A Technology-Based Approach to Water Conservation in California

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I.
INTRODUCTION

In the coming decades, as already seen today, global climate change will impact hydrologic balances and water availability.[1] Among the scientific community, "[t]here is a relatively firm consensus that arid and semiarid regions risk the net loss of stream runoff as winter snowpack diminishes and spring and summer evaporation increases" each year.[2] As water becomes increasingly scarce, water use and management will have to adapt to these changing conditions.

California water law is based on a combination of riparianism and prior-appropriation. These two doctrines assume regional water balances will remain relatively constant over time, but such an assumption is no longer viable.[3] As water becomes less available, water managers will have to change their assumptions and policies to better meet the needs of their water users. "Conflicts between senior users, junior users, and future claimants, as well as between consumptive and non-consumptive uses (such as environmental protection), will only increase."[4] In an effort to resolve these conflicts in uses and users, state policy must actively find new conservation methods. To date, most water conservation policy in California is voluntary, and the combination of riparianism and prior-appropriation does little to encourage conservation.

This paper argues that California should take a new approach to water conservation based on the command-and-control pollution laws of the 1970s. California should adopt a technology-based approach similar to the Clean Air Act ("CAA") and Clean Water Act ("CWA") to set new standards for water permits. A technology-based approach would require users to either adopt more efficient technology or use less water, thereby increasing conservation. It is also a flexible approach that

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1. Dan Tarlock, *How Well Can Water Law Adapt to the Potential Stresses of Global Climate Change?*, 14 U. DENV. WATER L. REV. 1, 2 (2011).
2. *Id.* at 4.
3. *Id.* at 2.
4. *Id.* at 3.

typically considers cost-benefit analysis at some point in the process for determining the standards.

The first section of this paper describes how California's system of riparianism and prior-appropriation functions, and explains why the system does not encourage conservation. The paper then looks at some of the conservation methods that California employs, ultimately concluding that those conservation policies are not adequate to deal with increasing water scarcity. The next section describes how technology-based standards work and how a technology-based standard can be applied to water conservation. Lastly, this paper addresses how a technology-based standard could be implemented and enforced, as well as responds to the potential opposition that a bill or regulation would face.

II.
CALIFORNIA WATER LAW

A. *Riparianism*

In California, riparian water rights "entitle owners of land bordering a stream to receive the natural flow of the stream undiminished except by the common right of all to receive a reasonable share of the water."[5] "Permissible uses of water were essentially limited to fulfilling domestic needs, such as withdrawing sufficient water for drinking, bathing, and watering animals."[6] States adopted the riparian "natural flow doctrine" from England, the purpose of which was to allow all landowners along a river or lake a sufficient amount of water for their daily needs.[7] The "natural flow doctrine" thereby limited use of water to ensure that each landowner along the river would receive a "reasonable" amount of water.

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5. Richard P. Shanahan, *The Application of California Riparian Water Rights Doctrine to Federal Land in the Mono Lake Basin*, 34 HASTINGS L.J. 1293, 1293 (1983).

6. Kurt M. Brauer, *Is "Reasonable Use" Reasonable? Formulating Comprehensive Water-Use Policy by Filling the Gap in the Townships' Authority to Regulate Inland Lakes and Streams*, 43 WAYNE L. REV. 1621, 1626 (1997).

7. *Id.*

In England, "[u]nder the natural flow doctrine, there was no need for a mechanism to determine whether competing uses were incompatible because uses were severely limited in the first place."[8] Industries like mining, which require large amounts of water, were not yet taking place. Furthermore, England is a temperate region with an adequate water supply.[9] In the United States, as settlers started moving out West, it became abundantly clear that the "natural flow doctrine" would require serious alterations. In the early history of the United States, the federal government had an economic policy that encouraged development of the abundant natural resources available. The "natural flow doctrine" was meant to supply an adequate amount of water to landowners for domestic needs, but riparian landowners needed more water to develop those abundant natural resources for their economic enterprises.[10]

The natural flow doctrine "was a serious impediment to the emerging economic reality as more sawmills, granaries, tanneries, and irrigated agriculture started dominating the scenery."[11] As industries emerged, the "natural flow doctrine" seemed incompatible with this economic reality, and judges limited the common law of riparianism to "reasonable use."[12] A "reasonable use" of water means that the amount of water supplied to a user is limited to an amount that is "reasonable" for a particular use, and some uses are considered more "reasonable" than others. Under riparian rights, conflicts between incompatible consumptive uses of water are resolved by eliminating or curtailing such uses which "unreasonably harm" other uses.[13] The battle over water rights among users depends on whose use is the most "reasonable."

One of the major problems with the "reasonable use" doctrine is that it does not encourage conservation; rather, it encourages

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8. *Id.*
9. *Id.*
10. *Id.* at 1627.
11. *Id.*
12. *Id.* at 1626.
13. Joseph W. Dellapenna, *The Law of Water Allocation in the Southeastern States at the Opening of the Twenty-First Century*, 25 U. ARK. LITTLE ROCK L. REV. 9, 11-12 (2002).

use so long as it is "reasonable." Thus, riparian landowners have an incentive to find more "reasonable uses" of their water instead of limiting their water consumption to the benefit of downstream users or in-stream use. Water users who can argue that their uses are the most "reasonable" get the most water. This violates the "natural flow doctrine" in the sense that all common users should receive the natural flow of the river, except that the flow may be diminished by common "reasonable use." If upstream water users can find more "reasonable uses" of water, there is grave potential for harming downstream users, especially in the West where water is not abundant.

Looking at settlements in the West, the traditional riparian right to demand the unimpeded and unchanged natural flow of streams seemed ill-adapted for the uses of water that settlers were undertaking.[14] Such rights would have made it nearly impossible for Western settlers to mine or irrigate non-riparian lands while water flowed virtually unused and unusable across riparian land.[15]

B. *Prior-Appropriation*

In the arid West of the United States, water law took a different turn when settlers started discovering gold. California adopted the first dual water system, which combined both riparian rights and prior-appropriation. California created the dual system as a result of a sporadic pattern of settlement, where there was no real local law, and the settlers completely rejected riparian rights.[16] The "forty-niners" were unwilling to patiently gain title to riparian lands for mining, so they simply sought gold as trespassers and took what they needed.[17] Thus came the doctrine of prior-appropriation: "first in time, first in right."[18] Those who claim the water first have the senior right and all subsequent claimants have junior rights. If there is a

14. *Id.* at 18.
15. *Id.* at 21.
16. *Id.* at 20-21.
17. *Id.*
18. *Id.* at 21.

shortage of water, seniors get their water first, and once the senior rights are satisfied, juniors and new users are granted their water rights.

It should come as no surprise that the prior-appropriation doctrine led to many disputes, especially with riparian landowners. In order to deal with these two competing common legal doctrines, the California Supreme Court decided in 1886 that a land patent from the federal government carried with it riparian rights to water abutting the land, subject to riparian appropriations perfected before the future riparian made a lawful entry to acquire title.[19] Such riparian rights would be superior to any later appropriations made after the riparian gained title.[20] After *Lux*, the dual system of water law was born in California, which recognized both appropriative rights and riparian rights.[21]

Prior-appropriation is limited to continuous beneficial use without waste.[22] Unused water, or water that is used wastefully, is no longer part of the user's water right and becomes available to junior users or those downstream.[23] That is, water not used beneficially is subject to the "call of the river." Nonuse results in forfeiture, and wasteful use is prohibited. The elements of prior-appropriation discourage conservation and encourage inefficient use of water. Under prior-appropriation, when an appropriator uses water more efficiently, and thus requires less water, she does not get to keep the water that she saves. The senior appropriator therefore has no incentive to save water because she would forfeit the water she saved.

The "beneficial use" doctrine of prior-appropriation has two main elements: (1) the type of use, and (2) the amount of water to satisfy that use.[24] If a use is beneficial but the water is used wastefully, the appropriator loses her rights. There are many

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19. *See* Lux v. Haggin, 69 Cal. 255 (1886).
20. *See id.*
21. *See id.*
22. Janet C. Neuman, *Beneficial Use, Waste, and Forfeiture: The Inefficient Search for Efficiency in Western Water Use*, 28 ENVTL. L. 919, 920 (1998).
23. *Id.* at 919.
24. *Id.* at 926.

uses considered beneficial, such as domestic, irrigation, farming, mining, industrial, and municipal. More recently, non-consumptive beneficial uses such as in-stream flow for fishing, wildlife habitat protection, and pollution abatement have become more prevalent.[25] In addition, as values change and scientific knowledge pertaining to water usage increases, particular practices that may not have raised an eyebrow in earlier times have been revealed as non-beneficial when viewed from a more contemporary perspective.[26]

Beneficial use requires actual, active use.[27] Nonuse of water or water used excessively so as to be considered a waste of water is forfeited or abandoned to junior appropriators.[28] Water that is legally wasted, though actively used, is not a legitimate part of the water right and is subject to challenge by junior appropriators.[29] The basic principle of waste is that "[n]o user is entitled to use more water than is reasonably [necessary] to accomplish his or her particular beneficial use, whether it is irrigation, domestic supply, manufacturing, or any other use."[30]

Though it seems the doctrine of waste should encourage conservation, it falls far short in times of need. To determine whether a use is wasteful, courts typically look at an amount of flow diverted in excess of the reasonable needs under customary practices.[31] If customary practices in a given industry seem unreasonable to junior appropriators or other users, it is difficult to challenge that customary practice as wasteful. Likewise, people who use water similarly are unlikely to challenge each other. For example, if one farmer is using sprinklers to farm her land, and sprinklers are inefficient, another farmer will not challenge that use as wasteful if she also uses sprinklers.

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25. *Id.* at 928.
26. *Id.*
27. *Id.*
28. *Id.*
29. *Id.*
30. *Id.* at 933.
31. *Id.* (citing Steven J. Shupe, *Waste in Western Water Law: A Blueprint for Change*, 61 OR. L. REV. 483, 491 (1982)).

III.
CALIFORNIA'S APPROACHES TO EFFICIENT WATER USE

In 1978, California was facing a potentially crippling water crisis.[32] In response, the Governor's Commission to Review California Water Rights Law ("Commission") issued a final report to address the water deficit and make recommendations for more efficient use.[33] At the time, California's net water demand exceeded the net dependable supply by around 2.4 million acre-feet.[34] Groundwater pumping was occurring way beyond natural recharge to combat the substantial water deficit, which further depleted California's water.[35]

The state water law at the time offered a framework for efficient water use, but the Commission expressed great concern about the lack of a clear definition in the California Constitution with regards to water rights.[36] The California Constitution restricts water use to amounts reasonably necessary for beneficial uses.[37] Section 2 offers little guidance in determining whether the reasonable beneficial use requirement is ever actually met. As mentioned above, courts relied on local custom to determine whether the reasonable beneficial use requirement of riparianism or prior-appropriation had been met.

When the Commission's Final Report was issued, salvaged water appropriation discouraged water conservation under existing law.[38] Salvaged water includes "new water introduced into a watercourse that would not have been available for beneficial use but for the salvage effort."[39] If a person uses

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32. Kimberly A. Felix, *Improving Efficiency in Water Use: An Overview of the Recommendations of the Governor's Commission to Review California Water Rights Law*, 36 MCGEORGE L. REV. 165, 165 (2005).

33. *Id.*; *see* GOVERNOR'S COMM'N TO REVIEW CAL. WATER RIGHTS LAW, FINAL REPORT (Dec. 1978), *available at* http://www.waterboards.ca.gov/publications_forms/publications/general/docs/l584a.pdf [hereinafter GOVERNOR'S COMM'N FINAL REPORT].

34. Felix, *supra* note 32, at 165.

35. *Id.*

36. *Id.*

37. *Id.*; *see* CAL. CONST. art. X, § 2.

38. Felix, *supra* note 32, at 166.

39. *Id.* at 166-67.

conservation methods to salvage water, however, it was unclear whether that person must then obtain a permit and license from the State Water Resource Control Board ("SWRCB") to hold a valid right for that salvaged water.[40] It was also unclear what priority a salvager received after salvage and diversion. These ambiguities in California law discouraged salvage efforts by conservationists.

Recognizing the severity of the water crisis, the Commission outlined a comprehensive policy with three focused approaches for improving efficiency: the regulatory approach, the market approach, and the administrative approach.[41] The regulatory approach sought to achieve efficiency by "restricting behavior that led to inefficient and non-beneficial water use."[42] The market approach emphasized the use of incentives to encourage efficient water use.[43] Lastly, the administrative approach sought to further streamline the water rights application process.[44]

As a result of the Commission's recommendations, the California state legislature adopted section 1011 of the California Water Code, which allows water users to retain their rights to all water "saved" through water conservation efforts.[45] The Water Code allows conserved water to be "sold, leased, exchanged, or otherwise transferred."[46] Though this section may help encourage water conservation, it does not require it. Voluntary water conservation is useful, and an incentive to conserve water in an effort to sell water rights is beneficial, but this section alone encourages only the most savvy water users to conserve. If a farmer has a right to water that she uses inefficiently, and she believes that upgrading her system to

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40. *Id.* at 167.

41. *Id.* at 169.

42. *Id.*

43. *Id.* at 170.

44. *Id.*

45. Craig Bell, *Promoting Conservation by Law: Water Conservation and Western State Initiatives*, 10 U. DENV. WATER L. REV. 313, 315 (2007); CAL. WATER CODE § 1011(a) (West 2000) ("[B]ecause of water conservation efforts, any cessation or reduction in the use of the appropriated water shall be deemed equivalent to a reasonable beneficial use of water to the extent of the cessation or reduction in use").

46. CAL. WATER CODE § 1011(b).

conserve water would not be worth the benefit of selling the water, the farmer is unlikely to upgrade her system. Furthermore, this section does not encourage water conservation for instream uses such as wildlife and habitat protection, recreation, or aesthetics.

California also targeted municipal water conservation incentives. California adopted statutory incentives encouraging cities to better manage their water resources and ensure a sustainable supply.[47] California's Urban Water Management Planning Act requires all "urban water suppliers" to prepare an Urban Water Management Plan ("UWMP").[48] In the plan, the urban water suppliers are required to describe conservation measures planned or implemented, including efficiency and demand management measures.[49] The state then offers grants and loans for the various programs, as well as drought resistance, so long as the plans are in compliance with the Act.[50] UWMPs must comply with conservation and information requirements of SWRCB and any other requirement imposed by "state law, regulation, or order."[51] These typically appear as building standards or appliance standards. These municipal codes are useful for water conservation, but they do not target some of the most inefficient uses of water that come from agricultural or industrial uses.

IV.
INTRODUCTION TO A TECHNOLOGY-BASED APPROACH

A. *Clean Water Act Approach*

Despite California's efforts to conserve water, drought problems are persistent. Voluntary conservation methods are

47. Bell, *supra* note 45, at 319.

48. CAL. WATER CODE § 10620 (2002) ("Every urban water supplier shall prepare and adopt an urban water management plan"); *see id.* § 10608.12(p), (q) (defining urban retail and wholesale water suppliers).

49. *See id.* § 10631(f).

50. *See id.* §§ 10621(b), 10631.5.

51. *Id.* § 10653.

simply not enough to conserve the water necessary to meet the ever-growing demand. Population in California continues to increase, the advent of hydraulic fracturing requires considerable amounts of water for injection, and farmers' thirst for water can never be quenched. With all this in mind, it is time California took a smart and reasonable approach to require water conservation. A technology-based approach would require that all users—whether agricultural, industrial, or municipal—use water efficiently.

Technology-based approaches first appeared in the CWA in 1972 as a response to the failed implementation of earlier health-based regulatory approaches adopted by the EPA.[52] The EPA had originally created standards to "protect the public health or welfare and enhance the quality of the water," which were intended to establish the maximum level of pollution that would be safe for individuals who drank or fished from waterways.[53] Most states did not adopt these standards because "they lacked the political will and the resources to do so," and as a result Congress turned to a technology-based program.[54]

The 1972 amendments "directed the EPA to set technology-based limits for pollutant discharges from existing industrial 'point sources,'" which would apply uniformly across members of a particular industrial category.[55] The EPA examined particular industries and the pollutants generated by those industries and determined what control options would be available.[56] There were two stages: (1) all existing industrial sources would have to satisfy discharge limits that reflected the best control technology practicable and currently available (referred to as "BPT" standards) by 1977;[57] and (2) these same sources would be

52. *See* Patricia Ross McCubbin, *The Risk in Technology-Based Standards*, 16 DUKE ENVTL. L. & POL'Y F. 1, 6 (2005).

53. *Id.*

54. *Id.* at 6-7.

55. *Id.* at 8 (quoting 33 U.S.C. §§ 1311(b), 1314(b) (2000)). For the full 1972 amendments, see Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816 (1973) (codified as amended at 33 U.S.C. §§ 1251-1387 (2000)).

56. McCubbin, *supra* note 52, at 8.

57. *Id.* at 8-9 (citing 33 U.S.C. §§1311(b)(1)(A)).

required to adopt stricter standards based on the best available technology that was economically achievable (referred to as "BAT" standards), by 1983.[58] In 1977, Congress amended the CWA again to include "best conventional technology," called "BCT" standards, for non-toxic pollutants that were found in abundance.[59]

For BPT standards and BCT standards, Congress required the EPA to do a cost-benefit analysis.[60] That means the EPA was required to consider the costs of reducing the pollutants and benefits from the effluent reductions to the public. As part of this cost-benefit analysis, "Congress required EPA to take costs into account to avoid imposing undue burdens on the regulated entities."[61] For some industries it was technically impossible to eliminate pollutants without ceasing operations due to the economic burdens, and for other industries, it was possible but very costly.[62] Considering "effluent reduction benefits," rather than referring to a level of safety, gave the EPA more flexibility to find reasonable technology that all members of an industry could adopt to reduce pollution without imposing burdens that would make particular industries completely uneconomical.[63] It was foreseeable that if the EPA imposed such substantial burdens, the political backlash would have been horrendous, so the technology-based approach with an emphasis on effluent reductions was a way to soften the blow while still making reasonable advancements in abating pollution.

Congress expressly established two goals for the EPA when creating BPT and BCT standards: (1) to eliminate harmful pollutants where possible using available control technology, and (2) to avoid imposing excessive burdens on the economy.[64] Congress did this by requiring the EPA to consider both the costs and the risk reduction benefits of candidate technologies when

58. *Id.* at 9 (citing 33 U.S.C. §§ 1311(b)(2)(A)).
59. *Id.* at 9-10 (citing 33 U.S.C. §§ 1311(b)(2)(E)).
60. *See* 33 U.S.C. § 1314(b)(4)(B).
61. *See* McCubbin, *supra* note 52, at 12.
62. *Id.*
63. *Id.* at 13.
64. *Id.* at 14.

selecting the "best" technology for an industry.

For setting the more stringent BAT standards, the EPA was not expressly required to consider any "benefits," but rather only the "cost of achieving an effluent reduction."[65] This standard has proved to cause problems due to its ambiguity, but the idea is that this more stringent standard should focus more on the best technology, regardless of the benefits.[66] However, if the costs are exorbitant, the EPA must be "reasonable." It is unclear exactly what a "reasonable" standard is, but some courts have interpreted it to mean that the EPA must choose the "best available" technology whose costs, in the EPA's judgment, is "reasonable" in light of the benefits, even if the costs do not necessarily justify the benefits.[67] Thus, the EPA is not looking at the optimal cost in relation to the benefit, but accepts a higher cost so long as there is some benefit.

Once the EPA sets a technology-based standard, all members within that industrial category must adopt the standards, but not necessarily the technology. That means that an industry can either adopt the technology, easily satisfying the standards, or reduce pollution another way as if it was using the technology.

B. *Clean Air Act Approach*

The EPA took a much less ambiguous technology-based approach under the CAA To understand how the CAA technology-based approach works, it is first crucial to understand how the CAA works generally. Under the CAA, the EPA uses both a health-based approach and a technology-based approach to regulate criteria pollutants and hazardous air pollutants.[68] This paper will only evaluate criteria pollutants. Criteria pollutants are those pollutants that in the EPA's

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65. *Id.* at 14 (quoting 33 U.S.C. § 1314(b)(2)(B)).

66. *Id.* at 14.

67. *See, e.g.*, *id.* at 17-18 (providing an overview of several cases where the court concluded that the costs of the technology must be reasonable compared to the benefits).

68. *See Id.* at 30 (citing 42 U.S.C. § 7412 (1999)) (discussing the shift from reliance on health-based standards to greater emphasis on technology-based approaches.

determination may "cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare," and the "presence of which in the ambient air results from numerous or diverse mobile or stationary sources."[69]

Congress directed the EPA to first identify what criteria pollutants exist.[70] Once the EPA identifies a criteria pollutant it must set a health-based standard for that pollutant, based on parts per million in the ambient air.[71] Once the standard is set the EPA classifies different regions to determine whether a particular air shed has met the health-based standard.[72] If an area has met the standard, that area is designated as in "attainment," and the air shed must remain in a state of attainment.[73] In other words, the state must adequately assure the EPA that it will continue to meet the health-based standard in the future.[74]

If an area does not meet the health-based standard then that area is classified as "non-attainment."[75] There are different ranges of non-attainment based on the severity of the air pollution: marginal, moderate, serious, severe, and extreme.[76] Once an area is designated as non-attainment the CAA requires states to develop a State Implementation Plan ("SIP"), which the EPA must approve and is essentially a one-way road to attainment.[77] The SIP is a set of proposals developed by the state that explicitly prove to the EPA that the state will meet the statutory requirements of the CAA, maintain the attainment regions, and reach attainment in the non-attainment regions.[78]

The technology-based standards are one of the many tools that states must use to maintain and make reasonable progress toward attainment. There are different technology-based

69. 42 U.S.C. §§ 7408(a)(1)(A)-(B).
70. *See* 42 U.S.C. § 7408(a)(1).
71. *See* 42 U.S.C. § 7409(b).
72. *See* 42 U.S.C. § 7407.
73. *See* 42 U.S.C. § 7407(d).
74. *See id.*
75. *See* 42 U.S.C. § 7501(2).
76. *See* 42 U.S.C. § 7511.
77. *See* 42 U.S.C. § 7410.
78. *See id.*

standards based on time, size, and location. For instance, all existing major stationary sources of a criteria pollutant in a non-attainment region must adopt Reasonably Available Control Technology (RACT).[79] Similar to the CWA, a stationary source is not required to actually adopt the technology, but the source is required to meet that standard as if it did adopt the technology. This approach allows flexibility from the polluting source.

For example, if a stationary source has three smoke stacks that each emit 10 tons of a pollutant (30 tons total), and the EPA adopts a standard that requires each stack to emit 5 tons (15 tons total), the source has multiple options to reduce its pollution from a total of 30 tons to 15 tons. The source may adopt the technology on each smoke stack, thereby reducing the emissions from 30 tons to 15 tons, or the source can completely shut down one smoke stack, install the technology on one smoke stack, and leave the third smoke stack unimpaired, which would also result in an emission reduction from 30 tons to 15 tons.

In developing a RACT standard, the EPA looks at various factors ranging from the availability of controls to the capital and operating costs of those controls. Typically, a RACT standard is based on technology that is commercially available and widely used, and is therefore reasonably available. There is nothing that requires the EPA to do a cost-benefit analysis when examining a RACT standard, but there is also nothing in the CAA that specifically excludes the EPA from doing a cost-benefit analysis in developing the standard.

The next technology-based standard that the EPA uses is the Best Available Control Technology (BACT) standard.[80] BACT is required in all new major sources in attainment regions.[81] The purpose of the BACT standard is for maintenance of attainment, and the general idea is that any new source should adopt the best available technology that exists. There is no reason that new sources of pollution should adopt old and dirty technology. In determining a BACT standard, the EPA will again look at various factors and technologies; however, it does not matter

79. *See* 42 U.S.C. § 7502(c)(1).
80. *See* 42 U.S.C. § 7479(3).
81. *See* 42 U.S.C. § 7475(a)(4).

whether the technology is currently being used, so long as it is commercially available.[82] If a technology is used by one source, that alone makes it commercially available and potentially BACT. If a technology is only used by one source, it likely is not reasonably available, and thus BACT is more stringent than RACT.

The most stringent technology standard in the CAA is the Lowest Achievable Emission Rate (LAER) standard.[83] LAER is required on all new major sources in non-attainment regions.[84] Congress realized that it could not stymie all economic development in polluted areas by not allowing construction of new facilities. Instead, Congress allowed the construction of new facilities in dirty air sheds, but those new facilities must adopt a very strict technology standard. A LAER standard is based solely on whether the technology exists or could exist in the near future. In other words, the LAER standard is potentially technology-forcing, requiring new sources in non-attainment regions to adopt a standard based on a technology that might not exist yet, but will exist soon. Even if no facility uses the technology, if the technology exists, it can be used to set a LAER standard.

C. *The Clean Air Act Was Successful*

Air pollution has a long history in the United States, and ineffectual policies to regulate that pollution led to the CAA. Air pollution emerged as a problem in the late 1800s when modern industrial-based cities began appearing.[85] Cities relied on cheap fuel supplies like coal, and the more the cities burned these fuels, the dirtier the cities became.[86] Until Los Angeles began controlling smog in the 1940s, most local programs in the United States only attempted to control smoke.[87] Between the 1940s and

82. *See* 40 C.F.R. § 51.165(a)(1)(xl) (2011).

83. *See* 42 U.S.C. §§ 7501(3), 7503(a)(2).

84. *See* 42 U.S.C. § 7503(a)(2).

85. Arnold W. Reitze, Jr., *A Century of Air Pollution Control Law: What's Worked; What's Failed; What Might Work*, 21 ENVTL. L. 1549, 1576 (1991).

86. *See id.*

87. *Id.*

the 1960s, movements were gaining momentum across the United States to control the pollution.[88] There was political tension between those concerned with economic "progress" and those concerned with the maintenance of a healthy physical environment.[89] Eventually, when the nation began to prioritize the environment in the 1960s, there was little data available to understand the health impacts of air pollution, and the federal government stepped in to begin regulating with the CAA.[90]

When the 1990 CAA Amendments became law, the costs to implement its provisions were estimated to be between $20 billion and $100 billion per year.[91] Despite these large costs, the EPA has evaluated the CAA in prospective studies, determining that the benefits of the CAA exceeded the costs by a factor of more than thirty to one.[92] According to the EPA data, the CAA Amendments of 1990 will prevent over 230,000 early deaths by 2020, up from 160,000 in 2010.[93] The table below[94] shows the expected improvements that the CAA will have in preventing death and disease, which is based on nearly forty years of air monitoring and data collection:

THE 1990 CAA AMENDMENTS PREVENT:	YEAR 2010 (IN CASES)	YEAR 2020 (IN CASES)
Adult Mortality – Particles	160,000	230,000
Infant Mortality - Particles	230	280
Mortality – Ozone	4,300	7,100
Chronic Bronchitis	54,000	75,000
Heart Disease - Acute Myocardial Infarction	130,000	200,000
Asthma Exacerbation	1,700,000	2,400,000
Emergency Room Visits	86,000	120,000
School Loss Days	3,200,000	5,400,000
Lost Work Days	13,000,000	17,000,000

88. *See id.* at 1578-80.

89. *Id.* at 1579.

90. *Id.* at 1581.

91. *Id.* at 1550.

92. *See Benefits and Costs of the Clean Air Act; Second Prospective Study – 1990 to 2020*, ENVTL. PROT. AGENCY, http://www.epa.gov/cleanairactbenefits/prospective2.html (last updated Aug. 15, 2013).

93. See *id.*

94. *Id.*

The EPA states that reductions in premature mortality associated with reductions in ambient particulate matter (one of the six criteria pollutants) are responsible for most of the economic benefits.[95] The 1990 CAA Amendments have a net improvement on economic growth because "cleaner air leads to better health and productivity for American workers as well as savings on medical expenses for air pollution-related health problems."[96]

Enforcement of the CAA legislative mandates has clearly improved human health by limiting the amount of pollution that may enter the natural environment.[97] After four decades of air quality monitoring mandated by the CAA, the average "life span in the United States has increased by 0.4 to 0.8 years due to government-mandated reductions in particulate matter."[98] Though environmental ethics involve difficult tradeoffs among competing values, forty years of federally-mandated and funded data collection and analysis show that more often than not, improved air quality lowers the incidence of air-induced diseases.[99]

V.
TECHNOLOGY-BASED STANDARDS AS APPLIED TO WATER CONSERVATION

The data collected by the EPA and state agencies pursuant to the CAA depict the effectiveness of command-and-control laws. Air pollution was a growing problem in this country, and Congress devised a successful policy for tackling that problem. Just as air pollution was a growing problem during the industrial revolution, sufficient water is becoming increasingly scarce, while populations and uses continue to grow. A technology-based approach to water conservation would be an effective tool to require users to use water more efficiently in a

95. *See id.*

96. *Id.*

97. *See id.*

98. Tracy Bach, *Protecting Human Health and Stewarding the Environment: An Essay Exploring Values in U.S. Environmental Protection Law*, 3 MICH. J. ENVTL. & ADMIN. L. 249, 250 (2014)

99. *See id.*

reasonable and cost effective manner.

Before delving into the details of how the technology-based system would function in the water context, it is important to address what agency would have authority to implement the system. The following section discusses the legality of this regulatory authority, but for now the take home point is that the SWRCB is the agency that should be charged with the mandate of configuring a technology-based system for water conservation. To give the agency that authority, the California state legislature could pass a bill requiring the SWRCB to devise a technology-based standard, or the SWRCB could use its own authority to implement standards based on its power to prevent waste and unreasonable use.

Conserving water is crucial for California's economy, but it is not as complicated as maintaining certain ambient health-based standards. With that in mind, the SWRCB should adopt a system somewhat simpler than the CAA and the CWA. Rather than having three or four standards, an efficient technology-based approach to water conservation should only have two standards: (1) Reasonably Available Conservation Technology ("RACT"), and (2) Best Available Conservation Technology ("BACT").

The RACT standard should be similar to BPT[100] and BCT[101] under CWA; the California Legislature should require SWRCB to perform a cost-benefit analysis to determine the technological standard. This means the SWRCB would be required to consider the costs of implementing the technology standards and the benefits from conserving the water for the public. The SWRCB may even use the knee of the curve under the cost-benefit analysis, meaning that the SWRCB should adopt a technology standard where the marginal increase in costs do not surpass the marginal benefits. By taking costs into account, the SWRCB will not impose undue burdens on regulated entities.

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100. *See* 33 U.S.C. § 1314(b)(1) (2000); *see also supra* notes 57, 60-64 and accompanying text.

101. *See* 33 U.S.C. § 1314(b)(4); *see also supra* notes 58-64 and accompanying text.

The BACT standards for water conservation should be aligned with a BACT[102] or LAER[103] standard from the CAA. The SWRCB should not focus on costs when creating the standard, but should rather focus on the benefits of the technology. The SWRCB should look at technologies that exist or that are commercially available, but not necessarily reasonably available or widely used. It may still be wise, however, for the SWRCB to use a "reasonable" standard similar to the strict BAT standard found in the CWA as a ceiling for creating a technology standard.[104] In other words, it would make sense for the SWRCB to consider costs in creating a BACT standard, but it should not have to justify the costs to the benefits. This would prevent the SWRCB from adopting a technology standard that had only a very minor benefit but exorbitant costs.

Similar to the CAA, the technology-based system for water conservation should be based on use categories such as agricultural, industrial, and municipal. Within the agricultural category, the SWRCB may further create sub-categories based on crop, location to water source, region, and other factors that may help differentiate between agricultural users. This is necessary because an efficient water system for fruit or nut trees may be very different than a system for watering major crops like rice or wheat. The SWRCB could then create sub-categories for each main category. Thus, industrial categories may be broken into manufacturers, refineries, power plants, oil production and injection, and so forth. Once each category is identified, the SWRCB should then evaluate technology standards particular to that industrial category.

This is a time consuming approach, but once complete, the SWRCB will have an inventory of available technologies, an understanding of how good those technologies are at conserving water, and estimates for how much those technologies cost. It

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102. *See* 42 U.S.C. § 7479(3); *see also supra* notes 80-82 and accompanying text.

103. *See* 42 U.S.C. § 7501(3); *see also supra* notes 83-84 and accompanying text.

104. *See* 33 U.S.C. 1311(b)(2)(A); *see also supra* notes 58, 65-67 and accompanying text.

may take a couple of years for the SWRCB to make this inventory, but once the inventory is made, it will be much easier for the SWRCB to update it with new technology standards.

A technology-based approach also creates an incentive for manufacturers to invent better technology. If a company can invent a water conservation technology that the SWRCB categorizes as RACT, the SWRCB would require users to adopt that standard, and presumably that company's technology. Manufacturers would be allowed to petition the SWRCB to evaluate their technology as a way to augment the standard, and if the technology sets the standard, the manufacturer could potentially make a hefty profit if users adopt it.

Agricultural irrigation systems provide a simple example of how a technology-based approach may work. According to EPA estimates, drip irrigation not only saves water, but saves money over time because the system is easier to maintain, and of course uses less water.[105] According to the EPA, drip irrigation can save about $7,000 in ten years in water use per acre as compared to sprinklers.[106] Many farmers have switched to drip irrigation simply because it saves water and money. There are still many farmers, however, that have not switched to drip irrigation because they already have senior water rights for essentially free water, and almost zero incentive to invest in better technology. Requiring all farmers to invest in a reasonably available control technology such as drip irrigation could potentially save millions of gallons of water, while actually saving money in the long run.

Drip irrigation delivers water (and fertilizer) either on the soil surface or directly to the roots of plants through systems of plastic tubing with small holes and other restrictive outlets.[107] By distributing inputs slowly and regularly, drip irrigation conserves 50 to 70 percent more water than traditional methods

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105. *See Sub-Surface Drip Irrigation Cost Calculator*, ENVTL. PROT. AGENCY 7, http://www.epa.gov/osw/conserve/tools/greenscapes/tools/drip.pdf (last modified Oct. 19, 2012).

106. *Id.* at 1.

107. *See Thirty-Five Water Conservation Methods for Agriculture, Farming, and Gardening*, BIG PICTURE AGRIC. (Feb. 12, 2013), http://www.bigpictureagriculture.com/2013/02/thirty-five-water-conservation-methods-agriculture-farming-gardening-323.html.

while increasing crop production by 20 to 90 percent.[108] Drip irrigation can exceed 90 percent water efficiency whereas sprinkler systems are 50 to 70 percent efficient because drip systems feed the water directly to the roots, preventing runoff and evaporation.[109] The low volume application of water to plant roots maintains a desirable balance of air and water in the soil.[110] Plants grow better with this balance; water from drip irrigation technology is applied frequently at low flow rates with the goal of applying only the water plants need.[111] In contrast, sprinkler irrigation results in a greater wet-to-dry fluctuation in the soil and may not produce optimal growth results.[112]

Drip irrigation saves both the time and labor that would otherwise be needed to water crops, leading to larger harvest yields.[113] The technology must be tailored to the crop conditions and particular crops, and there are many different types of drip inserts, which can be incorporated into the hoses and soaker hose segments used.[114] Drip irrigation systems, however, are less suitable for major rice growing areas or for staple grain growing; they are more suitable for vegetables, fruits, shrubs, and trees.[115] Within the last two decades, the areas irrigated using drip irrigation have increased more than six-fold to over 10 million hectares.[116]

Drip irrigation is clearly a reasonably available conservation technology. Under the California Constitution, the right to water "shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or

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108. *Id.*

109. *Water-Saving Technologies*, ENVTL. PROT. AGENCY, http://www.epa.gov/watersense/outdoor/tech.html (last visited Apr. 11, 2015).

110. C. Wilson & M. Bauer, *Drip Irrigation for Home Gardens*, COLO. STATE UNIV. EXTENSION (July 2014), http://www.ext.colostate.edu/pubs/garden/04702.html.

111. *Id.*

112. *Id.*

113. BIG PICTURE AGRIC., *supra* note 107.

114. *Id.*

115. *Id.*

116. *Id.*

unreasonable method of use or unreasonable method of diversion of water."[117] Drip irrigation would limit the use of water to the amount necessary for a given crop. By implementing a technology-based standard, any amount of water in excess of what is required by the standard would be considered waste since inefficient technology requires more water to serve the same purpose.

According to the EPA, conserving water and money is just the beginning of the benefits derived from drip irrigation: it reduces runoff and non-point source pollution, improves groundwater recharge, improves soil quality and retards erosion, supports local ecology, preserves wildlife habitat, conserves fossil fuels, reduces air pollution and improves air quality, and reduces human exposure to hazardous material.[118] If all farmers were required to adopt drip irrigation, the benefits would be substantial.

The question becomes how is the standard adopted, and who must adopt the standard? In evaluating RACT for irrigation, there are many different types of drip irrigation systems. There are numerous companies making and promoting the technology, and different systems are better for different types of crops. The SWRCB should evaluate sub-categories of crops between vegetables, major crops like rice and wheat, and trees. The SWRCB should then use a cost-benefit analysis to determine what drip irrigation system best meets the need of that type of crop.

All existing water users should have to adopt RACT since the technology is reasonably available. Obviously there will be a lot of pushback because many farmers who have secured senior water rights will have no interest in investing in new technologies, but the standard should apply evenhandedly. Drip irrigation systems will actually save farmers money in the long run by reducing water use, labor use, and improving crop harvests. The SWRCB will need sufficient time to evaluate different technologies in different categories. Once the SWRCB begins categorizing technology standards, the data it creates will

117. CAL. CONST. art. X, § 2.

118. *See* ENVTL. PROT. AGENCY, *supra* note 105, at 7.

make it much easier to adopt more efficient standards going forward. Farmers should also be given an adequate amount of time to meet the standard once it is identified by the SWRCB—one year seems reasonable.

To soften the blow on existing users, BACT should be reserved for new users. By requiring all existing users to adopt RACT standards, millions of gallons of water would potentially be saved in California. All that water would allow new junior users to gain water rights and enter the water market. Similar to the CWA and the CAA, new users have no excuse for not adopting the best technology, and therefore new users should have to adopt BACT standards. BACT standards would simply be the best technology available, regardless of cost, so long as the costs are not exorbitant. This approach would allow more water users to enter the market while still conserving large amounts of water.

As explained earlier, Section 1011 of the California Water Code allows water users to retain their rights to all water "saved" as a result of water conservation efforts.[119] The Water Code allows conserved water to be "sold, leased, exchanged, or otherwise transferred."[120] Thus, when existing users adopt new technology standards, they should retain their rights to the water saved; granted, that water right is still subject to a beneficial use standard under prior-appropriation. This means that a water user can either put the newly saved water to beneficial use or transfer it to new users. This will help reduce opposition to technology-based standards, while allowing existing users to make a potential profit from selling water saved by adopting the new standards. New users can then buy water from existing users, and put that water to beneficial use so long as the new user adopts a BACT standard.

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119. CAL. WATER CODE § 1011(a) (West 2000); *see also supra* notes 45-46 and accompanying text.

120. CAL. WATER CODE § 1011(b).

VI.
IMPLEMENTING AND ENFORCING THE STANDARDS

A. *Implementation*

There are two possible routes to implement technology-based standards in California. The first method would be for the California state legislature to pass a bill authorizing and requiring the SWRCB to regulate efficient water use by devising technology-based standards. The state legislature has the authority to require the SWRCB to manage water in a way that will best serve the public interest, and the legislature can use its authority to pass a bill that specifically dictates how the SWRCB should create the standard or provide the SWRCB with basic guidelines to develop a standard using its own discretion. Despite that authority, passing a water law bill is difficult due to intense opposition from stakeholders and competing interests.

The other route to implement a technology-based standard arises from authority already delegated to the SWRCB. As mentioned in previous sections, a water right under prior-appropriation is limited to beneficial use, and a water right under riparianism is limited to what is reasonable.[121] Water not put to beneficial use under prior-appropriation is considered waste and thereby forfeited.[122] The basic principle of waste is that no user is entitled to more water than is reasonably necessary to accomplish his or her particular beneficial use.[123] Similarly, under riparianism, water rights are limited to an amount that is reasonable for a particular use, where some uses are more reasonable than others.[124]

The SWRCB has authority under the California Constitution and the California Water Code to prevent waste and unreasonable use.[125] Pursuant to the California Constitution, the

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121. *See* discussion *supra* Part II.
122. See discussion supra Part II.B.
123. *See id.*
124. *See* discussion *supra* Part II.A.
125. *See* CAL. CONST. art. X, § 2; CAL. WATER CODE § 100 (West 1943).

right to water is "limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or unreasonable method of use or unreasonable method of diversion of water."[126] Pursuant to the California Water Code:

> [T]he general welfare requires that the water resources of the state be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such water is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.[127]

Under these two state provisions, the SWRCB could implement a technology-based standard like drip irrigation under the argument that less efficient technologies use more water than is reasonably required and do not put water in the state to a beneficial use to the fullest extent capable. Since drip irrigation is cost effective, any amount of water beyond what is required for a drip irrigation system for a particular crop may be unreasonable. Furthermore, if all farmers adopted drip irrigation systems, those farmers would be putting water in the state to a beneficial use to the fullest extent capable. Sprinklers would become excessive and even wasteful.

In 1988, the SWRCB used its authority under the California Constitution and California Water Code to require the Imperial Irrigation District ("IID") to take specified measures to conserve water after finding that IID had misused water.[128] In that case, a farmer had complained to the SWRCB that (1) IID was maintaining canals in overly full conditions, which caused frequent spills; (2) the absence of reservoirs caused the unnecessary delivery of excess amounts of water; (3) excess water was delivered to headgates, which resulted in excess tailwater; (4) there was an absence of tailwater recovery systems to capture the runoff for productive purposes; and (5) excess

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126. CAL. CONST. art. X, § 2.

127. CAL WATER CODE § 100.

128. *See In the Matter of Waste and Unreasonable Use of Water by Imperial Irrigation District*, Order No. WR 88-20, 1988 WL 1568205 (Sept. 7, 1988)

water was being delivered to farmers, which could not be used and thereby drained into the nearby Salton Sea.[129]

The SWRCB stated in its finding of waste that if parties "demonstrate[d] an intention to utilize water which could be conserved through reasonable conservation measures, the failure to undertake such conservation may be found to be unreasonable."[130] The SWRCB further explained that "[t]he fact that water conservation may require the water user to incur additional expense provides no justification to continue wasteful or unreasonable practices."[131] The SWRCB noted that the California Court of Appeals had previously ruled that "water users may properly be required to endure some inconveniences or to incur reasonable expenses in order to comply with the constitutional standard of putting the water resources of the state to maximum beneficial use."[132] The SWRCB held that there were practices available to reduce the present losses of water within the IID, concluding that failure to implement additional water conservation was unreasonable and constituted a misuse of water pursuant to the California Constitution and the California Water Code.[133] The California Court of Appeals in the Fourth District later upheld SWRCB's Decision.[134]

Based on that decision, the SWRCB could make a strong argument that technology-based standards like drip irrigation are required under the California Constitution and the California Water Code. First, the RACT standard is developed using a cost-benefit analysis, which would require the SWRCB to justify the costs to the benefits, thereby providing for a reasonable standard. Since it is reasonable by definition, the failure to undertake a reasonable method of conservation such as

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129. *In the Matter of Alleged Waste and Unreasonable Use of Water by Imperial Irrigation District*, Decision No. 1600, 1984 WL 947798, at *2-*3 (June 21, 1984) [hereinafter Decision 1600].

130. *Id.* at *12.

131. *Id.* at *13 (citing People *ex rel.* State Water Res. Control Bd. v. Forni, 54 Cal. App. 3d 743 (1976)).

132. *Id.* at *13.

133. *Id.* at *32.

134. *See* Imperial Irrigation Dist. v. State Water Res. Control Bd., 186 Cal. App. 3d 1160 (4th Dist., 1986).

technology-based standards may be considered unreasonable or wasteful. As the SWRCB's decision regarding IID states, the fact that water conservation may force water users to incur reasonable expenses provides no justification to continue wasteful practices.[135] A RACT standard utilizing cost-benefit analysis would ensure that expenses incurred are reasonable, and failure to adopt the standard could be considered a wasteful practice. As the IID decision further states, water users may even be required to endure some inconveniences or to incur reasonable expenses in order to comply with the constitutional standard of putting the water resources of the state to maximum beneficial use.[136] The SWRCB could therefore properly require water users to adopt technology-based standards because those standards would meet the constitutional criteria of putting water resources to maximum beneficial use.

Using its authority under the California Constitution and California Water Code, SWRCB could implement technology-based standards in two ways. California Water Code Section 174 provided the agency with rulemaking and adjudicatory functions to manage state water resources.[137] The first possible way for SWRCB to implement technology-based standards would be to issue a regulation declaring that existing users who do not use RACT and new users who do not use BACT are considered wasteful or unreasonable. In other words, the SWRCB could claim under the California Constitution and California Water Code that a reasonable and beneficial amount of water is limited to an amount that meets reasonably available conservation technology standards. Any amount of water in excess of the technology-based standard would be unreasonable. Thus, if the standard for agricultural use were based on a drip irrigation system, the amount of water used for a sprinkler system would be unreasonable under the proposed regulation.

For a new regulation, the SWRCB would be required to follow California rulemaking procedures under the California

135. Decision 1600, *supra* note 129, at *13.
136. *Id.*
137. CAL. WATER CODE § 174 (West 2014).

Administrative Procedure Act.[138] The California Government Code closely follows the Federal Administrative Procedure Act,[139] and the SWRCB would have to conduct notice and comment procedures for a rule. This is a lengthy process that will endure fierce opposition.

To avoid rulemaking procedures, the other method the SWRCB could use to implement a technology-based standard is to prepare a guidance document that does not have the force of law. The guidance document would essentially serve the same purpose as a regulation. The SWRCB could declare that in its evaluation of whether an individual is wasting water or using it unreasonably, it will take into account conservation technologies. The SWRCB could lay out what technology-based standards are considered reasonable (thereby defining RACT) and then claim that any amount of water above the standard is considered waste. Since guidance would not be binding, the SWRCB would have to implement it using adjudication on a case-by-case basis. That means that the SWRCB could publish the guidance, then find a user in violation of the beneficial use or reasonable use standard, and argue that the user is being wasteful by not using reasonably available conservation technology measures analyzed in the guidance.

B. *Enforcement*

Since the SWRCB would likely be in charge of developing the rule—whether the state legislature passed a bill or SWRCB used its own rulemaking authority to draft a regulation—the SWRCB should also be in charge of enforcing the standards. The SWRCB probably does not have the funding or labor force to completely oversee such a widespread standard, however, so interested private parties and environmental organizations would likely play a role in notifying the SWRCB of violations. It is also important to note that private parties and environmental organizations may have a cause of action that would require the SWRCB to adopt a technology-based standard by using the

138. *See* CAL. GOV'T CODE § 11340 (West 1993); *id.* § 11340.1.
139. *See* 5 U.S.C. §§ 500 et seq. (West 1967).

petition procedure in the California Government Code.[140]

Before describing enforcement of the standard, there remains the question of whether private parties and environmental organizations could require the SWRCB to create a water conservation technology-based standard if the SWRCB chose not to develop a standard on its own accord. Under California Government Code section 11340.6, any person or organization has the right to petition a state agency for adoption, amendment, or repeal of a regulation.[141] Under California Government Code section 11340.7, the agency must respond to the petition by granting or denying it.[142] If the agency denies the petition, any interested person may obtain judicial review to the validity of an order of repeal by bringing an action for declaratory relief in the superior court.[143] An order of repeal may be declared invalid if the agency's declaration is in conflict with substantial evidence on the record.[144]

Since the California Constitution and California Water Code require that water resources in the state be put to maximum beneficial use to the fullest extent capable, a petitioner would have a strong argument that a technology-based standard, particularly drip irrigation in agriculture, is necessary to utilize the state's water properly. The SWRCB would have to respond by claiming that the current technology and conservation regime used in the state is adequate to meet the needs of the state by preventing waste. The SWRCB has wide discretion in denying a petition, but it may be difficult for the SWRCB to reasonably explain how not using cost-effective technology like drip irrigation, which would prevent waste, meets the constitutional standard of putting the state's water resources to maximum beneficial use. Drought has become commonplace in California and throughout the arid West, and a technology-based standard is a reasonable solution to minimizing the consequences of a declining water supply.

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140. *See* CAL. GOV'T CODE § 11340.6.
141. *Id.*
142. *Id.* § 11340.7.
143. *Id.* § 11350(a).
144. *Id.* § 11350(b)(2).

Once the potential standard goes into effect, the SWRCB should incorporate the standards into the existing permit system.[145] Water rights permits carefully spell out the amounts, conditions, and construction timetables for proposed water projects.[146] The Board's Division of Water Rights maintains records of water appropriation and the amount of water used statewide.[147] The Board has the authority to enforce the conditions of both the permit and the license and is empowered to revoke either in case the conditions are not met.[148] Despite the authority to revoke a permit or license when conditions are not met, the SWRCB may not have the labor force necessary to catch every violation.

As seen in Decision 1600 explained in the previous section,[149] private parties can help the SWRCB enforce water law by notifying the SWRCB when they believe that an individual is in violation of a permit or the California Water Code. In the Decision 1600, the original petitioner was a farmer named John Elmore who requested that the California Department of Water Resources (predecessor to the SWRCB) investigate the alleged misuse of water by the IID.[150] It is important to note that John Elmore was a farmer who had an injury due to the alleged waste of water because the excess water was overflowing and degrading his farmland.[151] John Elmore had Article III standing since he had a concrete injury (excess water damaging farmland), the injury was caused by the IID's wasteful practice (allowing the water to overflow from canals), and the injury would be redressed if the IID took reasonable conservation measures to prevent the water from overflowing.[152]

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145. State Water Res. Control Bd., *The Water Rights Process,* CAL. ENVTL. PROT. AGENCY, http://www.waterboards.ca.gov/waterrights/board_info/water_rights_process.shtml#process (last visited Apr. 11, 2015) [hereinafter *The Water Rights Process*].

146. *Id.*

147. *Id.*

148. *Id.*

149. *See supra* notes 128-134 and accompanying text.

150. Decision 1600, *supra* note 129, at *1.

151. *Id.* at *18-*19.

152. *See generally* Lujan v. Defenders of Wildlife, 504 U.S. 555, 560 (1992)

Decision 1600 shows that a private party who is harmed by unreasonable use of water—whether because that unreasonable use actually damages physical property or impacts that user's water right—likely has a cause of action to request the SWRCB to enforce permit conditions. However, it is not clear whether an environmental organization would have standing to notify the SWRCB to enforce water law, particularly the proposed technology-based standards. The SWRCB claims that when considering permits, it considers flows needed to preserve in-stream uses such as recreation and fish and wildlife habitat.[153] That consideration does not necessarily give environmental organizations a cause of action, especially for technology-based standards, which are more focused on conserving water from inefficient uses rather than putting the water to use for in-stream conservation purposes. Since it is unclear whether environmental organizations could enforce technology-based standards, the SWRCB should include a citizen suit provision in the regulation explicitly granting any citizen the opportunity to enforce a violation of a permit condition.

When Congress passed the CAA, it was well aware of the funding necessary to first develop pollution control rules and then enforce them. Rather than putting the onus entirely on the EPA, Congress included a citizen suit provision to aid the EPA in enforcement.[154] Since this proposed technology-based standard closely resembles the CAA, the SWRCB should similarly include a citizen suit provision in any regulation for water conservation. The citizen suit provision in the CAA states:

> any person may commence a civil action on his own behalf against any person including the United States and any other governmental instrumentality . . . who is alleged to have violated . . . or to be in violation of an emission standard or limitation under this chapter or an order issued by the Administrator or a State with respect to such a standard or

(explaining the requirements for Article III standing, which are injury, causation, and redressability).

153. *See The Water Rights Process*, *supra* note 145.

154. *See* 42 U.S.C. § 7604 (West 1990).

limitation.[155]

A regulation for technology-based standards applied to water conservation should have the same provision allowing any citizens to commence suit. If any citizens could allege permit violations, this would create more reliability that the technology-based standards would be enforced without the entire burden falling on an administrative agency. This would also encourage water users not to violate permit conditions knowing that any watchdog organization could bring suit against them.

VII.
OPPOSITION TO A TECHNOLOGY-BASED STANDARD

The two main oppositions to technology-based standards will each come from different ends of the political spectrum. The expected opposition from the industry side is that it will cost too much money to implement. From a political point of view, people do not like to be told what to do, so any command-and-control law will face opposition from people that are set in their ways. From the other side, environmentalists may argue that technology-based standards are not as strict as they should be, especially if the proposed law allows the SWRCB to use a cost-benefit analysis. Before pursuing any new laws or regulations for water conservation, it is important to address potential opposition that may hinder the chances of the legislature passing a bill or the SWRCB implementing a regulation.

Water users who are forced to adopt technology-based standards will likely aggressively oppose any new bill or regulation because it will require them to spend money. The current water regime in California of riparianism and prior-appropriation has basically made water free to most users. Market based approaches for conserving water, such as changing the price of water, are presented quite frequently.[156] The idea is that if water is more expensive, people will voluntarily make

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155. *Id.* § 7604(a)(1) (punctuation omitted).

156. *See, e.g.*, GOVERNOR'S COMM'N FINAL REPORT, *supra* note 33, at 59-69 (outlining various market incentive proposals to encourage water conservation and efficiency).

more efforts to conserve the water. Even a water pricing approach will face stern opposition, however, and there is no proof that if water is more expensive water users will invest in better technology to use water more efficiently. Many corporate water users may pay the increased prices rather than conserve water, and there are many reasons why conserving water is worth more than the potential amount of money earned.

A command-and-control technology-based approach guarantees that a certain amount of water is conserved. As discussed in the CAA section of this paper,[157] technology-based approaches have worked to reduce air pollution significantly and have actually proven cost effective. A technology-based approach would likely save money and water, and with it create a host of other benefits. The system explained above has certain built-in guidelines that should minimize opposition to a future bill or regulation.

The first way to minimize opposition from the industry side is to create the standard RACT using a cost-benefit approach, and apply the law evenhandedly. All existing water users in a particular category would have to apply the same standard. As explained in the example of drip irrigation, the implementation of new technology would save water, increase harvests, reduce labor costs, and save money in the long run since a drip system requires less maintenance. Though a new system requires a lot of upfront costs, once the system is in place, users will notice the benefits immediately. Since the SWRCB would use a cost-benefit analysis, users would be assured that the amount of water saved by the standard would be commensurate with the cost of the technology used.

The next way to minimize opposition flows directly from the amount of water that the technology would save. As mentioned above, existing users that adopt the technology should retain the rights to their water. Since that water right would be limited to a beneficial use, if a water user does not put the water to a beneficial use, the user can transfer, exchange, or sell the water right under state law.[158] Thus, since the cost-benefit analysis

157. *See* discussion *supra* Part IV.B.

158. *See* CAL. WATER CODE § 1011(b) (West 2000).

would ensure that the cost of technology is proportional to the amount of water saved, and the user would get to keep the water saved, the user would retain most of the benefits from the standard. This differs from pollution abatement since there is nothing beneficial to save when reducing pollution.

Lastly, requiring new users to adopt a BACT standard assures that existing users will not have to spend as much money as new users entering the market. Since existing users will not have to conserve as much water as new users, they will have a leg-up in the market place. This should minimize opposition from existing users who may fear that new water users will gain an advantage over them. Since new users would have to use BACT, it also ensures that new users will conserve as much water as possible so that there is a reasonable amount of water consistently available for other uses.

With all of these safeguards designed into a technology-based approach for water conservation, it is actually in the best interest of industries to endorse this method. Despite the large upfront costs, water users would likely get more water, the opportunity to sell water, and save money in the long-term. The only cost to water users is replacing the technology, whereas a market-based approach, such as making water more expensive, would increase the costs of water indefinitely.

Environmentalists concerned with conserving water for ecological uses may fear that the proposed law or regulation would not conserve enough water generally, and more specifically, would not conserve enough water for in-stream uses. Since the law uses a cost-benefit analysis, there will undoubtedly be certain technologies that would save a lot of water, but would cost too much money for the SWRCB to implement. Though that may be correct, the current system does little to nothing to incentivize the voluntary conservation of water. Requiring users to conserve water, even a reasonable amount, would have huge positive impacts on California. Since a cost-benefit analysis would help minimize industry opposition, environmentalists should welcome any reasonable conservation.

The other environmental concern is that the proposed technology-based standard does nothing to require in-stream uses of conserved water. Although this is true, any conserved

water makes it more likely that there will be water available for in-stream purposes. It is difficult enough to fight for in-stream uses when water is not available. Since a command-and-control approach would guarantee that water is conserved, it would give environmentalists ammunition to argue that more water must be applied for in-stream uses under the public trust doctrine.

In 1983 the California Supreme Court in *National Audubon Society v. Superior Court* essentially gave the SWRCB authority to require more water for in-stream uses under the public trust doctrine.[159] Thirty years after that decision, it appears that the public trust doctrine deriving from the Mono Lake Case exerts less influence on California water management than expected.[160] It is undisputed that when the Mono Lake Case arose, the decision to not allow diversions from tributaries leading to Mono Lake was crucial to restoring the lake.[161] However, later cases have hardly ever produced similar results; in fact, not one has set aside an agency decision on public trust grounds.[162]

Despite exerting very little influence upon judicial decision-making, the public trust doctrine has played a relatively more valuable role in administrative decisions by the SWRCB.[163] The SWRCB used the public trust doctrine to achieve "compliance with a wide variety of measures designed to mitigate the impacts of new water uses."[164] A particularly common measure that the SWRCB used under this basis was a requirement for a minimum level of in-stream flows.[165] When confronted with new water right applications, the SWRCB apparently considered avoiding public trust impacts to be an important goal when addressing new water right applications, which is exemplified by the fact that the SWRCB refused new appropriations of water when

159. *See* Nat'l Audubon So'y v. Superior Court of Alpine Cnty., 33 Cal. 3d 419 (1983) [hereinafter Mono Lake Case].

160. See Dave Owen, *The Mono Lake Case, the Public Trust Doctrine, and the Administrative State,* 45 U.C. DAVIS L. REV. 1099, 1099 (2012).

161. *Id.* at 1122.

162. *Id.* at 1122-23.

163. *Id.* at 1129-30, 1139.

164. *Id.* at 1132.

165. *Id.*

public trust impacts were present.[166]

The SWRCB's authority over new water users is particularly salient for adoption of a technology-based standard for water conservation. Since a command-and-control regulation would guarantee additional water, it would open the door for new water users. As mentioned earlier, a water user who salvages water through conservation is allowed to put that water to beneficial use or sell or transfer that water to another user.[167] If the salvager cannot put the salvaged water to beneficial use, he would likely sell the water to a new or existing user, and the SWRCB would have the authority under the Water Code to evaluate that sale. In evaluating a water sale, the SWRCB could require in-stream minimum flows as well as other requirements to protect the public trust, or refuse the sale if it would detrimentally impact the public trust.

It is important to note that water users exercising existing water rights without seeking a new permit do not trigger agency approval under the Water Code or the California Environmental Quality Act.[168] There is no mandatory procedure for evaluating current public trust impacts.[169] The SWRCB and interested environmental organizations could potentially initiate a public trust proceeding by petition; however, nothing will happen absent such affirmative action.[170] The SWRCB does not have any form of protocol or schedule to review public trust impacts, and the SWRCB has broad discretion to deny petitions for review of such impacts.[171] The SWRCB therefore hardly ever reconsiders existing water rights, even though exercising those rights significantly affects public trust resources.[172]

The fact that the SWRCB does not exert public trust authority over existing users is important because a technology-based standard would require all existing users to use water more

166. *Id.* at 1132-33.
167. *See* discussion *supra* Part III.
168. Owen, *supra* note 160, at 1144.
169. *Id.*
170. *Id.*
171. *Id.*
172. *Id.*

efficiently, thereby generating conserved water and ultimately new users. If those water users cannot put all the excess water to beneficial use, they may sell it under the Water Code, or forfeit it to the "call of the river." Selling the water to new or existing users or forfeiting the water to be claimed by new users would put the new sales and appropriations under SWRCB scrutiny, allowing it to exert public trust authority without having to review existing water rights. Thus, despite the current lack of public trust doctrine cases, environmentalists should still support a technology-based approach because it would allow the SWRCB to exert its authority over the new water users that the conserved water would undoubtedly create.

VIII.
CONCLUSION

Water conservation is a necessary tool to adapt to a changing climate. Adopting a technology-based approach will not only help California adapt to a changing climate, it will also help facilitate the introduction of new water users while saving water for environmental and ecological purposes. The current regime of riparianism and prior-appropriation simply does not encourage water conservation at a time when conservation is becoming essential. The few programs that California has adopted to conserve water create small incentives for voluntary conservation, but ultimately do very little. Municipal water conservation has increased dramatically with new building standards and urban water management plans, but that has done nothing to require agriculturalists and industry to use water more efficiently.

If all existing users were required to adopt technology standards, millions of gallons of water could be saved, and those water users would actually save money in the long term. Examples of technology-based approaches from the CWA and CAA show that not only does the approach accomplish its goals,

but it also does so in a flexible and cost-effective manner.[173] A technology-based approach to water conservation would require all existing users to conserve water in the most cost effective way. By allowing the SWRCB to use a cost-benefit analysis, and allowing water users who adopt the standard to retain the right to their water subject to beneficial use, water users retain many of the benefits associated with conserving water. This will limit opposition to a potential bill or regulation, and the California Legislature or the SWRCB should seriously consider such a technology-based approach to tackle the looming water scarcity in the state.

173. *See Benefits and Costs of the Clean Air Act*, ENVTL. PROT. AGENCY, http://www.epa.gov/cleanairactbenefits/economy.html (last modified Aug. 15, 2013).