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Regulating unregulated groundwater in Texas: how the state could conquer this final frontier

Vanessa Puig-Williams[1]

Abstract: Texas has 9 major aquifers and 21 minor aquifers underlying the state. These aquifers are a vital water supply source in Texas, providing approximately 60% of the 16.1 million acre-feet of water used in the state annually. These underground waters also sustain surface water flow in rivers across Texas; thus, they are integral to the health of watersheds throughout the state and the economies that depend on this water. However, approximately one-third of Texas is not regulated by a groundwater conservation district. During a time of unparalleled pressure on groundwater resources across the state, the lack of groundwater protection in some areas of Texas is undermining important areas of law and policy—from property rights and natural resource protection, to groundwater management and regional water planning. The presence of a groundwater conservation district, however, does not guarantee effective management of groundwater resources or protection of private property rights, springflow, and surface water flow. Groundwater policy in Texas permits aquifers to be mined and fails to protect the property rights of landowners who wish to conserve their groundwater. In addition, a fragmented regulatory structure and insufficient funding for groundwater conservation districts impede effective management of groundwater resources. To bring effective groundwater management to areas of the state where groundwater conservation districts do not exist, therefore, Texas must resolve fundamental challenges in the way groundwater is managed in areas where it is regulated.

Keywords: rule of capture, groundwater, private property, regulation, springflow

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Terms used in paper

Acronym	Descriptive term
BSEACD	Barton Springs Edwards Aquifer Conservation District
DFC	desired future condition
EP	Electro Purification
GCD	groundwater conservation district
GMA	groundwater management area
MAG	modeled available groundwater
PGMA	priority groundwater management area
TCEQ	Texas Commission on Environmental Quality
TWDB	Texas Water Development Board

INTRODUCTION

Beneath the great state of Texas, there is water. Texas has 9 major aquifers and 21 minor aquifers underlying the state. These aquifers are a vital water supply source in Texas, providing approximately 60% of the 16.1 million acre-feet of water used in the state annually.[1] These underground waters also sustain surface water flow in rivers across Texas; thus, they are integral to the health of watersheds throughout the state and the economies that depend on this water. When W.H. Auden wrote, "Water is the soul of the Earth," he must have been referring to groundwater.

In 1917, as a result of several droughts, voters passed the Conservation Amendment to the Texas Constitution. The Conservation Amendment places the duty to protect the state's natural resources in the hands of the Legislature. Article 16, section 59 of the Texas Constitution provides:

> The conservation and development of all of the natural resources of this State, ... and the preservation and conservation of all such natural resources of the State are each and all hereby declared public rights and duties; and the Legislature shall pass all such laws as may be appropriate thereto.[2]

The Conservation Amendment provided the authority for the Texas Legislature to establish groundwater conservation districts (GCDs) to conserve the state's groundwater resources. Not all areas of the state, however, are controlled by a GCD. Approximately one-third of the surface area of Texas is not regulated by a GCD. These areas where a GCD does not exist are depicted on the map as areas without color (Figure 1). Out of the 254 counties in the state, 174 counties are either fully or partially within a confirmed or unconfirmed GCD.[3] In unregulated areas, there is no regulatory authority to monitor the rate and amount of groundwater withdrawal. Landowners can pump unlimited amounts of groundwater.

Texas landowners own the groundwater beneath their land as private property. Chapter 36 of the Texas Water Code states, "[t]he legislature recognizes that a landowner owns the groundwater below the surface of the landowner's land as real property."[4] In *Edwards Aquifer Authority v. Day*, the Texas Supreme Court held that "land ownership includes an interest in groundwater in place that cannot be taken for public use without adequate compensation guaranteed by article I, section 17(a) of the Texas Constitution."[5] Ownership of groundwater entitles a landowner to certain rights, which Chapter 36 of the Water Code articulates. A landowner is entitled to "drill for and produce the groundwater below the surface of real property, subject to section (d), without causing waste or malicious drainage of other property or negligently causing subsidence."[6] This statutory language describes the rule of capture in Texas—a court-created doctrine, which, with a few exceptions, does not impose liability on a landowner who depletes his neighbor's groundwater by pumping groundwater from beneath his own land for a beneficial purpose.[7]

While a landowner is entitled to drill for and produce groundwater below the surface of his property, as the Court in *Day* noted, he is also subject to reasonable regulation through GCDs.[8] Chapter 36 authorizes GCDs to regulate groundwater production to achieve Chapter 36's purpose of protecting property rights and balancing the conservation and development of groundwater.[9] In GCD-managed areas, therefore, a landowner's right to pump is tempered by the Water Code's goals of protecting property rights in groundwater and the groundwater resource.

In areas of the state without a GCD, however, a landowner's right to pump groundwater from beneath his property is limited only by the minimal exceptions to the rule of capture—he cannot cause waste, malicious drainage, or subsidence. Beyond these exceptions, groundwater is unprotected. It is important to note that the existence of a GCD does not eliminate the rule of capture in regulated areas of the state. Rather, regulation overlays the rule and ideally prevents one landowner from pumping to such an extent that nearby wells are impacted.

Unregulated areas in Texas are the final frontier—the last remaining, lawless parts of the state where groundwater regulation is nonexistent. Drought, coupled with booming population growth in many parts of the state, has placed increased pressure on the state's underground water resources and exacerbated tensions between people who want to pump groundwater and people who want to conserve it. During a time of unparalleled pressure on groundwater resources across the state, the lack of groundwater protection in some areas of Texas is undermining

[1] *See* https://www.twdb.texas.gov/groundwater/

[2] TEX. CONST. art. XVI, § 59(a).

[3] *See* http://www.twdb.texas.gov/groundwater/conservation_districts/facts.asp

[4] Tex. Water Code § 36.002.

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

[6] Tex. Water Code § 36.002(b)(1).

[7] The Texas Supreme Court has crafted a few exceptions to the rule of capture. A landowner cannot pump and use groundwater maliciously with the purpose of injuring a neighbor or in a manner that amounts to wanton and willful waste of groundwater. *See* City of Corpus Christi v. City of Pleasanton, 154 Tex. 289, 276 S.W.2d 798, 801 (1955). A landowner can be held liable for the negligent pumping of groundwater that causes subsidence of adjacent land. *See* Friendswood Dev. Co. v. Smith-Southwest Indus., Inc., 576 S.W.2d 21, 30 (Tex. 1978).

[8] Day, 369 S.W.3d 814, 840-841 (Tex. 2012).

[9] Tex. Water Code § 36.002 (d)(1)-(3); Tex. Water Code § 36.0015(b).

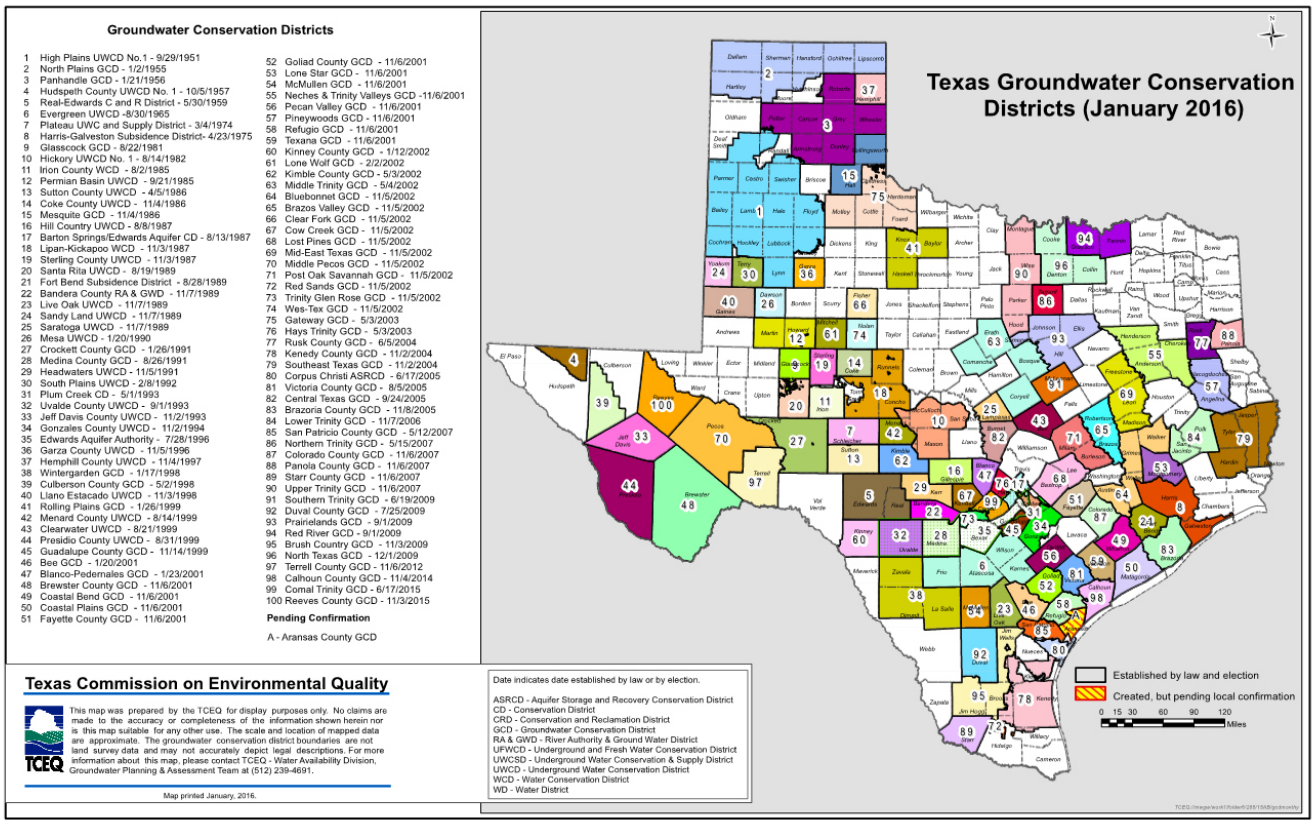

Figure 1. Groundwater conservation districts in Texas (Texas Commission on Environmental Quality).

important areas of law and policy—from property rights and natural resource protection, to groundwater management and regional water planning. These unregulated areas, therefore, are more akin to black holes, as the state's efforts to manage groundwater are lost in the regulatory void.

The solution to filling these regulatory black holes, however, is not for the Legislature to create poorly funded, single-county GCDs only to fill in regulatory gaps. As discussed below, when GCDs are ineffective at managing groundwater or when GCDs do not adequately protect springflow, they experience some of the same problems associated with a lack of groundwater regulation. Now, more than ever, groundwater use in Texas is wrought with complications and conflicts, whether it is regulated by a GCD or not. This paper examines these problems and explores possible solutions the state could use to ensure effective management of groundwater across Texas.

PROBLEMS CAUSED BY A LACK OF REGULATION

Groundwater Management

Large-scale groundwater pumping from unregulated areas in an aquifer can affect the ability of an adjacent GCD to effectively manage the portion of the aquifer within its jurisdiction. Under Chapter 36 of the Water Code, the Legislature has created a process where GCDs with jurisdiction over shared aquifers work together in a groundwater management area (GMA) to establish desired future conditions (DFCs) for these aquifers. DFCs are "the desired, quantified conditions of groundwater resources (such as water levels, water quality, springflow, or saturated thickness) at a specified time or times in the future…."[10] Under Chapter 36, a GMA submits the DFC for an aquifer to the Texas Water Development Board (TWDB), which uses it to determine the modeled available groundwater (MAG) for the aquifer. A MAG value is the

[10] Tex. Water Code §36.108.

amount of groundwater production, on an average annual basis, that will achieve a DFC according to the results of TWDB's model run.[11] Ideally, GCDs use the MAG as a factor in their permitting decisions, as Chapter 36 requires groundwater districts to manage groundwater in a way that achieves the adopted DFC.[12]

Unregulated pumping from a common aquifer, however, can affect the ability of a GCD to achieve the DFC. As "pumping in these areas is unregulated and, similarly, groundwater conditions are generally not monitored…the ability of a GMA to achieve a DFC with any level of confidence" is impacted.[13] GCDs had this exact concern with the Electro Purification (EP) Project in a formerly unregulated portion of the Trinity Aquifer in Hays County. The EP Project is a paradigm for the conflicts that are borne out of a lack of groundwater regulation. The project, which sought to pump almost 6,000 acre-feet of water a year from the Trinity Aquifer and pipe it to growing communities along the I-35 corridor, was highly controversial. The EP well fields are located in GMA 10, very close to the border of GMA 9. (Figure 2.) Groundwater production in this area was outside of the jurisdiction of the Hays-Trinity GCD, a member of GMA 9 and the Barton Springs Edwards Aquifer Conservation District (BSEACD), a member of GMA 10. Both GCDs were concerned that the project would interfere with their ability to achieve the DFCs for the Trinity Aquifer within their jurisdiction. For the portion of the Trinity Aquifer within GMA 9 and managed by the Hays-Trinity GCD, the annual amount of water EP intended to pump (5,600 acre-feet) was more than half of the MAG (9,100 acre-feet per year) that the TWDB determined is available for production based on the DFC. For the portion of the Trinity Aquifer within GMA 10 and managed by BSEACD, the TWDB determined that the MAG is 1,288 acre-feet a year. The amount of groundwater EP intended to pump was 4,300 acre-feet more than the MAG. BSEACD was worried that this excessive withdrawal of groundwater would interfere with the district's ability to achieve the DFC for the Trinity Aquifer.

Similarly, in other areas of the state, pumping from aquifers in unregulated counties threatens the ability of GCDs and GMAs in nearby areas to manage groundwater from the same aquifer. A GCD does not exist in the northern part of Travis County and all of Williamson County. Unregulated pumping of groundwater from the Edwards Aquifer in Williamson County is causing localized drawdown in Bell County, where the Clearwater Underground Water Conservation District has jurisdiction. In a 2005 report prepared for Williamson, Burnet and northern Travis counties, the Texas Commission on Environmental Quality (TCEQ) pointed out that there is no entity in northern Travis County or Williamson County that has "authority to control large-scale groundwater pumpage for private purposes that could potentially impact a shared groundwater supply."[14] According to the TCEQ, "[t]he Clearwater Underground Water Conservation District in Bell County noted the effectiveness of their groundwater management measures may be lessened if surrounding areas are not likewise managing the shared groundwater resource."[15]

As Chief Justice Hecht noted in his concurring opinion in *Sipriano v. Great Spring Water of Am., Inc*, "[w]hat really hampers groundwater management is the established alternative, the common law rule of capture."[16] The lack of groundwater regulation in parts of the state conflicts with the Legislature's duty to conserve natural resources under the Conservation Amendment to the Texas Constitution and undermines the implementation of this responsibility by GCDs under Chapter 36 of the Water Code.[17]

Water Planning

In addition to interfering with groundwater management, a lack of groundwater regulation makes water planning more uncertain in Texas because key areas of Texas groundwater are off radar. In general, the boundaries of a GMA are based on the hydrological boundaries of aquifers.[18] GCDs within these boundaries make up the voting members of a GMA.[19] Chapter 36 of the Water Code requires GCDs within a GMA to engage in joint planning, meeting annually to review management plans and proposals to adopt or amend DFCs.[20] Through this joint planning, every 5 years a GMA either adopts a new DFC or amends an existing one and submits the new or amended DFC to the TWDB. The TWDB uses the DFC to determine

[11] Tex. Water Code § 36.001(25).

[12] Tex. Water Code §36.1071(a).

[13] John Thomas Dupnik, P.G. *A Policy Proposal for Regional Aquifer-Scale Management of Groundwater in* Texas 27 at 85 (2012) (unpublished Masters Thesis, The University of Texas) *available at* https://repositories.lib.utexas.edu/bitstream/handle/2152/19658/dupnik_thesis_20129.pdf?sequence=1Dupnik, (referencing SENATE COMMITTEE ON NATURAL RESOURCES, Implementation of House Bill 1763 and Groundwater Management in Texas, INTERIM REPORT TO THE 81ST LEGISLATURE, at 5 (2009)).

[14] Updated Evaluation For the Williamson, Burnet and Northern Travis Counties Priority Groundwater Management Study Area, Texas Commission on Environmental Quality at 3 (2005) *available at* https://www.tceq.texas.gov/groundwater/gw.html/at_download/file

[15] *Id.*

[16] Sipriano v. Great Spring Water of Am., Inc., 1.S.W.3d 75 at 81, 83. (Tex. 1999) (Hecht, J., concurring).

[17] *See* TEX. CONST. art. XVI, § 59(a). and Tex. Water Code § 36.0015(b).

[18] Tex. Water Code § 35.004.

[19] Tex. Water Code § 36.108(c).

[20] Tex. Water Code § 36.108.

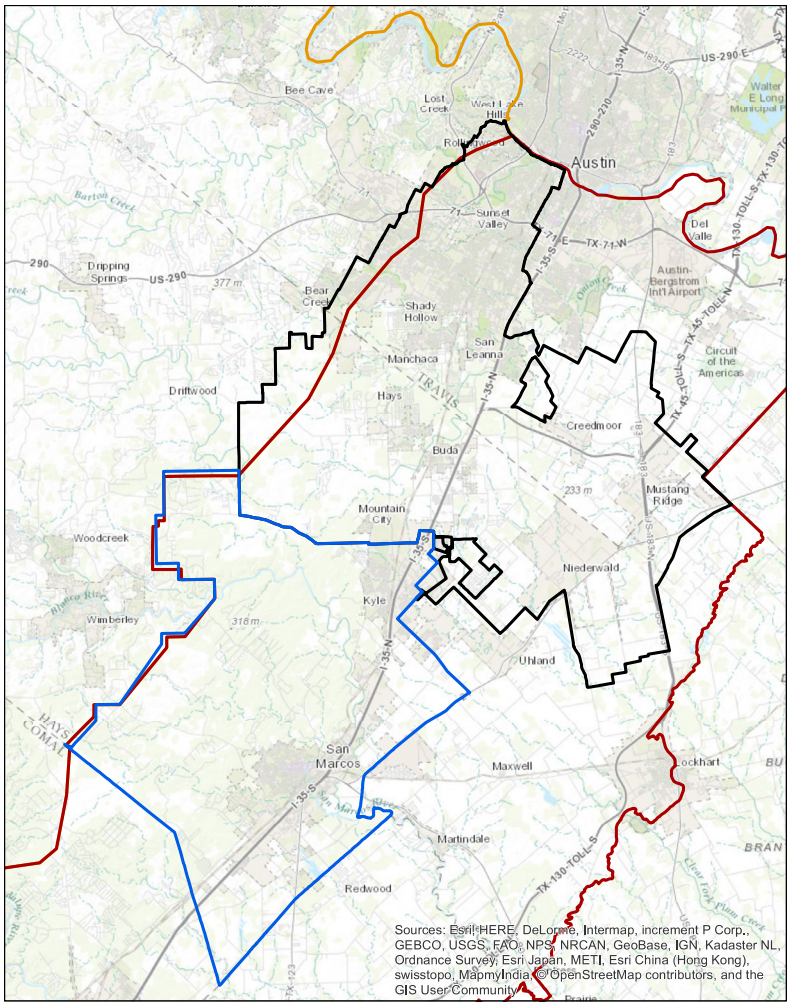

Figure 2. January 2016. Map of GMA boundaries near EP well field. (Prepared by BSEACD for author.)

the MAG for a particular aquifer. As stated earlier, GCDs use the MAG as a factor in their permitting decisions, but the MAG plays an important role in regional water planning decisions as well.

To help the state develop future water supplies, the Water Code tasks regional water planning groups with, among other things, quantifying current and projected population and water demands over a 50-year planning horizon and evaluating and quantifying current water supplies within each region.[21] Chapter 16 of the Water Code requires regional water plans to be consistent with the DFC for the relevant aquifer in the regional planning area and requires regional planning groups to use the MAG volume for groundwater availability.[22] Regional water planning groups may not recommend water management strategies that exceed MAG volumes.[23]

As the boundaries of GMAs follow the boundaries of aquifers, within a GMA there can be portions of an aquifer not regulated by a GCD. One example is GMA 8, which includes unregulated portions of the Edwards Aquifer in northern Travis and Williamson counties in addition to the regulated portion in Bell County. Because the MAG is based on the DFC adopted by GCDs within the GMA, unregulated areas within a GMA are not represented in this process. While GCD representatives may appoint an advisory committee to represent the interests of unregulated areas during the joint planning process or seek input from stakeholders within the unregulated area,

[21] *See* Tex. Water Code §16.053.

[22] 31 Tex. Admin. Code § 357.32(d) and Tex. Water Code §16.053(e)(2-a).

[23] 31 Tex. Admin. Code § 357.32(d). In August 2016, TWDB issued proposed rules that would allow regional water planning groups to recommend water management strategies that exceed the MAG under certain situations if approved by the GCDs within the relevant GMA. *See* 41 Tex. Reg. 5685 (August 5, 2016) (to be codified at 31 Tex. Admin. Code, Chapter 357).

these members are unable to vote, thus their contribution is limited.[24] The consequence is that stakeholders within unregulated areas of Texas do not have a meaningful, determinative role in establishing DFCs and the water management strategies that result. This is, "perhaps the most egregious example of insufficient representation,"[25] and it is entirely a consequence of a lack of groundwater regulation.

Furthermore, a regulatory void within a GMA threatens not only equitable water planning but also reliable water planning. The absence of a GCD means that, with the exception of some wells monitored by TWDB, no entity is collecting pumping data from groundwater wells across the unregulated area. Since the amount of pumping in unregulated areas is unknown and unreliable in GMAs with unregulated areas, there is a risk that the MAG underestimates total pumping and, as a result, regional water planning groups may recommend water supply strategies that contribute to over production from the aquifer.

Protection of Springflow and Surface Water

As discussed earlier, the Conservation Clause of the Texas Constitution declares that "the preservation and conservation of all such natural resources of the State are each and all hereby declared public rights and duties."[26] In unregulated areas of the state, however, the law—or lack of it—conflicts with this duty by failing to preserve and conserve not only groundwater but surface water as well.

When unregulated groundwater pumping threatens springflow or surface water flow, Texas law provides no mechanism for protection. Texas law regulates groundwater and surface water as though they are distinct bodies of water. This is contrary to the water cycle, where, as Professor Charles Porter explains, "surface water, diffused surface water, and groundwater are, have been, or will be ultimately in union with one another; water exists in a conjunctive relationship in all three geological containers all the time."[27] As groundwater from an aquifer is pumped for irrigation, municipal, or industrial use, the water level in the aquifer is lowered and can result in decreased flow from springs at the surface. The lack of recharge to the aquifer caused by drought can exacerbate the decline in groundwater levels and resulting diminished springflow. Reductions in springflow are problematic because springs sustain numerous creeks and rivers, especially during drought when surface runoff from rainfall is low. As springflow decreases, so does the flow of surface water, degrading aquatic habitats, threatening consumptive uses of water, interfering with recreational activities, and harming water quality. For example, Comanche Springs in Fort Stockton was once a treasured watering hole for travelers in West Texas and was the habitat of the endangered Comanche Springs pupfish before unregulated pumping of the Edwards-Trinity Aquifer caused springflow to cease.[28]

For many endangered or threatened groundwater-dependent species, the quality of their habitat depends on consistent springflow of clean water. Increased groundwater pumping causes reductions in aquifer levels and decreased flow from springs, which in turn can degrade a stressed species' habitat and lead to death or injury, which is a "take" under the Endangered Species Act (ESA).[29] In 1991, the Sierra Club made that argument in a lawsuit brought against the United States Fish and Wildlife Service (Service), which has become the poster child case for how "[t]he Endangered Species Act became the instrument that eventually brought state regulation to the [Edwards] Aquifer and the end to unrestricted withdrawals of groundwater."[30]

In areas of the state without a GCD, where the law does not restrict groundwater pumping, there is no mechanism to protect springflow or surface water flow. For example, the GCDs in GMA 8 adopted DFCs that maintain minimum flows for aggregated springs and streams in unregulated areas of the Edwards (Balcones Fault Zone) Aquifer. But these DFCs are impossible to achieve without a GCD managing groundwater withdrawals in these specific areas. Additionally, Val Verde County does not currently have a GCD to restrict pumping to protect the Devils River minnow habitat in San Felipe Creek. The Devils River minnow is listed as a threatened species under the ESA. Proposals by a water supply corporation to pump groundwater from the Edwards-Trinity Aquifer in Val Verde County to counties in the Permian Basin, where the natural gas industry is prompting the need for an additional water supply, has many locals and environmental advocates concerned about the impact large-scale groundwater withdrawals from the Edwards-Trinity Aquifer will have on the habitat of the Devils River minnow. In the Recovery Plan for the Devils River minnow, the Service states that "delisting the Devils River minnow should be considered when "[a]dequate flows in streams supporting Devils River minnow have been assured…through State or local groundwater management

[24] Tex. Water Code § 36.1081(b).

[25] *See* Dupnik supra note 15, at 86.

[26] TEX. CONST. art. XVI, § 59(a).

[27] Charles R. Porter, *Sharing the Common Pool, Water Rights in the Everyday Lives of Texans* 8 (2014).

[28] U.S. Fish and Wildlife Service Recovery Plan for the Comanche Springs Pupfish, 2-4 (1981), *available at* www.fws.gov/ecos/ajax/docs/recovery_plan/051221a.pdf (viewed on November 11, 2014).

[29] 16 U.S.C. § 1538.

[30] Todd H. Votteler, *The Little Fish that Roared: The Endangered Species Act, State Groundwater Law, and Private Property Rights Collide Over the Texas Edwards Aquifer*, 28 Envtl. L. 845, Winter (1998).

plans…"[31] In addition, this year the Service is expected to issue a listing decision for the Texas Hornshell, a species of mussel found in the Devils River. Large groundwater withdrawals from the Edwards-Trinity Aquifer may also impact flows to the Devils River and the habitat of the Texas Hornshell. Without a GCD in Val Verde County, however, there are no mechanisms in state law to ensure adequate springflow in San Felipe Creek or the Devils River.

Protection of Private Property

Texans are passionate about protecting private property rights. The Texas Supreme Court's decision in *Edwards Aquifer Authority v. Day* clarified that land ownership includes a vested interest in groundwater in place that cannot be taken for public use without compensation, holding that "[g]roundwater rights are property rights" and that landowners own the groundwater beneath the surface of their land in place.[32] The Court's decision, however, has resulted in an inequitable outcome, where the law now adds heightened protection of the property interest of landowners who seek to pump their groundwater over those who wish to conserve it. As a result of *Day*, to protect his property interest, a landowner in a regulated area of the state can bring a takings action against a GCD that limits the landowner's ownership interest in groundwater by denying or reducing his production permit.[33] In an unregulated area, however, a landowner whose groundwater is drained and pumped away by another landowner has no remedy or no ability to protect his property interest. The landowner's only recourse, following the law of oil and gas, is to drill his own well and begin producing the groundwater he desired to preserve. This recourse only affords the landowner the option to claim and use his property interest rather than preserve or conserve his property for future use.

In *Day*, the Court expressly stated that the rule of capture is not "antithetical" to ownership of groundwater in place.[34] As water law professor Gerald Torres notes, however, "[a]lthough 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, including the fundamental right to exclude others from the use of one's property.[35] In other words, for those landowners who desire to conserve their groundwater—or who do not want their groundwater pumped out from beneath them by large-scale production projects—the rule of capture prevents them from protecting their property interest by excluding others from taking their groundwater. In *Day*, the Court pronounced that groundwater is a private property right deserving of protection, but this is not the case in unregulated areas of Texas.

CHALLENGES WITH GROUNDWATER REGULATION

While a lack of groundwater regulation causes a number of inequities and management dilemmas, groundwater regulation in Texas has its own share of controversies. The difficulty in proposing solutions to problems caused by an absence of groundwater regulation is that some of these same problems occur when groundwater is regulated. Thus, to bring effective management of groundwater in areas where regulation does not exist, it is essential to offer solutions aimed at improving the management of groundwater regulation where it does.

For the reasons discussed in this paper, unregulated areas need to be regulated, but this does not necessarily mean that the Legislature should create ineffective GCDs only to fill in regulatory black holes. This might fill a regulatory void, but it will exacerbate larger problems related to effective management of the resource. An in-depth discussion of the challenges and benefits associated with groundwater regulation in the state is beyond the scope of this paper. However, since the alternative to no regulation is regulation, it is important to understand some of the challenges with groundwater regulation in Texas in order to offer worthwhile solutions for areas of the state that lack regulation. As a caveat, the discussion below is meant to be a general critique of the existing regulatory framework and is not necessarily applicable to all GCDs statewide.

Priority Groundwater Management Areas

Texas statutory law appears to have an answer for addressing the state's challenges in unregulated areas—by authorizing the TCEQ to designate Priority Groundwater Management Areas (PGMAs). PGMAs are areas of the state that the TCEQ has determined are experiencing or expected to experience critical water problems in the next 50 years and where groundwater

[31] U.S. Fish and Wildlife Service Recovery Plan for the Devils River Minnow, Executive Summary at iv (September 2005) *available at* http://ecos.fws.gov/docs/recovery_plan/050913.pdf (viewed on November 11, 2014).

[32] Edwards Aquifer Auth. v. Day, 369 S.W.3d 814, 833, 817 (Tex. 2012).

[33] Day at 838-40 (citing Sheffield Development Co. v. City of Glenn Heights, 140 S.W.3d 660 (Tex. 2004); Lingle v. Chevron U.S.A., Inc., 544 U.S. 528 (2005))(other citations omitted). A landowner would have to allege that a regulatory taking has occurred under the facts articulated in Sheffield Development Co. v. City of Glenn Heights, 140 S.W.3d 660 (Tex. 2004). As stated in the U.S. and Texas Supreme Court cases cited in *Day* and *Sheffield*, there are three inquiries in a takings claim under the federal decisions in Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419(1982), Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992), and Penn Central Transp. Co. v. New York City, 438 U.S. 104 (1978).

[34] Day, 369 S.W.3d at 823.

[35] Gerald Torres, *Liquid Assets: Groundwater in Texas*, 122 Yale L.J. Online 143 (2012), *available at* http://yalelawjournal.org/forum/liquid-assets-groundwater-in-texas.

management is needed.[36] In a PGMA evaluation, the TCEQ will consider whether creation of a GCD is necessary, and within a PGMA, the Water Code gives TCEQ authority to either create a GCD where one does not exist or require that an unregulated area be annexed by an existing GCD.[37]

But this process has not been extremely effective. TCEQ has designated 8 PGMAs.[38] Yet unregulated areas remain in 4 of the designated PGMAs. [39] In 1990, TCEQ designated the majority of the Hill Country as a PGMA because, among other things, groundwater demand from the Trinity Aquifer was expected to exceed availability.[40] According to TCEQ, "[b]etween 1997 and 2003 seven GCDs were created through local initiatives in the designated Hill Country PGMA counties.[41]

In 2010, TCEQ recommended the formation of a new GCD to jointly manage the Trinity Aquifer in Hays, Comal and Travis counties.[42] At the time of TCEQ's recommendation in 2010, the Trinity Aquifer in Comal County and southwestern Travis County was not regulated by a GCD. In the 2010 recommendation, TCEQ discouraged the creation of two new GCDs to manage Comal and Travis counties, instead recommending a regional approach. The report explains that "creating two new GCDs does not provide for the most effective or cost efficient management of the groundwater resources because it would require duplicative management programs be established. In addition, the boundaries would not provide for the most effective management program because each GCD would manage only a limited, politically delineated portion of the Trinity aquifer."[43]

Political opposition, however, thwarted TCEQ's efforts to create a regional GCD over Travis, Hays, and Comal county.[44] Rather than forming a regional groundwater district as the TCEQ recommended, legislative proposals have created smaller, local GCDs. For example, the Legislature recently passed a bill creating a GCD to manage the Trinity Aquifer in Comal County. The Trinity Aquifer in southwestern Travis County, however, remains unregulated, although the county is currently discussing the option of creating a GCD this upcoming Legislative session.

Fragmented Regulatory Structure

The solution to an absence of groundwater regulation is not necessarily for the Legislature to create a new district in unregulated areas, which could compound the challenges of a fragmented regulatory structure. When numerous GCDs with different rules and management plans regulate a shared aquifer, effective management can be difficult to achieve long term. Under this circumstance, each GCD must work hard to develop a local regulatory approach that is consistent with and does not impair the regulatory approaches of other area GCDs. The aquifer is not confined by GCD boundaries, and GCDs managing the same aquifer can have different management goals, unique rules, permitting and spacing requirements, and often entirely distinct concerns. As a result, "[m]anaging for sustainability or even some level of allowable depletion breaks down with small-scale county-based GCDs that do not have the power to regulate wells that are outside their district, even though such wells may draw from and deplete groundwater resources common to multiple districts."[45]

To avoid further fragmenting groundwater management, Chapter 36 of the Water Code provides processes where existing GCDs can annex additional territory, such as what BSEACD did in the unregulated area of Hays County. The TCEQ can use its authority under the Water Code to order existing GCDs in PGMA's to annex unregulated areas.[46] Furthermore, one possible solution to preserve local accountability and control but move toward a more regional, aquifer-based management structure, is for the Legislature to require GCDs within a GMA to develop consistent rules and management plans that apply regionally to aquifers.

Lack of Funding

Many smaller GCDs have difficulty managing the groundwater resources within their jurisdiction because their budgets are limited. Unfortunately, "GCDs in Texas face significant funding challenges, as they have statutorily restricted water use fee rates and low ad valorem taxation rates" and "[b]oth of these revenue-generating mechanisms are affected by the areal extent of the jurisdiction of a GCD."[47] Chapter 36 provides GCDs with the authority to levy taxes and require permitees

[36] Tex. Water Code §35.007(a).

[37] Tex. Water Code §36.0151

[38] For a map of PGMA areas, *see* https://www.tceq.texas.gov/assets/public/permitting/watersupply/groundwater/maps/pgma_areas.pdf

[39] Texas Commission on Environmental Quality, What is a Priority Groundwater Management Area, *available at* http://www.tceq.com/groundwater/pgma.html/#whatis

[40] Groundwater Conservation District Recommendation for Hill Country Priority Groundwater Management Area, Texas commission on environmental quality, 3-4 (June 2010).

[41] *Id.* at 5.

[42] *Id.* at 4.

[43] *Id.* at 19.

[44] *Id.*

[45] Dupnik, supra note 15 at 41.

[46] Tex. Water Code §36.0151.

[47] Charles Porter, Groundwater Conservation District Finance in Texas: Results of a Preliminary Study, Texas Water Resources Institute, Texas Water Journal, Vol. 4 No. 1 at 65 (2013); Dupnik supra note 15 at 43.

to pay user fees and production fees, but enabling legislation for many GCDs across the state limits this revenue authority. Many GCDs do not have the authority to levy taxes and others, such as the Hays Trinity GCD, are not permitted to set production fees or production fees are set at a very low rate. This can "hinder operational efficiency and limit the availability of resources and human capital needed to effectively manage the resource."[48] Without sufficient funding, some GCDs are limited in their ability to study aquifer dynamics, develop modeling, monitor drawdown, and study the connection between groundwater and surface water.

To avoid problems associated with insufficient funding, the Legislature can use its authority to ensure that GCDs have the funds to carry out their responsibilities under the Water Code: to balance the conservation and development of groundwater resources while also protecting property rights. At a minimum GCDs need the authority to set reasonable production fees and the ability to assess taxes if approved by voters. Moreover, if the *state* provided funding to GCDs, GCDs would have the financial ability to conduct scientific studies and monitoring and to defend their permitting decisions in the face of takings lawsuits.

Failure to Protect Springs and Surface Water

The presence of a GCD does not necessarily mean that springs and surface water are protected. Throughout Texas, in regulated areas and in unregulated areas, aquifers are declining.[49] The pressure to develop water supplies has resulted in more groundwater being pumped from aquifers than what these aquifers receive through recharge. As aquifer levels decline, flows from springs are reduced or completely cease, diminishing surface water flows in creeks and rivers, and ultimately inflows into bays and estuaries.

Currently, most of the DFCs adopted by GCDs across the state allow for some level of drawdown in aquifers. Under DFCs that allow for declining aquifer levels, GCDs are essentially managing the depletion of aquifers across the state rather than their sustainability. For example, the GCDs in GMA 9 approved a DFC that allows for 30 feet of drawdown in the Trinity Aquifer over the next 50 years, despite the fact that Jacob's Well—a Trinity Aquifer spring and the sole source of water for Cypress Creek—will cease to flow if the aquifer declines by just 2 to 3 feet.[50]

While Chapter 36 of the Water Code requires GCDs to consider impacts to springflow when adopting DFCs for aquifers, it does not require GCDs to protect springflow. Currently, only 3 GCDs (not including the Edwards Aquifer Authority) have established DFCs that incorporate minimum flow levels for springs within their jurisdiction: Barton Springs Edwards Aquifer Conservation District, Clearwater Underground Water Conservation District, and Kinney County GCD. All of these GCDs have done so, in part, because maintaining springflow is essential to maintaining endangered or threatened species habitat. As increased groundwater pumping occurs in areas where GCDs have not established minimum flow levels for springs, such as in the Hays Trinity GCD where Jacob's Well is located, springflow is likely to be impacted.

Furthermore, Chapter 36 of Water Code requires GCDs, before granting or denying a permit, to consider whether "the proposed use of water unreasonably affects existing groundwater and *surface water* resources,"[51] but many GCDs fail to meaningfully consider this permitting criteria because they lack the tools to do so. For GCDs to know whether localized pumping or a regional DFC will impact surface water, scientific studies are necessary. Many GCDs lack the funding necessary to conduct these studies. While the Water Code contemplates the connection between groundwater and surface water by requiring GCDs to consider the impact to surface water in both adopting DFCs and making permitting decisions, the state has not assisted GCDs in making these considerations because it has not provided the necessary funding.

Recently, in advance of the 85th Legislative Session, groundwater developers are maintaining that there is far more groundwater available in storage from aquifers across the state than what MAGs and corresponding DFCs allow GCDs to permit. Students at the Bush School of Government and Public Service at Texas A&M University recently authored a report claiming that the supply of groundwater in most of the state's aquifers is "unlimited" at current consumption rates.[52] The arguments in favor of pumping water stored in aquifers ignore the reality that in many parts of the state, before water from an aquifer is pumped, base flows to rivers and springflow will be captured. In other words, in some areas of the state, you cannot pump stored water without impacting surface water and springflow.[53]

The Legislature can craft and implement policy that requires GCDs to sustainably manage aquifers so that aquifers are not mined and surface water resources are not diminished. To

[48] Dupnik supra note 15 at 43.

[49] *See* Ronald Kaiser and Frank F. Skiller, *The Threat of Aquifer Depletion In Texas*, 32 Tex. Tech. L. Rev. (2001).

[50] Wierman, D.A., *Water Level Fluctuations in the Middle Trinity Aquifer during the drought of 2007-2009, with emphasis on correlating water level fluctuations and flow from Jacob's Well* (2010).

[51] Tex. Water Code §36.113(d)(2), *emphasis added.*

[52] Wayne Beckermann, et. al., The Bush School of Government and Public Service Report, *An Assessment of Groundwater Regulation in Texas* at 17 (January 2016).

[53] Bill Hutchison, Ph.D., P.E., P.G., *Groundwater–Surface Water Interaction: Implications for Groundwater Planning and Management,* Presentation at the Texas Water Law Institute (October 2015).

protect springflow and surface water flows, the Legislature can amend Chapter 36 of the Water Code to require GCDs to adopt DFCs tied to maintaining base flows and springflows for rivers and springs within their jurisdiction. Another possible avenue is for surface water interest groups, such as downstream water right holders and environmental and recreational interests within the relevant watersheds in a GMA to become voting members in the GMA so surface water interests are represented in the DFC adoption process. Policies that allow groundwater pumping to diminish a public resource and impede surface water rights or environmental flows should be reconsidered.

Failure to Protect Property Rights

The presence of a GCD does not guarantee that property rights in groundwater are protected. As discussed above, in *Day* the Texas Supreme Court held that "land ownership includes an interest in groundwater in place," and Chapter 36 states that landowners have a real property interest in groundwater.[54] The Water Code burdens GCDs with the responsibility of protecting these private property rights, declaring that GCDs are "the state's preferred method of groundwater management in order to *protect property rights*, balance the conservation and development of groundwater to meet the needs of this state, and use the best available science in the conservation and development of groundwater…"[55] In developing rules to regulate groundwater production, therefore, GCDs must consider groundwater ownership and rights, and in adopting DFCs, GCDs are required to consider the impact the proposed DFC will have "on the interests and rights in private property."[56] GCDs must walk a fine line of managing a common pool resource that is privately owned.

Section 36.113(d)(2) of the Water Code states that "before granting or denying a permit a GCD must consider whether the proposed use of water unreasonably affects existing permit holders."[57] There are many landowners across Texas who do not have wells, either because they rely exclusively on rainwater or because they intend to drill a well at some point in the future. The Texas Supreme Court has declared that these landowners own the water beneath their property in place; the Court did not differentiate between use and nonuse of groundwater, but instead emphasized ownership. Yet the regulatory structure under Chapter 36 of the Water Code favors use of the resource. Landowners who wish to conserve the groundwater they own in place are not always protected by groundwater regulations in Texas, arguably in contravention to the holding in *Day*. For example, in 2013 Lost Pines GCD denied landowners in Bastrop County party status to contest a large groundwater production permit application on the basis that the landowners did not have wells on their property. This decision was made even though aquifer tests showed pumping would cause substantial drawdown beneath the landowner's properties. The landowner plaintiffs have appealed Lost Pines' decision to the Bastrop County District Court.[58]

Furthermore, if a GCD's regulations are not adequately protecting wells or groundwater near a large-scale groundwater development project, the rule of capture prevents affected landowners from being able to take legal action against the groundwater developer to protect their property interest. The Texas Supreme Court has declared that groundwater is a private property right worthy of protection, but unless a landowner is using this groundwater, the legal system and regulatory structure fail to provide adequate protections.

To protect private property, the Legislature can amend Chapter 36 of the Water Code to ensure that all affected landowners, including those who wish to conserve their groundwater in place, have the legal right to defend their property interest in groundwater regardless of whether they own a well. Additionally, while this might be far reaching and logistically complex, the Legislature could amend the definition of "beneficial use" in the Water Code to include conservation. Landowners who desire to conserve their groundwater in place could apply for a "conservation permit" that essentially removes their ownership interest from the amount of groundwater available for production. If there is indeed a legislative push in the 85th Session toward statewide adoption of correlative rights for groundwater, it is important for legislative proposals to protect landowners' ability and right to *conserve* their fair share of the groundwater they own, as this is a logical and equitable extension of a correlative rights approach.

CONCLUSION

Texas' growing population is placing pressure on aquifers across the state, as groundwater developers seek additional water supply sources to meet increased consumption. While groundwater provides important water supply needs, it does much more; it is connected to and sustains the ecology and economy of entire watersheds. For this reason, even though there is a tremendous amount of groundwater beneath the state of Texas, there is far less available for people to use. Groundwater has value in place. Current policy does not adequately

[54] Day, 369 S.W.3d 814 at 817;Tex. Water Code §36.002.

[55] Tex. Water Code §36.0015(b).

[56] Tex. Water Code §36.101(3) and §36.108(d)(7).

[57] Tex. Water Code §36.113(d)(2).

[58] *See* Plaintiff's Initial Brief, Andrew Meyer, Bette Brown, Darwyn Hana, Individuals and Environmental Stewardship, Plaintiffs v. Lost Pines GCD, Cause No 29,696, 21st Judicial District Court of Bastrop County, Texas, *available at* http://www.environstewardship.org/wp-content/uploads/2016/06/Plaintiffs-Initial-Brief.pdf

recognize or protect this intrinsic value. Texas groundwater policy is allowing aquifers to decline at the expense of springs, at the expense of surface water, and at the expense of landowners' private property interests. To bring effective groundwater management to areas of the state where it does not exist, Texas must resolve these fundamental challenges; otherwise efforts to conquer this final frontier will be in vain.