

GERALD TORRES

## Liquid Assets: Groundwater in Texas

### INTRODUCTION

As I was walking around the tonier precincts of Austin, Texas, in the summer of 2012, I noticed that some things seemed out of place. The hot, humid weather was normal, and the recent rainstorms belied the existence of one of the most severe droughts on record.<sup>1</sup> People were beginning to talk about the droughts of the 1950s that had produced a rash of reservoir construction.<sup>2</sup> But no one was talking about dams this time. Instead, there was a new source of water for those who could afford it, sitting right beneath their feet. In addition to the yard crews attending to the shrubs and St. Augustine grass, there were gangs of roughnecks in work clothes setting up drilling rigs on those manicured urban lawns.

The drought, no doubt, has created a market for privately controlled water. Postcard fliers are slipped under front doors announcing deals: “\$6/foot – No

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1. The year 2011, with an average rainfall of 14.8 inches across the state, was the driest year in recorded Texas history. See *Everything You Need To Know About the Texas Drought*, NPR STATEIMPACT, <http://stateimpact.npr.org/texas/tag/drought> (last visited Nov. 7, 2012). For raw data on the extent of the drought, see John W. Nielsen-Gammon, *The 2011 Texas Drought: A Briefing Packet for the Texas Legislature*, OFF. OF THE ST. CLIMATOLOGIST 36 (Oct. 31, 2011), [http://climatexas.tamu.edu/files/osc\\_pubs/2011\\_drought.pdf](http://climatexas.tamu.edu/files/osc_pubs/2011_drought.pdf), which states that, “[a]t this point, the 2010–2011 drought is easily the most severe one-year drought on record and is clearly among the top five overall.”
  2. See Farzad Mashhood, *Current Drought Pales in Comparison with 1950s ‘Drought of Record,’* AUSTIN AM.-STATESMAN, Aug. 4, 2011, <http://www.statesman.com/news/news/local/current-drought-pales-in-comparison-with-1950s-d-1/nRdC5> (“As part of the state’s recovery, . . . Texas needed to build a network of reservoirs to protect against future droughts . . . . From 1957 to 1970, workers built 69 dams . . . . In addition, underground aquifers were tapped as important resources from the future. From 1947 to 1957, groundwater use increased fivefold . . . .”); see also Nat’l Climatic Data Ctr., *20th Century Drought*, NAT’L OCEANIC & ATMOSPHERIC ADMIN., [http://www.ncdc.noaa.gov/paleo/drought/drght\\_history.html](http://www.ncdc.noaa.gov/paleo/drought/drght_history.html) (Nov. 12, 2003) (discussing the severity of the 1950s drought).

Water—No Pay.” The Supreme Court of Texas did its part, too. In the long-awaited case of *Edwards Aquifer Authority v. Day*, the court decided that “land ownership includes an interest in groundwater in place.”<sup>3</sup> Those who can are making the most of that holding by tapping the generally heavily regulated Edwards Aquifer and claiming the water as their own.<sup>4</sup>

The Texas Supreme Court in *Day* declared that the landowner has a real-property interest in the groundwater in place under his land that is analogous to the landowner’s property interest in oil and gas. In so holding, the court affirmed the right of landowners to assert a regulatory-takings claim against a Texas groundwater conservation district if it regulates groundwater withdrawals in a way that denies the landowner all economically beneficial use of his property. The court remanded the case to the trial court for further proceedings to determine whether the Edwards Aquifer Authority (EAA) determinations were so excessive as to make them unconstitutional unless they are accompanied by compensation.<sup>5</sup>

The challenge in the *Day* case arose under the Edwards Aquifer Authority Act (EAA Act). The plaintiffs challenged the denial of a permit to withdraw groundwater in excess of the historical amount determined by the EAA. The difference between the requested amount and the permitted amount was substantial. Burrell Day asked for a permit to withdraw seven hundred acre-feet of water, but based on a calculation of historical beneficial use, the EAA issued a permit for fourteen acre-feet. This disparity triggered Day’s claim of a taking. The Texas Court of Appeals upheld the EAA permit limiting withdrawal to fourteen acre-feet, but also held that “landowners have some ownership rights in the groundwater beneath their property . . . entitled to constitutional protection.”<sup>6</sup> The reasoning of the appeals court is perplexing because the ownership interest being contested is almost completely dependent on the statutory exemptions under the EAA Act.

What makes these changes significant is that they have ushered in a transformation of the groundwater regime. But in doing so they have also sown confusion about the capacity of the state to regulate natural resources, while ignoring the science that ought to drive policy decisions. This latest

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3. *Edwards Aquifer Auth. v. Day*, 369 S.W.3d 814, 817 (Tex. 2012).

4. Austin, Texas, although on the edge of the aquifer, is not in a groundwater conservation district, nor is it subject to the rules of the Edwards Aquifer Authority (EAA). The Barton Springs/Edwards Aquifer Conservation District includes a good part of south Austin, but does not extend north of the Colorado River (Lady Bird Lake), and thus does not regulate the wells that have been drilled in those parts of Austin referenced in the text.

5. *Edwards Aquifer Auth. v. Day*, 274 S.W.3d 742, 756 (Tex. App. 2008).

6. *Id.* at 753-56 (citation omitted).

example illustrates how Texas as well as California—the two most populous states and powerful engines for the national economy—both manage groundwater in a piecemeal way despite the signal importance of the groundwater resource in each state. The capacity of the state to regulate groundwater is therefore limited in both California and Texas, but for different reasons. California has the legal capacity to preempt local regulations, but for the most part has not done so.<sup>7</sup> Despite its plenary control over surface water, Texas has not exercised similar control over groundwater, and *Day* suggests real limits to such power. Thus, what happens in Texas is likely to inform discussion throughout the American West, especially in California.<sup>8</sup>

Texas is conventionally considered a “rule of capture” state with regard to groundwater. Although sometimes referred to as an “absolute ownership regime,” the rule of capture means that, if you can reduce the groundwater to possession, it is yours.<sup>9</sup> This right is not unlimited, and the water is protected from your neighbor’s usurpation by a liability rule while it is in the ground.<sup>10</sup> That is, your neighbor can pump water from a well on his land, and as long as he does not commit a trespass, his possession of the groundwater is protected even if he injures your capacity to use the groundwater. Yet the water is protected by a property rule against the state, although the extent of that

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7. Cf. *Baldwin v. Cnty. of Tehama*, 36 Cal. Rptr. 2d 886, 888 (Ct. App. 1994) (holding that “state law, while regulating aspects of groundwater, does not wholly preclude county regulation”).
  8. California’s importance in setting national water law policy is enormous. See M. Rhead Enion, *Under Water: Monitoring and Regulating Groundwater in California*, EMMETT CENTER ON CLIMATE CHANGE & THE ENV’T (July 2011), [http://cdn.law.ucla.edu/SiteCollectionDocuments/Centers%20and%20Programs/Emmett%20Center%20on%20Climate%20Change%20and%20the%20Environment/Pritzker\\_01\\_Under\\_Water.pdf](http://cdn.law.ucla.edu/SiteCollectionDocuments/Centers%20and%20Programs/Emmett%20Center%20on%20Climate%20Change%20and%20the%20Environment/Pritzker_01_Under_Water.pdf).
  9. See *Hous. & T.C. Ry. Co. v. East*, 81 S.W. 279, 281 (Tex. 1904) (“[T]he owner of the soil is at liberty to dig therein and take away the percolating water for any legitimate purpose of his own . . .”).
  10. See *FPL Farming Ltd. v. Envtl. Processing Sys., L.C.*, 351 S.W.3d 306, 314 (Tex. 2011) (finding that the rule of capture does not insulate a landowner from tort liability arising from migrating water from an injection well); *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1, 15 (Tex. 2008) (finding that the natural gas under a tract of land was subject to drainage from a well on the adjoining tract); see also Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1092 (1972) (“Whenever someone may destroy the initial entitlement if he is willing to pay an objectively determined value for it, an entitlement is protected by a liability rule.”).

property right remains in doubt.<sup>11</sup> What this distinction seems to mean is that the state probably cannot prohibit all withdrawals of groundwater. But, as evidenced by the drilling rigs sprouting up around town, this much is clear: you own the groundwater you pump, so long as you do not negligently remove the water or exceed the amount you can beneficially use.<sup>12</sup> That is the rule of capture at work.

The irony, of course, is that the wells only nominally produce unregulated water: they do not create a new source of it. The water that comes out of the ground is linked, sometimes directly and sometimes indirectly, to the water that comes out of the tap. But if you drill a well and put up a sign indicating that you are watering your lawns, shrubs, and trees with well water, you can keep your estate as green as you want—drought and your neighbors be damned.

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11. See *Edwards Aquifer Auth. v. Day*, 369 S.W.3d 814 (Tex. 2012). The property interest in groundwater is outlined in section 36.002 of the Texas Water Code (commonly referred to as “S.B. 332”):

(b) The groundwater ownership and rights described by this section:

(1) entitle the landowner . . . to drill for and to produce the groundwater below the surface of real property, subject to Subsection (d), without causing waste or malicious drainage of other properties or negligently causing subsidence, but does not entitle a landowner . . . to the right to capture a specific amount of groundwater below the surface of that landowner’s land; and

(2) do not affect the existence of common law defenses or other defenses to liability under the rule of capture.

(c) Nothing in this code shall be construed as granting the authority to deprive or divest a landowner . . . of the groundwater ownership and rights described by this section.

(d) This section does not:

(1) prohibit a district from limiting or prohibiting the drilling of a well by a landowner for failure or inability to comply with minimum well spacing or tract size requirements adopted by the district;

(2) affect the ability of a district to regulate groundwater production as authorized under Section 36.113, 36.116, or 36.122 or otherwise under this chapter or a special law governing a district; or

(3) require that a rule adopted by a district allocate to each landowner a proportionate share of available groundwater for production from the aquifer based on the number of acres owned by the landowner.

TEX. WATER CODE ANN. § 36.002 (West 2012). I will discuss this statute in detail in Section I.B and Part II *infra*, but I note that it creates a limited property right and may even permit the conversion of the rule of capture into a correlative-rights system.

12. See *Day*, 369 S.W.3d at 820, 824-25. Note that the opinion does not establish a negligence standard; it cites the statutory mention of negligence. See *id.* at 832.

This Essay will detail the changes in groundwater ownership and management in Texas that have been triggered by the *Day* case. Of course, the case was decided on a foundation of groundwater management that has haltingly sought to more closely align multiple water-rights regimes in Texas. Part I of the Essay establishes that foundation. The science of water management has always outpaced the legal treatment of the water resource. It is now generally conceded that the hydrological cycle links all water in important ways.<sup>13</sup> The legal regimes that treat groundwater and surface water as distinct resources are based on primitive understandings of the water cycle, but they unfortunately have created a web of legal entitlements and expectations that are difficult to unravel. In addition to this outmoded regulatory structure, the nature of groundwater sources varies across the state. Thus the EAA Act, which regulates a critical aquifer for much of central Texas, has been among the most intensely litigated groundwater-management schemes in the country.<sup>14</sup>

Part II examines the various approaches to regulating groundwater, including those that create ownership rights for groundwater in place. Although hydrologists and geologists have long known that groundwater and surface-water resources are intimately interrelated, the law has consistently treated them as distinct. The politics of regulating a valuable resource that also has the potential to limit the future economic growth of Texas and California has narrowed the space available for reasoned policymaking.

Finally, in light of the *Day* case and the contest over the permissible reach of regulation, this Essay will consider alternatives for allocating both the value and utility of groundwater. Against the attempts to use groundwater management districts and other ownership regimes to solve the problems posed by water scarcity, the Essay will assess the possibilities that the current state of affairs leaves us.

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13. See THOMAS V. CECH, *PRINCIPLES OF WATER RESOURCES: HISTORY, DEVELOPMENT, MANAGEMENT, AND POLICY* 27-28 (3d ed. 2010).

14. See *infra* Section I.B. For example, the EAA Act was designed to protect a particularly vulnerable aquifer that serves a large part of the population of central Texas and lies beneath one of the most valuable areas of the state.

## I. GROUNDWATER BEFORE DAY

### A. Groundwater Management

The State of Texas has long characterized groundwater in three ways: (1) percolating, (2) underground river, or (3) underflow.<sup>15</sup> At the same time, the law applies only two rules: one for percolating groundwater and the other for underground rivers or underflow. Under the Texas Water Code and the attendant case law, if groundwater is classified as “percolating,” it is subject to the rule of capture—if you pump it, you own it.<sup>16</sup> If, however, the groundwater is characterized as an underground river or subterranean stream,<sup>17</sup> or if the groundwater is considered an “underflow” of a surface watercourse, then the water would be governed by the law of prior appropriation.<sup>18</sup> The characterization of a particular underground water source is subject to legislative determination. How groundwater is classified is, of course, critically important because it determines the ownership interests and the regulatory limits of the state.

Early recognition of the problem of scarcity led to the abandonment of the riparian system for the allocation of surface waters in favor of the prior-appropriation system and the declaration that surface waters in a natural

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15. See TEX. WATER CODE ANN. §§ 11.021, 36.001(5) (West 2012); see also *Tex. Co. v. Burkett*, 296 S.W. 273, 278 (Tex. 1927); *Denis v. Kickapoo Land Co.*, 771 S.W.2d 235, 236-37 (Tex. App. 1989). Both of these cases required the courts to distinguish between different forms of groundwater, and thus the governing legal rules, and applied the presumption that the source of water obtained by the surface owner is ordinary percolating waters. “Underflow” is defined in the Texas Administrative Code as

[w]ater in sand, soil, and gravel below the bed of the watercourse, together with the water in the lateral extensions of the water-bearing material on each side of the surface channel, such that the surface flows are in contact with the subsurface flows, the latter flows being confined within a space reasonably defined and having a direction corresponding to that of the surface flow.

30 TEX. ADMIN. CODE § 297.1(55) (2012).

16. Groundwater in Texas is specifically excluded from the definition of state water and is subject to the rule of capture as modified by the various groundwater conservation districts across the state; it is also subject to the constitutional limitations outlined in the *Day* case. Groundwater is defined as “[w]ater percolating below the surface of the earth.” TEX. WATER CODE ANN. §§ 35.002(5), 36.001(5) (West 2012); see 31 TEX. ADMIN. CODE § 356.22(3) (2012).

17. See *Bartley v. Sone*, 527 S.W.2d 754, 760 (Tex. Civ. App. 1974). Note that the current definition of groundwater neither explicitly excludes nor explicitly includes subterranean streams or underground rivers. TEX. WATER CODE ANN. § 36.001(5) (West 2012).

18. TEX. WATER CODE ANN. § 11.021(a) (West 2012) (noting that all underflow is the “property of the state”).

watercourse are waters of the state.<sup>19</sup> On the one hand, riparian rules give use rights to those landowners who border natural waterways. On the other hand, prior appropriation gives use rights to those who first take the water from natural waterways and put it to a beneficial use regardless of their ownership of land.<sup>20</sup>

Although the conservation amendment to the Texas Constitution gives the State the authority to establish conservation and reclamation districts, including groundwater conservation districts,<sup>21</sup> the State was slow to establish groundwater districts. The delay resulted both from the political difficulties associated with the conflict over natural and political boundaries, and from the different characterization of the private interests in the water being regulated. If landowners believe they have a right to the groundwater in place, then any regulation will trigger a more searching inquiry into the acceptable constitutional limits of that regulation. Because groundwater, unlike surface water, is not part of the “waters of the state,” the regulatory starting point is both different and more limited.

#### *1. The Conservation Amendment*

The recognition that a riparian regime<sup>22</sup> poorly suited the conditions facing the West was a conclusion most of the Western states eventually acknowledged. Even states such as Texas that have arid and semi-arid regions, as well as regions that more closely resemble the verdant East, came to share the Western states’ skepticism of riparian regimes. As a result, virtually all of the Western states had to reconcile a preexisting riparian system with a system of regulated prior appropriation. Only Colorado has held that riparianism was never part of the law of the state.<sup>23</sup> Texas, through a series of acts culminating most importantly in the Irrigation Act of 1917 and the subsequent amendment

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19. Irrigation Act of 1917, ch. 88, 1917 Tex. Gen. Laws 211.

20. For a brief statement of this doctrine, see *Wyoming v. Colorado*, 259 U.S. 419, 460-62 (1922), which summarizes the history of prior appropriation in the American West.

21. TEX. CONST. art. XVI, § 59.

22. Under the riparian principle, all landowners whose property is adjoined to a natural waterway or body of water have the right to make reasonable use of the water. Of course, riparianism has many complications and variations, but “reasonable use” riparianism is the most common modern version. See, e.g., RESTATEMENT (SECOND) OF TORTS § 850A (1979).

23. See *Coffin v. Left Hand Ditch Co.*, 6 Colo. 443 (1882).

of the Texas Constitution, replaced both common law riparianism and water rights that were derived from Spanish and Mexican property grants.<sup>24</sup>

The critical step in every system that has successfully made this transition from a riparian regime to a regime of regulated prior appropriation was to effectively assert state ownership over surface waters in a way that avoided liability for any reduced value that accompanied the elimination of riparian rights.<sup>25</sup> While making some accommodations for preexisting rights, most states have managed the rationalization of water allocation schemes consistent with the physical conditions of the state. By making the surface waters “state waters,” the rights that are conveyed through a system of prior appropriation are both secure and subject to the regulatory reach of the state as conditions dictate, including prohibitions on use. Being clear about which waters are state waters and which are not is of signal importance because the distinction has crucial implications for both the constitutionally permissible regulatory reach of the state and for the private value of the real property to which the water rights attach.

Not surprisingly, the transition from riparian rights to rights regulated through prior appropriation was contentious. On the one hand, conditions dictated the result largely because, without the change, much of Texas would be held hostage to the rights of landowners who claimed riparian interests. On the other hand, the segregation of groundwater from this regulatory and ownership regime, especially where the surface owner had preemptive rights, could be considered a kind of underground riparianism. The owners of the overlying land would have a potential monopoly on the groundwater resource. This outcome would seriously impede the rational development of this resource in the face of Texas’s heavy dependence on groundwater.<sup>26</sup>

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24. TEX. CONST. art. XVI, § 59 (1917); Irrigation Act of 1917, ch. 88, 1917 Tex. Gen. Laws 211; see *State v. Valmont Plantations*, 346 S.W.2d 853 (Tex. Civ. App. 1961) (holding that Spanish and Mexican land grants have no pertinent riparian irrigation rights), *aff’d*, 355 S.W.2d 502 (Tex. 1962).

25. See Irrigation Act of 1917, ch. 88, 1917 Tex. Gen. Laws 211; *Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist.*, 45 P.2d 972 (Cal. 1935) (explaining that limiting riparian rights to reasonable use was a valid exercise of the police power); *In re Adjudication of the Water Rights of the Upper Guadalupe Segment of the Guadalupe River Basin*, 642 S.W.2d 438 (Tex. 1982) (noting that the elimination of riparian rights was not unconstitutional). *But see Franco-Am. Charolaise Ltd. v. Okla. Water Res. Bd.*, 855 P.2d 568 (Okla. 1990) (holding that a state law extinguishing future riparian uses was unconstitutional).

26. See TEX. WATER DEV. BD., WATER FOR TEXAS: 2012 STATE WATER PLAN 163 (2012), [http://www.twdb.state.tx.us/publications/state\\_water\\_plan/2012/2012\\_SWP.pdf](http://www.twdb.state.tx.us/publications/state_water_plan/2012/2012_SWP.pdf).



The evolution of water rights in the arid West mapped the physical conditions of the geography and justified the maxim *cessante razione, cessat ipsa lex*—when the reason for the rule ceases, so should the rule itself. But the parallel developments of the law governing surface water and groundwater were out of sync. For the most part, the potential problems that concerned courts and legislatures with regard to surface water eluded policymakers with regard to groundwater. As in Texas and California (as well as most other states in the West), there were questions about the quality of the property interest of the groundwater in place, the relationship of that interest to surface ownership, and the level of government that ought to be making the decisions about allocated rights.

2. *Groundwater Management Districts and the General Regulatory Limits on State Water*

The conservation amendment clearly gave the State of Texas the power to create groundwater conservation districts to manage the groundwater resource. The question behind its use, however, is whether the power is plenary—like the power to control the use of surface waters—or whether it is something less. The nature of the private interest in groundwater is necessarily the limiting factor in the background regulatory principles that are found in the common law.

The debate<sup>27</sup> centers on how to resolve the tension between (a) the doctrine of absolute ownership of the resource in place that clearly articulates a property rule, and (b) the rule of capture that gives absolute ownership only to groundwater reduced to possession and that is only protected by a liability rule. The exercise of regulatory powers over groundwater must thread this conceptual needle.

The Texas Supreme Court in *Day* did little to resolve the tension, but it did suggest a constitutional standard that is implicit in every regulation that controls the use and disposition of property. The takings clauses of the federal and state constitutions are the constitutional guarantees against excessive regulation.<sup>28</sup> The contours of the regulatory-takings doctrine are outlined in

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27. See *infra* Part II.

28. The classic statements on the justifications for and limits of the Takings Clause are found in two justly famous essays: Frank I. Michelman, *Property, Utility, and Fairness: Comments on the Ethical Foundations of "Just Compensation" Law*, 80 HARV. L. REV. 1165 (1967); and Joseph L. Sax, *Takings and the Police Power*, 74 YALE L.J. 36 (1964). See also TEX. CONST. art. I, § 17(a) ("No person's property shall be taken, damaged, or destroyed for or applied to public use without adequate compensation being made . . .").

the famous *Penn Central* case.<sup>29</sup> There, the U.S. Supreme Court eschewed any set formula to determine when a compensable taking occurs.<sup>30</sup> Despite the reluctance to establish a firm test, the Court seems to have marked out the outer boundaries of acceptable regulation in two ways. On the one side are any rules that require a dedication of private property to a public use. This would always be a taking whether the state achieved it directly or through regulation. The state would not have to order an explicit physical occupation so long as the public use effectively supplanted the private use. On the other side are rules that would result in the complete destruction of the economic value of the parcel to be regulated or the complete frustration of “distinct investment-backed expectations.”<sup>31</sup> Of course, the area within those boundaries is quite capacious, and merely stating the borders asks more questions than it answers. The key question the plaintiffs asked in *Day* was whether the restrictions on the amount of groundwater that they could use were legitimate, especially where the regulation in question clearly suggested that they could only withdraw zero or close to zero groundwater.<sup>32</sup>

The legislature was empowered by the conservation amendment to authorize the creation of groundwater conservation districts. In chapter 36 of the Texas Water Code (“Chapter 36”), the legislature both outlined the reason for the creation of groundwater conservation districts and authorized each district to construct rules consistent with the conservation and management of specific aquifers or groundwater districts.<sup>33</sup> This approach suggests, of course,

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29. *Penn Cent. Transp. Co. v. New York City*, 438 U.S. 104 (1978).

30. *Id.* at 123-24. The Court stated:

While this Court has recognized that the “Fifth Amendment’s guarantee . . . [is] designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole,” this Court, quite simply, has been unable to develop any “set formula” for determining when “justice and fairness” require that economic injuries caused by public action be compensated by the government, rather than remain disproportionately concentrated on a few persons.

*Id.* (alteration in original) (citation omitted) (quoting *Armstrong v. United States*, 364 U.S. 40, 49 (1960); *Goldblatt v. Hempstead*, 369 U.S. 590, 594 (1962)).

31. *Id.* at 124.

32. *See Edwards Aquifer Auth. v. Day*, 369 S.W.3d 814, 832-33 (Tex. 2012).

33. TEX. WATER CODE ANN. § 36.116(d) (West 2012) (“For better management of the groundwater resources located in a district or if a district determines that conditions in or use of an aquifer differ substantially from one geographic area of the district to another, the district may adopt different rules for: (1) each aquifer, subdivision of an aquifer, or geologic strata located in whole or in part within the boundaries of the district; or (2) each geographic area overlying an aquifer or subdivision of an aquifer located in whole or in part within the boundaries of the district.”).

that “owners” of groundwater could be treated differently from one groundwater conservation district to another and even within the same district, depending on the conservation needs and physical limitations of the aquifer. Whether this distinction would constitute an unconstitutional regulatory burden on the landowners is unclear. However, there are suggestions that the conservation amendment and Chapter 36 did contemplate the power to issue these kinds of regulations. Before examining the extent of permissible Chapter 36 limitations, it would be useful to look at the most litigated groundwater conservation district and the one that was the specific subject of attack in the *Day* case.

*B. The Edwards Aquifer Authority*

The Edwards Aquifer Authority was created in 1993.<sup>34</sup> The object of the EAA Act was to protect the Edwards Aquifer, which serves much of central Texas and which is the principal source of water for San Antonio.<sup>35</sup> Population growth and irrigated agriculture have dramatically increased groundwater-withdrawal rates since the 1970s.<sup>36</sup> In addition, species protected by the Endangered Species Act<sup>37</sup> were directly dependent on flows from springs fed by the Edwards Aquifer. Those forces, in conjunction with the inability of local actors within the region to agree on a plan to address the management issues, led to the creation of the EAA.<sup>38</sup>

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34. See Edwards Aquifer Authority Act of 1993, ch. 626, 1993 Tex. Gen. Laws 2350.

35. See Darcy Alan Frownfelter, *Edwards Aquifer Authority*, in *ESSENTIALS OF TEXAS WATER RESOURCES* 325, 328 (Mary K. Sahs ed., 2009) (“Historically, the Aquifer has been the sole source of water supply for the 1.7 million people living in the Aquifer region.”). Because the aquifer is a karst system, which typically designates a porous limestone structure, surface activity has a major impact on the condition of the water in the aquifer and unregulated withdrawals have a serious impact on water availability in central Texas, including surface water.

36. For historical data on water withdrawals from different counties and basins, the Texas Water Development Board provides a helpful tool to search and compare withdrawals over time, broken down by category. *Historical Water Use Information*, TEX. WATER DEV. BOARD, <http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=1> (last visited Oct. 15, 2012).

37. 16 U.S.C. §§ 1532-1544 (2006).

38. See *City of San Antonio v. Tex. Water Comm’n*, 392 S.W.2d 200, 212, 217 (Tex. Civ. App. 1965) (holding that the legislature regulates not the final users of water, but merely “the purposes for which a permit could be granted for the use of water,” after the Texas Water Commission denied San Antonio a permit to move water from one watershed to another).

The operation of the EAA was supposed to be relatively straightforward. The rights to the groundwater would be regulated in an orderly way that would enable the EAA to transition groundwater rights from the common law rule of capture to a fully permitted system of withdrawals. This was not unlike the animating impulse behind the transition of surface-water regimes from a riparian ownership system to the permitted prior-appropriation system. Temporary interim authorizations would give way to initial regular permits if landowners filed their permits in a timely manner. Although the interim withdrawals were not subject to permits, they did form the basis for determining historic “maximum beneficial use” that would be the baseline for the allowable withdrawals in the initial regular permits.<sup>39</sup> Eventually, all historic users of groundwater would be integrated into the permit system, which would be limited to an aquifer-wide annual withdrawal cap.

Yet there were two classes of users and landowners who fell outside this process. The first class was owners of exempt wells. Under the EAA Act, these were typically small-volume wells that were employed primarily for domestic or livestock use outside urban areas.<sup>40</sup> The second class was those landowners who did not have producing wells during the time that historic use was determined. It was this second class of landowners who gave rise to the first major challenge to the Act, in *Barshop v. Medina County Underground Water Conservation District*.<sup>41</sup> The argument was simple: landowners have a right to the groundwater beneath their land, and prohibition on pumping (viewing the exempt wells as de minimis exceptions) would be an unconstitutional taking of their property right in the water. Although the Texas Supreme Court’s holding did not directly address this question because the case was a facial challenge, the court did note the problem:

While our prior decisions recognize both the property ownership rights of landowners in underground water and the need for legislative regulation of water, we have not previously considered the point at which water regulation unconstitutionally invades the property rights of landowners. The issue of when a particular regulation becomes an

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39. See *Edwards Aquifer Auth. v. Day*, 274 S.W.3d 742, 748-49 (Tex. App. 2008) (citations omitted).

40. See Lyn E. Dean, *Domestic and Livestock Use—What Rights Does My Client Have Left?*, 33 ST. B. TEX. ENVTL. L.J. 175 (2003).

41. 925 S.W.2d 618, 626 (Tex. 1996).

invasion of property rights in underground water is complex and multi-faceted.<sup>42</sup>

The Texas Supreme Court was very clear that the tension between property rights and Texas's constitutional obligation to conserve natural resources is especially acute where the resource being conserved is not a state resource but a private resource with an important public function. Yet the historic precedent of converting riparian rights into those rooted in prior appropriation posed virtually the same question. Riparian rights, though clearly usufructuary in nature,<sup>43</sup> were nonetheless incidents of real-property ownership. In conventional property law, riparian rights are more accurately characterized as real-property rights rather than as water rights, because the right to use the water was traditionally tied to ownership or the right to use the land that was appurtenant to the waterway. Despite this characterization, the Irrigation Act of 1917 and the Texas conservation amendment essentially converted important private property into state property that would then be allocated according to preexisting use and state needs. Yet, even in view of the practically plenary capacity of the state to legislatively characterize the legal category that water occupies, surface or otherwise, this power is not without limits. Earlier attempts to recategorize the kind of groundwater found in the Edwards Aquifer were found to be illegal.<sup>44</sup>

The *Day* case arose within the context of the EAA Act and its restrictions on groundwater withdrawal stemming both from the limitations based on historic beneficial use and from the limitations derived from the annual cap.<sup>45</sup> The plaintiffs in *Day*, although they had applied in a timely manner for a permit claiming historic use of seven hundred acre-feet of groundwater and had invested some ninety-five thousand dollars in a new well, were nevertheless issued a permit for only fourteen acre-feet of water.<sup>46</sup> Many facts account for the difference in amount, but, importantly, some of the groundwater *Day* was claiming had lost its character as groundwater because it was pumped into a lake. As water in the lake and in a natural watercourse, the groundwater

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42. *Id.* at 626.

43. A usufruct is a right to use a thing provided you do not consume or alter the utility of the thing.

44. The state undertook this reclassification in an attempt to prevent federal oversight through the Endangered Species Act. *See* *McFadin v. Tex. Water Comm'n*, No. 92-05214 (Tex. Dist. Ct. Oct. 2, 1992).

45. *Edwards Aquifer Auth. v. Day*, 369 S.W.3d 814, 822-23 (Tex. 2012).

46. *Id.* at 844.

became part of the waters of the state. Conversely, the plaintiffs argued that water, once groundwater, always remains groundwater.<sup>47</sup>

The EAA had already survived both the facial attack of the *Barshop* case and the attack on the extent of its rulemaking powers to regulate withdrawals to prevent waste.<sup>48</sup> But in addition to the cases arising under the EAA Act, the case of *City of Del Rio v. Clayton Sam Colt Hamilton Trust* had also become part of the background against which the dispute in *Day* would play out.<sup>49</sup> The *Hamilton Trust* case was touted for its support of the claim that landowners have a property interest in the groundwater in place.

In that case, the City of Del Rio purchased a tract of land from the Hamilton Trust. The Trust reserved all water rights associated with the tract. When the city drilled a well on the tract, the Trust sued to enjoin the pumping. The city argued that under the rule of capture, the sellers had no right to the groundwater until they reduced it to possession. Thus, the reservation was ineffective. The court, however, distinguished the rule of capture from the absolute ownership rule. Consistent with the case law arising from the century-old *East* decision,<sup>50</sup> the court held that the rule of capture is a tort rule developed as “a doctrine of nonliability for drainage, not a rule of property.”<sup>51</sup> Nonetheless, the court stated, “under the absolute ownership theory, the Trust was entitled to sever the groundwater from the surface estate by reservation when it conveyed the surface estate to the City of Del Rio.”<sup>52</sup>

Because the Trust owned adjacent land, it maintained access to the water under the tract sold to the city and reserved the right as against the owner to remove the groundwater of the surface estate. What the Trust clearly could not do was prevent anyone else from taking the groundwater from under the tract conveyed to the city. Thus, the Trust owned the water as against the buyer if and only if the buyer tried to pump the water out from a well drilled on the conveyed parcel. It seems equally clear, however, that the Trust, despite the holding regarding absolute ownership, could not enjoin the nonwasteful pumping from off-site even if it drained the water claimed by the Trust.

The *Hamilton Trust* case did not resolve the issue of ownership of groundwater in place. In many ways, it was really about the enforceability of a reservation. The capacity of the Trust to obtain the groundwater through

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47. *Id.* at 820-22.

48. See *Bragg v. Edwards Aquifer Auth.*, 71 S.W.3d 729 (Tex. 2002).

49. 269 S.W.3d 613 (Tex. App. 2008).

50. *Hous. & T.C. Ry. Co. v. East*, 81 S.W. 279 (Tex. 1904).

51. *Hamilton Trust*, 269 S.W.3d at 618.

52. *Id.* at 617.

drainage obviated the hard questions about restraints on alienation. Nonetheless, it did highlight the problem of defining the interest that the landowner has to the groundwater in place.<sup>53</sup>

The Texas Supreme Court in *Day* extensively discussed the range of powers contemplated by the statute permitting the creation of groundwater conservation districts.<sup>54</sup> Yet the court's main objective was to distinguish the extent of permissible constitutional authority between those powers when exercised by a Chapter 36 groundwater conservation district and the permissible powers exercised by the EAA Act. Because the EAA was created under a separate statute, the powers it exercises are not identical to those exercised by groundwater conservation districts created under the general statute. Whether the distinction ought to be of constitutional importance is not clear. Nonetheless, the Texas Supreme Court suggests that it is.<sup>55</sup>

The distinction is best made clear by comparing a case that arose under Chapter 36 with *Day*, which arose under the EAA Act. In *Guitar Holding Co. v. Hudspeth County Underground Water Conservation District No. 1*, the plaintiff argued that the district's new rules regarding out-of-district transfers by current users of groundwater were impermissible because they unfairly favored those users who were grandfathered in under rules protecting "historic and existing use."<sup>56</sup> Typically, the existing wells were used to support irrigation and ranching. Those who irrigated land were able to protect a greater quantity of water than those who did not.<sup>57</sup>

Because the existing rules would give an effective monopoly to the grandfathered uses and would give them a stranglehold on the lucrative transfer market that was being driven by the needs of a growing El Paso, the plaintiffs argued that transfers were new uses and thus not subject to

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53. See Susana Elena Canseco, *Landowners' Rights in Texas Groundwater: How and Why Texas Courts Should Determine Landowners Do Not Own Groundwater in Place*, 60 BAYLOR L. REV. 491, 510-11 (2008).

54. *Edwards Aquifer Auth. v. Day*, 369 S.W.3d 814, 833-37 (Tex. 2012).

55. *Id.* at 836-37.

56. 263 S.W.3d 910, 914 (Tex. 2008).

57. Under district rules there were three kind of permitted users: "(1) statutorily exempt users, (2) existing and historic users, and (3) new users." *Id.* at 914. The rules were changed in 2002 to define new permitted users: "(1) validation permits, (2) operating permits, and (3) transfer permits." *Id.* Validation permits were designed to include all users who were legally withdrawing water prior to the adoption of the new rules. Users who were not irrigating were entitled to withdraw the maximum amount of water beneficially used during the historic period. Operating permits were withdrawals conditioned on surface land ownership. Because these were new wells, they were subject to the prior claims of holders of validation permits. *Id.*

protection as existing or historic uses.<sup>58</sup> This interpretation would put all transfer permits on the same legal footing.

Of course, the grandfathered irrigators objected. The groundwater conservation district agreed with them, maintained that the provision providing protection for “historic and existing use” was designed to shield existing quantities of water withdrawn, and argued that it could not condition how the historic uses were actually *used*.<sup>59</sup> So long as the use was permissible, and so long as pumpers were not going to increase the amount of groundwater withdrawn, the district was constrained from further burdening the permit.<sup>60</sup>

The demand for water from El Paso and the creation of operating permits created greater tension among potential claimants of the groundwater. The new allocation structure combined a kind of correlative-rights regime with prior appropriation. A correlative-rights regime ties ownership of groundwater to ownership of the overlying land. It differs from absolute ownership only to the extent that it limits the share of groundwater a landowner can claim to a “reasonable” amount determined by surface acres owned. Prior appropriation protected the historic users, and the new operating permits were tied to surface acreage. Transfer permits were available either to historic users (through validation permits) or to operating permit-holders (as new users). The total amount of water that could be withdrawn was limited by the water level in the aquifer. Although old and new permittees were eligible to get transfer permits, the historic users were guaranteed a more secure supply through the application of the logic of prior appropriation.

The Texas Supreme Court ruled that the new rules that only regulated the *quantity* of water withdrawn and without regulating the *uses* for which the water was withdrawn were invalid.<sup>61</sup> The court uncoupled the transfer permits from the validation permits, thus placing all transfer permittees on the same footing. This decision does not completely eliminate the elements of either prior appropriation (as long as the water continues to be used for irrigation) or correlative rights; it merely shifts the power to larger landowners. Where the previous rules privileged use, the new regime suggests rights to groundwater based on surface land ownership. Whether this translates into rights to groundwater in place is unclear because correlative rights are not required. Of course, merely uncoupling the transfer permits from the validation permits

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58. In fact, section 36.113(e)(1) of the Texas Water Code requires that restrictions on new permits be applied uniformly. TEX. WATER CODE ANN. § 36.113(e)(1) (West 2012).

59. *Guitar Holding Co.*, 263 S.W.3d at 915.

60. *See id.* at 917-18.

61. *See id.* at 916.



does not completely shift the power to surface landowners, because the other rules relating to conservation still give preference to existing and historical uses where there are potential shortages that deleteriously affect the aquifer.

*C. Ownership of Groundwater and Day*

Against this murky background of contested groundwater rights and regulatory authority, the Texas Supreme Court in *Day* suggested that the limited purview of the EAA Act makes the regulatory scheme more vulnerable to challenge than the type of regulations at issue in *Guitar Holding Co.* The amount of groundwater that can be withdrawn under the EAA Act is based solely on the historic amounts of water that were put to beneficial use during the historic period and on the available water supply, but for the de minimis exceptions.<sup>62</sup> A landowner could thus be denied all use of groundwater. That fact, according to the Texas Supreme Court, made all the difference.<sup>63</sup> The crucial difference, apparently, is that the limitation created in the EAA Act amounts to forfeiture for nonusage.

According to the Texas Supreme Court, regulation under the EAA Act is constitutional only so long as the EAA (or the State) compensates frustrated landowners for the destruction of their economic interest in the groundwater, even if they had never used the groundwater. As the EAA argued, such a ruling would render continued regulation under the EAA Act ruinously expensive. Although cost is never a defense where the state or its subdivision has overreached, the regulation was designed to protect perfected interests rather than to insure inchoate interests. In takings jurisprudence, the state traditionally is never made to be the guarantor of unrealized interests.<sup>64</sup>

But even saying that the regulation unconstitutionally burdens an unrealized groundwater interest does not answer the question: what is the interest in the water? The Texas Water Code recognizes that a landowner owns the groundwater, but the landowner's interest is hedged, both by the preservation of the liability rule precluding actions for drainage and by the

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62. *Edwards Aquifer Auth. v. Day*, 369 S.W.3d 814, 835-36 (Tex. 2012).

63. A reading of the rules in *Guitar Holding Co.*, however, suggests that landowners there are also at risk of being denied access to groundwater.

64. This is one reason the *Penn Central* test is predicated on "distinct investment-backed expectations." *Penn Cent. Transp. Co. v. New York City*, 438 U.S. 104, 124 (1978). The Constitution would protect vested property rights as well as persons who had materially changed their position in reliance on a specific property rule.

preservation of groundwater conservation districts' ability to restrict withdrawals.<sup>65</sup>

## II. OWNERSHIP IN PLACE

### A. *The Oil and Gas Analogy*

Groundwater is not the only valuable incident of surface ownership. The subsurface rights we most commonly associate with surface ownership are those tied to mineral rights, which include oil and gas. Because of the tempestuous history of oil-and-gas exploration, this seemed to the Texas Supreme Court a likely place to begin the inquiry about the quality of the property interest in groundwater.<sup>66</sup> As the court said in *Day*, "Whether groundwater can be owned in place is an issue we have never decided. But we held long ago that oil and gas are owned in place, and we find no reason to treat groundwater differently."<sup>67</sup> Yet the analogy is fraught with difficulties, and not merely because of the distinctive nature of the substances or the differing consumptive use of each.

The starting point for the analogy stemmed from a taxing case in which an oil-and-gas lessee argued that he was not liable for the ad valorem tax on oil in place because his interest was speculative and amounted only to a right to capture whatever oil or gas might be discovered.<sup>68</sup> The claim was further buttressed by the argument that the landowner-lessor ought to be liable for the value of the oil or gas in place because it was part of the value of the land. The Texas Supreme Court concluded that the lessee's interest was a severable interest in the realty that amounted to a defeasible fee in the same way that a lease to remove coal or other mineral might be.<sup>69</sup> The interest in the mineral estate could be valued, at a minimum, at what the purchaser paid for it.

The discussion in that case included references to water as well as to hard-rock minerals that might be severed through a lease or other instrument. While in the ground, these minerals, and, by analogy, water, that might be severed, constitute some share of the value of the parcel as a whole and thus ought to be

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65. See TEX. WATER CODE ANN. § 36.002 (West 2012).

66. See JACQUELINE LANG WEAVER, UNITIZATION OF OIL AND GAS FIELDS IN TEXAS: A STUDY OF LEGISLATIVE, ADMINISTRATIVE, AND JUDICIAL POLICIES 201-02 (1986); see also *Day*, 369 S.W.3d at 823-32 (using the oil and gas analogy).

67. *Day*, 369 S.W.3d at 823.

68. *Tex. Co. v. Daugherty*, 176 S.W. 717 (Tex. 1915).

69. See *id.* at 719.

considered part of the realty. The leaseholder became the fee owner of the severed interest when he or she reduced the subject matter of the lease to possession. Nonetheless, the mineral interest had a value both as part of the real estate and as a separate interest.

This analysis makes sense, of course, only if one conceives of the right as exclusive and protected by a property rule. Trespass is one such rule, and it clearly prohibits a stranger from entering your land and allows you both to enjoin entry and to recover damages for anything that is removed. It is trespass that prohibits slant drilling (that is, drilling in a nonvertical manner in order to reach subsurface areas that do not underlie the drilling platform) or any invasion of your subsurface estate. To this extent the surface landowner has a property interest in the nonfugitive mineral interests. Nonetheless, the Texas Supreme Court recognized:

The possibility of the escape of the oil and gas from beneath the land before being finally brought within actual control may be recognized, as may also their incapability of absolute ownership, in the sense of positive possession, until so subjected. But nevertheless, while they are in the ground, they constitute a property interest.<sup>70</sup>

Of course, this merely says that the value of a parcel of land includes all of the potential incidents of ownership. If you can demonstrate that there is groundwater available from your land, then that parcel is going to be more valuable than land that does not overlie an aquifer. Yet characterizing an inchoate interest as property does not necessarily follow unless there are correlative rights among surface owners.

A brief hypothetical illustrates this point. Imagine that owner *A* drills a well on his property lowering the water table such that owner *B* must now drill much deeper to remove any water that underlies his property. Imagine that *B* even has a producing well that dries up. Before the well dries up and before *A* drills his well, *B* sells his property to *C*. Part of the value of the parcel is the access to water. Nonetheless, *C* has no right to enjoin *A* or to get damages from *A* so long as *A* puts the water he removes to a legitimate beneficial use.<sup>71</sup> The result would be completely different if the right to remove groundwater were contingent on the number of acres overlying the aquifer. In that case, each overlying landowner would have a right to a quantity of the groundwater

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70. *Id.* at 720.

71. See, e.g., *Sipriano v. Great Spring Waters of Am., Inc.*, 1 S.W.3d 75 (Tex. 1999); *Hous. & T.C. Ry. Co. v. East Co.*, 81 S.W. 279, 280 (Tex. 1904). This hypothetical is derived from these cases.

consistent with the surface acreage owned. But as the case law in Texas has stated again and again, supported by legislation, groundwater is not regulated according to any correlative-rights regime, and there is no obligation of groundwater conservation districts to impose such a regime.

Although the rule of capture may not preclude the idea of ownership of groundwater in place, it certainly strips the idea of ownership of what we normally regard as important attributes of property. The important point to remember, however, is that—except for the cases concerning drainage and the operation of immunity from tort liability—the cases that foreground the property interest arise in the context of groundwater regulation where the access to groundwater is rationed in some way. Perhaps the federal constitutional case that actually grounds these claims is *Goldberg v. Kelly*<sup>72</sup> rather than *Penn Central*.<sup>73</sup> The next section addresses these arguments.

### *B. The Current Status of Groundwater in Place*

In many ways, the question of the quality of the ownership interest in groundwater in place only has any resonance in situations where the state or one of its subdivisions applies an allocation or rationing scheme. Of course, that is what management and conservation are all about. The management plan and the concern for “desired future conditions” drive the rules.<sup>74</sup> Like the conversion to prior appropriation, moreover, concern for protecting existing users plays an important role in determining what the rationing system will look like. Despite the language in the Texas Water Code stating that “[t]his section does not . . . require that a rule adopted by a district allocate to each landowner a proportionate share of available groundwater for production from the aquifer based on the number of acres owned by the landowner,”<sup>75</sup> such an allocation is the effective result of the *Day* holding. Because of the limit created by the combination of the historic use criteria and the total withdrawal cap in the EAA Act, it is likely that some landowners will be restricted to close to zero permissible withdrawal. But unless the court holds that the domestic and livestock exemptions are sufficient to preserve the constitutionality of the EAA

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72. 397 U.S. 254 (1970).

73. *Penn Cent. Transp. Co. v. New York City*, 438 U.S. 104 (1978); see also Charles A. Reich, *The New Property*, 73 *YALE L.J.* 733 (1964). One of the brilliant insights of Professor Reich is that government-created interests, whether largesse or otherwise, not only benefit the recipient, but also in important ways may limit the power of the state to restrict those interests without providing some form of due process.

74. See *TEX. WATER CODE ANN.* § 36.108 (West 2012).

75. See *id.* § 36.002(d)(3).

Act scheme, some provision will have to be made to permit withdrawals in excess of the cap or outside the historic use limitation, or the EAA will have to pay to prevent pumping.

The Texas Supreme Court determined that the landowner has a “constitutionally compensable interest in groundwater.”<sup>76</sup> It is a property interest that has no private dimension other than protection through trespass. Although it is severable and valuable as an incident of real-property ownership, any private action that would arise to protect it would be in contract. There is no right to possess and no right to exclude other than through the policing of boundaries. Through the creation of a groundwater management district, the rules become the measure of the property interest of the landowner.

Because the rules governing access to groundwater under the EAA Act restrict withdrawal rights either to historic users as determined in the initial regular permits or to withdrawal necessary for domestic or livestock purposes, the rules are the functional equivalent of a constitutional deprivation. The EAA Act has a limited set of conditions for permissible withdrawals that makes its rules more restrictive than groundwater conservation districts created under Chapter 36. Although the Texas Supreme Court did not find that the limitations as applied to *Day* constituted a taking, the court determined that “a landowner cannot be deprived of all beneficial use of the groundwater below his property merely because he did not use it during an historical period and supply is limited.”<sup>77</sup>

The Texas Supreme Court opined that a strong public interest in conserving groundwater, even when the resource is limited, does not justify placing the burden on a few landowners. Instead, it must be shared by the public. Of course, it is a truism of takings jurisprudence that the state cannot extract a public benefit at the expense of a few private owners, but such a prohibition does not solve the problem of scarcity. The only way for the EAA to achieve the result suggested by the court in *Day* is to apply the total cap on withdrawals from the aquifer on some kind of pro rata basis. This would entail a restriction on preexisting permit holders and grant to landowners a right to withdraw groundwater in excess of the de minimis amount or to be compensated for the loss of value associated with the limit. Although this interpretation places the EAA in a difficult position, especially if permits based on historic uses are determined to be vested rights, it can only be understood as the imposition of a correlative-rights regime. Because the EAA, like other groundwater conservation districts, can regulate well size and spacing, it

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76. *Edwards Aquifer Auth. v. Day*, 369 S.W.3d 814, 838 (Tex. 2012).

77. *Id.* at 843.

effectively regulates withdrawals that would be nontortious but damaging to neighboring landowners. Thus, the rule of capture is supplanted by the permitting system, and in its place is a regulated rule of absolute ownership that is managed like a system of correlative rights.

## CONCLUSION

I began this Essay with a reflection on the impact the current drought has had on the use of unregulated groundwater supplies. The *Day* case illustrates that the system of groundwater ownership and the attendant regulatory regime are going to be critical for the rational management of groundwater resources, especially in times of scarcity. Texas and California have both eschewed statewide leadership in favor of delegating to local actors. As each state evolved, such an approach may have made sense. But the uncertainty regarding ownership and the capacity of the state to regulate groundwater withdrawals is certain to be complicated by projections of further restrictions on water availability. The Texas Climate Initiative has projected:

Taking [water] flows to the coast as a measure of river-basin impact, we calculate which changes will occur by mid-century under constant and changing climate conditions. Considering only population growth and the resulting increased water demand, flows will be reduced by about 25 percent under normal conditions and by 42 percent under drought conditions. When also considering climate change (3.6 [degrees] F increase in air temperature and 5 percent decrease in precipitation), 2050 projected flows to the coast are 70 percent of the 2000 values under normal conditions and 15 percent of 2000 normal under drought conditions.<sup>78</sup>

This decrease in surface flows will undoubtedly increase the stress on groundwater resources. After all, the “variability means river flows are not dependable as a source[] and will pose a major problem in using surface water or water supply”—especially because the surface sources are “already extensively plumbed.”<sup>79</sup>

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78. See George H. Ward, *Water Resources and Water Supply*, in *THE IMPACT OF GLOBAL WARMING ON TEXAS* 1, 11 (Jurgen Schmandt, Gerald R. North & Judith Clarkson eds., 2d ed. 2011).

79. *Id.* at 6.

Because of the relationship between surface and groundwater supplies, the capacity to regulate withdrawals consistent with the overall water needs of the state is critical.

Likewise, California is not immune to these stresses. The largely federally financed aqueduct that brings water from the north to the thirsty south and the restoration of the Sacramento-San Joaquin River Delta will continue to put pressure on surface-water supplies. There is currently a ballot initiative pending in San Francisco to remove the Hetch Hetchy Dam, which supplies the bulk of the drinking water for San Francisco.<sup>80</sup> If that water supply goes away, it will have to be generated from other sources.

The overallocation of surface-water rights and the continued population growth in both Texas and California mean that groundwater will play an ever-increasing role in slaking the thirst of these states. What the decision in *Day* has done is to suggest that some form of correlative rights will have to emerge in order to manage the competing demands of overlying landowners. This is especially true once the infrastructure for water marketing is fully in place. While the Texas Supreme Court in *Day* suggested the model of oil and gas as the appropriate one to use for groundwater, that can only be a first approximation. The nonsubstitutability of water as compared to oil and gas, the different consumption patterns, and the relationship between groundwater and surface water all suggest real, not conceptual, limitations to a full-bodied adoption of the oil-and-gas model.

The question of which ownership regime will govern is complex both because of the fact that the various approaches that have been tried across the country offer competing models and because of the web of expectations that have been allowed to develop under conditions of legal uncertainty. The law could, of course, merely ratify those expectations and, by doing so, avoid the kinds of constitutional challenges raised in *Day*. Alternatively, it could begin to construct the legal architecture and permitting system that takes most of the sting out of the changes in expectations. The EAA Act is an example of that approach, and the preservation of *de minimis* exemptions is another. Nonetheless, *Day* and the cases that trail in its wake suggest that this is not enough.<sup>81</sup> Many commentators suggest that a clear private-property regime in

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80. See S.F., Cal., Proposed Ordinance, Water Sustainability and Environmental Restoration Planning Act of 2012 (Feb. 29, 2012), [http://www.sfgov2.org/ftp/uploadedfiles/elections/candidates/Jun2012/Jun2012\\_TheWaterSustainabilityandEnvironmentalRestorationPlanningAct2012.pdf](http://www.sfgov2.org/ftp/uploadedfiles/elections/candidates/Jun2012/Jun2012_TheWaterSustainabilityandEnvironmentalRestorationPlanningAct2012.pdf).

81. See, e.g., *Hearts Bluff Game Ranch, Inc. v. State*, No. 10-0491, 2012 WL 3800186 (Tex. Aug. 31, 2012) (asserting an inverse-condemnation claim against the U.S. Army Corps of Engineers for their denial of a mitigation banking permit where Texas had identified the land as potential site for a reservoir); *Bragg v. Edwards Aquifer Auth.*, 71 S.W.3d 729 (Tex.

groundwater is not only more efficient but also more fair with respect to developed expectations.<sup>82</sup> The private-property response for making efficient use of a commons is an old argument, but it does set out clear boundaries on government regulatory authority as well as provide a basis for water marketing. But the treatment of surface water and the conversion from a riparian system to a system of prior appropriation provides an alternative model. It is one that fully protects private interests in water while setting up a well-regulated and monitored system of allocation. The system accounts for the kinds of uses and the physical limitations of the resource. It also provides a baseline and framework for planning that respects the ways in which water is a resource different from virtually any other, with its centrality to human life and well-being.

Water management has provided lessons throughout our history. In the early days of the Republic, water power was crucial to the economic welfare of the region, a fact that gave rise to the mill-dam acts.<sup>83</sup> From those states in the West, vested quasi-governmental powers in irrigation districts ensured that water would be used most productively. Because of its unique status and centrality to human welfare, water has always been treated differently. Groundwater is not *sui generis*. Perhaps the roiling conflicts over ownership only put an exclamation point on the quotation that is commonly attributed to Mark Twain: "Whiskey is for drinkin', water is for fightin'."<sup>84</sup> Let us hope that the fight will be fought fairly.

*Gerald Torres holds the Bryant Smith Chair in Law at the University of Texas at Austin. He served as Deputy Assistant Attorney General for the Environment and Natural Resources Division of the U.S. Department of Justice and as Counsel to the Attorney General during the Clinton Administration.*

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2002) (allowing plaintiffs to make a takings claim against the EAA maintaining that the denial of a permit was a confiscation under article I, section 17 of the Texas Constitution).

82. See, e.g., Bill Provencher & Oscar Burt, *A Private Property Rights Regime for the Commons: The Case for Groundwater*, 76 AM. J. AGRIC. ECON. 875 (1994).

83. See, e.g., *Smith v. Agawam Canal Co.*, 84 Mass. (2 Allen) 355, 357 (1861) (giving priority to the first dam and permitting flooding of upstream landowners).

84. There is much dispute over the authenticity of this quotation, and, although it has been attributed to Twain, no reliable source has been definitively identified.