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Public Trust Doctrine and Groundwater Rights

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Public Trust Doctrine and Groundwater Rights

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I. INTRODUCTION

The public trust doctrine, in its broadest form, is based on historical Roman and English notions that certain common properties are held by the sovereign for the benefit of the public.¹ The scope of the doctrine, however, has been difficult to define. In this country, courts have traditionally used the public trust doctrine to preserve public ownership in the beds of underlying navigable waterways.² Public ownership protects three primary uses of waterways: navigation, fishing, and commerce. Collectively, these three uses have been called the “traditional triad” of the public trust.³

Courts later acknowledged that the public trust doctrine extends

1. For extensive discussion on the origins of the public trust doctrine, see Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970); Jan S. Stevens, *The Public Trust: A Sovereign's Ancient Prerogative Becomes the People's Environmental Right*, 14 U.C. DAVIS L. REV. 195 (1980); and Charles F. Wilkinson, *The Headwaters of the Public Trust: Some Thoughts on the Source of the Traditional Doctrine*, 19 ENVTL. L. 425 (1989).

2. See *Shively v. Bowlby*, 152 U.S. 1 (1894); *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387 (1892); *Martin v. Waddell*, 41 U.S. 367 (1842).

3. See *Nat'l Audubon Soc'y v. Superior Court of Alpine County*, 658 P.2d 709, 719 (Cal. 1983).

beyond the traditional triad of uses. For example, some courts used the doctrine to protect the public interest in swimming, bathing, recreational boating, aesthetics, scientific study, and habitat protection for fish and wildlife.⁴ More recently, courts and commentators are considering the relationship between the public trust doctrine and private water rights.⁵ Extending the doctrine to the water rights context is inherently problematic because it compels individuals to relinquish legally recognized water rights for the benefit of the general public.

Application of the public trust doctrine in the water rights context has been largely confined to surface water appropriations. Courts have been reluctant to consider the public trust in groundwater allocation decisions.⁶ One apparent reason for this reluctance is that groundwater is not navigable,⁷ and historically the doctrine was heavily tied to the public interest in navigation. Nevertheless, many of the arguments used to advance the doctrine to surface water appropriations can be applied to consumptive uses of groundwater as well. In fact, the development of groundwater law indicates that states are increasingly recognizing the need to incorporate the public interest when allocating groundwater resources.

This comment will argue that the public trust doctrine should encompass groundwater rights. Part II traces the development of the doctrine through prominent judicial decisions, and will demonstrate the flexibility of the doctrine as a means of protecting an increasing variety of public interests. Part III contains a brief discussion on the complex nature of groundwater flow, and then reviews the different systems that states have implemented to allocate the resource. The examination of these systems will illustrate how the public trust doctrine can be used to protect public interests which may be overlooked by state allocation programs. Part IV explores the application of the public trust doctrine to a particular groundwater controversy that has frustrated the residents of west-central Florida. Finally, Part V summarizes some of the criticisms of the doctrine and tests whether it is still viable in light of modern trends in natural resources law.

II. DEVELOPMENT OF THE PUBLIC TRUST DOCTRINE

The public trust doctrine is a dynamic concept because the interests

4. See *Marks v. Whitney*, 491 P.2d 374 (Cal. 1971).

5. See *National Audubon*, 658 P.2d at 709; *Shokal v. Dunn*, 707 P.2d 441 (Idaho 1985); Joseph L. Sax, *The Limits of Private Rights in Public Water*, 19 ENVTL. L. 473 (1989).

6. See *Rettkowski v. Dep't. of Ecology*, 858 P.2d 232, 239 (Wash. 1993) (We do not find the public trust doctrine germane to resolving the issues before us today"). *But see id.* at 243-45 (Guy, J., dissenting) (advocating the extension of the public trust doctrine to groundwater).

7. See *Rettkowski*, 858 P.2d at 239.

protected by the trust are constantly evolving: Something that society ignores today may become of great interest tomorrow. As a result, the doctrine expands to accommodate these new public interests. Although the doctrine's fluid nature makes it a difficult concept to define, courts have identified certain rights in navigable waters which are protected under the public trust doctrine.

A. *The Public Trust in Navigable Waterways:
The Traditional Doctrine*

The public trust doctrine has been historically used to preserve public access to navigable waters for navigation, commerce, and fishing.⁸ Early settlers of the United States recognized.⁹ Rivers provided transportation routes for exploration and the fur trade, and also supported fishing for subsistence and commerce.¹⁰ The shores of the great waterways became logical areas for settlement.¹¹ Accordingly, early courts readily acknowledged a public trust in all navigable waterways to facilitate development and prosperity.¹² The leading case to announce the public trust doctrine is widely considered to be *Illinois Central Railroad v. Illinois*.¹³ The U.S. Supreme Court's underlying rationale in this case provides a compelling basis for expanding the public trust, rather than confining the doctrine to dated notions of navigability.

In 1869, the state of Illinois granted the Illinois Central Railroad title to part of the submerged beds of Lake Michigan, including valuable commercial waterfront along the harbor of Chicago.¹⁴ Four years later the state sought to rescind the grant, and brought suit against the railroad to obtain a judicial declaration of title.¹⁵ The Supreme Court upheld the state's claim by concluding that title to the waterfront had always been limited by the public trust.¹⁶ The Court recognized that the State of Illinois received title to the disputed land upon its admission into the Union in 1818.¹⁷ The Court then distinguished the lands under Lake

8. See Ralph W. Johnson, *Public Trust Protection for Stream Flows and Lake Levels*, 14 U.C. DAVIS L. REV. 233, 240 (1980).

9. See Wilkinson, *supra* note 1, at 431-33.

10. See *id.*

11. See *id.* at 432.

12. See *Shively v. Bowlby*, 152 U.S. 1 (1894); *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387 (1892); *Martin v. Waddell*, 41 U.S. (16 Pet.) 367 (1842).

13. 146 U.S. 387 (1892). For a review of the states that have relied on *Illinois Central* when adopting the public trust doctrine, see Eric Pearson, *Illinois Central and the Public Trust Doctrine in State Law*, 15 VA. ENVTL. L.J. 713, 719-721 (1996).

14. See *Illinois Central*, 146 U.S. at 448-52.

15. See Pearson, *supra* note 13, at 722-726 discussing the history of the case prior to the Supreme Court's Opinion.

16. See *Illinois Central*, 146 U.S. at 452-54.

17. See *id.* at 434. Under the equal footing doctrine, new states enter the Union with the full

Michigan from other properties held by the state:

[T]itle to the lands under the navigable waters of Lake Michigan. . . is. . . .

different in character from that which the state holds in lands intended for sale. . . . It is a title held in trust for the people of the State, that they may enjoy the navigation of the waters, carry on commerce over them, and have liberty of fishing therein freed from the obstruction or interference of private parties.¹⁸

Despite the Court's deference to the public trust, it is important to note that the Court did not entirely prohibit the transfer of trust lands to private parties. The court noted that the disposition of certain lands to private parties may advance the public interest in navigation and commerce by the construction of wharves, docks, and piers.¹⁹ Such grants are valid when they do not substantially impair the public interest in the trust lands that remain.²⁰ However, the state may not fully abdicate general control over an entire harbor, bay, sea, or lake.²¹

As explained by the Court, the harbor of Chicago is simply too valuable to grant to a private corporation.²² In the late 1800's, trading at the harbor equaled the trading in New York and Boston combined.²³ By 1869, the population of Chicago "increased nearly a million souls, and the increase of commerce. . . kept pace with it."²⁴ Based on the harbor's importance as a center of commerce, the Court found it unconscionable that the Illinois legislature could divest the state of its control of the harbor and assign it to a private party.²⁵

Illinois Central is important precedent because of the Court's sensitivity to the "face" of public interest at that time. The Court emphasized the economic and developmental value of the harbor to the city of Chi-

political equality enjoyed by the original 13 states. Since the original states received title to lands beneath their navigable waters, all subsequent states are entitled to the lands beneath their navigable waters as well. See Wilkinson, *supra* note 1, at 443-47.

18. *Illinois Central*, 146 U.S. at 452. The Court's opinion is replete with language supporting state ownership of navigable waters that may be adapted for public use:

"The principle of the common law to which we have adverted is founded upon the most obvious principles of public policy. The sea and navigable rivers are natural highways, and any obstruction to the common right, or exclusive appropriation of their use, is injurious to commerce, and if permitted at the will of the sovereign, would be very likely to end in materially crippling, if not destroying it'.

Id. at 458. (quoting *People v. Ferry Co.*, 68 N.Y. 71, 77 (1876)).

19. *See id.* at 452.

20. *See id.*

21. *See id.* at 452-53.

22. *See id.* at 454.

23. *See id.*

24. *Id.*

25. *See id.* at 454-55.

cago and the surrounding region. In contrast, little time is spent addressing the issue of navigability because the navigability of the Great Lakes was apparent. As discussed above, navigability is not determinative because the Court explicitly supports the transfer of navigable waters when the public interest is advanced or left unimpaired. Instead, the core of the opinion focuses on the public value of the harbor based in part on peoples' expectations that access to the harbor will not be infringed by a private party.²⁶ As future cases will show, the navigability requirement becomes further eroded with the changing "face" of public interest.

B. *The Public Trust in Recreation and the Environment*

The purpose of the public trust doctrine is to protect certain natural resources for public use. Courts have long held that the doctrine encompasses uses beyond simply traveling along a waterway by boat.²⁷ In other words, the traditional triad of uses—navigation, commerce, and fishing—does not limit the scope of the public trust. The California Supreme Court, in *Marks v. Whitney*,²⁸ recognized that the doctrine has long included the right to "fish, hunt, bathe, swim, to use for boating and general recreation purposes the navigable waters of the state, and to use the bottom of the navigable waters for anchoring, standing, or other purposes."²⁹ *Marks* is a significant case because it further expanded the public trust doctrine to include ecological concerns.

Marks owned a portion of tidelands that adjoined almost the entire shoreline of *Whitney's* upland property.³⁰ *Marks* asserted the right to fill and develop the tidelands he owned and *Whitney* objected, claiming that such action would cut off his right to the tidelands as a littoral owner and as a member of the public.³¹ The court upheld *Whitney's*

26. Professor Joseph L. Sax asserts:

The essence of property law is respect for reasonable expectations. . . . The central idea of the public trust is preventing the destabilizing disappointment of expectations held in common but without formal recognition such as title. The function of the public trust as a legal doctrine is to protect such public expectations against destabilizing changes, just as we protect conventional private property from such changes.

Joseph L. Sax, *Liberating the Public Trust Doctrine From Its Historical Shackles*, 14 U.C. DAVIS L. REV. 185, 186, 188 (1980).

27. See *infra* notes 28-67 and accompanying text.

28. 491 P.2d 374 (Cal. 1971).

29. *Id.* at 380. (citing *Forestier v. Johnson*, 127 P. 156 (Cal. 1912) *Bohn v. Albertson*, 238 P.2d 128 (Cal. App. 2d 1951); *Proctor v. Wells*, 103 Mass. 216 (1869); *Nelson v. De Long*, 7 N.W.2d 342 (Minn. 1942); *Jackvony v. Powel*, 21 A.2d 554 (R.I. 1941) *Munninghoff v. Wisconsin Conservation Comm'n*, 38 N.W.2d 712 (Wis. 1949)).

30. See 491 P.2d at 377.

31. See *id.*

objections, stating that, due to increases in population, the decline in undeveloped waterfront, and public demand for recreational areas, the tidelands were impressed with the public trust in order to preserve the public right of access.³² The court further added:

The public uses to which tidelands are subject are sufficiently flexible to encompass changing public needs. In administering the trust the state is not burdened with an outmoded classification favoring one mode of utilization over another. There is a growing public recognition that one of the most important public uses of the tidelands—a use encompassed within the tidelands trust—is the preservation of those lands in their natural state, so that they may serve as ecological units for scientific study, as open space, and as environments which provide food and habitat for birds and marine life, and which favorably affect the scenery and climate of the area. It is not necessary to here define precisely all the public uses which encumber tidelands.³³

With this language, the court articulated the proposition that certain resources have an inherently public nature that requires protection under the public trust doctrine. The doctrine is thus sufficiently flexible to encompass important natural resources regardless of their adaptability to man-made use. Furthermore, the court refrained from enumerating every possible extension of the public trust. Such a list would almost certainly be impossible to create. The public interest is a fluid abstraction that changes in tandem with society. In response to growing concern over the environment and recreational areas, the courts have applied the public trust doctrine to maintain in-place, or instream, flows. As the demand for instream flow has increased, courts have been further compelled to examine the role of the public trust doctrine in water rights allocation programs.

C. *The Public Trust in Private Water Rights*

Professor Joseph Sax, a leading commentator on the public trust doctrine, has stated that the traditional application of the doctrine—i.e., protection of the public interest in navigation, commerce, fishing, recreation and the environment—is generally well-developed.³⁴ Today, new problems arise in the context of applying the public trust doctrine to the allocation and appropriation of water resources.³⁵

The central issue facing managers of water resources is the imbalance between supply and demand.³⁶ Historically, areas of intense water

32. *See id.* at 378.

33. *Id.* at 380 (citations omitted).

34. *See Sax, supra* note 5, at 473.

35. *See id.* at 474.

36. *See A. DAN TARLOCK ET AL., WATER RESOURCE MANAGEMENT 2* (4th ed. 1993).

use have been in areas of low precipitation, such as the western and southwestern United States.³⁷ Water demand in these areas has been satisfied by billion-dollar delivery and storage systems.³⁸ Such large-scale projects are no longer pursued due to the lack of public funding and the growing appreciation for instream protection of the environment and recreation.³⁹ However, in order to accommodate instream flows and simultaneously provide for future users, it may become necessary to reclaim some water from existing users.⁴⁰

The California Supreme Court case of *National Audubon Society v. Superior Court of Alpine County* (the "Mono Lake" case)⁴¹ is a landmark example of the tension between the public trust doctrine and existing water rights. Briefly stated, an existing appropriator has a recognized right to divert and use a fixed amount of water. Any attempt by the state to diminish that right in favor of other uses might be deemed an unconstitutional taking of private property without compensation.⁴² However, property rights in water are not absolute.⁴³ Due to the public nature of water resources, an appropriator only holds an usufructuary right, or a right that incorporates the needs and interests of others.⁴⁴ It is therefore the duty of the state to regulate water use for the general benefit of the community.⁴⁵ In *Mono Lake*, the court recognizes this duty and further expands the scope of the public trust doctrine to include the allocation of water rights.

Mono Lake is the second largest lake in California and is located at the base of the Sierras.⁴⁶ The lake is highly saline because it has no flow-through outlets.⁴⁷ All waters that enter the Mono Lake basin eventually terminate in the lake.⁴⁸ The lake contains no fish, but its salinity supports populations of brine shrimp and alkali flies which, in turn, are the principal food source for nearly one million migratory birds annually.⁴⁹

37. *See id.*

38. *See id.* at 1.

39. *See id.*

40. *See Sax, supra* note 5, at 474.

41. 658 P.2d 709 (Cal. 1983).

42. *See generally Sax, supra* note 1, at 478-483 (distinguishing between private property owned by an individual, such as an automobile, and property owned by the public as a whole, such as a National Park).

43. *See id.* at 485.

44. *See id.*

45. *See id.*

46. *See National Audubon (Mono Lake)*, 658 P.2d at 711.

47. *See id.* at 715.

48. *See Michael C. Blumm & Thea Schwartz, Mono Lake and the Evolving Public Trust in Western Water*, 37 ARIZ. L. REV. 701, 704 (1995).

49. *See id.* at 705.

Mono Lake receives most of its water supply from five nonnavigable freshwater streams and loses water through evaporation and groundwater seepage.⁵⁰ In 1940, the City of Los Angeles Department of Water and Power (DWP) received a permit to appropriate virtually the entire flow of four of the streams.⁵¹ The lack of freshwater inflow resulted in the decrease of the lake level, a decline in surface area by one-third, and an increase in lake salinity.⁵² A principle nesting island was converted into a peninsula, subjecting the migratory birds to coyotes and other predators.⁵³ In addition, the exposed lake bed became difficult to access by foot and substantially diminished the lake's scenic value.⁵⁴ In 1979, the National Audubon Society filed suit to enjoin the DWP diversions, alleging that Mono Lake was protected by a public trust.⁵⁵

In a thorough analysis, the California Supreme Court held that the public trust doctrine does protect the navigable waters of Mono Lake from the harmful diversions of nonnavigable tributaries.⁵⁶ The court explained that although public trust doctrine and the water appropriation system developed independently of each other, both were part of an integrated system of water law.⁵⁷ In other words, before a state water agency approves a water diversion, it should examine the impact of the diversion on the public interest and attempt to minimize adverse impacts whenever possible. In reaching its decision, the court offered the following conclusions:

1. The state, as trustee, has a duty of "continuous supervisory control"⁵⁸ over trust resources. "This principle . . . prevents any party from acquiring a vested right to appropriate water in a manner harmful to the interests protected by the public trust."⁵⁹
2. Due to the state's dependence on water diversions for prosperity and habitability, the state legislature may grant water use permits even though such uses may unavoidably harm the public trust. "Now that the economy and population centers of this state have developed in reliance upon appropriated water, it would be disingenuous to hold that such appropriations are and have always been improper to the extent that they harm public trust uses . . ."⁶⁰
3. It is incumbent upon the state to consider the public trust when

50. See *National Audubon (Mono Lake)*, 658 P.2d at 711, 715.

51. See *id.* at 711.

52. See *id.* at 711, 715-16.

53. See *id.* at 711.

54. See *id.* at 716.

55. See *id.* at 712, 716.

56. See *id.* at 728-29, 732.

57. See *id.* at 732.

58. *Id.* at 727.

59. *Id.*

60. See *id.* at 728.

managing water resources. "The state has an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible."⁶¹ This duty includes the power of the state to reconsider any diversions that were previously authorized in accordance with public trust values.⁶²

The *Mono Lake* decision made several important contributions to public trust jurisprudence.⁶³ One notable contribution is the extension of the public trust doctrine to the nonnavigable waters affecting Mono Lake, thereby further disentangling the doctrine from the traditional navigability requirement.⁶⁴ More importantly, the court established that the state may not grant vested rights to public waters.⁶⁵ According to the court, all property rights in water are nonvested rights subject to revocation by the state if trust resources are harmed.⁶⁶ Nevertheless, the court acknowledged that the state must sometimes grant water rights in direct contravention of the public trust.⁶⁷ With this expansive interpretation, the court recognized that water rights should be allocated in a way that accounts for and minimizes damage to public waters. Carried to its logical conclusion, the public trust doctrine compels state regulators to explore alternative water sources when current uses unavoidably impact the public interest in navigable waterways.

The issues litigated in the cases of *Illinois Central*,⁶⁸ *Marks v. Whitney*⁶⁹, and *Mono Lake*⁷⁰ illustrate two fundamental principles underlying the public trust doctrine. First, the doctrine is sufficiently flexible to incorporate new public trust values as society's interests develop. Second, the state, as the ultimate executor of trust resources, has the duty to continually supervise and reconsider the allocation of these resources. With this framework in mind, this comment will now examine the application of the public trust doctrine to groundwater rights.⁷¹

61. *Id.*

62. *See id.*

63. For further discussion on the impact of the *Mono Lake* case, see Blumm & Schwartz, *supra* note 48.

64. *See National Audubon (Mono Lake)*, 658 P.2d at 721.

65. *See id.* at 712, 723, 729, 732.

66. *See id.*

67. *See id.* at 727-28.

68. 146 U.S. 387 (1897).

69. 491 P.2d 374 (Cal. 1971).

70. 658 P.2d 709 (Cal. 1983).

71. The scope of this comment is limited to the relationship between the public trust doctrine and appropriative rights in groundwater. The role of the trust doctrine in controlling groundwater contamination is not examined herein. To be sure, the issue of groundwater contamination is significant, especially since most groundwater pollution occurs through runoff from unregulated non-point sources such as agriculture. Briefly stated, nonpoint sources are anything not included in the Clean Water Act definition of a point source: "any discernible, confined and discrete

III. GROUNDWATER

Groundwater is subsurface water contained in the interconnected voids located below the water table in geologic formations.⁷² Although it only makes up about 0.61% of the world's water supply,⁷³ groundwater provides drinking water for approximately one half of the population of the United States.⁷⁴ In order to better understand the various doctrines that have developed to manage this resource, it is useful to review some basic terms and concepts that govern groundwater flow.

A. Basic Groundwater Hydrology

Water falls on land as part of the long-term hydrologic cycle.⁷⁵ Some of that water will seep into the soil and be pulled downward by gravity until it reaches a depth where the subsurface is saturated with water.⁷⁶ The top of this saturated zone is called the water table, below which flows groundwater.⁷⁷ In general, groundwater that flows in both unconfined and confined aquifers.⁷⁸

Groundwater flows more slowly than surface water because most groundwater is located in the void spaces, or pores, of rock formations. Porosity refers to the amount of void spaces within the rock and is

conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged." 33 U.S.C. § 1362(14) (1994). Sections 208 and 319 of the Clean Water Act instruct states to develop plans to control nonpoint sources. See David Zaring, *Agriculture, Nonpoint Source Pollution, and Regulatory Control: The Clean Water Act's Bleak Present and Future*, 20 HARV. ENVTL. L. REV. 515, 521-528 (1996). Unfortunately, these provisions are largely voluntary and have failed to reduce nonpoint source pollution. See *id.* For a discussion of the public trust doctrine as a pollution control device, see Ralph W. Johnson, *Water Pollution and the Public Trust Doctrine*, 19 ENVTL. L. 485 (1989).

72. See C.W. FETTER, *APPLIED HYDROGEOLOGY* 5, 570 (2d ed. 1988).

73. See *id.* at 5.

74. See SALLY BENJAMIN & DAVID BELLUCK, *STATE GROUNDWATER REGULATION GUIDE TO LAWS, STANDARDS, AND RISK ASSESSMENT* 9 (1994).

75. The hydrologic cycle describes the perpetual movement of water from the atmosphere to the surface of the earth through evaporation, precipitation, and related processes. For further discussion, see FETTER, *supra* note 72, at 4-6.

76. See *id.* at 4-5.

77. See *id.* at 5.

78. An aquifer is a saturated geologic formation that is capable of yielding an economic quantity of water to a well or spring. An unconfined aquifer is not overlain by any other geologic material, and its thickness extends from land surface to the base of the aquifer. The uppermost limit of an unconfined aquifer is marked by the water table, hence the synonym "water-table aquifer." In contrast, a confined aquifer is overlain by a confining layer, which is a geologic formation that is incapable of transmitting significant quantities of water. The term "confined" indicates that the water in the aquifer is under pressure. Therefore, when a well is placed in a confined aquifer, the water level of the well will typically rise above the top of the aquifer. See *id.* at 101-02.

described as a percentage.⁷⁹ Thus, the higher the porosity, the greater the amount of water stored in the rock. It is important to note that two different materials may have the same porosity, yet yield varying amounts of water. This variance is due to the molecular forces of surface tension that cause water to cling to rock surfaces.⁸⁰ As the grain sizes of a formation decrease, the surface area increases and more water is retained.⁸¹ For example, a formation of clay and a formation of coarse gravel may have the same porosity, but clay will not transmit a significant quantity of water due to the smaller size of clay particles. As a result, clays often constitute the confining layer overlying a confined aquifer. Conversely, gravel deposits are highly permeable and make excellent aquifers. Permeability describes the ease through which water flows through a geologic formation.⁸² It is basically proportional to the size of pore spaces through which fluid moves.⁸³ For the most part, hydrologists are interested in whether a geologic formation is permeable or impermeable.

The above discussion provides an elementary introduction to some terms and concepts of hydrology. Unfortunately, this introduction cannot adequately convey the enormous complexity underlying the principles of groundwater flow. The mathematical equations used to predict groundwater flow generally assume that aquifer characteristics are uniform throughout an aquifer formation.⁸⁴ In reality, aquifers may be highly heterogeneous, or nonuniform. For example, glacial deposits in the midcontinental areas of North America may consist of unsorted sand, silt, clay, and boulders.⁸⁵ This variation in particle size may cause significant variations in the permeability of glacially-related aquifers. In addition, limestone aquifers in the southeastern United States are highly fractured and contain dissolution cavities that may cause groundwater flow rates to fluctuate over short distances.⁸⁶ The difficulty of predict-

79. Porosity equals the ratio of the void spaces in a unit volume of earth material to the total volume of earth materials, including voids and solids. *See id.* at 63-64. Primary porosity represents the original amount of pore spaces at the time of deposition or formation of the rock. *See id.* at 70. Secondary porosity refers to the voids formed by the fracturing or weathering of a formation subsequent to deposition. *See id.*

80. *See id.* at 73.

81. *See id.*

82. *See id.* at 78.

83. *See id.*

84. *See id.* at 131-35.

85. Glacial aquifers are located in eastern Iowa, southern Minnesota, southern Wisconsin, and northern Illinois. Some of these aquifers include the Mt. Simon Sandstone, the Galesville Sandstone, and the Ironton Sandstone. *See id.* at 315.

86. *See id.* at 285-287. The Floridan aquifer is one of the most prolific aquifers in the world and underlies Florida and parts of South Carolina, Georgia, and Alabama. *See id.* at 317.

ing groundwater flow is reflected in the various doctrines that have developed to manage the resource.

One final consideration for state regulators is the interrelationship between groundwater and surface water. Groundwater and surface water often hydraulically connected. For example, in humid eastern states, streams typically receive groundwater discharge because the water table in the surrounding aquifer is at a higher elevation than the stream level.⁸⁷ However, when nearby pumping wells lower the water table below the elevation of the stream, stream flow diminishes as water drains from the stream into the aquifer.⁸⁸ As a result, the loss of stream flow may adversely impact surface water users downstream. Despite this interrelationship, water law has historically treated groundwater and surface water separately.⁸⁹

B. Allocating Groundwater Rights

Presently, there is no federal statute that specifically addresses groundwater allocation.⁹⁰ Groundwater management is typically left to the states.⁹¹ In order to deal with the unpredictable nature of the resource, state legislatures have experimented with the common law doctrines of absolute ownership, reasonable use, correlative rights, and prior appropriation.⁹² The common law tends to emphasize the rights of individuals over the public interest. As a result, each doctrine presents problems which make strict adherence by the state impractical.⁹³ Today, states are adopting permit systems that integrate the needs of private individuals with the interests of the public.⁹⁴

I. THE ABSOLUTE OWNERSHIP DOCTRINE

The doctrine of absolute ownership, or English rule, gives landowners the right to withdraw an unlimited amount of groundwater from beneath their property.⁹⁵ The English case of *Acton v. Blundell*⁹⁶ forms the basis of the doctrine.⁹⁷ The *Acton* court relied on ancient principles

87. See *id.* at 45-47.

88. See *id.*

89. See A. DAN TARLOCK, LAW OF WATER RIGHTS AND RESOURCES § 4.11 (1997).

90. See Linda A. Malone, *The Necessary Interrelationship Between Land Use and Preservation of Groundwater Resources*, 9 UCLA J. ENVTL. L. & POL'Y 1, 4 (1990).

91. See *id.*

92. See *id.* at 5.

93. See TARLOCK, *supra* note 36, at 515.

94. See *infra* notes 133-40 and accompanying text.

95. See TARLOCK LAW OF WATER RIGHTS, *supra* note 89, at § 4.04. The absolute ownership doctrine is still followed in Connecticut, Louisiana, Maine, Rhode Island, and Texas. See *id.*

96. 152 Eng. Rep. 1223 (Ex. Ch. 1843).

97. See Malone, *supra* note 90, at 5.

that gave property owners control of all underlying soil.⁹⁸ The opinion also reflects society's primitive understanding of hydrology at that time. Early American decisions, held that groundwater could simply not be regulated because it moved "by influences beyond our apprehension."⁹⁹ Due to the apparently mysterious and unpredictable nature of groundwater, early courts adopted the position that landowners had the right to take whatever groundwater they could pump.¹⁰⁰

The decline of the absolute ownership doctrine in this country began as early as 1862.¹⁰¹ Courts recognized that the doctrine was unduly harsh and impractical in light of the exhaustible nature of groundwater and potential problems with its depletion.¹⁰² In addition, the science of hydrology has advanced to a point where a cause and effect relationship can be established between groundwater pumping and associated harms.¹⁰³ In other words, it is no longer plausible for a landowner to claim that she did not notice nearby damages resulting from her groundwater use.¹⁰⁴

2. *the reasonable use rule and the correlative rights doctrine*

Courts rejected the absolute ownership doctrine in favor of groundwater limitations based on "reasonable use"¹⁰⁵ or "correlative rights."¹⁰⁶ Both the reasonable use rule and the correlative rights doctrine draw from the surface water law of riparianism which is practiced in the humid eastern states. The riparian system gives each landowner along a waterbody the right to use reasonable amounts of water on riparian land, as long as the use does not interfere with the uses of other riparian landowners.¹⁰⁷ Together, the reasonable use rule and the correlative rights doctrine are sometimes loosely referred to as the "American Rule."¹⁰⁸

98. *See id.*

99. *Roath v. Driscoll*, 20 Conn. 532, 541 (1850).

100. One court went so far as to hold that the malicious withdrawal of water at the expense of a neighbor was not actionable under the absolute ownership doctrine, but that decision has since been overruled. *See Huber v. Merkel*, 94 N.W. 354 (Wis. 1903), *overruled by State v. Michels Pipeline Constr. Inc.*, 217 N.W.2d 339 (Wis. 1974).

101. *See Bassett v. Salisbury Mfg. Co.*, 43 N.H. 569 (1862).

102. *See Malone*, *supra* note 90, at 5-6.

103. *See Michels Pipeline*, 217 N.W.2d at 345.

104. Early courts applied the English rule based on the rationale that "it would be unfair to compel a landowner 'to redress a wrong of which he cannot possibly have noticed.'" TARLOCK, *LAW OF WATER RIGHTS*, *supra* note 89, at § 4.04 (citing *Wheatly v. Baugh*, 25 Pa. 528, 534 (1855)).

105. *See TARLOCK LAW OF WATER RIGHTS*, *supra* note 89, at § 4.05[1]; *Higday v. Nickolaus*, 469 S.W.2d 859, 866, 870 (Mo. Ct. App. 1971), *Bassett v. Salisbury Mfg. Co.*, 43 N.H. 569, 577 (1862).

106. *See Katz v. Wilkinshaw*, 74 P. 766, 772 (Cal. 1903).

107. *See WILLIAM GOLDFARB*, *WATER LAW* 21-25 (2d. ed. 1988).

108. *See Higday v. Nickolaus*, 469 S.W.2d 859, 865 (Mo. Ct. App. 1971).

Nevertheless, they represent two distinct doctrines.

The reasonable use rule derives from the principle that a landowner must use her property in a way that does not injure nearby landowners.¹⁰⁹ In contrast to absolute ownership, a landowner is only entitled to reasonable amounts of water that can be put to a beneficial and reasonable use on the overlying land.¹¹⁰ In applying the rule, the principal difficulty is in determining what constitutes a reasonable use. Reasonableness may depend, *inter alia*, on the nature and comparative value of the uses, the pumping well locations, the amount of water, and climatic conditions.¹¹¹ The use of water on non-overlying lands is considered per se unreasonable.¹¹²

In general, the reasonable use rule only protects landowners from large municipal water withdrawals by forcing cities to pay for damages, or by requiring them to pay for new wells and pumping equipment.¹¹³ Owners of shallow wells may receive no compensation if a neighboring landowner is pumping large quantities of water for a reasonable use, such as a factory or apartment building.¹¹⁴ Another limitation of the reasonable use rule is its failure to apportion water during times of shortage.¹¹⁵ Theoretically, as long as the use satisfies the requirements of the rule, a landowner may withdraw a reasonable amount of water even if the pumping adversely affects nearby users.¹¹⁶

The correlative rights doctrine, which developed in California, applies the same principles as the reasonable use rule, except that it apportions water supplies during times of shortage to ensure that each landowner receives an equitable share.¹¹⁷ The problem with the doctrine is in determining the standard by which pumping should be reduced among the various users. The California Supreme Court in *City of Pasadena v. City of Alhambra*¹¹⁸ relied on the concept of mutual prescription in order to reduce pumping rates based on historical use.¹¹⁹ In that case, groundwater pumping by overlying users and appropriators

109. See TARLOCK LAW OF WATER RIGHTS, *supra* note 89, at § 4.05[1]. The reasonable use rule has been adopted in Alabama, Florida, Kentucky, Maryland, New York, North Carolina, and Tennessee. See *id.*

110. See *id.*

111. See Malone, *supra* note 90, at 6.

112. See *id.*

113. See *Michels Pipeline*, 217 N.W.2d at 350.

114. See *id.*

115. See Malone, *supra* note 90, at 6-7, 10-11.

116. See *id.* at 6-7.

117. See *id.* at 7-8; TARLOCK LAW OF WATER RIGHTS, *supra* note 89, at § 4.06[1]. Other states that follow the correlative rights rule include Arkansas, Delaware, Minnesota, Missouri, Nebraska, and New Jersey. See *id.* at § 4.06[2].

118. 207 P.2d 17 (Cal. 1949).

119. See *id.* at 29-33.

created an overdraft problem which interfered with everyone's ability to pump in the future.¹²⁰ Since the adverse users pumped groundwater openly and continuously without any judicial intervention, they obtained a right to pump by prescription.¹²¹ In effect, a "wrong" became a "right" because the original owners failed to challenge the actions of wrongdoers within the five-year statutory period. The court determined that the prescriptive rights should be propositional to actual historic use for purposes of production limitations that prescriptive rights should be actual historic use for purposes of production limitations.¹²² Unfortunately, the court's approach in *Pasadena* resulted in a perverse incentive to increase pumping in order to establish greater prescriptive rights.¹²³

3. THE PRIOR APPROPRIATION DOCTRINE

The common law doctrines outlined above are based on land ownership. In contrast, the prior appropriation doctrine recognizes seniority in groundwater uses that are first in time, regardless of whether the water is used on overlying land.¹²⁴ A water right is created under prior appropriation when a user intentionally diverts water and puts it to a beneficial use.¹²⁵

The doctrine first developed to regulate surface water rights in the arid West¹²⁶, but its underlying rationale applies to groundwater rights as well. Early pioneers required large amounts of water to operate mines and to maintain settlements.¹²⁷ Due to the scarcity of water, diversionary projects were necessary to deliver water to remote areas of intended use.¹²⁸ The prior appropriation doctrine is designed to protect such investments and the expectation that enough water will always be available.¹²⁹ Similarly, landowners who invest in groundwater wells and pumping equipment are entitled to some protection from subsequent groundwater users.

120. See *id.* at 31-33.

121. See *id.*

122. See *id.* at 32-33.

123. See DAVID H. GETCHES, *WATER LAW IN A NUTSHELL* 251 (3d. ed. 1997).

124. See Malone, *supra* note 90, at 8-9. Idaho, Kansas, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming follow the prior appropriation doctrine. See TARLOCK *LAW OF WATER RIGHTS*, *supra* note 89, at § 6.03.

125. See TARLOCK, *WATER RESOURCE MANAGEMENT*, *supra* note 36, at 177.

126. See TARLOCK, *supra* note 89, at § 5.02[1]; GOLDFARB, *supra* note 107, at 32; AMERICAN WATER WORKS ASSOCIATION, *WATER RIGHTS OF THE FIFTY STATES AND TERRITORIES* 23-24 (Kenneth R. Wright ed., 1990).

127. See Malone, *supra* note 90, at 8-9. Idaho, Kansas, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming follow the prior appropriation doctrine. See TARLOCK *LAW OF WATER RIGHTS*, *supra* note 89, at § 6.03.

128. See AMERICAN WATER WORKS, *supra* note 126, at 23-24.

129. See *id.* at 12-13.

Unfortunately, prior appropriation has the effect of "freezing" existing uses into place, thus making the establishment of new uses overly burdensome.¹³⁰ Despite the beneficial use requirement, the doctrine encourages waste by providing an incentive to withdraw excessive amounts of water in order to establish rights to a greater quantity of water.¹³¹ In addition, prior appropriation precludes states from weighing the value of certain uses when water supplies are in decline.¹³² For example, a senior appropriator could demand the entire flow of water, before a more valued junior user could get any.¹³³ To avoid this result, states that have codified the doctrine have tempered it with permitting systems that establish priority uses for groundwater.¹³⁴

4. PERMIT SYSTEMS

Common law allocation systems focus on the interests of the groundwater user, however, modern courts realize that strict adherence to a single common law doctrine is impractical in light of the need to accommodate future users as well as public concerns.¹³⁵ As a result, most states have enacted permit systems that incorporate both private and public needs.¹³⁶ Florida, for example, has one of the most comprehensive permit systems in the country.¹³⁷ The following discussion will show how Florida includes the public interest in its permit scheme, and will also provide a useful backdrop to the case study in Part IV of this comment.

In 1972, the Florida Legislature passed the Water Resources Act to address water management issues facing the state.¹³⁸ The Act divides the state into five water management districts, drawn on hydrologic boundaries.¹³⁹ Each district may require permits for consumptive uses of water and impose reasonable limitations in accord with district objectives.¹⁴⁰ Under Section 373.223(1) of the act, applicants must satisfy the following three-prong test to obtain a permit:

130. *See id.* at 11; GOLDFARB, *supra* note 107, at 40-41.

131. *See* GOLDFARB, *supra* note 107, at 35-36.

132. *See id.* at 33-34.

133. *See id.*; AMERICAN WATER WORKS, *supra* note 126, at 12.

134. *See* AMERICAN WATER WORKS, *supra* note 126, at 26.

135. *See* TARLOCK, *supra* note 36, at 514-515.

136. *See id.*

137. *See id.* at 526.

138. *See* 1972 Fla. Laws ch. 72-299 (codified at FLA. STAT. ch. 373.012 - 373.197 (1997)).

139. *See* Fla. Stat. § 373.069 (1997). These districts are the Northwest Florida, Suwannee River, St. Johns River, Southwest Florida, and South Florida water management districts. *See also* Ronald A. Christaldi, *Sharing the Cup: A Proposal for the Allocation of Florida's Water Resources*, 23 FLA. ST. U. L. REV. 1063, 1073 (1996).

140. *See* Fla. Stat. § 373.219 (1997).

- (1) To obtain a permit pursuant to the provisions of this chapter, the applicant must establish that the proposed use of water:
- (a) Is a reasonable-beneficial use as defined in § 373.019(4);
 - (b) Will not interfere with any presently existing legal use of water; and
 - (c) Is consistent with the public interest.¹⁴¹

The first two prongs of the test reflect the state's attempt to integrate the positive attributes of the reasonable use and prior appropriation doctrines. The third prong introduces the public interest factor lacking in the common law. A familiar problem with the test arises in determining what is a "reasonable-beneficial use" and what is included in the "public interest." To assist regulators with permit decisions, Rule 40D-2.301 of the Florida Administrative Code lists 14 factors for the District to consider.¹⁴² Despite this seemingly comprehensive list, Section 373.223(1) may allow regulators to find environmental public interests are outweighed by other state objectives.

For example, suppose a municipality pumps large amounts of groundwater to provide its citizens with potable water, but the withdrawals have the adverse effect of lowering overlying watercourses.¹⁴³ Certainly, the development of potable water supplies is a reasonable-beneficial use of the underlying aquifer. In addition, there is a strong public interest in providing high quality water for health and safety reasons. As a result, the District will likely grant the municipality's request

141. Fla. Stat. § 373.223(1) (1997).

142. In relevant part, FLA. ADMIN. CODE ANN. r. 40D-2.301 (1998) provides as follows:

- (1) In order to obtain a Water Use Permit, an Applicant must demonstrate that the water use is reasonable and beneficial, is in the public interest, and will not interfere with any existing legal use of water, by providing reasonable assurances, on both an individual and a cumulative basis, that the water use:
- (a) Is necessary to fulfill a certain reasonable demand;
 - (b) Will not cause quantity or quality changes which adversely impact the water resources, including both surface and ground waters;
 - (c) Will not cause adverse environmental impacts to wetlands, lakes, streams, estuaries, fish and wildlife or other natural resources;
 - (d) Will not cause water levels or rates of flow to deviate from ranges set forth in Chapter 40D-8;
 - (e) Will utilize the lowest water quality the Applicant has the ability to use;
 - (f) Will not significantly induce saline water intrusion;
 - (g) Will not cause pollution of the aquifer;
 - (h) Will not adversely impact offsite land uses existing at the time of the application;
 - (i) Will not adversely impact an existing legal withdrawal;
 - (j) Will utilize local water resources to the greatest extent practicable;
 - (k) Will incorporate water conservation measures;
 - (l) Will incorporate reuse measures to the greatest extent practicable;
 - (m) Will not cause water to go to waste; and
 - (n) Will not otherwise be harmful to the water resources within the District.

143. This example is based on the water-use conflict in west-central Florida that will be discussed further in Part IV of this comment.

for groundwater use permits despite the harm to hydraulically-connected waterways. This hypothetical example is not intended to suggest that "domestic wants" should yield to environmental concerns. Rather, it demonstrates that even a sophisticated permitting program can overlook particular aspects of the public interest.

C. *The Public Trust Doctrine and Groundwater Rights*

The public trust doctrine should extend to groundwater rights when the exercise of those rights impairs public trust values. Water rights are not absolute and remain subject to revocation by the state if the public trust is unreasonably harmed.¹⁴⁴ The public trust doctrine is applicable regardless of whether a state assigns rights through the common law or a statutory permit system. In fact, the doctrine may be a useful tool to protect public interests which may be neglected in state allocation schemes. Based on judicial expansion in cases like *Marks v. Whitney*¹⁴⁵ and *Mono Lake*,¹⁴⁶ the public trust doctrine is sufficiently broad to encompass groundwater rights.

The court in *Marks v. Whitney* recognize that the purpose of the public trust doctrine is to maintain the integrity of navigable waterways for various public interests, such as boating, fishing, and scientific study.¹⁴⁷ When groundwater withdrawals unfairly impinge upon these uses, the public trust doctrine should be available as a remedy. A possible jurisprudential problem with this approach is that groundwater is not navigable.¹⁴⁸ However, the court in *Mono Lake* determined that the doctrine protects navigable waters from harm caused by the diversion of nonnavigable tributaries.¹⁴⁹ In situations where groundwater and surface water are hydraulically connected, groundwater could be considered a tributary of an overlying navigable waterway.¹⁵⁰ The public trust doctrine would apply when groundwater pumping has the unwanted

144. See *supra* notes 41-67 and accompanying text.

145. 491 P.2d 374 (Cal. 1971).

146. 658 P.2d 709 (Cal. 1983).

147. See *Marks*, 491 P.2d at 380. This case was examined *supra* notes 28-33 and accompanying text.

148. See *Rettkowski v. Dep't of Ecology*, 858 P.2d 232, 239 (Wash. 1993).

149. See *National Audubon (Mono Lake)*, 658 P.2d at 721. This case was examined *supra* notes 41-67 and accompanying text.

150. A hydraulic link between groundwater and surface water should not be considered a threshold requirement for invoking the public trust doctrine. There may be instances where groundwater withdrawals impact the public trust regardless of hydraulic connection. For example, long-term groundwater pumping is partially responsible for land subsidence of up to 21 feet in areas of the Sacramento-San Joaquin Delta in California. Land subsidence increases the potential for flooding, which endangers lives, real estate, and food production. See R.A. FREEZE AND J.A. CHERRY, *GROUNDWATER* 370 (1979); M.E. IKEHARA, U.S. GEOLOGICAL SURVEY, *LAND SUBSIDENCE IN THE SACRAMENTO-SAN JOAQUIN DELTA CALIFORNIA* (1991).

effect of harming recreational and environmental interests in navigable waters.

Perhaps more compelling reason for extending the doctrine to groundwater rights is the idea that the state has a duty to exercise continuous supervisory control over water resources. As articulated by the court in *Mono Lake*, the state must take the public trust into account when allocating water resources and attempt to protect public trust uses whenever possible.¹⁵¹ This fiduciary duty includes the power to reconsider previously valid water uses that no longer coincide with trust values.¹⁵² If groundwater is part of a state's overall water resources budget, state officials must consider the public trust in groundwater allocation decisions. However, it is important to note that certain allocation decisions which are necessary to provide for the public welfare may have the inevitable effect of injuring the public trust. In such cases, a state should not disregard its obligation to explore alternatives which may minimize future adverse impacts. The following case study illustrates how the public trust doctrine could help resolve groundwater use conflicts.

IV. CASE STUDY: THE TAMPA BAY WATER WARS

The state of Florida is synonymous with sun and water. The peninsula receives an average of 175 billion gallons per day from rainfall as well as inflow from Georgia and Alabama.¹⁵³ Despite this apparent abundance, coastal cities face water supply problems due to the lack of freshwater resources located along the shoreline.¹⁵⁴ Residents of Tampa Bay, in west-central Florida, are currently confronting problems associated with the overuse of local groundwater supplies. In *West Coast Regional Water Supply Authority v. Southwest Florida Water Management District*,¹⁵⁵ a Florida administrative court issued a Recommended Order that the Southwest Florida Water Management District renew water use permits for four wellfields located in the northwest Tampa Bay area, despite findings that pumping at the wellfields has caused serious environmental harm to the surrounding region.¹⁵⁶

A. Background

The West Coast Regional Water Supply Authority (the "Authority"),¹⁵⁷ the City of St. Petersburg (the "City"), and Pinellas County filed

151. See *Mono Lake*, 658 P.2d at 727-28.

152. See *id.* at 728.

153. See Christaldi, *supra* note 139, at 1064.

154. See *id.* at 1064-65.

155. Nos. 95-1520 - 95-1528 (Fla. DOAH 1997).

156. See *id.*

157. The Authority was created to provide high-quality water to its member governments. See

suit against the Southwest Florida Water Management District (the "District").¹⁵⁸ The District regulates consumptive uses of water throughout all or part of 16 counties in west Florida,¹⁵⁹ While the Authority provides water for approximately 1.8 million people within the District's jurisdiction.¹⁶⁰ This case concerns the issuance of water use permits for four wellfields operated by the petitioners.¹⁶¹

Prior to 1972, the State of Florida did not regulate pumping from the subject wellfields.¹⁶² In 1972, the District established minimum aquifer levels to regulate the effects of pumping.¹⁶³ As water levels declined below the regulatory minimum, pumping was restricted.¹⁶⁴ In addition, the district "rotated" withdrawal rates among the wellfields in an attempt to balance the effects of pumping over the water resources of the area.¹⁶⁵

In 1975, the District implemented a permitting system to regulate consumptive uses of water.¹⁶⁶ From 1975 to 1989, the District allowed exemptions for permittees who could not meet regulatory standards, so long as the exemptions were "consistent with the public interest."¹⁶⁷ Under this public interest exemption, the District issued a series of water use permits for the subject wellfields, allowing withdrawals that failed to

Florida Interlocal Cooperation Act of 1969, Fla. Stat. § 163.01; Fla. Stat. § 373.1962 (1997), The Authority's members include Pinellas, Hillsborough, and Pasco counties and the cities of St. Petersburg, Tampa, and New Port Richey. Each member government is represented by an elected official who sits on the Board of Directors. *See West Coast Regl. Water Supply Auth., The Authority in Water* (West Coast Regl. Water Supply Auth., Clearwater, Fla.) Jan. 1996. As of July 1998, the Authority was reorganized and renamed Tampa Bay Water. However, for the purposes of this comment, the term "Authority" will refer to the West Coast Regional Water Supply Authority as described in the Recommended Order.

158. Collectively, the Authority, the City, and Pinellas will be referred to as the "petitioners."

159. The District was created pursuant to Fla. Stat. § 373.069 (1997).

160. *See West Coast Regl Water Supply Auth. v. Southwest Fla. Water Management Dist.*, Nos. 95-1520 - 95-1528, ¶ 183 (Fla. DOAH 1997).

161. The subject wellfields are located in northwest Hillsborough County and southern Pasco County, and include: the South Pasco, Section 21, Cosme-Odesa, and the Northwest Regional Hillsborough wellfields. The South Pasco wellfield is owned by the City and has been operating since 1973. *See id.* at ¶¶ 9-10. Section 21 is owned by the City and has been operating since 1963. *See id.* at ¶¶ 16-17. Cosme-Odesa is also owned by the City and has been operating since the early 1930's. *See id.* at ¶¶ 23-24. The Northwest Hillsborough Regional wellfield (NWHHRWF) began production in the mid-1980's. *See id.* at ¶ 32. Due to the relatively young age of the NWHHRWF and its vaguely linear design, the recommended order contained little discussion of the field's impact on the area's water resources. Instead, the hearing officer decided that a default permit should be issued for the NWHHRWF because the District failed to consider the authority's permit application in a timely manner. *See id.* at ¶¶ 269-284.

162. *See id.* at ¶ 45.

163. *See id.* at ¶ 46.

164. *See id.*

165. *See id.*

166. *See id.* at ¶ 48.

167. *See id.* at ¶ 49, 152.

comply with standard permitting requirements.¹⁶⁸ These permits were valid until September of 1992.¹⁶⁹ During the permitting process in the early 1980's, the District advised the Authority that alternate supplies needed to be developed to meet future demand.¹⁷⁰ However, the District provided little guidance as to what it would consider an acceptable alternative source.¹⁷¹

On August 18, 1992, the City and the Authority filed applications to renew the existing permits of three of the wellfields.¹⁷² In response, the District proposed on February 7, 1995, to issue one-year water use permits for each of the four wellfields.¹⁷³ After the petitioners challenged the one-year limitation, the District proposed to provide ten-year water use permits with "Environmental Protection Standards" and new aquifer regulatory levels for each wellfield.¹⁷⁴ However, on July 15, 1996, after reconsidering the proposed ten-year permits, the District issued Notices of Intent to Deny the permit applications and the present litigation ensued.¹⁷⁵

B. *Pumping Impacts on Lakes, Wetlands, and the Overall Hydrologic System*

Water withdrawals result in a lowering of the surficial water table as water is drawn downward into the deeper Floridan aquifer where pumping occurs.¹⁷⁶ The lowering of the water table results in the lowering of area lakes and wetlands.¹⁷⁷ The process where water from the surficial aquifer is pulled downward and leaks into the lower pumping zone is known as "induced recharge."¹⁷⁸ Additional impacts include loss of wetland-dependent species, replacement of wetland species by upland and other "exotic" species, tree loss, and increased incidence of

168. *See id.* at ¶ 50.

169. *See id.* at ¶ 52.

170. *See id.* at ¶ 53.

171. *See id.* at ¶ 54.

172. *See id.* at ¶ Preliminary Statement. The Authority applied for a renewal permit for the NWHRRWF on May 19, 1994 and the cases were consolidated. *See id.*

173. *See id.*

174. *See id.*

175. *See id.*

176. *See id.* at ¶ 90. The geology underlying the wellfields is a three-layer structure composed of the surficial and Floridan aquifer systems, separated by an intermediate confining unit. The surficial aquifer is the uppermost water-bearing unit and consists of sandy, fine-grained material. In contrast, the Floridan aquifer is a thick sequence of porous limestone and dolomite with sizable fractures and dissolution cavities. The intermediate confining unit primarily consists of clay and retards the movement of water, or leakage, between the surficial and Floridan aquifers. The wellfields pump water from the Floridan aquifer, which is classified as a confined aquifer. *See id.* at ¶¶ 60-66.

177. *See id.* at ¶ 90.

178. *See id.* at ¶ 91.

fire.¹⁷⁹ Although other factors, including reduced rainfall and increased evapotranspiration, can result in lowered lakes and wetlands, the evidence in this case establishes that induced recharge due to pumping is the primary culprit.¹⁸⁰

Notwithstanding the adverse impacts of pumping, the court found that the hydrogeologic systems in the area have reached a new state of "dynamic equilibrium."¹⁸¹ Prior to the development of the wellfields, the water resources in the area were in a natural balance—natural recharge, such as rainfall, was balanced by natural discharge, such as outflow to the coast.¹⁸² The introduction of pumping wells upset this balance by artificially increasing water discharge.¹⁸³ Over time, water resources adjust to the change and reach a new equilibrium. Where the increase in discharge is not matched by a corresponding increase in recharge, surrounding water levels stabilize at a lower level than before the pumping wells came on-line. The enormous withdrawals from the Floridan aquifer has resulted in a shifting of the local hydrologic systems, and water levels are now considered stable at lower levels.¹⁸⁴ Theoretically, now that the system has stabilized, no additional damages should occur *as long as* pumping is not increased above current rates.

C. *The Decision*

The evidence presented to the court establishes that there will be no new adverse environmental impacts caused by continued pumping at current rates.¹⁸⁵ "The continuation of water pumping at current actual levels of withdrawal will continue the ecological decline already in progress, but will not result in new kinds of adverse environmental impacts."¹⁸⁶ Accordingly, the court held that the petitioners meet the permitting criteria for pumping at average daily quantities.¹⁸⁷

To review water use permit applications, the District must establish

179. *See id.* at ¶ 107.

180. *See id.* at ¶ 92.

181. *See id.* at ¶ 123.

182. *See* C.W. FETTER, APPLIED HYDROGEOLOGY 230, 444 (2d ed. 1988).

183. In a confined aquifer, such as the Floridan aquifer, pumping will reduce the water level near the wells. This creates a "cone of depression" near the wells that expands with time. The cone of depression will stabilize when enough downward leakage is induced to balance the withdrawals. This induced recharge upsets the natural equilibrium of the overlying surficial aquifer. Accordingly, the surficial aquifer must "shift" and draw water from elsewhere to prevent from being drained. *See id.* at 230, 444-45.

184. *See* West Coast, Nos. 95-1520 - 95-1528 at ¶¶ 124-126. Such a shift can take as long as ten years. *See id.* at ¶ 124.

185. *See id.* at ¶ 174.

186. *Id.* at ¶ 175.

187. *See id.* at ¶ 171.

a “baseline” against which anticipated impacts may be predicted.¹⁸⁸ The establishment of an appropriate baseline is essential to determine whether the applicant has met the conditions for issuance of the permit and whether the applicant will be responsible for mitigating any adverse impacts associated with pumping.¹⁸⁹ The permitting history of the subject wellfields indicates that the District was aware of potential adverse impacts when it initially granted the public interest exemptions in the mid-1970’s.¹⁹⁰ To date, pumping impacts have not exceeded those which were previously deemed acceptable by the District.¹⁹¹ As a result, the court determined that the appropriate baseline in this case is the conditions that existed when the renewal applications were filed in 1992.¹⁹² In effect, the Court has allowed the petitioners to disregard any previous impacts and to start the permit renewal process with a clean slate.

The administrative court applied the District’s three-pronged test in reviewing the water use renewal applications.¹⁹³ Pursuant to the test, the applicant must establish that the proposed water use is a reasonable and beneficial use; will not interfere with any presently existing legal use of water; and is consistent with the public interest.¹⁹⁴ The court concluded that the petitioners presented sufficient evidence to meet the relevant permitting criteria.¹⁹⁵ Providing potable water to customers of the petitioners is a reasonable and beneficial use of the resource.¹⁹⁶ The court also found that current withdrawals do not interfere with other legal uses.¹⁹⁷ Furthermore, the provision of high quality water is necessary to meet public health and safety requirements, and is therefore consistent with the public interest.¹⁹⁸

D. *The Absence of the Public Trust*

The Recommended Order suggests that the District is partly culpable for existing environmental damages because regulators anticipated such impacts when they originally permitted the wellfields. Although the District may indeed be partially responsible, the court’s decision

188. *See id.* at ¶ 147.

189. *See id.*

190. *See id.* at ¶ 148.

191. *See id.* at ¶ 151.

192. *See id.* at ¶ 158.

193. A discussion of the District’s permitting criteria is provided *supra* notes 136-40 and accompanying text.

194. *See id.* at ¶ 172.

195. *See id.* at ¶ 171.

196. *See id.* at ¶ 179.

197. *See id.* at ¶ 180.

198. *See id.* at ¶ 182.

wrongly implies that governmental mistakes can never be amended, regardless of how harmful. Furthermore, the ruling does not address the duty of the state to continually supervise water uses and to reconsider prior allocation decisions when they detrimentally affect other interests. If the state had recognized its duty under the public trust doctrine when it initially considered the permit renewals, much of the time and resources spent in litigation could have been used to negotiate the development of alternative water supplies.

Ultimately, both parties have recognized that negotiation is in the best interests of everyone involved.¹⁹⁹ A final decision on the Recommended Order was repeatedly delayed to allow the District and the Authority to negotiate a deal that would end the litigation over pumping. The parties finally reached an agreement was reached in April of 1998 that promises to limit future lawsuits and start the search for new water supplies.²⁰⁰ One proposal involves diverting runoff during the rainy season into 1,200-acre reservoir capable of stockpiling hundreds of millions of gallons of water.²⁰¹ Another proposal considers building a desalination plant along Tampa Bay or near the Gulf of Mexico.²⁰²

Litigation over the wellfield permits has already cost the taxpayers of Tampa Bay nearly 10 million dollars.²⁰³ If the wellfields were shut-down, experts predict it would take up to ten years²⁰⁴ and 180 million dollars²⁰⁵ to develop comparable supplies. These numbers make it easier to understand why the permits were not denied or drastically limited. After all, Tampa Bay residents are entitled to high-quality potable water.

Nevertheless, the state could have averted such litigation by recognizing that the public trust doctrine allows the state to revoke consumptive use permits that harm the public interest. The District could have issued temporary permits to satisfy the water needs of Tampa Bay while alternative water sources were developed. In short, if the state had acknowledged the public trust doctrine early on in this case, much of the time and tax dollars spent litigating permit issues could have been used

199. See Neil Johnson, *Players Opt to Discuss Water War*, TAMPA TRIB., Nov. 11, 1997, Florida/Metro, at 4.

200. See Peter Howard, *Tampa, Pasco Approve Water Agreement*, TAMPA TRIB., May 1, 1998, Florida/Metro, at 2.

201. See Ivan Hathaway, *Water Group Pins Down Reservoir Site*, TAMPA TRIB., Oct. 3, 1998, Brandon, at 2.

202. See Neil Johnson, *Desalination Plant Proposals to be Pondered*, TAMPA TRIB., Jan. 26, 1998, Florida/Metro, at 1.

203. See Neil Johnson, *Peace should Reign under Water Pact*, TAMPA TRIB., Jan. 13, 1998, Florida/Metro, at 1.

204. See West Coast, Nos. 95-1520 - 95-1528 at ¶ 42.

205. See Neil Johnson, *Deadline Pressure Could Drown Truce in Water Wars*, TAMPA TRIB., Jan. 9, 1998, Florida/Metro, at 6.

to advance the negotiation process in which the parties eventually engaged.

V. CRITICISM OF THE PUBLIC TRUST DOCTRINE

Critics of the public trust doctrine suggest that public concern over natural resources and the resulting enactment of environmental legislation has rendered the doctrine obsolete.²⁰⁶ In general, the doctrine's diminishing importance can be tied to the rise of governmental police power. Nonetheless, the case study of the Tampa Bay Water Wars indicates how the public trust doctrine may still be used to fill gaps in the modern police power state.²⁰⁷

A. *The Rise of Governmental Authority*

Professor Richard Lazarus argues that the expansion of governmental police powers over the last century obviates any need for the public trust doctrine to protect the public interest.²⁰⁸ The trust doctrine developed during a time when sovereign authority to regulate resource uses was limited to the property it owned.²⁰⁹ Today, it is well established that state and local legislatures draft and enforce laws protecting the public's health, safety, and general welfare.²¹⁰ As concern over natural resources and environmental protection has grown, the scope of governmental authority has expanded to address these concerns.²¹¹ Thus, by reflecting current social values, the modern police power authority acts as a substitute for the public trust doctrine.²¹²

Increases in police power authority are related to a corresponding decline in the importance of private property rights.²¹³ This relationship is evident from an examination of cases involving the constitutional tak-

206. Some articulate criticisms of the public trust doctrine include: Patrick Deveney, *Title, Jus Publicum, and the Public Trust: An Historical Analysis*, 1 SEA GRANT L.J. 13 (1976); James L. Huffman, *Trusting the Public Interest to Judges: A Comment on the Public Trust Writings of Professors Sax, Wilkinson, Dunning, and Johnson*, 63 DENV. U.L. REV. 565 (1986); Richard J. Lazarus, *Changing Conceptions of Property and Sovereignty in Natural Resources: Questioning the Public Trust Doctrine*, 71 IOWA L. REV. 631 (1986); Roderick E. Walston, *The Public Trust Doctrine in the Water Rights Context: The Wrong Environmental Remedy*, 22 SANTA CLARA L. REV. 63 (1982).

207. See *supra* notes 151-201 and accompanying text.

208. See Lazarus, *supra* note 206, at 665-68.

209. See *id.* at 665.

210. See *id.*

211. See *id.* at 666.

212. In addition, by not relying on the public trust doctrine, litigants are relieved from arguing threshold issues which burden public trust cases. For example, it becomes unnecessary to prove that title to a contested resource has historically been held by a sovereign. See *id.* at 687.

213. See *id.* at 668.

ings clause.²¹⁴ The takings clause of the Fifth Amendment provides that private property shall not "be taken for public use, without just compensation."²¹⁵ Historically, the Supreme Court has been wary of governmental infringement of private property interests.²¹⁶ However, in *Ruckelshaus v. Monsanto Company*,²¹⁷ the Court held that when individuals engage in areas of great public concern, the possibility that the government may later regulate such areas is substantial.²¹⁸ With the development of complex permit and entitlement schemes, private property owners whose activities impact the natural environment are on notice that the takings clause may offer little protection. For example, the Clean Water Act requires dischargers of pollutants to obtain a permit through the National Pollutant Discharge Elimination System.²¹⁹ Such permits are not vested rights to pollute the nation's waterways; discharge permits can be denied or taken away in order to curtail harmful activities.

Professor Lazarus also argues that the explosion in administrative law during the 1970's has eliminated the need to rely on the public trust doctrine.²²⁰ The public trust doctrine was based on the traditional view that government played no role in environmental protection; rather, it promoted developmental activities.²²¹ Today, modern administrative agencies are directly involved in managing natural resources and ensuring environmental protection.²²² In addition, federal agencies employ career experts in environmental matters to assist with policymaking.²²³ These agencies should be left to administer natural resources free from judicial intervention under the public trust doctrine.²²⁴

B. *The Tampa Bay Water Wars Revisited*

Despite the advent of administrative agencies and permit schemes,

214. *See id.* at 668-74.

215. U.S. CONST. amend. V.

216. *See Lazarus, supra* note 206, at 668-74.

217. 467 U.S. 986 (1984).

218. *See id.* at 1008-09; Lazarus, *supra* note 206, at 673.

219. *See generally* 33 U.S.C. § 1342 (1994) (the Clean Water Act, or Federal Water Pollution Control Act, is codified at 33 U.S.C. §§ 1251-1387 (1994)).

220. *See Lazarus, supra* note 206, at 679.

221. *See id.* at 689.

222. *See id.* Such agencies include the Environmental Protection Agency, the National Park Service, and the U.S. Fish and Wildlife Service.

223. *See id.*

224. *See id.* at 712-13. Intervention under the public trust is considered antidemocratic since it allows courts to usurp the role of the legislature in allocating natural resources. In theory, the judiciary lacks competence to consider the complexities inherent in environmental decision-making. Such matters are better left to the administrative agencies created by elected officials. *See also Deveney, supra* note 206, at 13-14.

the litigation over wellfield permits in Tampa Bay provides a good example of how the public trust doctrine remains useful today. After all, the wellfield controversy persisted for several years even though Florida has one of the most sophisticated permit systems in the country.²²⁵ The Florida Water Resources Act created the Southwest Florida Water Management District to allocate the water resources of west-central Florida.²²⁶ Accordingly, any attempt by the state to appropriate, or “trump”, the District’s authority under the shield of the public trust could undermine the very agency the state created to handle such permit disputes. Nevertheless, the Florida Supreme Court case of *Osceola County v. St. Johns River Water Management District* (the “*Interdistrict Transfer*” case)²²⁷ suggests the application of the trust doctrine would not automatically run a foul of the Florida Water Resources Act.

The *Interdistrict Transfer* case involved the transfer of water from one district, or basin, to another.²²⁸ Brevard County applied to the St. Johns River Water Management District for a permit to use water drawn from nearby Osceola County, located in the South Florida Water Management District.²²⁹ Osceola County sought a writ of prohibition to prevent the St. Johns River Water Management District from considering the application, claiming that the district lacked jurisdiction to consider a permit for water drawn from outside its boundaries.²³⁰ The court affirmed the district court’s decision that the state properly authorized the districts to consider the interdistrict transfer of water.²³¹ Additionally, the District Court noted that:

[n]othing in the Water Resources Act indicates a legislative intent that water management districts operate solely as independent provinces, without regard for statewide concerns. . . . A two-tiered system of state and regional management was perceived by legislature as the most effective way to conserve and manage the state’s total water resources.²³²

To be sure, the *Interdistrict Transfer* case supports the delegation of regulatory authority to the water management districts. However, read more broadly, the decision also supports state-level involvement in significant water management issues. The District Court’s statement

225. See *supra* notes 135-40 and accompanying text.

226. See *supra* notes 135-40 and accompanying text.

227. 504 So. 2d 385 (Fla. 1987).

228. Recall that the districts are drawn on hydrologic boundaries. Therefore, the removal of water from one district theoretically removes that water permanently.

229. See 504 So. 2d at 387.

230. See *id.*

231. See *id.*

232. *Osceola County v. St. Johns River Water Management Dist.*, 486 So. 2d 616, 619 (Fla. 5th DCA 1986).

reflects the goal of the drafters of the Model Water Code, the code upon which the Florida Water Resources Act was based.²³³ The Model Water Code envisioned a system where policy making would occur at the state level, while operational decisions would occur at the district level.²³⁴ In reality, the districts have been granted significant regulatory authority and have become their own primary sources of water policy.²³⁵ Still, the water management districts do not have unbridled authority over state water resources. State officials must recognize their obligations under the Water Resources Act and provide leadership when districts become entangled in lawsuits with statewide implications.²³⁶ The public trust doctrine may serve as a vehicle for citizens to compel state review of inadequate administrative programs. While such review may not have solved the Tampa Bay wellfield dilemma, it may have helped bring an end to the protracted litigation and hastened the search for alternative water supplies.

VI. CONCLUSION

The public trust doctrine is an effective tool for protecting a variety of public uses in navigable waters, ranging from commerce to bathing. Increasingly, courts are using the doctrine to protect navigable waters from harm caused by the diversions of private appropriators. The Mono Lake case provides the basic framework for extending the doctrine to the water rights context. Due to the public nature of water resources, the state has a fiduciary duty to regulate water uses for the benefit of the general community. This duty compels the state to continually supervise the allocation of water rights, and reconsider those rights when public trust values are endangered. In other words, when the exercise of a previously legitimate water right begins to damage the public interest, the state should reallocate the water right in a way that accounts for and

233. Between 1967 and 1972, law professors at the University of Florida drafted a legislative proposal that combined the positive attributes of the riparian and prior appropriation systems within an administrative regulatory scheme. To a large extent, the Water Resources Act of 1972 is patterned after this Model Water Code. See Christaldi, *supra* note 139, at 1072.

234. See *id.* at 1075 (citing Richard C. Ausness, *The Influence of the Model Water Code on Water Resources Management Policy in Florida*, 3 J. LAND USE & ENVTL. L. 1, 3, 13 (1987)).

235. See Christaldi, *supra* note 139, at 1073-1074.

236. For example, state and local Tampa officials have invested millions of dollars to attract a computer chip plant to the Tampa Bay area. Billion dollar chip factories create high-paying jobs, provide research grants for universities, and increase municipal tax rolls. Unfortunately, these types of plants use up to three million gallons of clean water a day. Industry experts doubt that sufficient water supplies exist at eight of eleven potential sites in Florida. The uncertainty over water resources in Tampa Bay could eliminate the west coast from competing for a plant and force chip manufacturers to look out of state. See Jean Gruss & Neil Johnson, *Not in the Chips: The Tampa Bay Region's Efforts to Lure a Computer Chip Plant Could Fail Because of the Factory's Thirst for 3 Million Gallons of Water Daily*, TAMPA TRIB., June 28, 1998, Nation/World, at 1.

minimizes such damage. Based on the rationale of the Mono Lake court, the public trust doctrine should encompass all water rights granted by the state, including groundwater rights.

Groundwater is an inherently difficult resource to manage because, unlike surface water, the effects of groundwater use are not readily observable. Historically, the lack of understanding of groundwater movement made it difficult for state regulators to fairly allocate the resource among competing users, both private and public. As the science of hydrology has developed, states have adopted permit systems that now incorporate private and public interests. However, water managers face additional problems when groundwater use adversely impacts overlying surface waters. In situations where groundwater acts as a tributary to navigable waterways, the public trust doctrine should compel water managers to grant groundwater rights in a way that accounts for harm to the connected surface waters. The wellfield controversy in Tampa Bay, Florida, is one example of how the public trust doctrine could be logically extended to groundwater use. By invoking the public trust doctrine, state water agencies may be able to avoid costly litigation over groundwater rights and encourage the exploration of less harmful alternative water sources.

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