to use water without ownership of the water); *Laredo*, 675 S.W.2d at 260 (defining "usufruct"); THE INSTITUTES OF JUSTINIAN xlix (C. Sandars trans. 7th ed. 1970). The word "usufruct" is derived from "usus," the right to use a thing, and "fructus," the right to enjoy all of its products. *Id.*; *see also* H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 21 (1949).

11. *See, e.g.*, El Paso County Water Improvement Dist. v. El Paso, 133 F. Supp. 894, 909 (W.D. Tex. 1955), *aff'd in part, reformed in part*, 243 F.2d 927 (5th Cir. 1957), *cert. denied*, 355 U.S. 820 (1957) (riparian water rights dependent upon ownership of riparian property); Wallace Invs. Inc. v. Blackstock, 384 S.W.2d 910, 912 (Tex. Civ. App.—Houston 1964, no writ); Friedsam v. Ulbricht, 315 S.W.2d 442, 447 (Tex. Civ. App.—Austin 1958), *aff'd in part, rev'd in part*, 325 S.W.2d 669 (Tex. 1959) (riparian water rights dependent on ownership of contiguous property); *see also* B. DOBKINS, THE SPANISH ELEMENT IN TEXAS WATER LAW 16 (1959) (discussing rights of riparian landowners); H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 22 (1949).

12. *See* Village of Tequesta v. Jupiter Inlet Corp., 371 So. 2d 663, 666-67 (Fla. 1979), *cert. denied*, 444 U.S. 965 (1979) (citing Trelease, *Government Ownership of Water*, 45 CALIF. L. REV. 638, 640 (1957)). "Ancient law gave no special consideration to ground water, treating all water like air, the sea, and wild animals, as the property of no one or the property of everyone." *Tequesta*, 371 So. 2d at 666-67; *see also* H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 21 (1949) (comparing law of water to law of "fish and wild beasts").

13. *See* Village of Tequesta v. Jupiter Inlet Corp., 371 So. 2d 663, 666-67 (Fla. 1979), *cert. denied*, 444 U.S. 965 (1979) (under common law, water not subject to ownership until captured); Trelease, *Government Ownership of Water*, 45 CALIF. L. REV. 638, 640 (1957) (capturer owned water under Roman law).

14. *See* State v. Valmont Plantations, 346 S.W.2d 853, 863 (Tex. Civ. App.—San Antonio 1961), *aff'd*, 355 S.W.2d 502 (Tex. 1962) (water rights granted by Mexican state of Tamaulipas governed by laws of Mexico and Tamaulipas which existed at time of grant); *see also In re* Adjudication of Water Rights in Medina Watershed, 670 S.W.2d 250, 253 (Tex. 1984) (determining Mexican water law of 1933 and discussing history of Spanish and Mexican water law). Under both Spanish and Mexican laws, all property, including water, was owned by the sovereign. The only means of obtaining water rights was to receive a specific grant from the sovereign. *Id.*; *see also* W. HUTCHINS, THE TEXAS LAW OF WATER RIGHTS 4-5 (1961)

velopment of surface water law since perhaps as much as ten percent of all Texas lands have titles derived from land grants by the Spanish Crown or the Republic of Mexico.[15] Many of these land grants carried with them rights to water use which were greater than could be provided for under the common law riparian system.[16] The state protected these previously existing rights in 1852 with the Texas Relinquishment Act.[17] The act provided that where the rights granted by Spanish law were greater than those adopted by the common law, the Spanish law would prevail.[18] Also, the Texas Supreme Court stated that holders of titles under Mexican grants would be accorded the same rights provided by the laws of Mexico in effect when the grants were made.[19]

The Irrigation Acts of 1889 [20] and 1895 [21] led Texas into a second system of surface water law.[22] In this "dual system" the unappropriated water of

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(Texas Supreme Court took judicial notice of Spanish and Mexican laws in effect at time of land grants); H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 27 (1949) (discussing Texas recognition of Spanish water rights).

15. *See* B. DOBKINS, THE SPANISH ELEMENT IN TEXAS WATER LAW ix (1959) (total Texas acreage is 170,000,000, of this, 26,280,000 acres have titles of Spanish or Mexican derivation).

16. *See* H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 17 (1949) (Spanish laws in effect when grants made controlled over Texas law, even if Spanish law more favorable); Davenport & Canales, *The Texas Law of Flowing Waters with Special Reference to Irrigation From the Lower Rio Grande*, 8 BAYLOR L. REV. 138, 155 (1956) (discussing history of riparian rights).

17. Act of Feb. 10, 1852, 1852 Tex. Gen. Laws 63, 3 H. GAMMEL, LAWS OF TEXAS 941 (1852); *see also* H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 17 (1949) (adoption of Texas Relinquishment Act on February 12, 1852 protected water rights of titleholders under Spanish land grants); Davenport & Canales, *The Texas Law of Flowing Waters with Special Reference to Irrigation From the Lower Rio Grande*, 8 BAYLOR L. REV. 138, 155 (1956) (discussing Texas Relinquishment Act of 1852).

18. Act of Feb. 10, 1852, 1852 Tex. Gen. Laws 63, 3 H. GAMMEL, LAWS OF TEXAS 941 (1852); *see also In re* Contests of Laredo, 675 S.W.2d 257, 259 (Tex. App.—Austin 1984, writ ref'd n.r.e.) (water rights determined by law of granting sovereign, Spain, at time of grant); H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 17 (1949) (adoption of Texas Relinquishment Act on February 12, 1852 protected water rights of titleholders under Spanish land grants); Davenport & Canales, *The Texas Law of Flowing Waters with Special Reference to Irrigation From the Lower Rio Grande*, 8 BAYLOR L. REV. 138, 155 (1956).

19. *In re* Adjudication of Water Rights in Medina Watershed, 670 S.W.2d 250, 252 (Tex. 1984); Manry v. Robison, 56 S.W.2d 438, 443 (Tex. 1932). *See* H. DAVENPORT, THE TEXAS LAW OF FLOWING WATERS 18 (1949) (rights provided under Mexican land grants protected by Texas Supreme Court).

20. Irrigation Act of 1889, ch. 88, 1889 Tex. Gen. Laws 100, 9 H. GAMMEL, LAWS OF TEXAS 1128 (1889).

21. Irrigation Act of 1895, ch. 21, 1895 Tex. Gen. Laws 21, 10 H. GAMMEL, LAWS OF TEXAS 751 (1898).

22. *See In re* Adjudication of Water Rights of Upper Guadalupe Segment of Guadalupe River Basin, 642 S.W.2d 438, 440 (Tex. 1982) (enactment of Irrigation Acts began "dual sys-

streams in the more arid parts of the state became public property.[23] The rights of riparian owners, however, were not impaired.[24]

Finally, in 1967, recognizing the need for more widespread regulation of surface water, Texas enacted the Water Rights Adjudication Act.[25] The act provided for the stream-wide adjudication of water rights.[26] In this scheme, Texas assumed ownership of all surface water in the state and initiated a system of licensing water users.[27] This law, whereby the state retains ownership of all surface water in trust for the people, is the currently employed

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tem" of surface water regulation); *see also* Townsend, *Cancellation of Water Rights in Texas: Use It or Lose It*, 17 ST. MARY'S L.J. 1217, 1220, 1221 (1986). The Irrigation Act of 1889 was enacted in response to the 1883 drought. *Id.* The act provided for state ownership of all unappropriated water in rivers and natural streams in arid parts of Texas. *Id.* Riparian users were not prejudiced, but non-use would result in the loss of their riparian rights. *Id.* The Irrigation Act of 1895 added storm and rain waters to the body of state owned water. *Id.* at 1222.

23. *See In re* Adjudication of Water Rights of Brazos III Segment of Brazos River Basin, 746 S.W.2d 207, 209 (Tex. 1988) (discussing dual system of surface water control prior to 1967). In the dual system, Texas recognized both riparian rights and appropriated rights to water usage. *Id.*; *see In re* Adjudication of the Water Rights of Upper Guadalupe Segment of Guadalupe River Basin, 642 S.W.2d 438, 440 (Tex. 1982) (Irrigation Act of 1895 provided for state ownership of stream water in arid parts of Texas); *In re* Adjudication of Water Rights in Llano River Watershed of Colorado River Basin, 642 S.W.2d 446, 448 (Tex. 1982) (water rights acquired by appropriation after Irrigation Act of 1895).

24. *See In re* Adjudication of the Water Rights of Upper Guadalupe Segment of Guadalupe River Basin, 642 S.W.2d 438, 440 (Tex. 1982) (riparian rights not prejudiced by Irrigation Act of 1895); *In re* Adjudication of Water Rights in the Llano River Watershed of Colorado River Basin, 642 S.W.2d 446, 448 (Tex. 1982) (riparian rights limited to amount of water used in any given year from 1963 to 1967).

25. Water Rights Adjudication Act, ch. 45, 1967 Tex. Gen. Laws 45; *see also In re* Adjudication of Water Rights of Brazos III Segment of Brazos River Basin, 746 S.W.2d 207, 209 (Tex. 1988) (Water Rights Adjudication Act passed in 1967 to simplify distribution of surface water rights); TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 2-2 (July 1990) (Texas Water Commission administers use of state water since adoption of Water Rights Adjudication Act); Townsend, *Cancellation of Water Rights in Texas: Use It or Lose It*, 17 ST. MARY'S L.J. 1217, 1227 (1986) (discussing adoption of Water Rights Adjudication Act of 1967).

26. Water Rights Adjudication Act, ch. 45, 1967 Tex. Gen. Laws 45; *see also* TEX. WATER CODE ANN. § 52.002 (Vernon Supp. 1990) (state owns all ground water in Texas); Townsend, *Cancellation of Water Rights in Texas: Use It or Lose It*, 17 ST. MARY'S L.J. 1217, 1227 (1986) (Water Rights Adjudication Act ended "dual system" of surface water regulation and vested in Texas right to adjudicate all surface water rights); TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 2-2 (July 1990) (Texas owns all surface water and holds in trust for the people).

27. *See* TEX. WATER CODE ANN. § 11.021 (Vernon 1988) (state owns all surface water); *Id.* § 11.121 (permit required for use of state water); TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 2-2 (July 1990) (Texas Water Commission issues water use permits to applicants judged to be beneficial users).

system.[28]

III. THE STAGNATION OF TEXAS GROUND WATER LAW

A. *English Rule*

The history of Texas ground water law is, in comparison to the history of surface water law, quite stagnant.[29] Amazingly, the extraction of ground water in Texas remains largely unregulated.[30] Texas adheres to the English rule which is rooted in the old common law rule of property rights based on the ad coelum or "heaven to hell" ownership theory.[31] Texas landowners, by virtue of their surface ownership, are vested with property rights in all underlying ground water.[32] As such, property owners are accorded the right

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28. TEX. WATER CODE ANN. § 11.021 (Vernon 1988); South Texas Water Co. v. Bieri, 247 S.W.2d 268, 272 (Tex. Civ. App.—Galveston 1952, writ ref'd n.r.e.); Goldsmith & Powell v. State, 159 S.W.2d 534, 535 (Tex. Civ. App.—Dallas 1942, writ ref'd); *see also* W. HUTCHINS, THE TEXAS LAW OF WATER RIGHTS 77 (1961) (state owns all surface water); TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 2-2 (July 1990) (state holds all surface water in trust for the people of Texas).

29. *See* Johnson, *The Continuing Voids in Texas Groundwater Law: Are Concepts and Terminology to Blame?*, 17 ST. MARY'S L.J. 1281, 1282 (1986) (recognizing lack of progression in Texas ground water law). The English rule of ground water regulation was adopted in Texas by 1904 and is still in effect today. *Id.* at 1282-83.

30. *Compare* Houston & T.C. Ry. Co. v. East, 81 S.W. 279, 280 (Tex. 1904) (recognizing rule of absolute ownership of ground water in Texas in 1904) *with* TEX. WATER CODE ANN. § 52.002 (Vernon Supp. 1990) (Texas landowners own ground water in 1990).

31. TEX. WATER CODE ANN. § 52.002 (Vernon Supp. 1990); *see also* Baker v. Ore-Ida Foods, Inc., 513 P.2d 627, 631 (Idaho 1973) (English rule of ground water regulation allows landowners to extract unlimited quantities of water from beneath their property); Smith-Southwest Indus. v. Friendswood Dev. Co., 546 S.W.2d 890, 895 (Tex. Civ. App.—Houston [1st Dist.] 1978), *rev'd on other grounds*, 576 S.W.2d 21 (Tex. 1978) (Texas follows English rule of ground water ownership); RECOMMENDATIONS OF THE SENATE INTERIM COMMITTEE ON ENVIRONMENTAL AFFAIRS, WATER RESOURCES 15, 20 62d Leg. (1983) (Texas courts follow English rule of ground water regulation); H. WILLIAMS & C. MEYERS, MANUAL OF OIL AND GAS TERMS 19 (7th ed. 1987) (defining *ad coelum*). Under the doctrine of *ad coelum*, the property owner is vested with priorty rights in all of the sky above his property up to the heavens, and everything beneath his property to the center of the earth. *Id.* The Latin phrase reads: *Cujus est solum, ejus est usque ad coelum et ad inferos. Id.*; Comment, *Ground Water Management: A Proposal for Texas*, 51 TEX. L. REV. 289, 290 (1973).

32. TEX. WATER CODE ANN. § 52.002 (Vernon Supp. 1990). The English rule of ground water regulation has been followed in Texas since 1904, when the Texas Supreme Court firmly established it to be Texas law. Houston & T.C. Ry. Co. v. East, 81 S.W. 279, 280 (Tex. 1904). In *East*, the 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.

See id. at 280 (quoting Acton v. Blundell, 152 Eng. Rep. 1223, 1225 (Ex. 1843)); *see also*

to unbridled pumpage of the ground water beneath their land.[33] This right has been jealously guarded by Texas landowners, perhaps at the expense of our environment and future water resources.[34]

B. *Ground Water Conservation Districts*

1. Creation and Purpose

In an attempt to help preserve Texas water resources, the Texas Constitution was amended to provide for the creation of "conservation and reclamation" water districts.[35] The legislature responded by passing Chapter 52 of the Texas Water Code, which deals exclusively with the creation and mechanics of underground water conservation districts.[36] Such districts, however, are not mandatory and can only be created voluntarily by an approving vote of the affected landowners.[37] Furthermore, the cost of such

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Smith-Southwest Indus. v. Friendswood Dev. Co., 546 S.W.2d 890, 895 (Tex. Civ. App.—Houston [1st Dist.] 1978), *rev'd on other grounds*, 576 S.W.2d 21 (Tex. 1978) (defining English rule of ground water ownership); Bartley v. Sone, 527 S.W.2d 754, 760 (Tex. Civ. App.—San Antonio 1974, writ ref'd n.r.e.) (Texas landowners own water under surface of their property); Comment, *Ground Water Management: A Proposal for Texas*, 51 TEX. L. REV. 289, 290 (1973) (Texas follows English rule of absolute ownership).

33. *See, e.g.*, Friendswood Dev. Co. v. Smith-Southwest Indus., 576 S.W.2d 21, 30 (Tex. 1978) (absent negligent conduct, landowner has absolute right to use ground water beneath his land); Corpus Christi v. Pleasanton, 276 S.W.2d 798, 802 (Tex. 1955) (landowner can extract any amount of ground water for beneficial purposes on or off his land, or for sale to others); Pecos County Water Control & Improvement Dist. v. Williams, 271 S.W.2d 503, 505 (Tex. Civ. App.—El Paso 1954, writ ref'd n.r.e.) (landowner may use ground water "at his will"); RECOMMENDATIONS OF THE SENATE INTERIM COMMITTEE ON ENVIRONMENTAL AFFAIRS, WATER RESOURCES 15, 20 62d Leg. (1983) (Texas courts follow English rule of ground water regulation). Neither the state nor an injured neighbor can regulate pumpage of ground water. *Id. See generally* Ausness, *Water Rights Legislation in the East: A Program for Reform*, 24 WM. & MARY L. REV. 547, 550-553 (1983) (discussing effects of English rule).

34. RECOMMENDATIONS OF THE SENATE INTERIM COMMITTEE ON ENVIRONMENTAL AFFAIRS, WATER RESOURCES 15, 21 62d Leg. (1983). In some parts of Texas, excessive ground water mining has resulted in decreased springflow, risking loss of endangered species, and depletion of water resources. *Id.*; Venhuizen, *Regional Conservation Program for an Aquifer District*, in PROCEEDINGS OF THE CONSERV. '90 NATIONAL CONFERENCE AND EXPOSITION OFFERING WATER SUPPLY SOLUTIONS FOR THE 1990's 1187, 1187 (1990) (Texas water supplies would be dangerously low in event of drought).

35. TEX. CONST. art. XVI, § 59. This amendment originated as a response to the 1904 recognition of the scarcity of water resources in Texas. TEX. CONST. art XVI, § 59, interp. commentary (Vernon 1955). The amendment enabled water districts to constitutionally levy taxes to fund themselves. *Id.*

36. *See* TEX. WATER CODE ANN. ch. 52 (Vernon 1972) (providing for creation and administration of underground water conservation districts). One of the legislative purposes for the creation of underground water conservation districts was to meet the objectives set out in article XVI, section 59 of the Texas Constitution. TEX. WATER CODE ANN. § 52.021 (Vernon Supp. 1990).

37. TEX. CONST. art. XVI, § 59. *See* TEX. WATER CODE ANN. § 52.022 (Vernon Supp.

districts must be borne by the taxpayers living within the district's designated area.[38]

The purpose of underground water districts is to protect and preserve underground water reservoirs and to control land subsidence resulting from the withdrawal of water from underground water reservoirs.[39] Although the stated purpose is quite noble, it serves merely to demonstrate the legislature's recognition of the existing problems.[40] The authority given to the districts, and the inherently limited nature of their local scope, falls far short of that which is necessary to accomplish the stated purpose.[41]

2. Powers

Texas tradition dictates that water management be conducted at the local level.[42] In Texas, over 4,500 local entities combine with state and federal regulators to form state water policies.[43] Many of the powers granted to local water conservation districts are entirely appropriate.[44] For instance,

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1990) (underground water conservation districts may be created by majority of landowners within proposed district as provided in Texas constitution).

38. TEX. CONST. art. XVI, § 59. *See* TEX. WATER CODE ANN. § 52.031 (Vernon Supp. 1990) (petition to create an underground water conservation district must be filed by landowners who would be within boundaries of district).

39. TEX. WATER CODE ANN. § 52.021 (Vernon Supp. 1990). The Texas Water Code states,

> In order to provide for the conservation, preservation, protection, recharging, and prevention of waste of the underground water of underground water reservoirs or their subdivisions, and to control subsidence caused by withdrawal of water from those underground water reservoirs or their subdivisions, consistent with the objective of Article XVI, Section 59, of the Texas Constitution, underground water management areas and underground water conservation districts may be created as provided by this subchapter.

Id.; *see also* TEX. CONST. art. XVI, § 59 (expounding conservation policy of Texas).

40. TEX. WATER CODE ANN. § 52.051 (Vernon Supp. 1990). In another section of the water code, the legislature states that, "certain areas of the state are experiencing and will experience in the future critical underground water problems including water shortages, land subsidence, underground water contamination including salt water intrusion, and waste of underground water." *Id.*

41. *See* Johnson, *The Continuing Voids in Texas Groundwater Law: Are Concepts and Terminology to Blame?*, 17 ST. MARY'S L.J. 1281, 1282 (1986) (local ground water regulation is inadequate); Comment, *Ground Water Management: A Proposal for Texas*, 51 TEX. L. REV. 289, 302 (1973) (size of underground water conservation districts limits their effectiveness).

42. TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 2-2 (July 1990).

43. *Id.* at 2-1.

44. *See* TEX. WATER CODE ANN. § 52.151 (Vernon Supp. 1990) (enumerating powers of underground water conservation districts). One task assigned to underground water conservation districts is to promote conservation. *Id.* Generally, this task is better suited for local districts than for the state as a whole since different areas of the state use water for different purposes, requiring varying conservation promotion campaigns tailored specifically toward the primary users in that area. *See* TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND

the districts are encouraged to conduct research, promote conservation, and develop comprehensive water management plans.[45] Tasks such as these are well suited for smaller governmental units such as water districts since they are uniquely qualified to understand the supply and demand for water in their localities.[46] Although in some respects these local entities can be effective, many times they face such difficulties as the lack of financial resources, lack of technical staff, and inefficient economies of scale.[47]

The Texas legislature purports to distribute considerable power and authority to local ground water conservation districts; however, several factors combine to limit their effectiveness.[48] The most obvious hindrance is the legislature's reservation of ownership of ground water to the owner of the overlying surface estate.[49] The Water Code very clearly states that it is not intended to deprive the landowner of his ownership rights or any of the accompanying privileges.[50] Preservation of ownership would not be of such importance if the statutory definition of ground water were more strictly enforced by Texas courts. The Water Code defines "ground water" as water which percolates below the surface.[51] Underground streams and rivers are

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TOMORROW 3-38, 3-40 (July 1990) (describing primary water users in various areas). For instance, in the Guadalupe River Basin only 29% of all water usage is municipal. *Id.* at 3-38. However, in the San Antonio River Basin, 70% of all water usage is municipal. *Id.* at 3-40.

45. TEX. WATER CODE ANN. § 52.151 (Vernon Supp. 1990). The Texas Water Code states, "[a] district may make and enforce rules to provide for conserving, preserving, protecting, recharging, controlling subsidence, and preventing waste of the underground water of an underground water reservoir or its subdivisions and to carry out the powers and duties provided by this chapter." *Id.* The code also states: "The district may carry out research projects, develop information, and determine limitations which should be made on withdrawing underground water." *Id.* at § 52.161.

46. *See* TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 3-84 to 3-87 (July 1990) (describing water sources of various Texas cities). The supply of water varies greatly between cities. *Id.* San Antonio, for example, relies solely on ground water from the Edwards Aquifer, while Eagle Pass relies solely on surface water from the Rio Grande and the Amistad Reservoir. *Id.*

47. *See id.* at 3-14 (areas with small population need state assistance with water planning).

48. *See* TECHNICAL ADVISORY PANEL TO SPECIAL COMMITTEE ON THE EDWARDS AQUIFER, TECHNICAL FACTORS IN EDWARDS AQUIFER USE AND MANAGEMENT 8 (Feb. 19, 1990) (single management entity needed to regulate Edwards Aquifer, surrounding rivers, bays, and estuaries); PATTERSON, ENVIRONMENTAL LAW: TEXAS WATER RESOURCES, LEGISLATIVE ALTERNATIVES FOR GROUND WATER MANAGEMENT IN TEXAS, D, D-4 (Nov. 1982) (powers of ground water conservation districts not effectively utilized) (citing Comment, *Ground Water Management: A Proposal for Texas*, 51 TEX. L. REV. 289, 294 (1973)); Johnson, *Texas Ground Water Law: A Survey and Some Proposals*, 22 NAT. RES. J. 1017, 1020 (1982) (many problems associated with authority of underground water conservation districts).

49. *See* TEX. WATER CODE ANN. § 52.002 (Vernon Supp. 1990) (ownership of ground water preserved for owner of surface estate).

50. *Id.*

51. *Id.* § 52.001(6). Ground water is "water percolating below the surface of the earth

specifically excluded from the statutory definition.[52] In interpreting "ground water," however, Texas courts have often failed to distinguish between percolating water and flowing water.[53] The Texas Supreme Court has created a judicial presumption that water beneath the surface of one's land is percolating, and, as such, is the property of the landowner.[54] This interpretation effectively enlarges the definition of ground water far beyond that intended by the legislature and divests the public of its right to regulate the use of flowing underground water.[55]

Well-drilling and abandonment regulations also demonstrate the inadequacy of ground water conservation districts.[56] Specifically, the Water Code's grant of the ground water conservation district's authority to regulate and enforce the drilling and abandonment of water wells creates three problems.[57] First, in areas located outside a district, there is no method of regulating drilling or abandonment.[58] Second, the authority given to the districts is severely limited.[59] For example, a district cannot restrict production of any well which can produce only 25,000 gallons per day;[60] a permit to drill a well cannot be denied to a landowner who does not plan to produce more than 25,000 gallons per day;[61] and, wells in existence prior to 1985

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and that is suitable for agricultural, gardening, domestic, or stock raising purposes, but does not include defined subterranean streams or the underflow of rivers." *Id.*

52. TEX. WATER CODE ANN. § 52.001(6) (Vernon Supp. 1990).

53. *See, e.g.*, Texas Co. v. Burkett, 296 S.W. 273, 278 (Tex. 1927) (absent contrary evidence, judiciary presumes underground water is percolating); Bartley v. Sone, 527 S.W.2d 754, 760 (Tex. Civ. App.—San Antonio 1974, writ ref'd n.r.e.) (landowner presumed to own water beneath the surface); Pecos County Water Control & Improvement Dist. v. Williams, 271 S.W.2d 503, 506 (Tex. Civ. App.—El Paso 1954, writ ref'd n.r.e.) (all ground water presumed to be percolating).

54. *See Texas Co.*, 296 S.W. at 278 (judicial presumption that water beneath surface is percolating).

55. *Compare* TEX. WATER CODE ANN. § 52.001(6) (Vernon Supp. 1990) (exempting "subterranean streams or the underflow of rivers" from definition of ground water) *with* Bartley v. Sone, 527 S.W.2d 754, 760 (Tex. Civ. App.—San Antonio 1974, writ ref'd n.r.e.) (creating judicial presumption that springs arising from subterranean streams are ground water).

56. *See* TEX. WATER CODE ANN. § 52.171 (Vernon Supp. 1990) (underground water conservation districts charged with regulating well abandonment); *see also* TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 1-9 (July 1990) (greatest underground water pollution caused by abandoned wells).

57. *See* TEX. WATER CODE ANN. §§ 52.164-.172 (Vernon Supp. 1990) (statutory authority for underground water conservation districts to regulate water wells).

58. *See* Johnson, *The Continuing Voids in Texas Groundwater Law: Are Concepts and Terminology to Blame?*, 17 ST. MARY'S L.J. 1281, 1283 (1986) (some wells outside jurisdiction of local water conservation districts).

59. *See* TEX. WATER CODE ANN. § 52.170 (Vernon Supp. 1990) (limitations and exceptions to underground water conservation districts' statutory authority to regulate water wells).

60. *Id.* § 52.170(d).

61. *Id.* § 52.170(c).

must be allowed to continue production if not producing more than 100,000 gallons per day.[62] Most importantly, underground water conservation districts cannot require well-owners located outside districts to report pumpage, and districts often fail to enforce reporting requirements of landowners within the districts.[63] Without data on well-water extraction, however, ground water waste cannot be successfully prevented.[64]

Finally, the underlying purposes of well-drilling and abandonment regulations are not efficiently and effectively served by the water districts.[65] Data concerning ground water contamination shows that abandoned wells are the largest man-induced pollutant of Texas ground water.[66] This is understandable when one considers that there are at least 600,000 water wells in Texas, 150,000 of which are abandoned.[67] The scope of well abandonment pollution makes it difficult for ground water districts, faced with limited funding and limited authority, to effectively police this problem.[68]

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62. *Id.* § 52.170(h).

63. *Compare id.* § 52.164 (requiring districts to maintain records and reports of water-well activities) *with* TECHNICAL ADVISORY PANEL TO SPECIAL COMMITTEE ON THE EDWARDS AQUIFER, TECHNICAL FACTORS IN EDWARDS AQUIFER USE AND MANAGEMENT 9 (Feb. 19, 1990) (well owners do not report pumpage).

64. *See* TECHNICAL ADVISORY PANEL TO SPECIAL COMMITTEE ON THE EDWARDS AQUIFER, TECHNICAL FACTORS IN EDWARDS AQUIFER USE AND MANAGEMENT 12 (Feb. 19, 1990) (impossible for underground water conservation districts to develop solutions to ground water problems without data on pumping of individual well owners).

65. *Compare* TEX. WATER CODE ANN. § 52.166 (Vernon Supp. 1990) (purposes of requiring permits are to conserve ground water and to prevent land subsidence) *with* Johnson, *Texas Ground Water Law: A Survey and Some Proposals*, 22 NAT. RESOURCES J. 1017, 1020 (1982) (underground water conservation districts have not successfully regulated well-drilling and abandonment); *and* Teutsh, *Controls and Remedies for Ground Water-Caused Land Subsidence*, 16 HOUS. L. REV. 283, 283 (1979) (dangerous land subsidence in Galveston Bay caused by unrestricted ground water withdrawals).

66. *See* TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 1-9 (July 1990) (discussing ground water quality). Wells sometimes allow pollution of ground water through vertical leakage of surface pollutants such as pesticides. *Id.* Also, improperly abandoned wells allow upward dispersion of saline waters and entrance of oil, gas, and chemicals used in the drilling process. *Id. See generally* Comment, *Groundwater Contamination: Removal of the Constraints Barring Recovery of Increased Risk and Fear of Future Diseases*, 1988 DET. C.L. REV. 65, 71-75 (discussing causes and scope of ground water pollution).

67. *See* TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 1-9 (July 1990) (providing numerical data regarding well abandonment).

68. *See id.* at 3-14 (areas with small population need state assistance with water planning); PATTERSON, ENVIRONMENTAL LAW: TEXAS WATER RESOURCES, LEGISLATIVE ALTERNATIVES FOR GROUND WATER MANAGEMENT IN TEXAS, D, D-4 (Nov. 1982) (powers of ground water conservation districts not effectively utilized) (citing Comment, *Ground Water Management: A Proposal for Texas*, 51 TEX. L. REV. 289, 294 (1973)). *See generally* Johnson, *Texas Ground Water Law: A Survey and Some Proposals*, 22 NAT. RESOURCES J. 1017, 1020 (1982) (discussing failure of underground water conservation districts to effectively regulate well-drilling and abandonment).

IV. Environmental And Conservation Problems

A. *Ground Water Supply*

Recognizing the grave problems excessive ground water usage would pose, the Texas Senate's Interim Committee on Environmental Affairs in 1973 warned that some major Texas cities would encounter severe problems with municipal water use in two decades.[69] At that time, the Senate Committee, together with the Texas Water Rights Commission, the Texas Water Development Board, the Texas Water Quality Board, and the Texas Water Conservation Association urged the adoption of a comprehensive law to protect and regulate Texas ground water.[70] Unfortunately, their proposal was ignored and today, almost twenty years later, the predicted crisis has occurred, yet still no comprehensive plan has been adopted by the state. Currently, the Texas Water Development Board reports that during a drought, water supplies will barely be adequate to support demand.[71] In addition, the Texas population is projected to double over the next fifty years, drastically increasing water usage.[72] Without some state action towards conservation and regulation of ground water, these supply problems can only be expected to worsen.

The ground water crisis in Texas is heightened by the heavy reliance on underground aquifers as a primary source of water.[73] Approximately forty-

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69. Recommendations of the Senate Interim Committee on Environmental Affairs, Water Resources 15, 17 62d Leg. (1983). The awareness of water scarcity in Texas was actually evidenced much earlier than 1973. *See* Tex. Const. art. XVI, § 59 (Conservation Amendment). In 1917, after the droughts of 1910 and 1917, Texas citizens amended the Constitution to provide for the conservation of public waters. *Id.*; *In re* Adjudication of Water Rights of Upper Guadalupe Segment of Guadalupe River Basin, 642 S.W.2d 438, 440 (Tex. 1982) (droughts of 1910 and 1917 led Texas citizens to adopt Conservation Amendment).

70. Recommendations of the Senate Interim Committee on Environmental Affairs, Water Resources 15, 18 62d Leg. (1983).

71. *See* Tex. Water Dev. Bd., Water for Texas: Today and Tomorrow 1-3 (July 1990) (existing state water resources inadequate in case of drought); Venhuizen, *Regional Conservation Program for an Aquifer District*, in Proceedings of the Conserv '90 National Conference and Exposition Offering Water Supply Solutions for the 1990's 1187, 1187 (1990) (Texas water supplies would be dangerously low in event of drought).

72. Tex. Water Dev. Bd., Water for Texas: Today and Tomorrow 3-3 (July 1990).

73. *See id.* at 1-4 (Texas relies on ground water resources). Texas has 29 aquifers that underlie more than 81% of Texas land. *Id.* San Antonio relies entirely on the Edwards-Balcones aquifer to supply its water needs. *Id.* at 3-41, 3-83, 3-85; Allanach & Nickerson, *The Genesis of Surface Water for San Antonio*, in Proceedings of the Conserv '90 National Conference and Exposition Offering Water Supply Solutions for the 1990's 397, 397 (1990) (San Antonio is the largest city in the United States to rely solely on ground water).

five percent of all water used for municipal purposes is ground water.[74] Despite Texas' dependence on ground water, many areas of the State withdraw ground water from aquifers at a rate faster than natural recharge.[75] This excessive use of ground water has caused significant decreases in aquifer levels and pumping yields.[76] The resulting low aquifer levels lessen the quality of ground water and can lead to land subsidence and drastic reductions in springflow.[77] Furthermore, rapid land development has left Texas with only a few desirable locations for developing new surface water supplies, thus increasing the importance of preserving and protecting the state's ground water resources.[78]

B. *Endangered Species*

Low water levels in aquifers act to reduce the springflow of those springs fed by the aquifer.[79] As a result, ecosystems dependent on springs are threatened.[80] Relying on the Endangered Species Act, Texas conservationists have enlisted the aid of federal regulatory agencies to regulate ground water extraction.[81] Already, springflow in the Guadalupe Basin is considered a major problem and is being highly scrutinized by the federal government.[82] If Texas does not take action to reduce ground water pumpage

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74. TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 1-4 (July 1990).

75. *Id.*; Venhuizen, *Regional Conservation Program for an Aquifer District*, in PROCEEDINGS OF THE CONSERV. '90 NATIONAL CONFERENCE AND EXPOSITION OFFERING WATER SUPPLY SOLUTIONS FOR THE 1990'S 1187, 1187 (1990) (excessive mining in Barton Springs/Edwards Aquifer Conservation District has led to the need for corrective measures).

76. TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 1-3 (July 1990).

77. *Id.*

78. *Id.*

79. *Id.*; *see also* Venhuizen, *Regional Conservation Program for an Aquifer District*, in PROCEEDINGS OF THE CONSERV '90 NATIONAL CONFERENCE AND EXPOSITION OFFERING WATER SUPPLY SOLUTIONS FOR THE 1990'S 1187, 1187 (1990) (inadequate rainfall lowers water level in Edwards Aquifer which in turn lessens springflow).

80. *See* TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 1-4 (July 1990) (state concerned about environmental instream needs); *see also* Anderson & Leal, *Going with the Flow: Marketing Instream Flows and Groundwater*, 13 COLUM. J. ENVTL. L. 317, 318-19 (1988) (discussing significance of instream flows from ground water and environmental impact of low levels). *See generally* Comment, *Environmental Significance of Instream Flows*, 17 ST. MARY'S L.J. 1297 (1986) (delineating environmental problems caused by Texas water law, proposing solutions).

81. *See* San Antonio Express-News, Sept. 20, 1990, at 8-F, col. 2-3 (U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service enlisted to protect endangered species in Guadalupe river basin); *see also The U.S.: No Water to Waste*, TIME, Aug. 20, 1990 at 61, 61 (discussing critical water shortages in the western states).

82. TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 3-41 (July 1990); *see also* TECHNICAL ADVISORY PANEL TO SPECIAL COMMITTEE ON THE EDWARDS

soon, the federal government may step in and take control of Texas ground water resources.[83]

V. PROPOSED SOLUTIONS

A. *Legislation in Western States*

Between the late 1800's and the early 1900's, most western states adopted the English rule of absolute ownership to regulate their state ground water resources.[84] In 1939, eleven of the eighteen western states were governed by the English rule.[85] Twenty years later, only three states remained under the English rule.[86] Today, Texas is the only western state to rely solely on the English rule providing for absolute ownership of all percolating ground

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AQUIFER, TECHNICAL FACTORS IN EDWARDS AQUIFER USE AND MANAGEMENT 4 (Feb. 19, 1990) (excessive pumpage in Guadalupe Basin has caused low spring levels and diminishing water supplies). In 1956, the Comal Springs dried up, resulting in the loss of some species in the area. *Id.* The advisory panel to the Special Committee on the Edwards Aquifer stated that if both Comal and San Marcos Springs dry up, there will be permanent loss of some endangered and threatened species. *Id.*; *see also* San Antonio Express-News, Sept. 20, 1990, at 8-F, col. 1. (construction of Applewhite reservoir delayed due to federal concerns about whooping crane and bald eagle, both endangered species).

83. *See* Times Mirror Magazine's Conservation Council, *Wetlands: Critical Links in Natural Ecosystems*, FIELD & STREAM, Oct. 1990, at 13 (message from President Bush and information about recent federal legislation). The federal government is taking action to protect endangered species living in wetlands. In Texas, the U.S. Fish and Wildlife Service, together with the Texas Parks and Wildlife Department, has acquired 62,000 acres of wetlands to protect endangered species. *See* Streiffert, *A Tale of Two Marshes*, TEXAS PARK & WILDLIFE, Sept. 1990, at 42 (describing Texas wetlands under administration of the U.S. Fish and Wildlife Service); *see also* Willey & Graff, *Federal Water Policy in the United States - An Agenda for Economic and Environmental Reform*, 13 COLUM. J. ENVTL. L. 325, 347-349 (1988) (discussing federal-state relationship in ground water regulation). *See generally* Yanggen & Amrhein, *Groundwater Quality Regulation: Existing Governmental Authority and Recommended Roles*, 14 COLUM. J. ENVTL. L. 1, 6-7 (1989) (discussing federal role in ground water regulation).

84. Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 641 n.2 (1984). *See generally* Ausness, *Water Rights Legislation in the East: A Program for Reform*, 24 WM. & MARY L. REV. 547, 554-576 (1983) (discussing various doctrines of ground water regulation used in western states and describing ground water regulation in eastern states).

85. *See* Clark, *Ground Water Legislation in Light of Experience in the Western States*, 22 MONT. L. REV. 42, 50 (1960) (chart showing ground water regulation schemes of western states in 1939). Arizona, Kansas, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Texas, Wyoming, and Alaska followed the English rule of ground water regulation in 1939. *Id.*

86. *See id.* (chart showing ground water regulation plans of western states in 1959). In 1959, Montana, Texas, and Alaska were the only states to follow the English rule of ground water regulation. *Id.*

water.[87] Now, Texas too must progress to a more comprehensive, centralized ground water regulatory scheme which will effectively accomplish the goals set forth in the Texas Constitution and by the legislature.[88]

In the mid 1900's, when other western states abandoned the English rule, they selected from three alternative doctrines of ground water regulation.[89] One of these is the correlative rights doctrine.[90] This rule allows property owners to retain ownership of the water beneath their property, but use of the water is subject to the needs and rights of the adjoining landowners.[91]

The second alternative is the reasonable use or American rule.[92] The reasonable use rule still allows landowners to use the ground water beneath their property, but places limits on pumpage.[93] Only the amount of water

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87. Tyler, *Underground Water Regulation in Texas*, 39 TEX. B.J. 532, 535 (1976).

88. *See* TEX. CONST. art. XVI, § 59(a) (providing for creation of water districts).

> The conservation and development of all of the natural resources of this State including the control, storing, preservation and distribution of its storm and flood waters, the waters of its rivers and streams, for irrigation, power and all other useful purposes, the reclamation and irrigation of its arid, semi-arid and other lands needing irrigation, the reclamation and drainage of its overflowed lands, and other lands needing drainage, the conservation and development of its forests, water and hydro-electric power, the navigation of its inland and coastal waters, 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.

Id. The legislature shares these goals. *See* TEX. WATER CODE ANN. § 52.021 (Vernon Supp. 1990) (setting out purposes of underground water conservation districts).

89. *See* Baker v. Ore-Ida Foods, Inc., 513 P.2d 627, 632-35 (Idaho 1973) (explaining all doctrines of ground water regulation employed by American courts); Yeo v. Tweedy, 286 P. 970, 972 (N.M. 1929) (many western states abandoned riparian rights for prior appropriation); Hutchins, *Trends in the Statutory Law of Ground Water in the Western States*, 34 TEX. L. REV. 157, 160-70 (1955) (discussing departure by Western states from English rule of ground water regulation). The three alternate doctrines of ground water regulation are correlative rights, reasonable use, and prior appropriation. *See id. See generally* Clark, *Ground Water Legislation in Light of Experience in the Western States*, 22 MONT. L. REV. 42 (1960) (discussing various ground water regulatory schemes).

90. *See* Hutchins, *California Ground Water: Legal Problems*, 45 CALIF. L. REV. 688, 689-91 (1957); Hutchins, *Trends in the Statutory Law of Ground Water in the Western States*, 34 TEX. L. REV. 157, 163-65 (1955).

91. *See, e.g.*, Pasadena v. Alhambra, 207 P.2d 17, 29 (Cal. 1948) (water rights are correlative as between adjoining landowners); Orchard v. Cecil F. White Ranches, Inc., 217 P.2d 143, 148 (Cal. Dist. Ct. App. 1950) (in correlative rights system each landowner is limited to reasonable use of ground water in times of drought); Revis v. I. S. Chapman & Co., 19 P.2d 511, 512 (Cal. Dist. Ct. App. 1933) (doctrine of correlative rights gives adjoining landowners common rights to water underlying their property).

92. *See* Baker v. Ore-Ida Foods, Inc., 513 P.2d 627, 631 (Idaho 1973) (reasonable use rule first adopted in United States in 1862 by New Hampshire Supreme Court); Hutchins, *Trends in the Statutory Law of Ground Water in the Western States*, 34 TEX. L. REV. 157, 162 (1955).

93. *See* Chino Valley v. State Land Dept., 580 P.2d 704, 709 (Ariz. 1978) (doctrine of reasonable use allows landowners to use ground water for beneficial purposes on the overlying

reasonably necessary for the beneficial use of the surface estate can be pumped, so landowners are prevented from extracting water from beneath their property for use on other land or for sale.[94]

The third option is the rule of prior appropriation.[95] This doctrine is based on the "first come, first served" principle.[96] The first landowner to put ground water to a beneficial use retains usage rights.[97] In the prior appropriation system, however, landowners are not automatically accorded usufructuary rights in ground water underlying their property.[98] Since appropriation states own all ground water, landowners must obtain a water use permit from the authorized state agency, board or official.[99]

The western state which is most similar to Texas in ground water regula-

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estate only); Hutchins, *Trends in the Statutory Law of Ground Water in the Western States*, 34 TEX. L. REV. 157, 162 (1955) (discussing American rule of reasonable use).

94. *See Chino Valley*, 580 P.2d at 709 (in reasonable use system, transportation of ground water for use on land other than the overlying property is limited); Baker v. Ore-Ida Foods, Inc., 513 P.2d 627, 632 (Idaho 1973) (reasonable use rule does not permit landowners to transport ground water away from the surface estate); *see also* Doyle, *The Transportation Provisions of Arizona's 1980 Groundwater Management Act: A Proposed Definition of Compensable Injury*, 25 ARIZ. L. REV. 655, 666 (1983) (doctrine of reasonable use does not permit transportation and sale of ground water); Hutchins, *Trends in the Statutory Law of Ground Water in the Western States*, 34 TEX. L. REV. 157, 162 (1955) (discussing American rule of reasonable use).

95. *See* Balleau, *Water Appropriation and Transfer in a General Hydrogeologic System*, 28 NAT. RESOURCES J. 269, 281-85 (discussing system of prior appropriation); Hutchins, *Trends in the Statutory Law of Ground Water in the Western States*, 34 TEX. L. REV. 157, 165 (1955).

96. *See* Baker v. Ore-Ida Foods, Inc., 513 P.2d 627, 634 (Idaho 1973) (Idaho prior appropriation doctrine recognizes rights of first users); Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 642 n.5 (1984) (first beneficial ground water user retains right to use); Comment, *Environmental Significance of Instream Flows*, 17 ST. MARY'S L.J. 1297, 1310 (1986).

97. *See* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 642 n.5 (1984) (first beneficial ground water user retains right to use).

98. *See* Lower Colorado River Auth. v. Texas Dept. of Water Resources, 638 S.W.2d 557, 562 (Tex. App.—Austin 1982), *rev'd on other grounds*, 689 S.W.2d 873 (Tex. 1984) (discussing water rights under appropriation system). *See generally* Ausness, *Water Rights Legislation in the East: A Program for Reform*, 24 WM. & MARY L. REV. 547, 554-56 (1983) (discussing prior appropriation system).

99. *See Lower Colorado River Auth.*, 638 S.W.2d at 562 (state regulates water usage through permit or filing system in appropriation states); Baker v. Ore-Ida Foods, Inc., 513 P.2d 627, 634 (Idaho 1973) (Idaho, a prior appropriation state, owns all ground water and regulates distribution); *see also* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 642 (1984) (water permits usually issued by centralized state agency); Comment, *Liability Rules as a Solution to the Problem of Waste in Western Water Law: An Economic Analysis*, 76 CALIF. L. REV. 671, 723 (1988) (in prior appropriation states, state water boards regulate water usage through permitting).

tion is California.[100] Like Texas, California has no centralized state regulation of ground water pumpage.[101] While some pumpage is regulated at the local level, other ground water is essentially unregulated.[102] In 1903, the California Supreme Court abolished the English rule of absolute ownership of ground water.[103] Subsequently, California case law has firmly established the correlative rights doctrine.[104] Under the correlative rights doctrine, the state has no control over the amount of ground water extracted by landowners.[105] Instead, when disputes between competing landowners arise, the courts determine which party has a superior right of extraction.[106] As a result, ground water pumpage has remained excessive in California, irrespective of the judicial adoption of correlative rights.[107]

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100. *See* Baker v. Ore-Ida Foods, Inc., 513 P.2d 627, 632 (Idaho 1973) (California allows transportation of ground water, like Texas, but only when resources are abundant); Hutchins, *Trends in the Statutory Law of Ground Water in the Western States*, 34 TEX. L. REV. 157, 158 (1955) (California and Texas both distinguish between percolating ground water and underground streams); Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 642 (1984) (California and Texas do not have centralized control over ground water pumpage).

101. *See* Weatherford, Malcolm & Andrews, *California Groundwater Management: The Sacred and the Profane*, 22 NAT. RESOURCES J. 1031, 1031, 1033 (1982).

102. *See id.* at 1031 (noting absence of ground water management in many areas of California).

103. *See* Katz v. Walkinshaw, 74 P. 766, 772 (Cal. 1903) (English rule of absolute ownership replaced by doctrine of correlative rights).

104. *See, e.g.*, Miller v. Bay Cities Water Co., 107 P. 115, 124 (Cal. 1910) (California adopted doctrine of correlative rights to regulate usage of ground water); Hudson v. Dailey, 105 P. 748, 753 (Cal. 1909) (California landowners have right to reasonable share of ground water); Revis v. I. S. Chapman & Co., 19 P.2d 511, 512 (Cal. Dist. Ct. App. 1933) (adjacent landowners have correlative rights to ground water use); *see also* PATTERSON, ENVIRONMENTAL LAW: TEXAS WATER RESOURCES, LEGISLATIVE ALTERNATIVES FOR GROUND WATER MANAGEMENT IN TEXAS, D, D-13 (Nov. 1982); Hutchins, *California Ground Water: Legal Problems*, 45 CALIF. L. REV. 688, 689 (1957) (California follows doctrine of correlative rights).

105. *See* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 684 (1984) (California Department of Water Resources has no power to restrict rate of ground water pumpage).

106. *See* Katz v. Walkinshaw, 74 P. 766, 772 (Cal. 1903) (recognizing burden placed on courts by adoption of correlative rights). The burden placed on the courts by the correlative rights doctrine is evidenced by the plethora of California cases involving ground water disputes. *See, e.g.*, Miller v. Bay Cities Water Co., 107 P. 115, 124 (Cal. 1910) (dispute between orchard owner and California corporation regarding diversion of underground water); Hudson v. Dailey, 105 P. 748, 753 (Cal. 1909) (dispute between landowners as to right to use water in underground creek); Revis v. I. S. Chapman & Co., 19 P.2d 511, 512 (Cal. Dist. Ct. App. 1933) (dispute between adjoining landowners regarding drainage of percolating waters).

107. *See* Towner, *The Role of the State*, 45 CALIF. L. REV. 725, 725 (1957) (California experiencing critical water problems); Weatherford, Malcolm & Andrews, *California Ground-*

A more restrictive system of ground water pumpage regulation is followed in Arizona, which has adopted the doctrine of reasonable use.[108] The reasonable use rule was recommended by a special commission appointed by the Arizona legislature to formulate a ground water policy for the state.[109] Afraid that entrusting ground water management to local government entities would equate to having no ground water management at all, the commission decided to recommend state control.[110]

In 1980, the proposals of the commission were enacted as the Arizona Groundwater Management Act.[111] The act created a state agency responsible for managing all ground and surface water in Arizona.[112] Ground water

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water Management: The Sacred and the Profane, 22 NAT. RESOURCES J. 1031, 1032 (1982) (recognizing excessive overdraft of 11 ground water basins and signs of overdraft in 31 additional basins).

108. *See* ARIZ. REV. STAT. ANN. § 45-401 (1987) (declaring policy of legislature in adopting reasonable use standard); Chino Valley v. State Land Dept., 580 P.2d 704, 709 (Ariz. 1978) (discussing application of reasonable use rule in Arizona); *see also* Wheeler, *The Right to Use Groundwater in Arizona After* Chino Valley II *and* Cherry v. Steiner, 25 ARIZ. L. REV. 473, 484 (1983) (Arizona follows reasonable use rule of ground water regulation). *See generally* Leshy & Belanger, *Arizona Law Where Ground and Surface Water Meet*, 1988 ARIZ. ST. L.J. 657, 707 (examining Arizona Ground Water Management Act which adopted reasonable use rule for ground water regulation).

109. *See* Connall, *A History of the Arizona Groundwater Management Act*, 1982 ARIZ. ST. L.J. 313, 323 (Groundwater Study Commission established in November of 1977); Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 649 (1984) (legislature created Groundwater Management Study Commission in 1977).

110. *See* Higdon & Thompson, *The 1980 Arizona Groundwater Management Code*, 1980 ARIZ. ST. L. REV. 621, 634-35 (commission decided against local management in favor of centralized authority); Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 652 (1984) (commission decided to recommend centralized state ground water management).

111. 1980 Ariz. Sess. Laws, 4th Spec. Sess. 1339. The recommendations of the Groundwater Management Commission were rapidly approved by the state legislature. *See* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 649-50 (1984) (bill submitted to legislature on June 11, 1980, passed by both house and senate within 8 hours). This was due in part to the legislative provision which allowed the recommendations of the commission to become law if no groundwater legislation was formally adopted by September 7, 1981. *See id.* at 650-51.

112. *See* Higdon & Thompson, *The 1980 Arizona Groundwater Management Code*, 1980 ARIZ. ST. L. REV. 621, 635 (1980) (act created Department of Water Resources); Leshy & Belanger, *Arizona Law Where Ground and Surface Water Meet*, 1988 ARIZ. ST. L.J. 657, 707 (Arizona Department of Water Resources has central authority over all ground water resources); Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 652 (1984) (Arizona State Department of Water Resources responsible for management of both ground and surface water). The act set up four Active Water Manage-

may be extracted upon receiving a permit issued by the state water engineer,[113] or under a grandfathered right.[114]

Many common sense, practical solutions to the western water crisis are implemented in the Arizona act. For instance, landowners who irrigated at any time during the five-year period preceding the act have a right to pump ground water for continued irrigation.[115] The water available to such users is limited to the amount necessary to irrigate effectively the number of acres previously cultivated by the landowner.[116] If a farmer withdraws less than allowed, he can credit the unused water for future use. Also, farmers are permitted to extract as much as fifty percent more than the allotted amount and pay back the excess used in subsequent years.[117] This system regulates ground water pumpage, yet provides flexibility to farmers facing droughts or floods.

Under the Arizona system, municipalities are permitted to meet the demand in their established service areas.[118] However, the extension of service

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ment Areas in which ground water usage is restricted. ARIZ. REV. CIV. STAT. ANN. § 45-411 (1987).

113. ARIZ. REV. STAT. ANN. § 45-512 (1987); *see also* Connall, *A History of the Arizona Groundwater Management Act*, 1982 ARIZ. ST. L.J. 313, 336 (discussing Arizona Groundwater Management Act).

114. ARIZ. REV. STAT. ANN. § 45-462 (1987); *see also* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 654 (1984) (extraction of ground water in Active Management Areas limited partly to users with grandfathered rights). *See generally* Connall, *A History of the Arizona Groundwater Management Act*, 1982 ARIZ. ST. L.J. 313, 336 (discussing Arizona Groundwater Management Act).

115. ARIZ. REV. STAT. ANN. §§ 45-463, 45-465 (1987); *see also* Higdon & Thompson, *The 1980 Arizona Groundwater Management Code*, 1980 ARIZ. ST. L. REV. 621, 650 (discussing irrigation grandfathered rights). *See generally* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641 (1984) (discussion of Arizona ground water law).

116. ARIZ. REV. STAT. ANN. § 45-465 (1987). The director of the Active Management Area determines the amount of water necessary to irrigate farm lands. This is calculated with a formula prescribed by the Arizona legislature. First, the director determines the "irrigation water duty." *Id.* This is the water in acre feet per acre reasonably necessary to irrigate a farm unit. ARIZ. REV. STAT. ANN. § 45-402 (1987). This number is then multiplied by the number of acres which can legally be irrigated under the grandfathered right, resulting in the amount of water which can be used in a given year. *Id. See generally* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641 (1984).

117. ARIZ. REV. STAT. ANN. § 45-467 (1987). *See generally* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641 (1984).

118. ARIZ. REV. STAT. ANN. § 45-492 (1987). *See generally* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641 (1984).

areas which are unnecessary or which would inhibit conservation is limited.[119] Also, water permits may be obtained for only limited purposes.[120] For example, a permit can be issued for the use of poor quality ground water. A "poor quality water" permit allows industries to extract water which is of little or no use to municipalities and irrigators, but could nevertheless be effectively utilized by an industry. Should the water quality in these areas improve, however, these permits are subject to revocation.[121] This provision is likely to encourage industries to select "non-beneficial" water for their use if possible, as opposed to polluting clean water which is needed for other purposes.

One of the most important features of Arizona's ground water plan is that it provides for both civil and criminal penalties for abusive water users.[122] Also, since the regulations are uniform throughout the state and controlled by one entity, enforcement of rule compliance is more likey to be even-handed.

Finally, the most controlled system of ground water regulation is exempli-

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119. ARIZ. REV. STAT. ANN. § 45-493 (1987). Service areas may not be extended to include a well field, or to furnish large quantities of water to any one user, unless it is consistent with the Active Management Area water plan and is approved by the director. *Id. See generally* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641 (1984).

120. ARIZ. REV. STAT. ANN. § 45-511 (1987). The seven categories under which water permits are issued are: dewatering, mineral extraction, industrial use, poor quality groundwater, temporary, drainage water, and hydrologic testing. *Id.* at 45-512. *See* Colby, *Economic Impacts of Water Law - State and Water Market Development in the Southwest*, 28 NAT. RESOURCES J. 721, 730 (1988) (describing beneficial uses of water permitted in Arizona). *See generally* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641 (1984).

121. ARIZ. REV. STAT. ANN. § 45-516 (1987). *See generally* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641 (1984).

122. The Arizona legislature provided for strict civil penalties for violating the Groundwater Code. *See* ARIZ. REV. STAT. ANN. § 45-635 (1987) (providing penalties for ground water usage abuse). Any violation "not directly related to illegal withdrawal, use, or transportation of groundwater" can result in a penalty as high as one hundred dollars per day. *Id.* at 45-635(A) (1). Any violation "directly related to illegal withdrawal, use or transportation of groundwater" can result in a penalty as high as ten thousand dollars per day. *Id.* at 45-635(A) (2). In addition to civil penalties, the code categorizes some violations as criminal misdemeanors and even felonies. *See id.* at 45-636; *see also* Connall, *A History of the Arizona Groundwater Management Act*, 1982 ARIZ. ST. L.J. 313, 340 (Arizona Groundwater Management Act would be ineffective without sanctions); Higdon & Thompson, *The 1980 Arizona Groundwater Management Code*, 1980 ARIZ. ST. L. REV. 621, 643 (describing penalties for illegal water use).

fied in New Mexico, which uses the prior appropriation system.[123] The state owns all ground water in New Mexico and is charged with the promulgation and enforcement of both surface and ground water laws.[124] Anyone who wishes to use water in New Mexico must first apply to the state engineer.[125] If there is unappropriated water available, and the applicant shows that the water will be used beneficially, a permit is issued.[126] New Mexico has no statute which limits the rate of withdrawal in state aquifers or requires aquifers to remain at reasonable levels.[127]

B. *Implementation in Texas*

Perhaps there is no solution to Texas' ground water regulation problems that will be politically popular.[128] However, recent concerns regarding con-

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123. N.M. STAT. ANN. § 72-12-1 (1985). *See* DuMars, *New Mexico Water Law: An Overview and Discussion of Current Issues*, 22 NAT. RESOURCES J. 1045, 1046 (1982) (prior appropriation doctrine followed in New Mexico).

124. N.M. STAT. ANN. §§ 72-1-1, 72-12-1 (1985). *See* State v. Mendenhall, 362 P.2d 998, 1000 (N.M. 1961) (state of New Mexico owns all underground water); DuMars, *New Mexico Water Law: An Overview and Discussion of Current Issues*, 22 NAT. RESOURCES J. 1045, 1046-47 (1982) (state engineer appropriates water which is held by the state in trust for the people).

125. N.M. STAT. ANN. § 72-12-1 (1985). *See* Albuquerque v. Reynolds, 379 P.2d 73, 75-79 (N.M. 1962); Colby, *Economic Impacts of Water Law - State Law and Water Market Development in the Southwest*, 28 NAT. RESOURCES J. 721, 731 (1988) (New Mexico state engineer allows beneficial uses of ground water); Recent Development, *New Mexico State Engineer Issues Orders on Mine Dewatering*, 20 NAT. RESOURCES J. 359, 359 (1980) (state engineer issues permits for beneficial water use). *See generally* DuMars, *New Mexico Water Law: An Overview and Discussion of Current Issues*, 22 NAT. RESOURCES J. 1045 (1982) (discussion of New Mexico ground water law).

126. N.M. STAT. ANN. § 72-12-2 (1985). *See* State v. King, 321 P.2d 200, 201 (N.M. 1958) (state waters may be aquired for beneficial use); State v. McLean, 308 P.2d 983, 987 (N.M. 1957) (state determines what is "beneficial use"). *See generally* DuMars, *New Mexico Water Law: An Overview and Discussion of Current Issues*, 22 NAT. RESOURCES J. 1045 (1982) (discussion of New Mexico ground water law).

127. *See* DuMars, *New Mexico Water Law: An Overview and Discussion of Current Issues*, 22 NAT. RESOURCES J. 1045, 1047 (1982).

128. Interviews conducted in 1981 and 1982 indicate political hostility toward ground water regulation. *See* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 685-86 (1984) (results from interviews of representative leaders in Arizona, California, and New Mexico regarding popularity of their ground water regulatory systems). In Arizona, leaders representing municipal and mining interests expressed approval of their reasonable use system, while agricultural groups disagreed. *Id.* at 685. No group favored centralized state authority. *Id.* In California, where there is very little restriction on ground water use, groups approved of the current regulatory system, yet recognized it to be ineffective. *Id.* at 686. Finally, New Mexico groups approved of their system of appropriation, but attributed this approval to their respect for the state engineer. *Id.*; *see also*, Getches, *Water Planning: Untapped Opportunity for the Western States*, 9 J. ENERGY L. &

servation and an increase in environmental awareness may serve to lessen the political hostility toward ground water controls and make this an area ripe for legislation in Texas.

What ground water policy should be adopted by Texas? One possibility is the correlative rights doctrine. This plan would not likely result in any significant conservation, however, because the state could not limit ground water pumpage or otherwise create incentives to conserve.[129] To illustrate, California continues to experience excessive ground water extraction even after adopting the correlative rights doctrine.[130] The most likely result of the adoption of the correlative rights doctrine in Texas would be an increase in litigation between landowners as to who should get what water, how much, and when.[131] Then Texas would be a waster of both ground water and judicial resources.

Should Texas, like New Mexico, choose to adopt the prior appropriation doctrine? At first blush, the adoption of the prior appropriation doctrine appears to have many advantages. First, it would create a uniform rule regarding both surface and ground water.[132] Subsequently, the services of the Texas Water Commission could be utilized to license ground water users in much the same way they license users of surface water.[133] Furthermore, because a system of state licensing is already in place, implementation of the prior appropriation doctrine would be simplified. [134]

POL'Y 1, 25 (1988) (western states face political obstacles to comprehensive water plans); Comment, *Ground Water Management: A Proposal for Texas*, 51 TEX. L. REV. 289, 298 (1973) (residents in West Texas opposed to ground water regulation).

129. California, which follows the correlative rights doctrine, does not have state control over the volume of ground water pumpage. *See* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 684 (1984) (California Department of Water Resources unable to restrict rate of ground water pumpage). California's increasing rate of ground water extraction shows that use of the correlative rights doctrine provides no incentive to conserve ground water. *See* Weatherford, Malcolm & Andrews, *California Groundwater Management: The Sacred and the Profane*, 22 NAT. RESOURCES J. 1031, 1032 (1982).

130. *See* Weatherford, Malcolm & Andrews, *California Groundwater Management: The Sacred and the Profane*, 22 NAT. RESOURCES J. 1031, 1032 (1982) (recognizing excessive overdraft of 11 ground water basins and signs of overdraft in 31 additional basins).

131. *See* Katz v. Walkinshaw, 74 P. 766, 772 (Cal. 1903) (recognizing judicial burden placed on courts by correlative rights doctrine). The rule of correlative rights creates a judicial obligation to settle disputes between landowners. In some cases application of the rule may create a substantial burden on the courts. *Id.*

132. TEX. WATER CODE ANN. § 11.021 (Vernon 1988). The prior appropriation doctrine has already been adopted for regulating Texas surface water. *Id.*

133. *See* TEX. WATER CODE ANN. § 11.121 (Vernon 1988) (permit required to use state water).

134. *See id.* (Texas Water Commission issues water use permits for state waters).

Although there may be some benefits to the adoption of the prior appropriation system, the problems associated with its adoption far outweigh the benefits. Historically, Texans have been opposed to any ground water regulation, but especially to those regulations which require landowners to surrender their ground water property rights to the state.[135] Texans have successfully avoided transferring ownership of ground water to the state and, in doing so, the private ownership of ground water has become thoroughly entrenched in both Texas case law [136] and statutes.[137] Texas is unlikely to switch from one extreme in ground water usage to the other without encountering significant obstacles. Perhaps the primary obstacle is formulating a legal justification for divesting all Texas landowners of a part of their property.[138] Would such a taking fall within the purview of the state power of eminent domain?[139] If so, the state would be bound to pay landowners the reasonable value of the water beneath their land.[140] All things considered, drafting a comprehensive ground water appropriation act which would pass state constitutional muster would be difficult, if not impossible. Also, the Texas legislature is unlikely to approve a plan that would so outrage Texas voters.

Finally, Texas could adopt a reasonable use standard similar to that adopted by Arizona. Much of the anticipated political opposition could be avoided by selecting this doctrine since, technically, ownership of ground water would remain with the owner of the overlying property.[141] Also, the reasonable use doctrine could be more easily justified under the state's police

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135. *See* Comment, *Ground Water Management: A Proposal for Texas*, 51 TEX. L. REV. 289, 298 (1973) (West Texas residents value ground water property right).

136. *See, e.g.*, United States v. Shurbet, 347 F.2d 103, 106 (5th Cir. 1965) (percolating water considered part of soil, owned by landowner); Houston & T.C. Ry. Co. v. East, 81 S.W. 279, 280 (Tex. 1904) (adopted English rule of ground water regulation); Pecos County Water Control & Improvement Dist. v. Williams, 271 S.W.2d 503, 505 (Tex. Civ. App.—El Paso 1954, writ ref'd n.r.e.) (percolating water owned by landowner).

137. TEX. WATER CODE ANN. § 52.002 (Vernon Supp. 1990).

138. *See* Comment, *Ground Water Management: A Proposal for Texas*, 51 TEX. L. REV. 289, 314 (1973) (state appropriation of ground water may be an unconstitutional taking).

139. *Id.*; *see also* Hutchins, *Trends in the Statutory Law of Ground Water in the Western States*, 34 TEX. L. REV. 157, 190 (1955) (appropriation statutes may create constitutional problems).

140. *See* Tyler, *Underground Water Regulation in Texas*, TEX. B.J. 532, 538 (June 1976) (if Texas adopts appropriation doctrine, state will be exercising eminent domain).

141. Many Arizona citizens are pleased with the adoption of the reasonable use system. *See* Smith, *Centralized Decisionmaking in the Administration of Groundwater Rights: The Experience of Arizona, California and New Mexico and Suggestions for the Future*, 24 NAT. RESOURCES J. 641, 685-56 (1984) (all satisfied except agricultural groups). *But see* Patterson, ENVIRONMENTAL LAW: TEXAS WATER RESOURCES, LEGISLATIVE ALTERNATIVES FOR GROUND WATER MANAGEMENT IN TEXAS, D, D-19 (Nov. 1982) (grandfathered rights and state licensing are too restrictive).

power than could the prior appropriation doctrine.[142]

By adopting the reasonable use standard, Texas could gain as much control over ground water as in an appropriation state.[143] This is demonstrated in Arizona, a reasonable use state, which is considered to have the most widely regulated ground water of all the western states.[144]

If Texas adopts the reasonable use doctrine, it should also appoint the Texas Water Commission, or some other centralized state agency, to monitor and enforce the standards adopted by the legislature.[145] There are many advantages to having a centralized ground water regulatory authority. First, a centralized agency would be more economically sound since it would benefit from economies of scale.[146] That is, one larger entity is often more efficient than several smaller entities.[147] Also, the workers would benefit from the pooling of their knowledge and expertise, and duplication of effort would be prevented.[148] Tax dollars could be saved or spent on other areas, such as research and conservation-awareness programs. Furthermore, the authority necessary to enforce the promulgated rules would be more effectively vested in a state agency already equipped with law enforcement abilities and experience.[149]

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142. *See* Johnson, *The Continuing Voids in Texas Groundwater Law: Are Concepts and Terminology to Blame?*, 17 ST. MARY'S L.J. 1281, 1290 (1986) (reasonable use doctrine does not require state ownership of ground water); *cf.* Peel, *Acquisition of Municipal Water Rights in Texas: A Conceptual and Operational Analysis*, 17 TEX. TECH L. REV. 811, 823 (1986) (in prior appropriation system, state assumes ownership of water).

143. *See* Johnson, *The Continuing Voids in Texas Groundwater Law: Are Concepts and Terminology to Blame?*, 17 ST. MARY'S L.J. 1281, 1294 (1986) (state ground water can be effectively regulated without state ownership).

144. *See* Connall, *A History of the Arizona Groundwater Management Act*, 1982 ARIZ. ST. L.J. 313, 313 (Arizona Groundwater Management Act is most intensive ground water regulation in the nation).

145. *See* Getches, *Water Planning: Untapped Opportunity for the Western States*, 9 J. ENERGY L. & POL'Y 1, 37 (1988) (state water planning more effective than local or district planning); RECOMMENDATIONS OF THE SENATE INTERIM COMMITTEE ON ENVIRONMENTAL AFFAIRS, WATER RESOURCES 15, 18 62nd Leg. (1983) (calling for a comprehensive water development plan in Texas).

146. TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 3-14 (July 1990).

147. *See* D. RACHMAN, BUSINESS TODAY 591 (3rd ed. 1982) (defining "economies of scale"). For instance, if each local entity employed an administrator, a hydrologist, and a geologist, considerable expenses would be incurred. When 7 small entities combine, however, it may not be necessary to hire 7 administrators, 7 hydrologists, and 7 geologists to accomplish the same job. *See id.*

148. *See* TEX. WATER DEV. BD., WATER FOR TEXAS: TODAY AND TOMORROW 3-14 (July 1990) (recognizing disadvantages of smaller ground water regulatory agencies).

149. Texas has enforced both civil and criminal penalties for the unlawful use of state surface water since 1913. *See* TEX. WATER CODE ANN. §§ 11.081, 11.083, 11.084 (Vernon

VI. CONCLUSION

The natural progression of surface water law has shown an increase in regulation as citizens have become more aware of acute conservation and environmental problems. The evolution of ground water law should now follow this natural progression and resist the political pressures which caused it to stagnate. Texas should not preserve an archaic property law which protects the unfair advantage of the few over the rights and needs of all Texas citizens. The conservation policies of Texas can be furthered by the legislative or judicial adoption of the reasonable use doctrine of ground water regulation and by centralizing the control of Texas ground water. Water is a scarce resource and, as such, must be fairly and efficiently allocated among all users.

1988) (providing criminal sanctions for unlawful use of state surface water); *Id.* at § 11.082 (providing civil penalties for unlawful use of state surface water).