



UNIVERSITY OF
OREGON

School of Law

Environmental and Natural
Resources Law Center



BUILDING TRUST:

Public Trust Principles in State Water Law that Encourage Sustainable Management of Water Resources and Promote Principles of Intergenerational Equity

**A White Paper of the University of Oregon School of Law
Environmental and Natural Resources Law Center
Oceans, Coasts and Watersheds Project**

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About this Paper

This white paper was created through the University of Oregon Environmental and Natural Resources Law (ENR) Center's Oceans, Coasts and Watersheds Project, an interdisciplinary research project focused on engaging the law to promote sustainability for ocean, coastal, and freshwater resources. This project was funded by NorthLight Foundation.

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About the Oceans, Coasts and Watersheds Project

The Oceans, Coasts, and Watersheds Project is one of seven theme-based, interdisciplinary research projects administered by the University of Oregon ENR Center. The Project is led by faculty leaders Sarah Adams-Schoen and Adell Amos. The mission of the Oceans, Coasts and Watersheds Project is to engage the law to promote sustainability for ocean, coastal, and freshwater resources. Important issues the Project has recently explored include the following: assessing instream flow in the Willamette River basin, evaluating U.S. ocean and coastal law and policy in a post-Obama administration, innovations at the nexus of food, energy and water, and integrated water resources planning.

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I. EXECUTIVE SUMMARY

This report was prepared with the generous support of the NorthLight Foundation and in cooperation with the Natural Resources Defense Council. The project germinated from conversations around the common failure of existing natural resources management frameworks to achieve sustainable use and equitable distribution for both present and future generations despite the inclusion of these principles in regulatory frameworks. Two strategic areas of research—state water codes and forest planning—emerged from these conversations as potentially fertile areas to develop a strategy to advance sustainability and intergenerational equity as outcomes of natural resource management schemes.

This report examines the first strategic area—state water codes. Several attributes of water codes make it a unique context to examine how principles emanating from the public trust doctrine can moderate or rebalance existing resource management frameworks to make them more sustainable and equitable. Water resources are already recognized as having the attributes of a public resource and imbued with public trust obligations. In addition, water use rights have always straddled the line between public rights and private use, recognizing use rights but not permitting water itself to be privatized. Finally, states have already begun to integrate considerations of the broader public interest and the environment into water management frameworks. Notably, these provisions are often overlaid onto regulatory frameworks with discordant principles of inviolable private use rights and unlimited development. This attribute makes water codes a particularly interesting case study when considering how to integrate sustainability and equity principles into management frameworks that have prioritized resource extractions.

Four state water codes—Colorado, Nevada, Michigan, Virginia—were surveyed for regulatory mechanisms that integrate public trust principles and the identified provisions were analyzed to determine the provision's

impact on the health and sustainability of the resource. Based on this research, the project identified the following key elements of the surveyed water codes that provided opportunity for integration of public trust principles:

- A. Affirmation that water is a public resource.
- B. Public interest as a criterion in management decisions.
- C. Opportunity for public participation in management decisions and to enforce public interest values.
- D. Requirements for planning and data collection.
- E. Ability to adjust water use to address potential or actual overuse.
- F. Identification of the needs of future generations and the environment as beneficial uses.
- G. Mechanism to protect environmental flows.
- H. Requirement to manage within safe yields.
- I. Flexibility to allow for the voluntary reallocation of water.

For each of these elements, the report offers model provisions drawn from the surveyed states. It is important to note, that while these provisions represent the most effective approach among the surveyed states, approaches taken by other states, tribes, and countries may provide even more innovative and effective means of advancing public trust principles.

II. INTRODUCTION

This report first provides background information on the public trust doctrine and state approaches to water use management. With that grounding, the report then provides an overview of findings from each surveyed state. Finally, the report identifies provisions that can advance public trust principles within water codes and may be transferable to other natural resource management frameworks.

Within each state summary, the research focused on five broad categories that exist within every state's water code: (1) the general water management framework; (2) the provisions for managing and regulating groundwater; (3) any requirements for public interest analysis when making water management decisions; (4) provisions for the protection of non-consumptive or often-called "environmental flow"; and (5) comprehensive planning tools for engaging communities and addressing long-term water management goals. As this paper demonstrates, these five categories each have particular language and approaches for addressing sustainable yield and intergenerational principles. While each state water code is distinct and the particular language may differ, it is clear that in adopting provisions of state water law, legislatures and agencies are cognizant of the need to manage water resources in ways that protect the long-term viability of that resource for all of its citizens and the environment. As a matter of policy and politics these provisions may not have been fully implemented or reached their potential in each of these states, but that is where the work lies—making the potential embedded in each of these code provisions more salient and visible the potential.

Each state section closes with a summary of the public trust principles that are embedded within that state's water code. These summaries offer a quick roadmap and references for the potential pathways within that particular state. Public trust principles, as a general term used in the paper, encompass a wide range of provisions in state water law that capture the ideas of sustainability and

intergenerational water use. The hope is that these closing sections offer a way to pursue greater focus and attention on the ways in which the law and policy may already contain the mechanisms to pursue more sustainable practices or provide pathways for legislative or policy reform within the context of the existing state water code.

This paper concludes with nine recommendations for advancing sustainable water use and pursuing trust principles in state water law. Each of these recommendations pulls particular examples of legislative or policy language from the four states that are the focus of this report, but these recommendations are designed to be a matrix that could be utilized in any of the 50 states. These nine recommendations focus on the themes of building on public trust in the long-term sustainable management of water resources utilizing state water law provisions. As this project was initially imagined, there is also the hope that by looking more closely at state water codes and the potential embedded within these complex and individualized systems, wider ideas about how to integrate the themes and structures of state water codes into other resources management areas may be possible. State water law represents an area of natural resources law, though replete with issues and problems, where the principles of public trust have always been an animating and a concretely articulated force. The public trust doctrine writ large, after all, had its birth in state water law cases in the U.S.

Further, research that focuses on these nine principles across any of the 50 states would be worthwhile but was beyond the scope of this project. In addition to further state specific research, there are important questions regarding inter-basin transfer within states and the role and significance of federal water policy that could also be added to this body of inquiry. While beyond the scope of this specific project, these would also be significant lines of further research.

III. BACKGROUND PRINCIPLES: PUBLIC TRUST AND STATE WATER LAW FRAMEWORKS

A. PUBLIC TRUST PRINCIPLES

The public trust doctrine recognizes that certain natural resources (“trust resources”) are reserved for the public and imposes obligations on the trustee to manage the resource to ensure its availability for present and future generations. Fundamental to the doctrine is the understanding that certain resources are essential to the wellbeing of the public and the public’s right to utilize the resources should not be impaired.¹ While not always conceived of as advancing environmental sustainability, those consequences naturally flowed from obligations around ensuring the continued availability of the resource and prohibitions on privatization. The doctrine is now understood to incorporate principles of environmental stewardship—e.g., prevention of degradation of the resource and management of the resource to support ecological health.²

In the United States, the doctrine was first recognized as applicable to navigable waters.³ As distilled, the doctrine prevents the privatization of land under navigable waters in order to preserve the public’s access and use of the water. Where the public trust is recognized, it operates as an independent and judicially enforceable constraint on a state’s management of resources encumbered by the trust.⁴

The doctrine was first applied as a limit on state-regulated water use rights by the California Supreme Court in *National Audubon*

Society v. Superior Court.⁵ Commonly referred to as the Mono Lake decision, the court held the public trust doctrine applied to water resources and imposed a continuing obligation on the state to ensure the use of water was in the public’s interest—“[o]nce the state has approved an appropriation, the public trust imposes a duty of continuing supervision over the taking and use of the appropriated water.” The Hawaii Supreme Court has similarly extended the doctrine as an independent constraint on state regulatory authority over water use.⁶ Most recently, the Nevada Supreme Court affirmed the public trust doctrine applies to the state’s water resources and recognized the doctrine as a constraint on the state’s management of water use rights. However, in contrast to the Mono Lake decision, the Nevada Court held the public trust did not act to restrict water use once a water right had been issued by the state.⁷ In reaching its conclusion, the Nevada Court found the state’s water code incorporated required public trust considerations and, therefore, the doctrine was satisfied as part of the state’s process for issuing and administering water rights.

As described above, the public trust doctrine has traditionally been applied as a common law doctrine imposing obligations on resource managers separate from statutory requirements. While this application of the public trust doctrine is an important mechanism for protecting resources from unsustainable use, this research project does not consider the application of the public trust as a common law doctrine. Excellent work has been done to help advance the adoption and development of the common law public trust

¹ Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471, 475 (1970).

² Robin Kundis Craig, *Comparative Guide to the Western States’ Public Trust Doctrines: Public Values, Private Rights, and the Evolution toward an Ecological Public Trust*, 37 ECOLOGY L.Q. 53 (2010).

³ Illinois Cent. R.R. v. Illinois, 146 U.S. 387 (1892).

⁴ Hon. Milan D. Smith, Jr., *A Blast from the Past: The Public Trust Doctrine and Its Growing Threat to*

Water Rights, 46 Lewis & Clark Envtl. L. Rev. 461,476 (2016).

⁵ Nat’l Audubon Soc. et al. v. Superior Court of Alpine County, 658 P.2d 709, 719-24, 728 (1983).

⁶ In re Water Use Permit Applications, 9 P.3d 409 (Haw. 2000) [hereinafter *Waiahole I*]; In re Water Use Permit Applications, 93 P.3d 643 (Haw. 2004) [hereinafter *Waiahole III*].

⁷ Mineral County v. Lyon County, Nev. Adv. Op. 58 (Sept. 17, 2020).

doctrine as a means to protect water resources.⁸

This project instead examines how states have integrated principles underlying the doctrine—the public nature of the resource, sustainable use to preserve the environment and to support future generations, and protection from degradation—into regulatory structures and how the integration of public trust principles into regulations can provide an additional opportunity to advance the public trust doctrine’s key principles.

The benefit of incorporating these principles into state water code is at least two pronged. First, it provides a procedural mechanism to advance sustainability and intergenerational equity considerations in state regulatory decisions. These types of provisions can establish goals and policies that direct agency decision making. In addition, they create procedural obligations that allow for citizen engagement in the management of water resources. These types of opportunities may be particularly important in states where the common law public trust doctrine is not recognized. Second, the inclusion of public trust considerations in regulatory schemes may provide a further basis of support for the development of a common law public trust doctrine in the state. For example, in Hawaii’s *Waiahole* decision, the court cited the state’s water code as a basis for recognizing the public trust doctrine within the state, noting, “the legislature appears to have engrafted the doctrine wholesale in the Code.”⁹ By

comparison, Colorado Supreme Court declined to recognize the public trust doctrine in part due to incompatible statements in both the state constitution and water code.¹⁰

B. STATE MANAGEMENT FRAMEWORKS

For context, the following provides a brief overview of the water management frameworks adopted by states.¹¹ States have primary control over the allocation of water resources within its borders and most, through delegation from the EPA, also administer water quality regulations. With respect to the management of water use, states historically adopted either the prior appropriations doctrine or riparian system. The choice of management approaches was principally driven based geography and the availability of water. Western states, characterized by water scarcity, adopted the prior appropriations doctrine. Eastern states, characterized by plentiful water, adopted the riparian system.

The prior appropriations doctrine, followed by Colorado and Nevada, promotes development of water resources for specific “beneficial uses” (historically limited to uses requiring diversion from the river to the exclusion of environmental needs). These water management systems were heavily regulated by the state through a permit (Nevada) or court decree (Colorado). After a user diverts and places water to beneficial use, a state-issued water right confirms the holder’s right to use water in the quantity and manner described in the water right. A water rights

⁸ Alexandra B. Klass & Lin-Yee Huang, *Restoring the Trust: A Manual for Advocates*, CENTER FOR PROGRESSIVE REFORM (Sept. 23, 2009), <http://ssrn.com/abstract=1477556>.

⁹ *Waiahole I*, 9 P.3d at 458 (relying on Haw. Rev. Stat. § 174C-2 (“However, adequate provision shall be made for the protection of traditional and customary Hawaiian rights, the protection and procreation of fish and wildlife, the maintenance of proper ecological balance and scenic beauty, and the preservation and enhancement of waters of the State for municipal uses, public recreation, public water supply, agriculture, and navigation. Such

objectives are declared to be in the public interest.”)).

¹⁰ Stephen H. Leonhardt & Jessica J. Sphuler, *The Public Trust Doctrine: What it Is, Where it Came From, and Why Colorado Does Not (And Should Not) Have One*, 16 U. DENV. WATER L. REV. 47, 50 (2012).

¹¹ It is important to note that there have been other means of managing water resources in the United States by tribal and indigenous sovereigns. While this report does not address those approaches, they may provide further insights into innovative ways to manage resources to support goals of sustainability and intergenerational equity.

create quasi-property right—usufructuary right. However, irrespective of the quantity decreed in the water right, all water rights are limited to the quantity of water that can be put to beneficial use. Any diversion of water beyond that quantity is considered waste (and not a beneficial use) and the holder does not have a right to take that quantity of water. Priority of use was based on the first person to make use of the water—the older water right is termed a senior water right. The promotion and protection of water use was the primary goal of the doctrine. More recently, states have modified water codes to integrate public interest considerations in water resources management. However, overallocated water systems and regulatory schemes that prioritize water development and the protection of existing uses challenge the effectiveness of these provisions. The incorporation of public trust principles is further challenged by the specter of private property interests in state-authorized water rights that if curtailed may result in takings liability for states.

In contrast, the riparian system, followed by Michigan and Virginia, recognized a riparian landowner's right to use water flowing by its property. As practiced in the United States, the riparian doctrine follows the "reasonable use" approach that provides for a riparian landowner's right to use a reasonable quantity of water that maintained the natural flow of water for downstream property owners. The right to use water was correlative, so in times of shortage all users would correspondingly decrease water use. Historically, states adopting the riparian approach did not have state-regulated water permitting systems. Water use was administered through the application of common law by the courts. More recently, riparian states have adopted an amalgamated approach to water management termed "regulated riparianism." Under this approach, states implement a state system for regulating and permitting certain water uses. For unregulated uses, the common law system continues to control. Unlike states adopting the prior appropriations doctrine, the riparian states may have more latitude in integrating public trust principles into water management

frameworks. First, the framework of "reasonable use" carried with it the indicia of the public trust doctrine by requiring water use to not adversely impact other users or disrupt the natural flow of streams. Further, these state permitting frameworks are newer and, due to geography, water resources are less likely to be overallocated. These factors may ease integration of the public trust principles as the existing regulatory frameworks do not create hurdles around established property rights, existing overallocation, and entrenched models for water management.

IV. STATE OVERVIEWS

The following provides an overview of the findings from the four surveyed states—Colorado, Nevada, Michigan, and Virginia. These findings focus on aspects of the state water codes that provide either examples of provisions that have increased sustainability and intergenerational equity or that elucidate challenges to integrating these principles into existing legal frameworks.

For each state, the primary regulations governing water allocation are described. In addition, the overview highlights how each state has incorporated public interest standards, protection of environmental flows, and water resources planning requirements.

A. COLORADO

1. Water Management Framework

Perhaps no state is as firmly rooted in the prior appropriations doctrine as Colorado. The doctrine has been the law in Colorado since 1860 and its principles are enshrined in the constitution—“[p]riority of appropriation shall give the better right as between those using water for the same purpose.”¹² Colorado’s water laws—known as the Colorado Doctrine—seek to promote development of scarce water resources through a comprehensive system of regulated water rights. The doctrine emphasizes the maximum utilization of water for the greatest number of uses. It accomplishes this by requiring state authorization for water use, authorizing use only for state-identified beneficial uses, prohibiting waste, and protecting developed water rights from diminishment (the “no injury” standard). The inviolate nature of water rights is a touchpoint of Colorado water law.

Colorado water use is overseen by seven water courts each with a state water engineer’s office. Simplified, the system tasks water courts with adjudication (determining the scope and legitimacy of water rights) and the state engineer’s office with the administration of water rights. While beyond the scope of this report, a series of compacts, agreements, and treaties also constrain use in the state.¹³

Legal Frameworks

- Colorado Revised Statute Chapter 37
- 2 Colorado Code Rules 400
- Colorado Constitution Article XVI, Section 6
- 2015 Colorado Water Plan

¹² COLO. CONST. art. XVI, § 6.

¹³ *Citizens Guide to Denver Basin Groundwater*, COLO. FOUND. FOR WATER EDUCATION (Jan. 28, 2016), <https://www.watereducationcolorado.org/publications-and-radio/citizen-guides/citizens-guide-to-denver-basin-groundwater/>.

¹⁴ COLO. REV. STAT. § 37-92-103(3)(a).

a. *Water Use Regulations*

As noted above, subject to few exceptions, all water use requires state authorization and is limited to state-recognized beneficial uses.¹⁴ Colorado’s constitution declares all waters of natural streams available for appropriation limited only as needed to protect existing senior water rights. Therefore, the amount of natural stream flow available for diversion is limited only by other existing uses—historically, these uses were exclusively out-of-stream uses. Even in cases where water cannot be withdrawn without harming existing rights, a new water allocation may be allowed if the new user augments its use by providing substitute water to offset any out-of-priority uses.¹⁵ This framework allows Colorado to accommodate continued growth and new uses in an overallocated system. An augmentation plan will identify an alternative source of water, e.g., stored water, that can replace depleted streamflows in the quantity necessary to ensure senior water users’ rights are satisfied. Augmentation plans are intended to maximize the quantity of water available for beneficial uses.

Designating all water as available for appropriation allows for unsustainable water use.

Water use is authorized only for beneficial uses (generally requiring diversion out-of-stream)¹⁶ and is limited to the amount reasonably needed

¹⁵ COLO. REV. STAT. § 37-92-103(9).

¹⁶ See *Colo. River Water Conservation Dist. v. Rocky Mountain Power Co.*, 406 P.2d 798, 800 (Colo. 1965) (quoting *City & Cnty. of Denver v. N. Colo. Water Conservancy Dist.*, 276 P.2d 992, 998 (Colo. 1954)) (“the rule is elementary that the first

to accomplish the use.¹⁷ A decreed water right is granted in perpetuity and is protected from impairment by new uses. Further, water rights are generally protected from diminishment and cancellation except in limited circumstances. A water right may be wholly or partially canceled where the State Engineer determines the water user intends to permanently discontinue use of the water right.¹⁸ The State Engineer publishes a list of abandoned water rights every ten years.¹⁹

The risk of abandonment can drive users to divert and apply water that is not needed.²⁰ While the doctrine of waste—limiting a water right to only the amount needed to fulfill the beneficial use—should prevent this type of excessive use, once a water right is decreed reducing the quantity of the right can be difficult.²¹ In addition, the risk of abandonment can also frustrate the implementation of conservation activities—the risk of losing a water right may discourage the implementation of conservation efforts. Colorado provides for exceptions to abandonment for nonuse due to participation in water conservation activities to overcome these regulatory barriers.²² For example, a water right that is loaned for instream use is not subject to abandonment for nonuse.

Exceptions to abandonment presumptions when nonuse is due to conservation activities provide needed flexibility to promote more efficient water management.

b. Groundwater Regulation

As with many western states, surface water was the first resource developed and therefore, the first resource regulated. Groundwater development began in earnest in the state in the 1940s and the state adopted a comprehensive regulatory framework in 1957.²³ Among other additions, the 1957 Act required a permit for the development of groundwater and established the Groundwater Commission.²⁴ In 1969, the legislature sought to further address the integration of groundwater and surface water use. The 1969 Act directed that tributary groundwater and surface water be administered conjunctively: “it is the policy of this state to integrate the appropriation, use, and administration of underground water tributary to a stream with the use of surface water in such a way as to maximize the beneficial use of all of the waters of this state.”²⁵ The 1969 Act also authorized the use of augmentation plans as a means to allow out-of-priority development of groundwater resources.²⁶

essential of an appropriation is the actual diversion of the water with intent to apply to a beneficial use.”).

¹⁷ COLO. REV. STAT. § 37-92-103(4) (“Beneficial use means the use of that amount of water that is reasonable and appropriate under reasonably efficient practices to accomplish without waste the purpose for which the appropriation is lawfully made.”).

¹⁸ COLO. REV. STAT. § 37-92-103.

¹⁹ COLO. REV. STAT. § 37-92-401(1)(a).

²⁰ Abraham Lustgarten, *Use it or Lose it, Across the west, exercising one’s right to waste water*, PROPUBLICA, June 9, 2015, <https://projects.propublica.org/killing-the-colorado/story/wasting-water-out-west-use-it-or-lose-it> (last visited July 23, 2020).

²¹ COLO. REV. STAT. § § 37-92-103(4); *Santa Fe Trail Ranches v. Simpson*, 990 P.2d 46, 54–5 (Colo. 1999).

²² COLO. REV. STAT. § 37-92-103(b).

²³ SB 113, 1957 Colo. Sess. Laws 863, enacted May 1, 1957 (formerly codified at §§ 147-19-1, *et seq.*, C.R.S. 1953 and §§ 147-18-1, *et seq.*, C.R.S. 1963).

²⁴ *Id.*

²⁵ COLO. REV. STAT. § 37-92-101; COLO. REV. STAT. § 37-82-101(1) (defining waters of the natural stream subject to appropriation under the prior appropriation system to include tributary groundwater); *Safranek v. Town of Limon*, 228 P.2d 975, 977 (Colo. 1951) (stating Colorado’s presumption of that groundwater is tributary).

²⁶ COLO. REV. STAT. § 27-92-602(6).

Colorado organizes its groundwater regulation based on the aquifer's connection to natural surface streams. Tributary water—with a hydrologic connection to surface water—is regulated within the priority system and requires a state decree.²⁷ Small capacity wells used for domestic, stockwatering and small-scale commercial activity are generally exempt from applicable groundwater regulations.²⁸ There are generally no limitations to appropriations based on the aquifer's capacity. Rather, limitations are imposed based on impacts to senior water users.²⁹ Augmentation plans that mitigate for water use are required for out-of-priority uses; however, those plans are tied to protecting senior water users and not at addressing environmental conditions.³⁰ While the injury standard is limited to the protection of other water users, it does constrain use and can prevent continued unsustainable use patterns. For example, the injury standard was used to support a basin-wide curtailment of groundwater users in the Rio Grande & Conejos River Basins.³¹

Nontributary groundwater is defined as groundwater outside of designated basins (described below) and located in deep confined aquifers.³² Given its location, nontributary water is not considered a renewable resource and is managed for depletion within 100 years. Water rights are allocated based on overlying landownership through a permit system.³³

Groundwater within the Denver metro area (the most densely populated area of the state) is regulated as a third category of groundwater. Driven by a period of drought in

the 1950s, the Denver metro area became heavily reliant on groundwater. This reliance resulted in significant and, ultimately, unsustainable groundwater depletions. This pattern of unsustainable use coupled with the economic importance of the region led to the development of a separate regulatory system for managing these aquifers.³⁴ In general, the state manages Denver basin water for depletion within a 100-year aquifer life.³⁵ Pumping data in the aquifers for municipal supply shows steady declines suggesting withdrawals exceeding recharge rates.³⁶

A final category of groundwater occurs in Designated Basins. By the 1960s, a convergence of rapid increases in groundwater pumping and increasing surface water shortages prompted revisions to Colorado's Groundwater Management Act. Surface water users began to tie their water shortages to groundwater pumping, raising concerns that the senior surface water users, by claiming injury to their water rights, could curtail most groundwater pumping. In response, the legislature amended the existing groundwater management framework to allow for continued use of groundwater while still honoring the prior appropriations systems. The amendments particularly sought not to prevent unsustainable use but rather to authorize the "full economic development" of groundwater. To achieve this balancing, the legislature established Designated Basins as areas where there was little connectivity with surface water. In doing so, the legislature allowed for the regulation of these basins outside the prior

²⁷ *Simpson v. Bijou Irrigation Co.*, 69 P.3d 50, 60 (Colo. 2003).

²⁸ COLO. REV. STAT. § 37-92-602; COLO. REV. STAT. § 37-90-105.

²⁹ COLO. REV. STAT. § 37-92-102(d).

³⁰ Community Planning, LA PLATA COUNTY COLO. http://lpcdds.org/UserFiles/Servers/Server_1323669/File/La%20Plata%20County%27s%20Community%20Development%20Services%20Department%20Migration/Planning/Historic%20Preservation/Research,%20Studies%20and%20Presentations/beginnersguidetoaugmentationplansforwells.pdf [last visited Oct. 8, 2020].

³¹ *Alamosa-La Jara Water Users Prot. Ass'n v. Gould*, 674 P.2d 914, 931 (Colo. 1983).

³² COLO. REV. STAT. § 37-90-103(10.5) [defining nontributary water].

³³ COLO. REV. STAT. § 37-90-137.

³⁴ *Citizens Guide to Denver Basin Groundwater*, *supra* note 13, at 15. The Denver basin is subject to complex rules and terminology that are not addressed here.

³⁵ *Id.* at 26 [noting that groundwater use in the Denver Basin is not sustainable].

³⁶ *Id.*

appropriations system and associated risks of curtailments.³⁷

Withdrawals in designated basins are managed by the Groundwater Commission and, where established, local groundwater management districts.³⁸ There are eight designated basins and 13 local management districts.³⁹ Once the State Engineer designates a basin, it can impose additional regulatory requirements for groundwater withdrawals. Importantly, this authority includes the ability to consider aquifer levels in approving allocations. Withdrawals require an assessment of “the area and geologic conditions, the average annual yield and recharge rate of the appropriate water supply.”⁴⁰ However, regulations do not prohibit mining of aquifers and allow for “reasonable rates of depletion.”⁴¹

Requiring the consideration of aquifer capacity in allocation decisions is a critical component of providing for more sustainable use. However, the lack of any requirement to manage within a safe yield allows for continued unsustainable groundwater use.

In addition, all withdrawals within a designated basin—including domestic uses that are exempt in other management areas—require a state decree. Further, all wells require a permit prior to construction.

Comprehensive permit requirements provide important regulatory authority to ensure water use remains within sustainable levels.

³⁷ COLO. REV. STAT. § 37-90-106 (defined as locations where groundwater constitutes the primary source of water for at least 15 years and had little connectivity with surface water).

³⁸ Designated Basins and Ground Water Management Districts, COLO. DIVISION OF WATER RESOURCES [Aug. 2019], <https://drive.google.com/file/d/1nsMMokWlQo1aXHFkp6SJZNu3OdLmdlNw/view>.

³⁹ *Id.*

c. *Integrated Water Management*

Colorado’s regulatory framework does not integrate the management of water quality and quantity. While this decoupling is common in the west, Colorado goes one step further and prohibits the imposition of flow requirements to address water quality issues.⁴²

Water quality is a critical piece of a sustainable water supply to support both present and future generations and the environment. Colorado’s prohibition on considering impacts to water quality in water use decisions presents a barrier to achieving more sustainable and equitable water management.

However, Colorado’s recent state-wide water plan, recognizes the link between water quality and quantity—“Colorado’s water quantity and quality questions can no longer be thought of separately. Each impacts the other and our state water policy should address them conjunctively.”⁴³ However, regulatory change may be necessary to fully integrate the considerations of quantity and quality in the state.

While water plans do not modify existing regulatory frameworks, they can identify gaps in the state’s water management framework and spur legislative action to address identified gaps.

⁴⁰ Upper Black Squirrel Creek Ground Water Management Dist. v. Goss, 993 P.2d 1177, 1185 (Colo. 2000) (internal citations omitted).

⁴¹ *Id.* at 1189.

⁴² See City of Thornton v. Bijou Irrigation Co., 926 P.2d 1, 91–92 (Colo.1996).

⁴³ Exec. Order No. D 2013-005 (2013), <https://drive.google.com/a/state.co.us/file/d/1p1Tnl7-NE94tRDyxROR3AKPN5esx9hAg/view?usp=sharing>.

2. Public Interest

a. Public Resource

Apart from the state's instream flow program, Colorado, relatively uniquely, does not incorporate any public interest criteria in its administration of water rights. The lack of any enforceable public interest criteria is a result of constitutional provisions requiring that all water be open for appropriation, judicial interpretation of those provisions, and the lack of any explicit public interest considerations in the water code.

Colorado's constitution recognizes water as a public resource—"the water of every natural stream . . . within the state . . . is hereby declared to be the property of the public."⁴⁴ However, the constitution clarifies this provision as providing only the right to appropriate water, a right that "shall never be denied."⁴⁵ As interpreted, this provision requires the "maximum utilization of water in the state"⁴⁶ and is "intended to make water available for as many decreed uses as there is available supply."⁴⁷ The legislature has codified the "maximum utilization doctrine" in the Water Code which identifies a policy of "maximiz[ing] the beneficial uses of all waters of this state."⁴⁸

The maximum utilization doctrine has been identified as constraining the consideration of

public interests in administering water resources.⁴⁹ As the Colorado Supreme Court has recognized, "[c]onceptually, a public interest theory is in conflict with the doctrine of prior appropriation."⁵⁰ Further, it has prevented the recognition of the common law public trust doctrine in Colorado—which has been described as incompatible and even antithetical with the purely appropriative Colorado Doctrine.⁵¹

The lack of discretionary or enforceable public interest criteria has meant that these considerations do not constrain water use decisions.

While the "maximum use" doctrine has presented a barrier to the incorporation of public interest criteria, the Court has tempered its impact by holding the doctrine does not require "a single-minded endeavor to squeeze every drop of water" from the state's aquifers.⁵² Citing the statutory language requiring the State Engineer manage water resources for "optimum use,"⁵³ the Court moderated the "maximum utilization" doctrine and provided for the possible consideration of broader public interest considerations, including "ensur[ing] that water resources are utilized in harmony with the protection of other valuable resources"⁵⁴ and with "proper regard for all

⁴⁴ COLO. CONST. art. XVI, § 5.

⁴⁵ COLO. CONST. art. XVI, § 6.

⁴⁶ *Fellhauer v. People*, 447 P.2d 986, 994 (Colo. 1968).

⁴⁷ *Pagosa Area Water & Sanitation Dist. v. Trout Unlimited*, 170 P.3d 307, 313 (Colo. 2007).

⁴⁸ *Alamosa-La Jara*, 674 P.2d at 934–35.

⁴⁹ *Bd. of County Comm'rs of the County of Arapahoe v. United States*, 891 P.2d 952, 971–72 (Colo. 1995) [rejecting argument that the limitation of water use for a beneficial use "inherently encompasses a broad public policy of protecting the natural and man-made environment" and requiring the State Engineer consider those reasons in approving a new water application]; Justice Gregory J. Hobbs, Jr., *Colorado Water Law: An Historical Overview*, 1 U. DENV. WATER L. REV. 1 (1997); see also *St. Jude's Co. v. Roaring Fork Club, LLC* 351

P.3d 442, 448 (Colo. 2015) [establishing "the right to the maintenance of the flow of the stream is a riparian right and is completely inconsistent with the doctrine of prior appropriation"] (internal citations omitted).

⁵⁰ *Arapahoe County*, 891 P.2d at 972.

⁵¹ *People v. Emmert*, 597 P.2d 1025 (Colo. 1979) (holding that the public trust doctrine is not applicable in Colorado); Bruce Walters, *A Comparative Discussion of the Public Trust Doctrine: Mono Lake and Groundwater In California, Citizen Initiative and Legal Adaptation In Colorado*, 18 U. DENV. WATER L. REV. 455 (2015) [discussing application of the public trust doctrine in the Colorado].

⁵² *Alamosa-La Jara*, 674 P.2d at 935.

⁵³ COLO. REV. STAT. § 37-92-501(2)(e).

⁵⁴ *Alamosa-La Jara*, 674 P.2d at 935.

significant factors, including environmental and economic concerns.”⁵⁵

Despite the Court’s nod to public interest values, the only concrete opportunity for consideration of public interest impacts is through Colorado’s instream flow program. As described below, the Colorado Water Conservation Board (CWCB) acquires and holds instream water rights necessary for the “reasonable preservation of the environment.” Once acquired, the CWCB has standing to protect those water rights for the benefit of both present and future generations.⁵⁶ The Court has consistently “recognized that the CWCB acts to protect the environment on behalf of the public. Thus, to the extent that any water rights are at issue in the CWCB proceeding, it is the public’s interest in the preservation of the environment.”⁵⁷

b. Public Participation

Any person can file a statement of opposition challenging a water right application.⁵⁸ The statement of opposition holds an applicant to a standard of strict proof—challenging whether the applicant has met the statutory criteria for water allocation. As described above, apart from instream water rights, these criteria do not include public interest requirements. In addition, water rights holders that assert injury from a water rights application have standing to affirmatively challenge a water rights application—termed a protest.⁵⁹

The CWCB’s acquisition process for instream water rights provides additional opportunities for public participation.⁶⁰ Any person can

contest the CWCB’s recommended appropriations and further, any person can request “contested hearing participant status” which allows them to participate in the contested hearing. Conservation interests have used this authority to help defend CWCB instream flow recommendations.⁶¹ The CWCB program also provides for opportunity for the public to participate in the identification of instream water rights, including making recommendations and providing comment on proposed appropriations.⁶²

3. Environmental Flows

a. Instream Flow Program

Colorado’s instream flow program provides the primary mechanism through which the state accounts for environmental needs in its management of water resources. The program functions entirely within the state’s priority system and relies on the inviolable nature of water rights as the means of ensuring long-term protection of water needed to support ecosystem functions.

In 1973, the Colorado legislature amended the water code to allow for the appropriation of water for environmental flows.⁶³ The program authorized the CWCB to appropriate water rights for the minimum quantity of water to support the “natural environment.”⁶³ The statute also authorizes the acquisition of existing water rights and appropriates one million dollars annually to support acquisitions. Each year, the CWCB makes recommendations on water rights appropriations based on recommendations

⁵⁵ *Pagosa Area Water and Sanitation Dist.*, 170 P.3d at 314.

⁵⁶ COLO. REV. STAT. § 37-92-103(4)(c).

⁵⁷ *Concerning the Application for Water Rights of the Colorado Water Conservation Board in the San Miguel River v. Colorado Water Conservation Board*, 346 P.3d 52, 58–59 (Colo. 2015).

⁵⁸ COLO. REV. STAT. § 37-92-302(1)(b).

⁵⁹ *Concerning the Water Rights of Turkey Canon Ranch Ltd. Liability Co.*, 937 P.2d 739, 747 (Colo. 1997).

⁶⁰ Colo. Rev. Stat. § 37-92-102(3)(c).

⁶¹ *See* Notice of Party Status of Western Resources Advocates, Proposed Instream Flow Appropriation in Water Division: Disappointment Creek (Upper) and Disappointment Creek (Lower), COLORADO WATER CONSERVATION BOARD (2019), <https://dnrweblink.state.co.us/cwcbsearch/ElectronicFile.aspx?docid=209105&dbid=0>.

⁶² 2 COLO. CODE REGS. § 408-2(5)(a).

⁶³ COLO. REV. STAT. § 37-92-102(3).

from state and federal agencies and the public.⁶⁴ The CWCB assesses proposed appropriations to ensure a natural environment exists, water is available for appropriation, and there will be no material injury to other water rights.⁶⁵ Following a decision to appropriate water CWCB files for a water decree with the water court.⁶⁶

The first foundational piece of the program was the identification of environmental needs as a beneficial use. Specifically, the legislature amended the list of identified beneficial uses to include “minimum flows . . . to preserve the natural environment to a reasonable degree” for the benefit of present and future generations.⁶⁷ Water in Colorado may only be appropriated for beneficial uses; therefore, with this amendment, the legislature effectively authorized the appropriation of water for the environment. Prior to the 1973 amendments, instream uses were considered antithetical to the prior appropriations doctrine—which was thought to require diversion and application of water out-of-stream to perfect a water right.⁶⁸ In reviewing the legislature’s authority to authorize the appropriation of instream water rights, the Colorado Supreme Court found no statutory or constitutional requirement that required diversion from the natural stream and upheld the inclusion of instream water rights as a beneficial use.⁶⁹

A second foundational piece of the program was the creation of the CWCB, a state agency

Identification of environmental needs as a beneficial use is a critical component of creating a more sustainable water management framework in prior appropriations systems.

distinct from the State Engineer’s Office, directed—and importantly funded—to acquire and hold instream water rights. As interpreted, the CWCB “acts to protect the environment on behalf of the public”⁷⁰ and further, “is burdened with a fiduciary duty arising out of its unique statutory responsibilities.”⁷¹ While CWCB is the only entity authorized to hold instream water rights for environmental flows, any person or government entity can petition the CWCB to acquire water rights.⁷²

A dedicated program and targeted funding to support instream flow acquisitions can help advance the reallocation of water.

A final foundational piece of the instream flow program is the protection of instream water rights within the state’s priority system. As confirmed by the Colorado Supreme Court, “the legislative intent is quite clear that these appropriations are to protect and preserve the natural habitat and that the decrees confirming them award priorities which are superior to the rights of those who may later appropriate.”⁷³ The status of instream rights as protectable interests within the priority system is a critical piece of the state’s program as it allows the CWCB to protect decreed instream rights from injury by any junior users.⁷⁴ As the

⁶⁴ See 2021 Instream Flow Recommendations, COLORADO WATER CONSERVATION BOARD, <https://cwcb.colorado.gov/2021-isf-recommendations> (last visited Oct. 8, 2020).

⁶⁵ 2 COLO. CODE REGS. § 408-2(5)(i).

⁶⁶ New Appropriation Process Timeline, COLORADO WATER CONSERVATION BOARD, <https://dnrweblink.state.co.us/cwcbsearch/ElectronicFile.aspx?docid=211050&dbid=0> (last visited Oct. 8, 2020).

⁶⁷ COLO. REV. STAT. § 148-21-8(7).

⁶⁸ Hobbs, *supra* note 49.

⁶⁹ Colo. River Water Conservation Dist. v. Colo. Water Conservation Bd., 594 P.2d 570, 575 (Colo. 1979).

⁷⁰ Colo. Water Conservation Bd. v. Farmers Water Dev. Co., 346 P.3d 52, 58 (Colo. 2015).

⁷¹ Aspen Wilderness Workshop, Inc. v. Colo. Water Conservation Bd., 901 P.2d 1251, 1259 (Colo. 1995).

⁷² COLO. REV. STAT. § 37-92-102(3).

⁷³ *Id.*

⁷⁴ Colorado Water Conservation Bd. v. City of Central, 125 P.3d 424, 439 (Colo. 2005) (“We now further conclude that, to effectuate the General

Court recognized, “[o]therwise, upstream appropriations could later be made, the streams dried up, and the whole purpose of the legislation destroyed.”⁷⁵ Further, while any person may file a statement of opposition, because Colorado limits standing to protest new water rights allocations to water rights holders injured by the proposed use, instream water rights confer important standing to CWCB to protect minimum flows in water rights changes and new appropriations.⁷⁶

A limitation of the instream flow program’s inclusion within the state’s priority system is that instream rights are often junior in priority and located in already overallocated streams. These factors limit the impact of new instream rights as they may be subject to curtailment in dry years when environmental flows are particularly important.⁷⁷ To address this limitation, the legislature authorized the CWCB to acquire existing water rights and conduct temporary leases and loans for instream uses.⁷⁸ Authorizing the acquisition of existing water rights allows CWCB to acquire senior water rights that will be more secure in times of low flow.⁷⁹ In addition, temporary transfers allow CWCB to meet environmental needs in times of shortage and can allow for creative arraignments to protect instream uses where a water user does not wish to permanently

relinquish its water right.⁸⁰ As of 2020, the legislature added additional flexibility to the program by increasing the term of instream loans from a maximum of 15 consecutive years to 35 years.⁸¹

Providing tools to transfer senior rights instream is critical in states adopting a prior appropriations approach to instream flow management. These tools allow for reallocation and protection of water in already overallocated systems.

Additional limitations with the program include restrictions on the quantity of water that the CWCB can appropriate. The CWCB is limited to the minimum quantity needed to “reasonably protect” the natural environment.⁸² This phrase is left undefined; however, the CWCB’s practice is to preserve the quantity needed to support cold water fisheries.⁸³ In 2015, the Colorado Supreme Court affirmed that the protection of aesthetics, recreation, and fishing is not a beneficial use, noting “[t]he flow of water necessary to efficiently produce beauty, excitement, or fun cannot even conceptually be quantified.”⁸⁴

Assembly’s purpose of preserving the environment through minimum streamflows, the Board is entitled to necessary protective terms and conditions in a decree approving an augmentation plan.”).

⁷⁵ *Colo. River Water Conservation Dist.*, 594 P.2d at 575.

⁷⁶ *Application for Water Rights of Hines Highlands Ltd. P’ship*, 929 P.2d 718, 722 (Colo. 1996).

⁷⁷ *City of Central*, 125 P.3d at 439 (“Because instream flows are administered within the priority system, the instream flow cannot take water away from existing uses and the senior will always be able to make its diversion for its decreed beneficial uses. Since the prior appropriation system thus guarantees that pre-existing uses are unaffected by junior instream flow rights, the date of its priority may be of little value in protecting instream resources.”).

⁷⁸ COLO. REV. STAT. § 37-83-105 (Allowing temporary loans/leases of water to CWCB); COLO. REV. STAT. §

37-92-102(3) (Allowing long term leases of water for instream flow use and establishing exclusive authority of CWCB to appropriate instream flow water rights); COLO. REV. STAT. § 39-22-533 (Establishing an instream flow incentive tax credit (HB 09-1067)).

⁷⁹ COLO. REV. STAT. § 37-92-102(3).

⁸⁰ COLO. REV. STAT. § 37-80-104.5(1)(a)(III) (Transfers are further incentivized by excluding non-use of water due to loan or contract with CWCB as evidence of a water-users intent to abandon water); Colo. Rev. Stat. § 37-92-103.2.

⁸¹ H.B. 20-1157, 72nd Gen. Assembly, 2nd Reg. Sess. (Colo. 2019).

⁸² COLO. REV. STAT. § 37-92-102(3).

⁸³ *Colo. River Water Conservation Dist.*, 594 P.2d at 578.

⁸⁴ *St. Jude Co. v. Roaring Fork Club, LLC*, 351 P.3d 442, 451 (Colo. 2015).

Limitations around conserving only minimum flows necessary to support environmental needs can unnecessarily constrain protection of water resources.

This limitation was recently mitigated when the Colorado legislature authorized the CWCB, in locations where CWCB holds existing instream rights, to accept temporary loans for flows above the amount “necessary” to preserve the environment to a reasonable degree.⁸⁵ This provision permits the CWCB to buffer its instream water rights to protect environmental flows in dry years, particularly where CWCB holds junior rights that may be subject to curtailment.

In addition, the CWCB is only authorized to appropriate water rights where there is a “natural environment.” Therefore, significantly degraded streams (both due to low flow or water quality) that cannot support fish populations may not qualify for protection under the instream flow program. The determination of what constitutes a natural environment is left to the CWCB’s discretion.⁸⁶

Finally, the CWCB is only authorized to acquire surface water rights, limiting the program’s impact on groundwater. This limitation is tempered by Colorado’s conjunctive management of surface and tributary groundwater that should prevent new groundwater appropriations that would impact an instream water right. However, the act will not reach nontributary groundwater.

The program is largely touted as successful in protecting instream water rights. To date, the CWCB has acquired minimum flows to protect 9,700 miles of streams and 480 natural lakes.

There are several components of Colorado’s program that appear to have contributed to its success: (1) the creation of a discrete entity charged with actively assessing the need for and acquiring instream flows; (2) the authorization of both individuals and government entities to recommend appropriations; (3) a source of funding for CWCB’s acquisitions—the statute allocates one million dollars in funding annually to support the acquisition of water, water rights, and interests in water for instream flow use⁸⁷; and (4) allowing the public to intervene in protests to proposed instream flow acquisition.⁸⁸ The state has also incentivized the transfer of water rights to CWCB with a tax deduction of 50% of the value of the water right donated.⁸⁹ Finally, as described above, Colorado’s instream program benefits from the security of state’s water right system that protects instream water rights from injury from more junior users.

b. Recreational In-Channel Diversions

A second mechanism for protecting instream flows are Recreational In-Channel Diversions (RICD). In 2001, the state recognized recreation as a beneficial use and authorized municipal entities to appropriate minimum stream flows necessary to provide a “reasonable recreation experience.”⁹⁰ However, these rights are subject to significant limitations (both in scope, purpose, and acquiring entity) that are intended to prevent their use as a mechanism to establish environmental flows.⁹¹ Despite these limitations RICDs do provide a separate opportunity to keep water instream which can support ecological needs.

⁸⁵ H.B. 20-1157, 80th Gen. Assembly, Reg. Sess. (Colo. 2020).

⁸⁶ *Colo. River Water Conservation Dist.*, 594 P.2d at 575-76.

⁸⁷ COLO. REV. STAT. § 37-60-123.7(1).

⁸⁸ COLO. REV. STAT. § 37-60-123.7(1).

⁸⁹ H.B. 09-1067, 67th Gen. Assembly, Reg. Sess. (Colo. 2009).

⁹⁰ COLO. REV. STAT. § 37-92-103.

⁹¹ *Colo. Water Conservation Bd. v. Upper Gunnison River Water Conservancy Dist.*, 109 P.3d 585, 592-603 (Colo. 2005) (reviewing RICD appropriation procedures in detail).

4. Planning

Colorado's water code does not require statewide water planning. However, in 2013, in response to a recognized need to comprehensively assess the state's water resources, the Governor directed the CWCB to complete a statewide water plan that would advance Colorado's water values:

- (1) productive economy that supports vibrant and sustainable cities, viable and productive agriculture, a robust skiing, recreation and tourism industry;
- (2) efficient and effective water infrastructure promoting smart land use; and
- (3) a strong environment that includes healthy watersheds, rivers and streams, and wildlife.

⁹²

The plan identified goals and actions to meet measurable objectives for water use in the next 30 years. Conservation programs are envisioned as playing a key role in making necessary reallocations among water uses to meet future needs and support the environment. These recommended actions are intended to work within existing water regulations; however, it recognizes that some actions may require legislative action to add flexibility to the water code.⁹³ In this way, the water plan highlights areas for amendment or

Water planning provides a platform to redefine community priorities and drive legislative change.

⁹² COLO. REV. STAT. § 37-60-126.5 (The CWCB was authorized by statute to conduct drought a planning and water efficiency program).

⁹³ Executive Order, D2013-005 III(H) ("The Colorado Water Plan will reaffirm the Colorado Constitution's recognition of priority of appropriation while offering recommendations to the Governor for legislation that will improve coordination, streamline processes, and align state efforts.").

repeal of existing laws that hamper water conservation measures, as well as a means to articulate new policy priorities that can help reframe resource management. In 2019, citizens approved a ballot measure that would provide up to 29 million to support the implementation of the state water plan.⁹⁴

Colorado does not mandate the collection of water use data but does provide the State Engineer with the authority to require measuring at the point of diversion.⁹⁵ Comprehensive data on water use remains lacking due to unregulated exempt uses (e.g., domestic wells) and failure to require comprehensive water measuring.

5. Public Trust Principles

- 💧 **Constitutional and statutory frameworks that support maximum use of water resources contribute to unsustainable use.**
- 💧 **A lack of public interest considerations in water allocation decisions prevents consideration of impacts beyond existing water users.**
- 💧 **Creation of a robust and funded acquisition program for instream water assists in protecting environmental flows.**
- 💧 **Flexibility to reallocate water both permanently and temporarily allows for protection of the environment within overallocated systems.**
- 💧 **Consideration of the capacity of the resource is a critical component of ensuring sustainable water use.**

⁹⁴ *Colorado's Water Plan Keeps Rivers Flowing. But Not Without A Reliable Cash Flow. Here's What You Need to Know About the Colorado Water Plan*, CONSERVATION COLORADO, <https://conservationco.org/2020/02/27/blog-what-you-need-to-know-about-the-colorado-water-plan/> (last visited Oct. 8, 2020).

⁹⁵ See COLO. REV. STAT. § 37-84-120; COLO. REV. STAT. § 37-60-124.4.

Public Trust Elements	Principles in Colorado Water Code
Affirmation that water is a public resource	✓ Colorado Constitution, Article XVI, Section 5.
Water recognized as a public trust resource	X
Public interest as a criterion in management decisions	X
Opportunity for the public to participate in decision making and to enforce public interest obligations	✓ Colorado Revised Statute § 37-92-102(3)(C) (participation in the CWCB) ✓ Colorado Revised Statute § 37-92-302(1)(b) (authorizing public participation in water rights applications)
Requirements for planning and data collection	X [only through Executive Order]
Ability to adjust water use to address potential or actual overuse	X
Identification of the needs of future generations and the environment as beneficial uses	✓ Colorado Revised Statute § 37-92-102(3)
Mechanism to protect environmental flows.	✓ Colorado Revised Statute § 37-92-102-3(4)(c)
Requirement to manage within safe yields	X
Flexibility to allow for the voluntary reallocation of water	✓ Colorado Revised Statute § 37-92-302(1)(b) (authorizing public participation in water rights applications)

B. NEVADA

1. Water Management Framework

As the driest state in the West, Nevada's already scarce water resources are being further stressed by rapid population growth, more frequent drought, and climate change. Surface water resources are already largely overallocated.⁹⁶ Further, as of 2015, over half of Nevada's groundwater basins were exceeding perennial yield (the quantity of water that can be recharged in a year) and 53 of those basins had appropriations that exceeded 200% of their perennial yield.⁹⁷ Groundwater provides 40% of the water used in Nevada.⁹⁸ Groundwater is being further stressed as the state explores the use of inter-basin transfers to support growing urban centers.⁹⁹ Inter-basin transfers can raise environmental concerns as it removes the full quantity of water from ecosystems.¹⁰⁰

As with other western states, Nevada manages water through the prior appropriations system. Courts administered water use in the state until 1903 when the legislature established the State Engineer's office. Nevada adopted a comprehensive statutory scheme for managing surface water in 1913 and groundwater in 1939.¹⁰¹

Legal Frameworks

- Nevada Revised Statutes Chapter 533 (Water Allocation)
- Nevada Revised Statute Chapter 534 (Groundwater)
- Nevada Revised Statute Chapter 540 (Planning)
- State Water Plan (1995)

a. Water Use Regulations

Subject to two exceptions—groundwater used for domestic purposes and water rights predating the 1913 water code—all water use in the state requires a permit.¹⁰² The State Engineer permits and conditions water use based on statutory requirements. In order to approve an application, the State Engineer must find that the water will be put to beneficial use and that the applicant has demonstrated both a good faith intent and financial ability to develop and use the water with reasonable diligence.¹⁰³ In approving water rights for new appropriations, the State Engineer must also affirm there is unappropriated water, the use will not impair existing rights or other protectable interests not required to obtain a water right (e.g., exempt wells), the development is feasible and not speculative, and the use will not “threaten[] to prove detrimental to the public interest.”¹⁰⁴ In assessing water use applications, the State Engineer may require an environmental

⁹⁶ *Nevada State Water Plan*, NEV. DIV. WATER PLANNING, *Executive Summary*, 4 (Mar. 1999), http://water.nv.gov/programs/planning/stateplan/documents/NV_State_Water_Plan-complete.pdf. [hereinafter *Water Plan*].

⁹⁷ Minutes of the Assembly Committee on Natural Resources, Agriculture, and Mining, 78th Session of the Nevada Legislature, at 21 (February 24, 2015) [Statement of Jason King, Nevada State Engineer].

⁹⁸ *Water Plan*, *supra* note 96, at *Summary: Section 7*, 7-10.

⁹⁹ *Id.* at 1C-1.

¹⁰⁰ *Id.* at 1C-5.

¹⁰¹ Hugh A. Shamberger, *Evolution of Nevada's Water Laws, as Related to the Development and Evaluation of the State's Water Resources From 1866 to 1960*, STATE OF NEVADA, DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES (1991).

<http://images.water.nv.gov/images/publications/water%20resources%20bulletins/Bulletin46.pdf>.

¹⁰² NEV. REV. STAT. § 534.180; NEV. REV. STAT. § 5330.085(1).

¹⁰³ NEV. REV. STAT. § 533.370(1).

¹⁰⁴ NEV. REV. STAT. § 533.370(2).

study.¹⁰⁵ For surface water, the state considers all water to be available for appropriation. The only limit is the quantity of water already withdrawn for use.

The lack of any limits on the quantity of surface water available for appropriation, beyond amounts appropriated by other users, contributes to the overproportion of water that can dewater streams, degrade the environment, and impair the availability and quality of water for future generations.

b. Integrated Water Management

Despite Nevada's early adoption of a comprehensive framework for managing groundwater, the state did not require conjunctive management of water resources until 2017, when amendments to the water code directed the State Engineer to "manage conjunctively the appropriation, use and administration of all waters of this State, regardless of the source of the water."¹⁰⁶

With respect to water quality, the State Engineer is not authorized to consider impacts to quality in water use allocations and the agency responsible for water quality does not have authority to appropriate water to address water quality.¹⁰⁷ However, Nevada does provide for temporary permits to "avoid pollution," though these are limited in scope.¹⁰⁸ In addition, the state water code permits the transfer of agricultural use to improve water quality.¹⁰⁹ However, the state's water planning provisions recognize the "relationship between the

quantity of water and quality of water" and further "the necessity to consider both factors simultaneously when planning the uses of water."¹¹⁰

Water plans provide opportunities to integrate water quality and quantity where there is a lack of regulation.

c. Groundwater Regulation:

Nevada requires state approval for all groundwater uses except for small quantity domestic wells. Outside of specially designated basins, groundwater management tracks the prior appropriations system for surface water—requiring a finding that there is unappropriated water, the use will not harm existing water rights or the public interest, and the use is not speculative.¹¹¹ While not codified in statute, the State Engineer's longstanding policy is to limit the availability of groundwater to the aquifer's perennial yield.¹¹² Therefore, for groundwater applications, the State Engineer considers the availability of water to be the perennial yield minus existing uses. As discussed further below, the state has also reserved from appropriation 10% of unappropriated water as of 2019.

While not defined in statute or regulation, the State Engineer adopts the definition of perennial yield as "the maximum amount of groundwater that can be salvaged each year over the long term without depleting the groundwater reservoir . . . The perennial yield cannot be more than the natural recharge to a groundwater basin and in some cases is

¹⁰⁵ Applications for interbasin transfers must comply with additional environmental hurdles. Unlike water use within a single basin (where water not consumptively used returns to the same system), interbasin transfers remove water from systems entirely, which can exacerbate environmental impacts. *See* NEV. REV. STAT. § 533.370(3) [requiring a determination of whether "the proposed action is environmentally sound"].

¹⁰⁶ NEV. REV. STAT. § 533.024(1)(e).

¹⁰⁷ *Water for Wildlife & Environmental Purposes*, NEV. DIV. WATER PLANNING 8–9,

<http://water.nv.gov/programs/planning/stateplan/documents/pt3-3b.pdf> (last visited Oct. 8, 2020) [noting that water quality violations due to low flow are exempt].

¹⁰⁸ NEV. REV. STAT. § 533.437-4377.

¹⁰⁹ NEV. REV. STAT. § 533.0243.

¹¹⁰ NEV. REV. STAT. § 540.011(3).

¹¹¹ NEV. REV. STAT. § 533.370. f

¹¹² *White Pine County, et al v. Tim Wilson*, No. CV-1204049, 7 (March 9, 2020) [discussing the State Engineers longstanding policy].

less.”¹¹³ By 1970, Nevada had calculated perennial yields for all groundwater basins. The limitation of available water to a safe yield is a critical component of maintaining a sustainable water supply. Without this approach, groundwater could be pumped at a rate which would eventually deplete the aquifer. Not only would that approach be detrimental to the environment but also inequitable to future generations as it denies them a right to use a critical resource.

Requirements that constrain water withdrawals within a sustained yield provide an important limit that protects groundwater systems. States should incorporate perennial yield limits as a basis for water allocations.

Limiting water appropriations to the aquifer’s perennial yield protects against groundwater mining that cause the water table to decline due to pumping from “the storage rather than the recharge.”¹¹⁴ In a recent case, the Nevada Court reversed the State Engineer’s approval of an interbasin transfer when the withdrawals would result in groundwater mining. The Court found that allowing the allocation would “prove detrimental to the public interest because the awards . . . result in water mining” and would be inconsistent with the State Engineer’s rules restricting groundwater withdrawals to perennial yield.¹¹⁵

¹¹³ *Id.* at 7 [citing *Water for Nevada*, Nevada Resources Report No. 3, 13, State Engineer’s Office, October 1971]; *Groundwater Management in Nevada: The Good, The Bad & The Ugly*, WATERWIRED (June 19, 2019), <https://www.waterwired.org/2019/06/jason-king-awra-presentation-groundwater-management-in-nevada-the-good-the-bad-and-the-ugly-1.html>. The state water plan adopts a slightly different definition of perennial yield incorporating considerations of economic viability of development: “the amount of usable water from a ground-water aquifer which can be economically withdrawn and consumed each year for an indefinite period without depleting the source.” See also *Water Plan*, *supra* note 96, at 3-11.

Despite these limitations, the combined allocated groundwater—which includes both consumptive and non-consumptive quantities—in the 13 “hydrographic regions” of the state still exceeds the combined perennial yield of the basins by almost one million-acre feet.¹¹⁶ This is in part due to the early overallocation of water prior to restrictions around perennial yield and difficulty curtailing water use once water rights are acknowledged.

The water code creates two special area designations for groundwater to address overallocation: Designated Basins and Critical Groundwater Management Areas. “Designated Groundwater Basins” are areas experiencing increased water demand. The State Engineer has discretion to designate basins either on its own initiative or on petition of water users. One hundred and twenty of Nevada’s 256 basins are designated management areas.¹¹⁷ Once designated, the State Engineer has authority to adopt rules, regulations and orders that are “essential for the general welfare,” including the ability to set preferred uses, issue temporary permits, impose metering obligations, and close basins to new uses.¹¹⁸

Preferred uses are designated by the State Engineer and may be used to prioritize or even deny new water permits for certain types of uses.¹¹⁹ For example, in some basins the State Engineer has identified irrigation as not a preferred use thereby prohibiting new allocations. Temporary permits allow the State

¹¹⁴ *White Pine County*, No. CV-1204049 at 8-9.

¹¹⁵ *Id.* at 33.

¹¹⁶ *Water Plan*, *supra* note 96, at *Summary*, 3-12.

¹¹⁷ Hydrographic Regions and Basins, STATE OF NEVADA, DIVISION OF WATER RESOURCES, <http://water.nv.gov/hydrographicregions.aspx> (last visited Oct. 8, 2020) (providing a list of designated basins).

¹¹⁸ NEV. REV. STAT. § 534.030; NEV. REV. STAT. § 534.120.

¹¹⁹ NEV. REV. STAT. § 534.120(2). The last preferred use order declaring types of preferred uses was issued in 1991. See OFFICE OF THE STATE ENGINEER OF THE STATE OF NEVADA, Orders List, <http://water.nv.gov/StateEngineersOrdersList.aspx> (filtered by Type: Preferred Uses).

Engineer to permit water use while retaining authority to restrict or revoke use rights when necessary to protect the aquifer. Designation provides authority to require measurement and reporting of withdrawals. For instance, in 2015, the State Engineer issued 28 orders requiring the installation of meters, monthly record keeping, and submission to the State Engineer.¹²⁰ Finally, the designation also authorizes the State Engineer to close the basin to new uses.¹²¹

The authority to issue temporary permits and set preferred uses allows for continued growth in basins while retaining the authority to protect aquifer levels.

The Las Vegas groundwater basin illustrates how the State Engineer can leverage this additional management authority in designated basins.¹²² The State Engineer first designated the basin in 1941 and expanded the designated area between 1941 and 1944. In 1949, the State Engineer closed a portion of the basin to new irrigation water withdrawals. Subsequently, in 1955, the legislature authorized the issuance of temporary permits in designated basins to allow for continued growth in the basin without creating permanent property rights in water use. After 1955, all issued groundwater rights were temporary and subject to revocation when a municipal source of water becomes available.¹²³ In 1997, a groundwater management plan was adopted to increase conservation efforts

and assist residents in shifting to municipal water supplies which utilize surface water. These efforts supplemented existing regulatory requirements that domestic wells be closed when a municipal supply is available.¹²⁴ Interestingly, between 1999 and 2012 only ten of the 504 wells shifting from groundwater to municipal water sources were mandatory under state law, highlighting the importance of voluntary conservation efforts.¹²⁵

For areas consistently exceeding safe yield, the State Engineer may designate critical groundwater management areas. Designation is discretionary until petitioned by the majority of water rights holders in the basin.¹²⁶ Upon designation, water users have ten years to develop a groundwater management plan to address overdraft and remove the designation. If withdrawals continue to exceed safe yield, the State Engineer must restrict use in the order of priority, with withdrawals capped to stabilize the aquifer. There is currently only one critical management area designated in the state. In 2015, on petition of the majority of groundwater users in the basin, the State Engineer designated Diamond Valley as a critical groundwater management area due to groundwater pumping exceeding perennial yield for over 40 years. Following designation, groundwater users developed a groundwater management plan that will govern water use going forward. The plan created a market system that would allow users to trade water allocations to meet the State Engineer's

¹²⁰ OFFICE OF THE STATE ENGINEER OF THE STATE OF NEVADA, Orders List, <http://water.nv.gov/StateEngineersOrdersList.aspx> (filtered by Type: Meter).

¹²¹ See e.g., Order 1310, OFFICE OF THE STATE ENGINEER OF THE STATE OF NEVADA (June 26, 2020).

¹²² *Protecting Groundwater Through Legislation*, LAS VEGAS VALLEY GROUNDWATER MANAGEMENT PROGRAM, <https://www.lasvegasgmp.com/program/laws-legislation/index.html> (last visited Oct 8, 2020).

¹²³ A 1997 bill authorized the Southern Nevada Water Authority to assist property owners in plugging wells and connected to municipal water systems. See A.B. 09-1067, 70th Leg., Reg. Sess. (Nev. 1999).

¹²⁴ NEV. REV. STAT. § 543.120 (authorizing the mandatory conversion of wells to municipal supplies); Miranda Willson, *Las Vegas Groundwater Management a Success, But Overpumping Issues Loom*, LAS VEGAS SUN (Dec. 8, 2019), <https://lasvegassun.com/news/2019/dec/08/1-as-vegas-groundwater-management-success-overpump/>.

¹²⁵ *Las Vegas Valley Groundwater Management: Report to the Nevada Legislature*, S. NEVADA WATER AUTHORITY 7 (Dec. 2012), <https://www.leg.state.nv.us/Division/Research/Library/Documents/ReportsToLeg/2011-2013/243-13.pdf>.

¹²⁶ NEV. REV. STAT. § 534.110.

reduction targets.¹²⁷ The plan was appealed to the district court which found the proposed plan violated Nevada’s water rights framework requiring curtailment within ten years of designation.¹²⁸

The critical management area designation provides a unique regulatory lever to drive voluntary action to reduce groundwater consumption. Specifically, the designation triggers a countdown to the mandatory curtailment of water rights based on priority to meet perennial yield which has the potential to completely eliminate water rights for many water users. This potentially harsh outcome can spur compromise among water users and conservation.

Mandatory requirements to curtail uses to bring basins back into sustainable yields and can provide incentives to increase conservation.

The voluntary reduction of water use—both in the groundwater and surface water context—is challenged by the possibility of abandonment and forfeiture. Failure to use the full quantity of the water right for the statutory period of years can result in a determination that the right has been abandoned or forfeited (for unperfected rights).¹²⁹ This can incentivize the continued use of water beyond the quantity actually needed. For example, in assessing whether to approve the Diamond Valley Groundwater Management plan, objections were made based on the State Engineer’s failure to take steps to initiate abandonment proceedings against the water rights holders. As the State Engineer noted, such action could “exacerbate conditions in the basin by increasing pumping.”¹³⁰ To address this

¹²⁷ Order No. 1302, OFFICE OF THE STATE ENGINEER OF THE STATE OF NEVADA (Jan. 11, 2019).

¹²⁸ See Diamond Valley Groundwater Management Plan Frequently Asked Questions, OFFICE OF THE STATE ENGINEER OF THE STATE OF NEVADA, <http://water.nv.gov/Diamond%20Valley%20GMP/FAQs.pdf>.

¹²⁹ NEV. REV. STAT. § 534.090 (groundwater with a statutory period of 5 years); NEV. REV. STAT. § 533.060 (with a statutory period of 10 years).

concern, the legislature authorized the State Engineer to extend the time for a groundwater user to overcome a claim of forfeiture or abandonment, where the nonuse was due to the designation of a critical groundwater management area, conservation efforts or the availability of water was limited due to the basin’s withdrawals exceeding perennial yield.¹³¹

2. Public interest

a. Public resource

Both the Nevada common law public trust doctrine¹³² and state statute recognize water as a public resource and requires management in the public interest.¹³³ However, the impact of these provisions on the state’s water allocation system was unclear until last month when the Nevada Supreme Court affirmed the public trust doctrine’s applicability to the state’s water laws.¹³⁴

i. *Mineral County v. Lyon County*

The *Mineral County* case arose as a challenge to the state’s management of Walker Lake, where agricultural diversions have reduced the lake’s water level to one-half and degraded water quality. Mineral County intervened in ongoing federal litigation over water rights and asserted the public trust doctrine required the state as trustee to restore the lake.¹³⁵

As part of the federal litigation, the Ninth Circuit Court of Appeals certified the following question to the Nevada Supreme Court: “does the public trust doctrine apply to rights

¹³⁰ Order No. 1302 at 9-10.

¹³¹ NEV. REV. STAT. § 534.090(3).

¹³² *Lawrence v. Clark County*, 254 P.3d 606 (Nev. 2011) (describing the history of the public trust doctrine in Nevada).

¹³³ NEV. REV. STAT. § 533.025.

¹³⁴ *Mineral County*, 136 Adv. Opp. at 58.

¹³⁵ *Id.* at 6.

already adjudicated and settled under the doctrine of prior appropriation and, if so, to what extent?”¹³⁶ In answering the question, the Court held the common law public trust doctrine applied to all waters of the state¹³⁷ and extended to water rights adjudicated under the state’s water code. However, it found the state’s water code satisfied the state’s obligations as trustee of the public trust resource to ensure (1) the use of the resource is in the public interest and (2) that disposition of the resource comports with common law.¹³⁸

The Court found the first obligation satisfied by requirements in the water code that the State Engineer deny appropriations not in the public interest.¹³⁹ The requirements of the public interest review are discussed in more detail below.

With respect to the second obligation, the Court found the state water code satisfied the common law requirements for disposition of trust resources (here, through the issuance of a water right): “(1) disposition was made for a public purpose, (2) the state received fair consideration in exchange for the disposition, and (3) the disposition satisfies the states special obligation to maintain the trust for the use and enjoyment of present and future generations.”¹⁴⁰ First, the Court found the restriction that water rights only be granted for beneficial uses ensures the water use will be for a public purpose. Second, the Court found the state received a “fair exchange” for the alienation of water because development of water resources contributes to economic growth and community prosperity. Finally, the Court found water code provisions limiting water rights to quantities that can be put to beneficial use without waste and requiring that water use be in the public interest satisfied the

state’s obligation to ensure the maintenance of the resource for future generations.¹⁴¹

The Court also held the public trust doctrine did not provide a basis to reallocate existing water rights. While the Court appeared to acquiesce that the public trust doctrine imposes a continuing obligation on the state to ensure the use of trust resources remain in the public interest, it again found the obligation satisfied through the water code.¹⁴² Specifically, the Court found the obligation met by (1) the water code’s prohibition against waste (a water right is limited to the quantity that can be put to beneficial use), (2) the State Engineer’s obligation to ensure proposed uses are consistent with the public interest, and (3) the State Engineer’s authority to set preferred uses and regulate groundwater use in basins where groundwater is being depleted.¹⁴³

In finding the water code’s statutory requirements satisfied the state’s obligation as trustee, the Court found the public trust doctrine did not provide an independent judicially-enforceable mechanism to regulate water use.¹⁴⁴

The dissent disagreed with the majority’s conclusion that the state’s public trust obligations were entirely satisfied by compliance with the statutory requirements of the water code. Instead, the dissent argued the public trust doctrine is an independent constraint on the state’s management of water and imposes continuing obligations to preserve the resource. The dissent noted the failure of the state’s water code to satisfy the state’s obligation as trustee was demonstrated by Walker Lake itself: “[t]he public trust doctrine demands that some responsible state entity take action to preserve the public value of Walker Lake, yet all parties recognize its

¹³⁶ Mineral County, et al. v. Lyon County, et al., Case No. 75917 (Nev. July 18, 2018) [accepting certified question and directing briefing].

¹³⁷ The majority opinion held the public trust doctrine applied to all water in the state—both navigable and non-navigable. Mineral County, 136 Adv. Opp. at 14-5.

¹³⁸ *Id.* at 13-14.

¹³⁹ *Id.* at 17.

¹⁴⁰ *Id.* at 19.

¹⁴¹ *Id.* at 19-21 [internal quotations omitted].

¹⁴² *Id.* at 18.

¹⁴³ *Id.* at 17-20.

¹⁴⁴ *Id.* at 17-8.

continuing decline despite the State Engineer's statutory obligations.¹⁴⁵

By finding the public trust doctrine entirely subsumed within the state's water code, the Court has limited the impact of the public trust doctrine as an independent source of authority to ensure the state's management of public resources is sustainable and supports both present and future generations. In doing so, the holding serves to highlight the importance of including enforceable statutory provisions that require consideration of public trust principles in state administration of water resources.

ii. *Public Interest Criteria*

The Court in *Mineral County* rests its holding in part on the water code's requirement that the State Engineer ensure water appropriations are in the public interest. For new allocations, the State Engineer must deny an application if it "threatens to be detrimental to the public interest."¹⁴⁶ Further, the State Engineer may approve temporary changes only where they are in the public interest.¹⁴⁷

Mandatory consideration of public interest criteria is an important component of ensuring water uses are balanced with other societal values.

While the water code requires the protection of the public interest, it leaves the contours of the interest undefined. Therefore, the State Engineer has discretion to determine how the "public interest" standard is applied.¹⁴⁸ To date, the State Engineer has limited the public interest considerations to principles identified in Nevada's water code.¹⁴⁹ These criteria essentially restate existing requirements for

appropriation identified in the water code. For example, identified criteria include that water must be appropriated for a beneficial use and the need to demonstrate the amount, source and purpose of appropriation.¹⁵⁰ However, some criteria are drawn from policy principles that would otherwise not be incorporated expressly into a water use decision. For example, the State Engineer has identified water planning policies as a public interest criterion.¹⁵¹ While the Nevada Supreme Court has upheld the State Engineer's use of statutory principles, a critical view would note that this approach merely results in "a useless summary of readily accessible statutory water law."¹⁵²

The State Engineer has noted that applicable public interest criteria may vary depending on the type of application and, further, do not remain static and must evolve with changing societal values.¹⁵³ However, under the current approach that draws criteria from principles identified in statute any new criteria would need to be incorporated by the legislature.

The Court's opinion in *Mineral County* rests even more weight on the State Engineer's public interest review. However, the ability of the public interest review to ensure the public interest is met, has been moderated by the lack of a statutory definition and the State Engineer's narrow reading of what constitutes public interest.

Failure to define the public interest may result in criteria that ignores considerations of the environment and intergenerational equity.

¹⁴⁵ *Mineral County*, 156 Adv. Opp. at 10 (Pickering, C.J. and Silver, J., concurring in part and dissenting in part).

¹⁴⁶ NEV. REV. STAT. § 533.370.

¹⁴⁷ NEV. REV. STAT. § 533.345.

¹⁴⁸ Ruling 6146, OFFICE OF THE STATE ENGINEER OF THE STATE OF NEVADA 152 (March 22, 2012).

¹⁴⁹ *Id.*

¹⁵⁰ *Id.* at 155.

¹⁵¹ *Id.* at 157.

¹⁵² *Pyramid Lake Paiute Tribe of Indians v. Washoe County*, 918 P.2d 697, 705 (Nev. June 14, 1996) (Justice Springer and Chief Justice Stefen, dissenting).

¹⁵³ Ruling 6146 at 150.

b. Public Participation:

Nevada's water rights framework provides opportunity for public involvement in the State Engineer's water management decisions. Nevada permits "any person" to challenge a water use decision by the State Engineer.¹⁵⁴ The term "any person" includes both impacted water users and those asserting broader public interests. Parties who protest administrative decisions may seek judicial review of those decisions.¹⁵⁵

3. Environmental Flows

As noted above, the Nevada water code does not provide express authorization for instream water rights¹⁵⁶ and there is no codified program to protect instream flows.¹⁵⁷ Consistent with prior appropriations doctrine, beneficial uses were typically tied to out-of-stream consumptive uses. However, Nevada did recognize one instream exception to this framework to support recreation.¹⁵⁸ In *State v. Morros*, the Nevada Supreme Court held that water to support fish was included within the state-recognized beneficial use for "recreational purposes," which the water code defined to include "wildlife watering."¹⁵⁹ Further, the Court rejected the argument that a water right required a diversion of water. In doing so, the court found that Nevada law only required the water be used for a beneficial purpose, which could include in situ use where physical diversion is not required to achieve the use.

Nevada does not distinguish between the acquisition and management of instream water rights and other consumptive water uses. As such, any entity or individual that is otherwise able to acquire water rights is authorized to acquire instream water rights—this includes both private individuals and public entities. A new water rights for instream purposes can be acquired following the states process for appropriating new water rights. Alternatively, existing water rights can be transferred to instream use. Nevada law allows for both the permanent¹⁶⁰ and temporary (one year) transfer of water rights to instream use.¹⁶¹ More recently, Nevada has authorized the temporary transfer of agricultural water for "wildlife purposes or to improve the quality or flow of water."¹⁶² These types of transfers are limited to 3 years unless an extension is approved by the State Engineer.¹⁶³

The ability of both public and private parties to hold instream water rights provides flexibility in how environmental flows are protected.

The lack of any specific statutory program has both supported and hindered the reallocation of water for environmental purposes. The broad eligibility of individuals and entities that can hold instream rights and clear statutory processes for acquiring and transferring water rights has facilitated numerous transfers. A 2015 report, identified 57 instream transfers approved in Nevada—39 of which are

¹⁵⁴ NEV. REV. STAT. § 533.145(1) (for surface water); NEV. REV. STAT. § 534.270(2) (for groundwater).

¹⁵⁵ NEV. REV. STAT. § 533.450(1); NEV. REV. STAT. § 534.037(4).

¹⁵⁶ One example exists for spring flows which the State Engineer must protect for wildlife populations. See NEV. REV. STAT. § 533.367 ("Before a person may obtain a right to the use of water from a spring or water which has seeped to the surface of the ground, the person must ensure that wildlife which customarily uses the water will have access to it.").

¹⁵⁷ Nevada's water code does contain one example of protecting instream uses in the water code. In the use of any spring or seep the water code requires the preservation of water flows sufficient

to support the wildlife that "customarily uses the water." NEV. REV. STAT. § 533.367.

¹⁵⁸ NEV. REV. STAT. § 533.030(2).

¹⁵⁹ *State v. Morros*, 766 P.2d 263, 265 (Nev. 1988). This case involved the State Engineer's issuance of a water right to the Bureau of Land Management to support water levels in a natural lake. Challengers of the water right asserted that Nevada state law required a diversion from the stream for the appropriation of water.

¹⁶⁰ See NEV. REV. STAT. § 533.340.

¹⁶¹ See NEV. REV. STAT. § 533.345(4).

¹⁶² NEV. REV. STAT. § 533.0243(1).

¹⁶³ NEV. REV. STAT. § 533.0243.

permanent.¹⁶⁴ However, the lack of a state-mandated program, including targeted funding, to affirmatively protect instream flows likely inhibits a comprehensive plan to address environmental needs. Indeed, the state's 1999 water plan recommended both of these components as a means to help advance the acquisition of instream water rights in the state.¹⁶⁵

Another important advancement in the protection of flows occurred in 2019 when the Nevada legislature directed the State Engineer to reserve from any further appropriation "10 percent of the total remaining groundwater" not already "committed for use in the basin" as of June 5, 2019.¹⁶⁶ The bill, referred to as the "reserved water bill," protects groundwater basins that are not already over appropriated and "ensures that water is available both to support the environment and future generations."¹⁶⁷ In response, the State Engineer entered 89 interim orders implementing the bill.¹⁶⁸ The orders calculated the new quantities of water available for appropriation by subtracting the reserved 10% plus current commitments from the basin's perennial yield. The reservation of water presents a critical development in the state's ability to ensure sustainable use of water resources as it allows the state to proactively protect quantities of groundwater.

The reservation of base amounts of groundwater in the aquifer provides an important opportunity to protect groundwater in situ.

4. Planning

Nevada incorporates requirements for water planning and recognizes planning as a critical piece for understanding the status of the state's water resources.¹⁶⁹ The policy for water planning recognizes "the critical nature of the State's limited water resources" and importance of planning to provide for current and future water needs in the state. The goals of the plan include securing "enough water of sufficient quality for future generations," achieving "more conservation and less waste of water," "protection and enhancement of the environment," and "a better educated citizenry and more public participation." Water planning advances these goals while recognizing the need to protect "existing water rights."¹⁷⁰

Comprehensive planning builds critical information needed to understanding current resources and how those resources can be managed meet existing and future needs.

The State Engineer has also cited these legislative goals as guiding frameworks for its water management decisions and incorporated them into its public interest review.¹⁷¹

Identifying clear goals for water planning that incorporate intergenerational equity and protection of the environment provide authorization for state agencies to implement water management frameworks to achieve these goals.

¹⁶⁴ Leon F. Szeptycki, Julia Forgie, Elizabeth Hook, Kori Lorick, and Phil Womble, *Environmental Water Rights Transfers: A Review of State Laws*, WATER IN THE WEST FOR THE NATIONAL FISH AND WILDLIFE FOUNDATION (Aug 31, 2015), <https://waterinthewest.stanford.edu/sites/default/files/WITW-WaterRightsLawReview-2015-FINAL.pdf> (last visited Oct. 8, 2020).

¹⁶⁵ *Water for Wildlife & Environmental Purposes*, *supra* note 107.

¹⁶⁶ NEV. REV. STAT. § 533.0241 (proposed amendments to the bill would have allowed reserved water to be used during drought. The amendments were not approved).

¹⁶⁷ S.B. 140, 80th Leg., Reg. Sess. (Nev. 2019).

¹⁶⁸ Order No. 1308, OFFICE OF THE STATE ENGINEER OF THE STATE OF NEVADA (March 3, 2020).

¹⁶⁹ NEV. REV. STAT. § 540 (providing for the planning and development of water resources).

¹⁷⁰ *Water Plan*, *supra* note 96, at *Summary*, 1-4.

¹⁷¹ Ruling 6146 at 157-58.

The first Nevada Water Plan was completed in 1974 and the most recent plan completed in 1999. The Plan provides an overview of existing uses, future needs, and how existing water resources and management tools can help meet those needs.

In 2017, the legislature amended the water code to require the State Engineer to “prepare and maintain water budgets and calculate[] and maintain[] an inventory of water” including the amount of appropriated groundwater, amount allocated for domestic wells and the amount available for appropriation.¹⁷² Prior to this legislative requirement, Nevada had estimated that only 50% to 75% of water use was measured and reported.¹⁷³

5. Public Trust Principles

- 💧 **Inclusion of public interest criteria allows for consideration of public values in water allocation decisions.**
- 💧 **Limiting groundwater withdrawals to be within the sustained yield of the aquifer and prohibiting groundwater mining helps protect against unsustainable water use.**
- 💧 **Authorizing the designation of critical groundwater areas and mandating curtailment of water uses to bring aquifers back to sustainable water levels helps correct over allocations.**
- 💧 **Allowing private individuals to acquire and hold water rights can help advance the protection of instream flows by leveraging the power of NGOs and private markets.**

¹⁷² NEV. REV. STAT. § 532.167

¹⁷³ *Water Plan*, supra note 96, at *Summary*, 3-16.

Public Trust Elements	Principles in Nevada Water Code
Affirmation that water is a public resource	<ul style="list-style-type: none"> ✓ NEV. REV. STAT. § 533.025 (water is a public good) ✓ NEV. REV. STAT. § 534.020 (water is a public good)
Water recognized as a public trust resource	<ul style="list-style-type: none"> ✓ (Applies to all waters including appropriative rights)
Public interest as a criterion in management decisions	<ul style="list-style-type: none"> ✓ NEV. REV. STAT. § 534.370 (water is a public good)
Opportunity for public participation in decision making and to enforce public interest values	<ul style="list-style-type: none"> ✓ NEV. REV. STAT. § 533.145(1) (surface water proceedings) ✓ NEV. REV. STAT. § 534.270(2) (groundwater proceedings)
Requirements for planning and data collection	<ul style="list-style-type: none"> ✓ NEV. REV. STAT. § 540 (providing for the planning and development of water resources)
Ability to adjust water use to address potential or actual overuse	<ul style="list-style-type: none"> ✓ NEV. REV. STAT. § 534.120 (ability to issue temporary permits in designated basins) ✓ NEV. REV. STAT. § 534.120 (curtailment in critical management areas)
Identification of the needs of future generations and the environment as beneficial uses	<ul style="list-style-type: none"> ✓ NEV. REV. STAT. § 533.030(2) (beneficial uses include water to preserve wildlife needs)
Mechanism to protect environmental flows	<ul style="list-style-type: none"> ✓ NEV. REV. STAT. § 533.030(2) ✓ NEV. REV. STAT. § 533.0241 (reserving 10% of unallocated groundwater)
Requirement to manage within safe yields	<ul style="list-style-type: none"> ✓ NEV. REV. STAT. § 533.370(2) (limiting water appropriations to available unappropriated water coupled with State Engineer defining available water to be the perennial yield of an aquifer)
Flexibility to allow for the voluntary reallocation of water	<ul style="list-style-type: none"> ✓ NEV. REV. STAT. § 533.0243(1) (Temporary transfers of agricultural water) ✓ NEV. REV. STAT. § 533.0243(1) 533.345 (allowing changes in place of diversion, manner of use, and place of use; temporary transfers must not exceed one year)

C. MICHIGAN

1. Water Management Framework

Water use in Michigan is governed by the common law riparian doctrine, public trust principles, international charters and treaties, interstate compacts, and statutory frameworks. The common law riparian doctrine recognizes a riparian landowner's right to the natural flow of water subject to the rights of other riparian landowners.¹⁷⁴ At common law, groundwater use is still governed by the reasonable use doctrine that permits the surface landowner to make reasonable use of the water subject to the limitation that the use cannot unreasonably harm other landowners.¹⁷⁵ In addition, Michigan recognizes the public trust doctrine as applicable to navigable waters.¹⁷⁶ As a Great Lakes Basin State, water use in the state is also constrained by international charters and interstate compacts.

Michigan is characterized by plentiful water resources—the Great Lakes have 6 quadrillion gallons of water. However, plentiful water has not insulated the state from concerns around both the quality and quantity of water. Prompted by these concerns, the Great Basin States ratified the Great Lakes—St. Lawrence River Basin Water Resources Compact (“Compact”)—committed to in 2001 and ratified in 2008—a legally binding interstate agreement setting minimum standards for signatory states in managing water withdrawals.¹⁷⁷ Minimum standards for water use management include mandatory reporting of water uses, development of a water inventory, regulation of new withdrawals,

¹⁷⁴ Michigan Citizens for Water Conservation v. Nestlé Waters North America, Inc., 709 N.W.2d 174, (Mich. 2005); Glass v. Goeckel, 703 N.W.2d 58, (Mich. 2005).

¹⁷⁵ Dumont v. Kellogg, 29 Mich. 420, 424 (Mich. 1874) [the overlying landowner's right to use groundwater is constrained by “whether under all the circumstances of the case the use of the water by one is reasonable and consistent with a correspondent enjoyment of right by the other.”].

prohibition on water withdrawals, and conservation and efficiency programs.¹⁷⁸

Legal Frameworks

- Natural Resources and Environmental Protection Act (NREPA), Part 37, Great Lakes Preservation
- Natural Resources and Environmental Protection Act (NREPA), Part 31, Michigan Environmental Protection
- Great Lakes—St. Lawrence River Basin Water Resources Compact (adopted MCL § 324.34201)
- Michigan Constitution 1963, Article 4, Section 52

a. *Water Use Regulations*

In response to Compact obligations, Michigan adopted a comprehensive regulatory program for large quantity water users in 2006, as amended in 2008. Michigan's water use regulations are codified in the Natural Resources and Environmental Protection Act and are administered by the Michigan Department of Environment, Great Lakes, and Energy (EGLE).¹⁷⁹

Water withdrawal regulations impose registration and permitting requirements on large quantity surface water and groundwater withdrawals (in-basin uses)¹⁸⁰ and diversions (out-of-basin uses):

¹⁷⁶ Bott v. Comm'n of Natural Res., 327 N.W.2d 838, (1982). See also *Nestlé Waters*, 709 N.W.2d at 174; *Glass*, 703 N.W.2d at 58.

¹⁷⁷ Codified at MICH. COMP. LAWS § 324.32701.

¹⁷⁸ The Great Lakes—St. Lawrence River Basin Water Resources Compact, art. 4, § 3.

¹⁷⁹ The agency was previously known as the Michigan Department of Environmental Quality until 2019.

¹⁸⁰ See MICH. COMP. LAWS § 324.32701(1)(cc).

- Registration and review for all new or increased large quantity withdrawals.¹⁸¹ Large quantity withdrawals are defined as withdrawals over 100,000 gallons per day.¹⁸²
- Permits for (1) new or increased withdrawals over two million gallons per day in the Great Lakes; (2) diversions of water over 100,000 gallons per day; and (3) large quantity withdrawals that will likely cause adverse resource impacts.¹⁸³
- Registration for all large quantity withdrawals, defined as withdrawals over 100,000 gallons or more per day averaged over a 30-day period. All diversions are required to register.¹⁸⁴

Water uses that are not subject to the water withdrawal regulations are governed through common law riparian principles and subject to enforcement by other water users under the reasonable use doctrine but otherwise unregulated and untracked.¹⁸⁵ These water withdrawals are not insubstantial. For example, a 2005 USGS report noted that private wells were used to provide 2.9 million people with drinking water.¹⁸⁶

As in other states, unregulated small-quantity users may cumulatively contribute to unsustainable water use in the state.

The touch point of Michigan’s water registration and permitting system is a prohibition on any withdrawal or diversion that would cause an Adverse Resource Impact

(“ARI”). The ARI standard is intended to ensure that water use does not have significant adverse impacts on the quality and quantity of Michigan’s waters or water-dependent ecosystems.¹⁸⁷ The potential for an ARI is determined by assessing the withdrawal’s impacts on characteristic fish populations that are used as indicator species for the ecological health of the waterbody.¹⁸⁸ Fish populations are protected to ensure “thriving fish populations” which are protectively defined as “fish species that are expected to flourish at very high densities”¹⁸⁹

The ARI considers the amount of flow needed to support fish populations based on the size and temperature of the stream (e.g., cold and small). Michigan has classified all streams into eleven habitat types based on temperature and size.¹⁹⁰ The proposed withdrawal is then assessed to determine whether it would reduce the “index” flow of the stream below the quantity necessary to support ecological functions. For example, an ARI occurs in small cold-water streams when the withdrawal would result in a 3% reduction in fish populations.¹⁹¹ Through modeling, the EGLE has determined the quantity of streamflow necessary to ensure protection of 97% of fish populations. Withdrawals are then limited to the quantity that can be removed from the index flow while still maintaining the minimum quantity of water needed to protect fish populations from an ARI.

The index flow is defined as the flow equal to the 50% “exceedance flow” for rivers and streams during its low flow month (typically the summer). Distilled, this is the quantity of water that a stream has at least half of the time during the summer.¹⁹² The use of the lowest

¹⁸¹ See MICH. COMP. LAWS § 324.32701(1)(a)(ii)(A).
¹⁸² MICH. COMP. LAWS § 324.32701(1)(cc).
¹⁸³ MICH. COMP. LAWS § 324.32723(1).
¹⁸⁴ MICH. COMP. LAWS § 324.34201.
¹⁸⁵ MICH. COMP. LAWS § 324.3278.
¹⁸⁶ Saichon Seedang & Patricia E. Norris, *Water Withdrawals & Water Use in Michigan*, MICH. STATE UNIV. EXTENSION BULLETIN 4 (Feb. 2011), [https://www.canr.msu.edu/uploads/resources/pdfs/water_withdrawals_and_water_use_in_michigan_\(wq62\).pdf](https://www.canr.msu.edu/uploads/resources/pdfs/water_withdrawals_and_water_use_in_michigan_(wq62).pdf).

¹⁸⁷ Davide A. Hamilton & Paul W. Seelbach, *Michigan’s Water Withdrawal Assessment Process and Screening Tool*, MICH. DEP’T OF NATURAL RES. 2 (May 2011), https://www.michigan.gov/documents/dnr/sr55_540475_7.pdf.
¹⁸⁸ *Id.* at 4.
¹⁸⁹ MICH. COMP. LAWS § 324.32701(1)(oo).
¹⁹⁰ Hamilton & Seelbach, *supra* note 187, at 1.
¹⁹¹ MICH. COMP. LAWS § 324.32701(1)(A).
¹⁹² Hamilton & Seelbach, *supra* note 187, at 2.

yearly flow period is an important characteristic of Michigan’s water withdrawal system. Low flow periods are generally the most ecologically stressful. In addition, in summer months—typically characterized by low precipitation—groundwater makes up a substantial part of streamflow (termed its base flows). The use of this period can make it easier to assess groundwater pumping impacts to streamflow.

The use of the lowest yearly flow period as the basis to assess withdrawals helps ensure that water quantities sufficient to safeguard ecological functions remain instream during all seasons.

Michigan has identified index flows for 7,000 surface waters including both natural and manmade waters (recognizing that manmade ditches and other waterbodies support important fish populations). However, gauges are located on only a small number of streams and statistical modeling is used to set index flows. In addition, exempt uses are not quantified. These data gaps may result in higher than actual streamflow levels being used to assess the potential for ARI and, as a result, fail to accurately assess resource impacts.

Withdrawals are assessed from its baseline capacity, defined, subject to certain exceptions, as the capacity of a system reported as of April 1, 2009.¹⁹³ Therefore, only the increased portion of the withdrawal is assessed for an ARI. As a practical matter, this may result in findings that ignore the actual impact of a withdrawal. For example, in a recent opinion related to Nestlé’s proposed expansion of its water bottling facility, the administrative law judge affirmed EGLE’s assessment of impacts based only on the well’s increased capacity of 250 gallons per minute versus the well’s total capacity of 400 gallons per minute.¹⁹⁴

Therefore, instead of assessing resource impacts that would occur from pumping 400 gallons per minute, the court only considered the resource impacts from withdrawing 250 gallons per minute.

Failure to assess the impacts from the full quantity of a withdrawal can fail to account for actual impacts.

An innovative online assessment tool—the Water Withdrawal Assessment Process—is used to assess a proposed withdrawal’s impact to the state’s resources. The goal of the assessment process is to “link[] ecological and hydrologic principles and appl[y] them to water management decisions.”¹⁹⁵ Simplified, the water user inputs the quantity and location of the withdrawal. The WWAT then calculates the likelihood of an ARI using the index flow and stream type. The screening tool is adjusted with every new regulated withdrawal, so the available capacity reflects existing uses.

The potential for an ARI is described as a “zone.” Four management zones—A through D—are designated by statute. Withdrawals in Zone D have the highest risk of ARI and withdrawals in Zone A have no or a small risk of ARI. The opportunity for public input and regulatory requirements increases commensurate with likelihood of an ARI. Withdrawals in Zone A are authorized without further action, withdrawals in Zone B are authorized with notice to interested parties, withdrawals in Zone C require site-specific review by the EGLE, and withdrawals in Zone D require site specific review and are not permitted without mitigation.¹⁹⁶

For withdrawals in Zone C, the user must incorporate “environmentally sound” and “economically feasible” conservation measures. Notably, the EGLE does not determine the efficacy of these measures or whether other

¹⁹³ MICH. COMP. LAWS § 324.32701(1)(d).

¹⁹⁴ *Petitions for Michigan Citizens for Water Conservation, and the Ottawa Traverse Band of Ottawa and Chippewa Indians on the permit issued*

to Nestlé Waters North America, Inc., Case No. 18-011549 (April 24, 2020).

¹⁹⁵ Hamilton & Seelbach, *supra* note 187, at 2.

¹⁹⁶ MICH. COMP. LAWS § 324.32701(1)(tt).

measures would be more effective.¹⁹⁷ Withdrawals of more than 1 million gallons a day in Zone C require a permit.¹⁹⁸ Withdrawals in Zone D are generally not permitted. However, regulations provide that a Zone D withdrawal may be authorized under a permit but would need to incorporate preventative measures.¹⁹⁹

Permit applications must also comply with four decision-making criteria: any non-consumptive part of the water withdrawn is returned to the source watershed, there will be no ARI, the withdrawal complies with local laws, and is reasonable under common law and consistent with public rights.²⁰⁰

The EGLE has ongoing authority to revoke a permit if the withdrawal is causing an ARI.²⁰¹ Continuing a regulated withdrawal causing an ARI is subject to a civil penalty.²⁰²

Building in authority to adjust permits to address unanticipated adverse impacts allows for responsiveness to changing conditions and societal values.

In the first year the WWAT was utilized, 216 withdrawals were proposed. Of the 216, the assessment tool flagged 44 withdrawals for site-specific review. Of those, the state only rejected four proposed withdrawals, three of which due to an unacceptable ARI.²⁰³

b. Groundwater Regulation:

Michigan's regulatory approach is built on a recognition of the interconnection between groundwater and surface water. Both groundwater and surface water are managed within the same registration and permitting system, and subject to the same ARI assessment standard. Michigan uses analytical modeling to determine the impact of groundwater pumping on surface streams.²⁰⁴ All groundwater withdrawals are assessed within the system regardless of distance from a stream or well depth.²⁰⁵ The use of the same modeling parameters for the whole state has been a subject of criticism for failing to account for regional variances resulting in the authorization of withdrawals that would cause ARI in some areas while being too conservative in other areas.²⁰⁶ For example, in areas of the state with more water, the model could unnecessarily restrict water user. In contrast, in drier areas, the model could result in groundwater mining.²⁰⁷

The online tool has been lauded for its integrated approach to assessment of water impacts that desegregates impacts of groundwater pumping, streamflow diminishment, and habitat impacts.

¹⁹⁷ MICH. COMP. LAWS § 324.32723(6)(e).

¹⁹⁸ MICH. COMP. LAWS § 324.32723(1)(c).

¹⁹⁹ MICH. COMP. LAWS § 324.32706(c).

²⁰⁰ MICH. COMP. LAWS § 24.32723(6).

²⁰¹ MICH. COMP. LAWS § 324.32723(11).

²⁰² MICH. COMP. LAWS § 324.32713.

²⁰³ Sara R. Gosman, *Water Withdrawals in Michigan Implementing the Great Lakes Compact*, 90 MICH. B.J. 20, 23 (2011).

²⁰⁴ Ivan Steven Jayawan, *Evaluation of Modeling Framework and Social Perspectives Regarding Sustainable Groundwater Management in Michigan*, UNIV. MICH. DEP'T OF ENVTL. ENG'G 8- 9 (2019) (dissertation)

https://deepblue.lib.umich.edu/bitstream/handle/2027.42/149860/ijayawan_1.pdf?sequence=1.

²⁰⁵ *Ground-Water-Withdrawal Component of the Michigan Water-Withdrawal Screening Tool*, U.S. GEOLOGICAL SURVEY, 1 (2009),

https://pubs.usgs.gov/sir/2009/5003/pdf/sir2009-5003_web.pdf (Under the 2006 legislation, groundwater use was presumed to not cause an ARI when the well was over ¼ mile from a stream and deeper than 150 feet. Wells that did not meet the criteria were designated as having potential to cause an ARI.).

²⁰⁶ Ivan Steven Jayawan, *supra* note 204, at 8.

²⁰⁷ *Id.*

c. Challenges

i. Legislative Rollbacks:

The WWAT and permitting system were arguably weakened in 2018 when the Michigan legislature amended water withdrawal requirements to provide an alternative process to register a water withdrawal.²⁰⁸ The added process allows the user to submit a report from a hydrologist with analysis on the impact of the withdrawal. The hydrologist's report creates a presumption that the withdrawal will not result in an ARI. The legislation gives EGLE only 20 days to review the finding. If the EGLE does not complete its review in 20 days, the user may register the withdrawal. The 2018 amendment was spurred by concerns that the existing water withdrawal system was burdening water users. As the author of the bill described, "[u]nder the old, broken system, some farm families reported waiting as long as two years before finally getting the go-ahead to drill a well and water their crops - even though all of the data showed no risk to the environment. It's time for the government to get out of the way so our farm families and other businesses can get back to work."²⁰⁹ However, opponents of the bill note that it provides an avenue to avoid scientific review through the state's WWAT thereby weakening the state's permitting system.

Authorizing exceptions to review under the WWAT weakens Michigan's ability to review water uses for environmental impacts.

ii. Out-of-Basin Uses and Bottled Water

The transfer of water out of the basin was a significant concern for the Great Basin States in crafting the Compact. Despite this concern,

²⁰⁸ H.B. 5638, 99th Leg., Reg. Sess. (Mich. 2018).

²⁰⁹ Brad Devereaux, *Governor Signs Bill to Streamline Groundwater Withdrawal Process*, MICH. LIVE (Jan. 30, 2019),

the Compact excepted water exported in 5.7-gallon containers or smaller from the general prohibition on the diversion of water from the basin. Termed the "bottled water exception", there is no limit on the amount of water that can be exported under this provision. Michigan incorporated the exception within its regulatory approach, exempting water use for bottled water from permitting requirements.

The efficacy of the state's water withdrawals system was tested in 2016 when the EGLE granted a request by Nestlé to increase groundwater withdrawals at its water bottling facility by 250 gpm. The WWAT determined the increased withdrawal would cause an ARI. However, the ARI finding was reversed during agency review. The decision prompted significant public opposition with 80,945 comment filed against the project and just 75 for the project. Despite these protests and evidence that the increased pumping will harm the state's groundwater resources, the EGLE has continued to affirm its original authorization. The permit decision was recently affirmed by an administrative law judge. *Petitions for Michigan Citizens for Water Conservation, and the Ottawa Traverse Band of Ottawa and Chippewa Indians on the permit issued to Nestlé Waters North America, Inc.*, 18-011549 (April 24, 2020).

Recognizing the exception's potential resource impacts, Michigan regulators have sought to remove the loophole. Most recently, a 2019 bill would have removed the bottled water exception from the general prohibition on diversions.²¹⁰

https://www.mlive.com/news/grand-rapids/2018/06/governor_signs_bill_to_stream.html (last visited Oct. 8, 2020).

²¹⁰ H.B. 5291, 100th Leg., Reg. Sess. (Mich. 2019).

2. Public Interest

a. *Public Resource*

Both Michigan's constitution and statutory frameworks incorporate and affirm obligations to protect natural resources for the benefit of the public. Michigan's constitution provides a clear directive on the state's duty to protect the state's natural resources: "[t]he conservation and development of the natural resources of the state are hereby declared to be of paramount public concern in the interest of the health, safety and general welfare of the people. The legislature shall provide for the protection of the air, water and other natural resources of the state from pollution, impairment and destruction."²¹¹ While the provision does not prohibit any pollution of natural resources, it has been interpreted as imposing a mandatory duty to protect the public's natural resources from impairment or destruction.²¹²

The legislature further affirmed the public's interest in a healthy environment in Michigan's Environmental Protection Act (MEPA) which authorizes "[a]ny person (or the attorney general) [to] bring an action for declaratory or injunctive relief against any person for the protection of the air, water, and other natural resources and the public trust from pollution, impairment or destruction."²¹³ This provision

provides citizen authority²¹⁴ to enforce trust obligations of the state.²¹⁵ As Joseph Sax, scholar of the public trust doctrine, noted—"you must not only recognize the right . . . but you must recognize that the right is enforceable by the public."²¹⁶ The citizen suit provision creates a citizen-enforced backstop on administrative actions and integrates a key underpinning of the public trust doctrine—the ability to enforce the state's obligation—into the state's environmental laws. The Michigan Supreme Court has recognized that "[t]he Act provides private individuals and other legal entities with standing to maintain actions ... against anyone 'for the protection of the air, water and other natural resources and the public trust therein from pollution, impairment or destruction.'"²¹⁷

Finally, within its water use regulations, Michigan recognizes that "[t]he waters of the state are valuable public natural resources held in trust by the state, and the state has a duty as trustee to manage its waters effectively for the use and enjoyment of present and future residents and for the protection of the environment."²¹⁸

In addition to these statutory obligations, Michigan recognizes the common law public trust doctrine as applicable to navigable waters. Importantly, however, Michigan does not apply the public trust to groundwater. The use of groundwater for commercial bottled

²¹¹ MICH. CONST., art. IV, § 52.

²¹² Mich. Att'y Gen. Op. No 4590, 26-9 (Jan. 27, 1969), <https://www.ag.state.mi.us/opinion/datafiles/1960s/op03327.pdf>.

²¹³ MICH. COMP. LAWS § 324.1701(1).

²¹⁴ In *Michigan Citizens for Water Conservation v. Nestle Waters North America, Inc.*, the court imposed federal standing requirements (e.g., showing the plaintiff personally suffered injury) on citizens suing under the MEPA. The opinion severely curtailed the public's ability to enforce the private right of action conferred under the MEPA. In 2010, the Michigan Supreme Court overruled its prior opinion in *Nestle Waters North America, Inc.* and reaffirmed that where the Michigan legislature has provided a cause of action—such as in the MEPA—

Michigan imposes no further standing requirements.²¹⁴

²¹⁵ JOSEPH L. SAX, *DEFENDING THE ENVIRONMENT* (1971).

²¹⁶ See *Give Earth A Chance: Environmental Activism in Michigan*, MICH. IN THE WORLD & THE ENVIRONMENTAL JUSTICE HISTORY LAB, http://michiganintheworld.history.lsa.umich.edu/environmentalism/exhibits/show/main_exhibit/1970s_activism/mepa (last visited Oct. 8, 2020); Joan Wolfe, *A 'History' of the Michigan Environmental Protection Act of 1970*, <https://dspace.nmc.edu/bitstream/handle/11045/10580/wolfe-history-of-mepa.pdf?sequence=6> (last visited Oct. 8, 2020).

²¹⁷ Ray et al. v. Mason County Drain Commissioner, 224 N.W.2d 883, 888 (Mich. 1975).

²¹⁸ MICH. COMP. LAWS § 324.32702(i)(c).

water operations has highlighted concerns around adverse impacts to the resource and gaps in both common law and statutory protections. The state legislature has attempted to close the bottled water loophole at least three times—in 2006, and 2009, and 2019. In 2009, a bill was introduced to provide that “[t]he waters of the state, including groundwater, are held in trust by the state” and require the state to manage water resources under the public trust “for the benefit of present and future generations.”²¹⁹ In 2019, two bills were introduced to establish that groundwater is a “public trust resource” and integrate those obligations with respect to Great Lakes waters.²²⁰

Clear statements on the state’s duty to protect natural resources can help direct management of the resource to protect public benefits.

b. Public Participation

Michigan provides several opportunities for the public to participate in water allocation decisions. With respect to registrations, public opportunities for participation increase relative to the likelihood of an ARI. For withdrawals in Zone A (with little likelihood of ARIs), there is no opportunity for public participation.²²¹ For registrations in Zone B or Zone C, the state must provide public notice on its website and direct notice to “interested parties” which include municipal entities and water user committees.²²² Water user committees consist of local governments and water users; however, they allow for the creation of subcommittees comprised of residents that may provide opportunities for the general public to participate in the water resources planning in its region. For permits, Michigan requires a 45-day public comment period.²²³ The statute also provides the right to contest EGLE administrative decisions.²²⁴

3. Environmental Flows

The protection of sufficient instream flows to support ecological functions is the foundation of Michigan’s water withdrawal system. As described above, the withdrawal regulations are drafted to prevent water use from adversely impacting the ecological health of the environment which requires the protection of base streamflow. Therefore, Michigan’s regulatory system caps withdrawals to maintain the flow required to support ecological function.

The ARI standard represents an important reframing of how to evaluate water availability. Under Michigan’s framing, only water quantities that exceed the amount needed to protect aquatic ecosystems are available for diversion. In contrast, states following the prior appropriations doctrine commonly consider all natural flow available for appropriation. Availability of water is limited only by the amount of water needed to protect existing uses.

In theory, Michigan’s approach should protect instream flows to support ecological function. By setting index flows based on low flow amounts, the state’s regulatory approach reduces risks that flows will be reduced below threshold levels. Further, the integration of the assessment of groundwater impacts recognizes the important hydrologic function groundwater plays in maintaining base flows. However, Michigan’s approach does not incorporate all water uses in its assessment; therefore, cumulative effects of unregulated uses may result in reductions below the minimum streamflow thresholds.

²¹⁹ H.B. 5139, 100th Leg., Reg. Sess. (Mich. 2019).

²²⁰ H.B. 5292, 100th Leg., Reg. Sess. (Mich. 2019); H.B. 5290, 100th Leg., Reg. Sess. (Mich. 2019).

²²¹ MICH. COMP. LAWS §324.32706b(3).

²²² MICH. COMP. LAWS § 324.32725(2).

²²³ MICH. COMP. LAWS § 324.3273(4).

²²⁴ MICH. COMP. LAWS § 324.32725(5).

4. Planning

Michigan participates in regional water planning efforts through the Compact but does not otherwise require comprehensive state-wide water resources planning.²²⁵ However, water planning at a local level is promoted through water committees formed by large quantity water users: “[a]ll persons making large quantity withdrawals within a watershed are encouraged to establish a water users committee to evaluate the status of current water resources, water use, and trends in water use within the watershed and to assist in long-term water resources planning.”²²⁶ It is unclear the extent to which these committees have been utilized.

Water use reporting is required for all registered users in the water withdrawal system. This excludes users not required to register and registrants using under 1.5 million gallons per year.²²⁷ In accordance with Compact requirements, Michigan collects data on water use for all large quantity withdrawals.²²⁸

Water users not subject to reporting requirements account for a significant amount of water use in the state. For example, 2.6 million people rely on private domestic wells that are not required to register. DEQ, Factsheet: Groundwater Statistics (January 2018), https://www.michigan.gov/documents/deq/deq-wd-gws-wcu-groundwaterstatistics_270606_7.pdf
The failure to account for these uses creates data gaps that may misrepresent actual water use impacts and create roadblocks to managing water sustainably.

5. Public Trust Principles

- **Constitutional and statutory provisions confirming the legislature as trustee of the state’s natural resources and requiring the protection of the resources from impairment provide a guiding framework for water management and create standing for the public to enforce trustee obligations.**
- **Limiting water withdrawals to protect ecological conditions assists in protecting instream uses.**
- **Innovative, science-based systems to assess water use impacts supports sustainable water management.**
- **Authority to modify permits allows regulators to adjust water use to respond to changing conditions.**

²²⁵ MICH. COMP. LAWS § 324.32710.

²²⁶ MICH. COMP. LAWS § 324.32725.

²²⁷ MICH. COMP. LAWS § 324.32707.

²²⁸ *2019 Five-Year Program Review*, DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY 5-6 (Dec. 6,

2019),

<https://www.glscompactcouncil.org/media/2wcjr-e4s/mi-water-management-program-report-2019.pdf>.

Public Trust Elements	Principles in Nevada Water Code
Affirmation that water is a public resource	<ul style="list-style-type: none"> ✓ Mich. Const., art. IV, § 52. ✓ Mich. Comp. Laws § 324.1701(1). ✓ Mich. Comp. Laws § 324.32702(i)(c)
Water recognized as a public trust resource	<ul style="list-style-type: none"> ✓ (Navigable waters are recognized as a public trust resource) X (The doctrine does not extend to non-navigable waters and groundwater)
Public interest as a criterion in management decisions	<ul style="list-style-type: none"> ✓ (Subsumed within ARI)
Opportunity for public participation in decision making and to enforce public interest values	<ul style="list-style-type: none"> ✓ Mich. Comp. Laws § 324.32725(2) (Zone B and C withdrawals) ✓ Mich. Comp. Laws § 324.3273(4) (Permits) ✓ Mich. Comp. Laws § 324.32707 (reporting)
Requirements for planning and data collection	<ul style="list-style-type: none"> X (No state-wide planning requirements) ✓ Mich. Comp. Laws § 324.32707 (reporting)
Ability to adjust water use to address potential or actual overuse	<ul style="list-style-type: none"> ✓ Mich. Comp. Laws § 324.32723(11) (authority to revoke permit if violating ARI)
Identification of the needs of future generations and the environment as beneficial uses	<ul style="list-style-type: none"> ✓ (Subsumed with Adverse Resource Standard) ✓ Mich. Comp. Laws § 324.32702(i)(c)
Mechanism to protect environmental flows.	<ul style="list-style-type: none"> ✓ Mich. Comp. Laws § 24.32723(6) (not allowing a withdrawal that would cause an adverse resource impact) ✓ Mich. Comp. Laws § 324.32706(c) (Requiring a permit to not have an ARI)
Requirement to manage within safe yields	<ul style="list-style-type: none"> ✓ (Subsumed with Adverse Resource Standard)
Flexibility to allow for the voluntary reallocation of water	<ul style="list-style-type: none"> X

D. VIRGINIA

1. Water Management Framework

Virginia, characterized by plentiful water, historically managed its water resources through a pure riparian system—recognizing a riparian landowner’s right to the reasonable use of water limited by other landowner’s right to make reasonable use of water.²²⁹ With respect to groundwater, landowners were granted rights to the groundwater beneath their property. Virginia adopted its first surface water management framework in 1989 and first groundwater code in 1973. The state’s current water management framework addresses both surface and groundwater. The State Water Resources Board (Board)²³⁰ oversees the management of water resources and the Department of Environmental Quality (DEQ) administers regulations.²³¹ Water use in the state is now managed through a combination of both riparian rights and statutory frameworks.

Legal Frameworks

- Virginia Constitution, Article XI, Section 1
- Virginia Code Annotated Chapter 62
- Virginia Administrative Code Chapter 25
- State Water Resources Plan (2015)

²²⁹ Scott v. Burwell’s Bay Improvement Ass’n, 709 S.E.2d 858, 861–62 (2011).

²³⁰ VA. CODE ANN. § 62.1-44.15:22.

²³¹ CITIZEN BOARDS, VA. DEP’T OF ENVTL. QUALITY, <https://www.deq.virginia.gov/LawsRegulations/CitizenBoards.aspx> (last visited Oct. 8, 2020).

²³² VA. CODE ANN. § 62.1-44.2.

²³³ VA. CODE ANN. § 62.1-44.15:20.

²³⁴ *Id.* Under the VWPPP, it is unlawful to “[e]xcavate in a wetland,” or “[a]lter the physical, chemical, or biological properties of state waters and make

a. Water Use Regulations

The State Water Control Law provides the primary mechanism for regulating both the quantity and quality of surface water resources in the state, with the stated purpose of “protect[ing] existing high quality state waters and restor[ing] all other state waters to such condition of quality that . . . will permit all reasonable public uses and . . . support the propagation and growth of all aquatic life . . . reasonably be expected to inhabit them” and “protecting water from pollution and promoting the conservation of water.”²³²

Surface water withdrawals are primarily regulated under the Virginia Wetlands Protection Permit Program (VWPPP).²³³ The VWPPP provides a comprehensive permitting program for activities impacting surface water, including all surface water withdrawals.²³⁴ A “permit is required for any activity that will permanently or temporarily impact surface waters” including withdrawals.²³⁵ The VWPPP exempts several uses from permitting requirements. Examples include withdrawals of nontidal water of less than 10,000 gallons per day and less than one million gallons per month for agricultural uses.²³⁶ Notably, however, DEQ may require a water use that is otherwise exempt to cease withdrawals and apply for a permit where such use is or “may reasonably be expected” to “cause or contribute to a significant impairment of state waters or fish and wildlife resources,” cause or contribute to a violation of water quality standards, or impair other beneficial use.²³⁷ The administrative rules cite authority for the determination of whether a unregulated use is causing significant impairment with DEQ; it is unknown whether

them detrimental to the public health, animal or aquatic life” without a permit from SWCB. *See also* 9 VA. ADMIN. CODE § 25-210-10.

²³⁵ *Virginia Water Protection Permit Program*, VA. DEP’T OF ENVTL. QUALITY, https://www.deq.virginia.gov/Portals/0/DEQ/Water/OWS-WWPandC/VWP_VWVRhandout_2019-01-15b.pdf?ver=2019-01-15-132751-673 (last visited Oct. 8, 2020).

²³⁶ 9 VA. ADMIN. CODE § 25-210-6.

²³⁷ 9 VA. ADMIN. CODE § 25-210-310(B).

there is a public process through which the public can participate in this determination.

The authority to regulate otherwise exempt uses where the withdrawal could cause an adverse environmental impact codifies an important mechanism to address resource use without requiring the state to regulate all uses.

The permit process incorporates consideration of instream uses—defined to include “the protection of fish and wildlife habitat, maintenance of waste assimilation, recreation, navigation, and cultural and aesthetic values.”²³⁸ An applicant for a permit must provide information on the current instream conditions and an analysis of the withdrawal’s impacts to those flows. In addition, the applicant must identify an alternative source of water for times of low flow.²³⁹

Criteria for reviewing a new withdrawal includes (1) limiting withdrawals to the amount that can be put to beneficial use; (2) a determination that the withdrawal will not have a “detrimental impact on existing instream or off stream uses”; and (3) a determination that the project (including consideration of impacts from existing withdrawals) will not cause a “significant impairment of the state waters or fish and wildlife resources,” have an adverse impact to existing beneficial uses (which is defined to include instream uses), or cause a violation of water quality standards.²⁴⁰ If these criteria are not met, the Board must condition permits to meet the criteria.²⁴¹ In addition, the Board must condition permits to protect instream flows which may include limiting the amount and timing of the withdrawal to protect instream and public needs.²⁴² In developing the

conditions, the Board is instructed to balance the needs of other water users as well as environmental needs.²⁴³

The Board retains the authority to modify surface water permits under specific conditions. Triggers for modification include failure of minimum instream flow levels to protect instream beneficial uses that existed at the time of issuance.²⁴⁴

Continued authority to adjust water use to address impacts to instream uses creates regulatory flexibility to protect instream needs even after water permits are issued.

In addition to permitting requirements under the VWPPP, the water code authorizes the designation of Surface Water Management Areas (SWMA).²⁴⁵ The Board may designate an SWMA where there are “substantial instream values;” the area has either historically experienced or *could experience* “low flow conditions” that would “threaten important instream uses;” or “current or potential off stream uses contribute to or . . . exacerbate natural low flow conditions to the detriment of instream values.”²⁴⁶ Substantial instream values are evidenced by the fishery, recreation, habitat, cultural or aesthetic properties of the stream.²⁴⁷ The SWMA legislation uniquely provides the ability to designate an area based on the possibility of impairment in contrast to requiring existing impairment or overallocation. The designation of an SWMA also provides a basis to modify existing VWPPP permits.²⁴⁸ The Board is given discretion to designate SWMA’s; however, local municipal entities and state agencies may petition for designation. The Board has not yet formally designated any SWMAs within the State.²⁴⁹

²³⁸ 9 VA. ADMIN. CODE § 25-210-340(5)(a).

²³⁹ 9 VA. ADMIN. CODE § 25-210-340.

²⁴⁰ 9 VA. ADMIN. CODE § 25-210-370.

²⁴¹ *Id.*

²⁴² VA. CODE ANN. § 62.1-44.15:22; *Id.*

²⁴³ *Id.*

²⁴⁴ 9 VA. ADMIN. CODE § 25-210-380(A)(1).

²⁴⁵ VA. CODE ANN. § 62.1-246.

²⁴⁶ VA. CODE ANN. § 62.1-246.

²⁴⁷ 9 VA. ADMIN. CODE § 25-220-40

²⁴⁸ 9 VA. ADMIN. CODE § 25-210-380(A)(4).

²⁴⁹ *Water Withdrawal Permitting and Compliance Program*, VA. DEP’T OF ENVTL. QUALITY,

Where designation is purely discretionary the state agency may choose not to designate areas that otherwise qualify for increased protection for reasons unrelated to the resource needs. States may consider making designation mandatory where certain conditions are met.

Once designated, “no person shall withdraw or attempt to withdraw any surface water” from the SWMA.²⁵⁰ Exemptions exist for withdrawals of less than 300,000 gallons per month and withdrawals for non-consumptive uses.²⁵¹ Permits issued within an SWMA must include flow restrictions to protect instream uses.²⁵² Further, water permits should include water conservation plans and monitoring procedures.²⁵³ Permits are subject to modification to address changing conditions including failure to protect instream uses.²⁵⁴

Providing for increased management authority in areas where instream uses are at risk of degradation can provide an important regulatory backstop to protect the ecological health of a waterway.

As of 2019, the DEQ administered 104 permits for 172 billion gallons per year. However, 76% of all surface water withdrawals had no permitting requirements.²⁵⁵

<https://www.deq.virginia.gov/Programs/Water/WaterSupplyWaterQuantity/WaterWithdrawalPermittingandCompliance.aspx> [last visited Oct. 8, 2020].

²⁵⁰ VA. CODE ANN. § 62.1-247.

²⁵¹ VA. CODE ANN. § 62.1-243.

²⁵² VA. CODE ANN. § 62.1-248.

²⁵³ 9 VA. ADMIN. CODE § 25-220-80(B)(F).

²⁵⁴ 9 VA. ADMIN. CODE § 25-220-210 (describing circumstances allowing for modification of an SWMA permit).

²⁵⁵ *Status of Virginia’s Water Resources: A Report on Virginia’s Water Resources Management Activities*, VA. DEP’T OF ENVTL. QUALITY 22 (Oct. 2019) [hereinafter 2019 STATUS REPORT],

b. Integrated Management

Unique from the other surveyed states, Virginia does not integrate groundwater and surface water management. This is despite the recognized connection between groundwater and surface water in the state—as the State’s Water Plan notes, “the degree of interconnectedness of fractured rock groundwater systems and surface water features in western Virginia is significant, resulting in unique challenges to assessing water supply risk In most watersheds, groundwater discharge to streams constitutes a significant portion of the water in the stream.”²⁵⁶

The failure to integrate management of groundwater and surface water creates a gap in the state’s authority to sustainably manage water resources.

Virginia does not integrate the regulation of water quantity and quality. The state recognizes that water quantity and quality are linked and impacts to water quality are expressly considered as part of permitting water withdrawals.²⁵⁷ For surface water withdrawals, new water permits must not “cause or contribute to . . . a violation of water quality standards.”²⁵⁸ While water quality is not a permitting consideration for groundwater

https://www.deq.virginia.gov/Portals/0/DEQ/Water/WaterSupplyPlanning/AWWWR_webcompliant2019-10-01.pdf?ver=2019-10-08-155708-377 [last visited Oct. 8, 2020].

²⁵⁶ *Virginia Water Resources Plan*, VA. DEP’T OF ENVTL. QUALITY, CH. 6 WATER RESOURCES PLANNING 102 (Oct. 2015) [hereinafter 2015 WATER RESOURCES PLAN],

<https://www.deq.virginia.gov/programs/water/watersupplywaterquantity/watersupplyplanning/statewaterresourcesplan.aspx> [last visited Oct. 8, 2020].

²⁵⁷ 9 VA. ADMIN. CODE § 25-210-370.

²⁵⁸ 9 VA. ADMIN. CODE § 25-210-370(3)(c).

permits, it does act as an independent basis to designate a Groundwater Management Area.²⁵⁹

Water use and water quality are closely linked and the failure to incorporate considerations of water quality in water use management decisions creates an artificial distinction that can result in resource degradation. Virginia's consideration of water quality impacts as part of water use permitting recognizes the relationship between quantity and quality and provides an important layer of protection for water resources.

c. Groundwater

Groundwater withdrawals are regulated separately under the Groundwater Management Act. Passed in 1992, the Act was intended to correct excessive withdrawals that were found to be "contributing . . . to pollution and shortage of ground water, thereby jeopardizing the public welfare, safety and health."²⁶⁰

To address these concerns, the Act authorized the creation of Groundwater Management Areas (GWMA) and established a permitting system for withdrawals within those areas.²⁶¹ Withdrawals outside of the GWMA are exempt from regulatory requirements.²⁶²

The Board may designate a GWMA when there is evidence of existing or potential overdraft, excessive declines in groundwater levels, signs of well interference, or risk of pollution.²⁶³

²⁵⁹ VA. CODE ANN. § 62.1-257(A)(4) (identifying water quality as a basis for designation).

²⁶⁰ VA. CODE ANN. § 62.1-254.

²⁶¹ VA. CODE ANN. § 62.1-257.

²⁶² VA. CODE ANN. § 62.1-259(ix).

²⁶³ VA. CODE ANN. § 62.1-257.

²⁶⁴ VA. CODE ANN. § 62.1-258 [making it unlawful "for any person to withdraw, attempt to withdraw, or allow the withdrawal of any ground water, other than in accordance with a ground water withdrawal permit"]; *see also* VA. CODE ANN. § 62.1-259 [providing exceptions to permit requirements].

The ability to proactively designate a GWMA prior to overdraft provides important regulatory authority to prevent overdraft rather than correct unsustainable water use. This approach may be especially important where the state has not adopted a comprehensive water regulatory program.

Upon Board designation, a permit is required for all new or increased withdrawals in a GWMA over 300,000 gallons per month.²⁶⁴ The permit requirement includes withdrawals existing at the time of designation.²⁶⁵ Private wells for domestic use are generally exempt from permit requirements but are required to register with both the Board and the Department of Health (which regulates drinking water standards).²⁶⁶ The registration requirement has helped quantify the impact of private wells in the state. For example, in 2017, DEQ estimated that if private well use continues to increase at current rates, the quantity of water drawn from private wells would offset all the reductions that DEQ has been able to achieve through its permitting program.²⁶⁷

The GWMA legislation identifies specific criteria for the evaluation of groundwater permits. These include criteria intended to protect the water resource including evaluating the area of impact and potential for drawdown, as well as impacts to other public interests including environmental conditions, economic, and population growth.²⁶⁸

²⁶⁵ VA. CODE ANN. § 62.1-261.

²⁶⁶ VA. CODE ANN. § 62.1-258.

²⁶⁷ *Report to the Virginia Department of Environmental Quality and Virginia General Assembly, EASTERN VIRGINIA GROUNDWATER MANAGEMENT ADVISORY COMMITTEE 28* (July 2017) [hereinafter 2017 STATUS REPORT], http://leg5.state.va.us/User_db/frnView.aspx?Vewid=5053&s=14 [last visited, Oct. 8, 2020].

²⁶⁸ VA. CODE ANN. § 62.1-263.

The Board may only issue permits for a maximum of fifteen years, though applicants may request renewal.²⁶⁹

Limiting water permits to a specified term of years allows for periodic assessment of whether the water use still aligns with societal priorities.

Further, the Board retains authority, either through its own initiative or in response to a public petition, to modify or revoke the permit.²⁷⁰ Among the basis to revoke or modify a permit is “[a] determination that the withdrawal authorized by the permit or special exception endangers human health or the environment and cannot be regulated to acceptable levels by permit or special exception modification.”²⁷¹

DEQ has used this permitting authority to reduce the quantity of water withdrawals by regulated users. For example, the Board recently negotiated reductions in water withdrawals with 14 water users. Water users agreed to reduce water withdrawals by 52% of the current amount authorized in their permits—the equivalent of 69 million gallons. DEQ subsequently issued new 10-year permits set at the negotiated withdrawal levels. Water withdrawals by these users accounted for 80% of permitted groundwater withdrawals in the Eastern Virginia GWMA.²⁷²

Authority to revoke or modify permits provides flexibility to manage water use to prevent public harm.

There are currently two management areas that cover the eastern portion of the state—the Eastern Shore and Eastern Virginia GWMAs.²⁷³ These areas were designated as part of the 1992 Act; however, the Eastern Shore GWMA was expanded in 2014. As of 2019, DEQ administers 333 groundwater permits for 46.5 billion gallons per year.²⁷⁴

Despite the increased regulatory authority provided by designation, these areas continue to experience declining groundwater levels. In 2014, DEQ noted concern around declining aquifer levels.²⁷⁵ In 2017, DEQ identified four management concerns with groundwater: declining groundwater levels, “increased potential for saltwater intrusion,” “accelerated rates of land subsidence,” and “irreversible loss of long-term aquifer storage.”²⁷⁶ In 2019, DEQ again noted continuing concerns around declining groundwater levels.²⁷⁷ Importantly, DEQ has emphasized that these declines have “transpired under the current water withdrawal permitting and water supply statutory and regulatory framework.”²⁷⁸

Unregulated groundwater withdrawals present a growing management challenge. The 2015 State Water Resources Plan noted in 2010 “it was estimated that 137.81 MGD of water was used by small self-supplied users of private residences.”²⁷⁹ These uses are typically exempt

²⁶⁹ VA. CODE ANN. § 62.1-266.

²⁷⁰ VA. CODE ANN. § 62.1-266(E).

²⁷¹ *Id.* at (E)(3); 9 VA. ADMIN. CODE § 25-610-300(A)(4); 9 VA. ADMIN. CODE § 25-610-310(A); 9 VA. ADMIN. CODE § 25-610-290 (initiation of revocation).

²⁷² *Id.*; Robert Zullo, *State Reaches Deals with Large Water Users to Preserve Aquifers*, RICHMOND TIMES-DISPATCH (Dec. 15, 2017), https://richmond.com/news/virginia/state-reaches-deals-with-large-water-users-to-preserve-aquifers/article_c607fb2e-c757-5017-8e6f-de923a456ac4.html.

²⁷³ VA. CODE ANN. § 62.1-260.

²⁷⁴ 2019 STATUS REPORT, *supra* note 255, at 6.

²⁷⁵ *Status Report to the Virginia Department of Environmental Quality and Virginia General Assembly*, EASTERN VIRGINIA GROUNDWATER MANAGEMENT ADVISORY COMMITTEE 14 (October 2014),

https://www.deq.virginia.gov/Portals/0/DEQ/LawsAndRegulations/GeneralAssemblyReports/AWRP_090814FINAL.pdf (last visited Oct. 8, 2020).

²⁷⁶ 2017 STATUS REPORT, *supra* note 267, at 14. .

²⁷⁷ 2019 STATUS REPORT, *supra* note 255, at 6.

²⁷⁸ 2017 STATUS REPORT, *supra* note 267, at 15.

²⁷⁹ 2015 WATER RESOURCES PLAN, *supra* note 256, Ch. 6 at 102.

from groundwater regulations as they fall below the 300,000 gallon per month permitting trigger.²⁸⁰ Further, a 2008 USGS study found that unpermitted uses accounted for the use 29 million gallons per day in the Eastern Virginia GWMA and that domestic wells accounted for 67% of the water use. A 2017 report from the Eastern Virginia GWMA Advisory Committee²⁸¹ recognized that “[e]fforts by permitted users to reduce consumption are not enough to restore the aquifer for the long term in the absence of a way to address the concurrent impact that unpermitted users have on groundwater resources.” The Committee “generally supported the notion that these users bear a proportionate responsibility to maintain aquifer productivity and availability into the future.”²⁸²

Small quantity users are often unregulated but may cumulatively cause significant resource impact and create challenges for achieving sustainable levels of water use.

A further challenge facing the state is the need to address increasing groundwater withdrawals outside of GWMAs. The Water Resources Plan noted that “seventy-five percent of the groundwater demand for 2040 is expected to occur outside the coastal plain GWMAs” and recommended “creating some basic water budgets in these areas” as means to begin addressing unregulated groundwater use in these areas.²⁸³ Currently, 52% of all groundwater withdrawals do not trigger permit requirements.²⁸⁴

Failure to track groundwater use in unregulated basins creates the potential for unsustainable use.

²⁸⁰ *Id.* at 102.

²⁸¹ The legislative authorization for the Committee has expired. *See* VA. CODE ANN. § 62.1-256.1.

²⁸² 2017 STATUS REPORT, *supra* note 267, at 29.

²⁸³ 2015 WATER RESOURCES PLAN, *supra* note 256, at 102.

2. Public Interest

a. *Public Resource*

Virginia’s constitution and statutory frameworks recognize water as a public resource to be managed and protected for the benefit of the public. The Virginia Constitution provides:

To the end that the people have clean air, pure water, and the use and enjoyment for recreation of adequate public lands, waters, and other natural resources, it shall be the policy of the Commonwealth to conserve, develop, and utilize its natural resources, its public lands, and its historical sites and buildings.

Further, it shall be the Commonwealth’s policy to protect its atmosphere, lands, and waters from pollution, impairment, or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth.²⁸⁵

The public nature of the resource and duty to protect it from impairment for the benefit of the public is reiterated throughout the state water code. The introductory language of Virginia’s State Water Control Law states “[t]he public welfare and interest of the people of the Commonwealth require the proper development, wise use, conservation and protection of water resources together with protection of land resources, as affected thereby.”²⁸⁶ Further, the legislature identifies its policy to “protect existing high quality state

²⁸⁴ 2019 STATUS REPORT, *supra* note 255, at 22.

²⁸⁵ VA. CONST. art. XI, § 1. Virginia’s Constitution recognizes the public trust doctrine for the land beneath navigable waters.

²⁸⁶ VA. CODE ANN. § 62.1-1.1(d).

waters and restore all other state waters to such condition of quality that any such waters will permit all reasonable public uses and will support the propagation and growth of all aquatic life . . .²⁸⁷

In addition to these broad policy statements, the state's permitting schemes incorporate public interest criteria as mandatory considerations in permitting decisions. For example, in permitting a water withdrawal the Board must find that the withdrawal will not have a "detrimental impact on existing instream or off stream uses" and determine the project (including consideration of existing impacts from existing withdrawals) will not cause a "significant impairment of the state waters or fish and wildlife resources," have an adverse impact to existing beneficial uses (which is defined to include instream uses), or cause a violation of water quality standards.²⁸⁸ Further, a groundwater withdrawal permit may be modified or revoked if the Board "determin[es] that the withdrawal authorized by the permit or special exception endangers human health or the environment and cannot be regulated to acceptable levels by permit or special exception modification."²⁸⁹

b. Public Participation

Both groundwater and surface water permitting processes provide for public notice and opportunity to comment on water management.²⁹⁰ Prior to issuance of a final permit an applicant must publish notice of the draft permit in a public newspaper. Comments are reviewed to determine whether to hold a hearing on the permit. DEQ must grant a hearing where a minimum of 25 comments

demonstrate "significant public interest in the issuance, denial, modification, or revocation of the permit in question."²⁹¹ Final permit decisions are appealable.²⁹² Opportunity for public notice and comment is also available during the designation of SWMA and GWMA.²⁹³

Finally, opportunity for public notice and comment is required as part of the development of water plans.²⁹⁴ This includes opportunity to comment on the plan but also the opportunity to request a public hearing where there is substantial interest and demonstrated concern regarding consistency with the planning requirements.²⁹⁵

3. Environmental Flows

Instream flows to support ecological function are protected as part of the state's surface water permitting framework. Specifically, regulated withdrawals are conditioned to protect instream uses.²⁹⁶ The VWP statutory authority expressly authorizes conditions for the "preservation of instream flow," including but not limited to conditions on "the volume of water which may be withdrawn as a part of the permitted activity and conditions necessary to protect beneficial uses."²⁹⁷ Similarly, the SWMA provides additional authority to incorporate minimum flow requirements as condition to a permit to protect instream beneficial uses—"flow conditions may include but are not limited to conditions that limit the volume and rate at which water may be withdrawn at certain times and conditions that require water conservation and reductions in water use."²⁹⁸

DEQ evaluates the impact to instream uses as part of every surface water withdrawal permit. To support this assessment, applicants are

²⁸⁷ VA. CODE ANN. § 62.1-44.2.

²⁸⁸ VA. CODE ANN. § 62.1-44.15:20; 9 VA. ADMIN. CODE § 25-210-370.

²⁸⁹ 9 VA. ADMIN. CODE § 25-610-300(A)(4); 9 VA. ADMIN. CODE 25-610-310(A).

²⁹⁰ 9 VA. ADMIN. CODE § 25-610-250 (groundwater); 9 VA. ADMIN. CODE § 25-610-140 (surface water).

²⁹¹ 9 VA. ADMIN. CODE 25-210-140(B) (for surface water); 9 VA. ADMIN. CODE § 25-610-270 (for groundwater).

²⁹² VA. CODE ANN. § 62.1-44.29.

²⁹³ 9 VA. ADMIN. CODE § 25-11-150(A) (for groundwater); 9 VA. ADMIN. CODE § 25-220-150(B).

²⁹⁴ 9 VA. ADMIN. CODE § 25-780-150.

²⁹⁵ 9 VA. ADMIN. CODE § 25-780-150(D).

²⁹⁶ VA. CODE ANN. § 62.1-44.3 (definition of beneficial use); VA. CODE ANN. § 62.1-44.15:22.

²⁹⁷ VA. CODE ANN. § 62.1-44.15:22.

²⁹⁸ 9 VA. ADMIN. CODE § 25-220-100.

required to provide information on current streamflows, instream needs, and anticipated impacts to those instream uses.²⁹⁹ Based on the anticipated cumulative impacts, DEQ integrates withdrawal limits into permits that are necessary to maintain instream flows needed to protect in-stream uses.³⁰⁰

Authorizing the incorporation of minimum flows can provide a mechanism to ensure a minimum quantity of water is maintained instream.

Important components of Virginia's approach to instream flows include protection of instream uses as a primary focus of the state's water management framework,³⁰¹ mandatory consideration of impacts to instream uses as part of any permitting decision,³⁰² the ability to adjust water permits when they negatively impact instream uses,³⁰³ and an inclusive definition of instream uses beyond fish and wildlife to include aesthetic, recreational, and water quality needs.³⁰⁴

Where Virginia has integrated instream needs in its surface water management, those considerations are notably absent from its regulation of groundwater withdrawals. The groundwater code does not include environmental uses as a beneficial use.³⁰⁵ Further, the regulation of groundwater does not consider impacts to instream uses of surface water. However, Virginia's State Water

Resources Plan recognizes that groundwater withdrawals can impact surface water flows and that such impacts are likely to be particularly acute during low flow periods. The plan also recognizes that data related to connections between groundwater withdrawals is lacking.³⁰⁶ Despite these acknowledgements, without being incorporated into the water code they lack regulatory teeth.

While most streams are not currently overallocated, it is predicted that additional out-of-stream uses coupled with the increasing prevalence of drought will result in lower flows than are needed to maintain healthy ecosystem function.³⁰⁷ Therefore, it may become important for the state to identify the minimum flows necessary to protect identified beneficial uses and incorporate those as clear limits in water resources allocations. The state should also recognize the link between groundwater withdrawals and surface water flows and codify requirements for the state to consider those impacts as part of its groundwater management. Finally, unpermitted withdrawals also pose a challenge to maintaining sufficient instream flows to protect instream uses. Without regulatory authority, the state lacks the ability to condition these withdrawals to require the maintenance of minimum levels of instream flow.³⁰⁸

²⁹⁹ 9 VA. ADMIN. CODE § 25-210-340(B)(5).

³⁰⁰ 2019 STATUS REPORT, *supra* note 255, at 7.

³⁰¹ VA. CODE ANN. § 62.1-44.36(5) (directing the Board to foster and encourage "the maintenance of stream flows sufficient to support aquatic life and to minimize pollution").

³⁰² 9 VA. ADMIN. CODE § 25-210-370 (regulations require the protection of instream flows uses as part of the state's permitting program and the Board is required to condition permits to protect these instream uses).

³⁰³ VA. CODE ANN. § 62.1-266(E)(3) (GWMA permit); 9 VA. ADMIN. CODE 25-610-300(A)(4) (GWMA permit); 9 VA. ADMIN. CODE § 25-210-380(A)(1) (surface water permit).

³⁰⁴ VA. CODE ANN. § 62.1-44.3 (defining beneficial uses to include a broad set instream uses necessary for "the protection of fish and wildlife resources and habitat, maintenance of waste assimilation, recreation, navigation, and cultural and aesthetic values").

³⁰⁵ VA. CODE ANN. § 62.1-255 ('Beneficial use' includes domestic (including public water supply), agricultural, commercial, and industrial uses.)

³⁰⁶ 2015 WATER RESOURCES PLAN, *supra* note 256, at Ch. 5, 75.

³⁰⁷ *Id.* at 98.

³⁰⁸ 2015 WATER RESOURCES PLAN, *supra* note 256, at Ch. 6, 100.

4. Planning

Virginia's water management framework emphasizes the importance of planning to meet the diverse range of present and future needs.³⁰⁹ Plans must address seven areas that include estimates of current and future water needs; estimates of minimum instream flows during drought conditions to "maintain water quality and avoid permanent damage to aquatic life in streams, bays, and estuaries"; and the ability to meet current and future needs to include instream needs in drought conditions.³¹⁰ Board regulations require all counties, cities and towns to submit its own local water supply plan or participate in a regional planning.³¹¹ Developed water plans must "(i) ensure that adequate and safe drinking water is available, (ii) encourage and protect all beneficial uses, (iii) encourage and promote alternative water sources, and (iv) promote conservation."³¹² State water plans must be developed every five years—the most recent state-wide plan was released in 2015 and will be updated in 2020.

In addition to providing a comprehensive overview of the status of water resources, needs of the state and management challenges, the plan identifies gaps in the state's water management framework and suggest actions to address these shortcomings. For example, in the context of addressing unpermitted uses, the report recommended agency action through existing statutory authority and legislative action to increase agency authority: recommending future options of "the establishment of Surface Water Management Areas and Groundwater Management Areas and changes to pertinent statutes and/or regulations to capture unpermitted withdrawals."³¹³

Robust planning provides opportunity to understand status of water resources and adapt management to changing conditions.

In addition to planning requirements, the Board is required to provide annual updates to the state legislature on "the status of the state's water resources." These updates provide important information on current uses as well as identify challenges and priorities.³¹⁴

In addition to planning requirements, the legislature authorizes the Board to require reporting of water use over one million gallons in one month for irrigation uses and 10,000 gallons for other uses.³¹⁵ Since 1982, the Board has implemented this authority to require water users to report uses as outlined in the water code, recognizing that water reporting increases the state's understanding of water uses which is critical to water planning.³¹⁶ In addition, the Board emphasizes that reporting assists water users in understanding their own water use and can help increase efficiency.³¹⁷ Exemptions from reporting requirements challenge the accuracy of data collected. The 2019 Water Status Report noted an increase in private wells and that "the understanding of unreported unpermitted withdrawals is essential to ensure that the water resource management gains from permitting and permit reductions are not lost due to those unpermitted withdrawals."³¹⁸

Mandatory water reporting should include all water users to allow for a comprehensive understanding of water use.

³⁰⁹ VA. CODE ANN. § 62.1-44.38.

³¹⁰ VA. CODE ANN. § 62.1-44.38(A)-(B).

³¹¹ 9 VA. ADMIN. CODE § 25-78-10.

³¹² 9 VA. ADMIN. CODE § 25-780-40.

³¹³ 2015 WATER RESOURCES PLAN, *supra* note 256, Ch. 6 at 100.

³¹⁴ VA. CODE ANN. § 62.1-44.40

³¹⁵ VA. CODE ANN. § 62.1-44.38(C); 9 VA. ADMIN. CODE § 25-200-10.

³¹⁶ 9 VA. ADMIN. CODE § 25-200-20.

³¹⁷ WATER SUPPLY PLANNING PROGRAM - ANNUAL WATER WITHDRAWAL REPORTING, VA. DEP'T OF ENVTL. QUALITY, <https://www.deq.virginia.gov/Programs/Water/WaterSupplyWaterQuantity/WaterSupplyPlanning/AnnualWaterWithdrawalReporting.aspx> (last visited Oct. 8, 2020).

³¹⁸ 2019 STATUS REPORT, *supra* note 255, at 23.

5. Public Trust Principles

- **Incorporating the protection of environmental flows as a required permit condition helps protect instream flows.**
- **Including the consideration of water quality within water use decisions acknowledges the tie between quantity and quality and allows for the inclusion of permit conditions to protect water quality.**
- **Maximum permit terms and the authority to revoke or modify permits allows the state to maintain control over water resources and respond to changing conditions and needs.**
- **Authority to require permits for unregulated uses where the use is having an adverse impact on instream uses allows the state to respond to resource challenges without imposing additional regulatory burdens by requiring regulation of a new category of uses.**
- **Establishing water management goals that require both the protection and restoration of water resources creates obligations to manage the resource for the benefit of future generations and to protect the environment.**

Public Trust Elements	Principles in Nevada Water Code
Affirmation that water is a public resource	<ul style="list-style-type: none"> ✓ Virginia Constitution, Article XI, Section 1 ✓ Va. Code Ann. § 62.1-1.1(d). ✓ Va. Code Ann. § 62.1-44.2.
Water recognized as a public trust resource	<ul style="list-style-type: none"> ✓ (Applied to navigable waters)
Public interest as a criterion in management decisions	<ul style="list-style-type: none"> ✓ 9 Va. Admin. Code § 25-210-370 (surface water permitting criteria) ✓ VA. CODE ANN. § 62.1-263 (groundwater permitting criteria)
Opportunity for public participation in decision making and to enforce public interest values	<ul style="list-style-type: none"> ✓ 9 VA. ADMIN. CODE § 25-610-250 (groundwater) ✓ 9 VA. ADMIN. CODE § 25-610-140 (surface water).
Requirements for planning and data collection	<ul style="list-style-type: none"> ✓ Va. Code Ann. § 62.1-44.38 (Planning requirements) ✓ Va. Code Ann. § 62.1-44.40 (yearly status reports) ✓ Va. Code Ann. § 62.1-44.38(C); 9 Va. Admin. Code 25-200-10 (reporting requirements)
Ability to adjust water use to address potential or actual overuse	<ul style="list-style-type: none"> ✓ 9 Va. Admin. Code § 25-210-380(A)(1) (authority to adjust VWPPP) ✓ 9 Va. Admin. Code 25-220-210 (describing circumstances allowing for modification of an SWMA permit). ✓ 9 Va. Code Ann. § 62.1-266 (groundwater management area permits are term limited and revocable) ✓ 9 Va. Admin. Code § 25-210-310(B) (authority to regulate unpermitted uses)
Identification of the needs of future generations and the environment as beneficial uses	<ul style="list-style-type: none"> ✓ 9 Va. Admin. Code § 25-210-340(5)(a) (definition of in stream uses) ✓ Va. Code Ann. § 62.1-44.36(5) (directing the Board to foster and encourage “the maintenance of stream flows sufficient to support aquatic life and to minimize pollution”).
Mechanism to protect environmental flows	<ul style="list-style-type: none"> ✓ Va. Code Ann. § 62.1-44.15:22 (conservation of in stream flows in VWPPP) ✓ Va. Code Ann. § 62.1-248 (SWMA permits must include flow conditions) ✓ Va. Code Ann. § 62.1-246 (designation of SWMA to protect in stream flows)
Requirement to manage within safe yields	<ul style="list-style-type: none"> X
Flexibility to allow for the voluntary reallocation of water	<ul style="list-style-type: none"> X

V. RECOMMENDATIONS

Aggregating research from the four focus states, nine types of regulations emerged as important components of advancing sustainability and intergenerational equity as outcomes of water management. The appropriate type and combination of provisions will vary based on existing regulatory systems, geography, and political climate. It is important to note that recommended regulations are based on the water codes in the four surveyed states and a review of other states and countries may yield more effective and varied approaches. Because water law and policy in the United States focuses on state water codes, each state is unique landscape. The representative states in this study provide a good overview of the basic structures of state law and all states share some commonalities and general architectures in common, but particular study within an individual state's water code is necessary to make progress in that context.

A. Affirmation that water is a public resource

States should codify the status of water as a public resource and the state's obligation to steward the resource for the benefit of present and future generations and to preserve the environment.

While the affirmation of water as a public resource protects against privatization of the resource and carries implied duties of equitable management; it is also recommended that provisions direct management of water to support public trust outcomes. As is seen in both Nevada and Colorado, merely stating the public nature of the resource does not protect against overallocation. The inclusion of clear policies around protection of the resource for specific goals can guard against unsustainable use.

Michigan provides the most comprehensive statement on the duties to steward the environment for present and future

generations. These statements are incorporated in the state's constitution and natural resources statutes.

💧 **Michigan Constitution, Article 4, Section 53.** The conservation and development of the natural resources of the state are hereby declared to be of paramount public concern in the interest of the health, safety and general welfare of the people. The legislature shall provide for the protection of the air, water and other natural resources of the state from pollution, impairment and destruction.

💧 **Michigan Compiled Laws § 324.32702(c).** The waters of the state are valuable public natural resources held in trust by the state, and the state has a duty as trustee to manages its water effectively for the use and enjoyment of present and future residents and for the protections of the environment.

💧 **Michigan Compiled Laws § 324.1701(1).** The attorney general or any person may maintain an action in the circuit court having jurisdiction where the alleged violation occurred or is likely to occur for declaratory and equitable relief against any person for the protection of the air, water, and other natural resources and the public trust in these resources from pollution, impairment, or destruction.

B. Public interest as a criterion in management decisions

Water codes should incorporate a nondiscretionary public interest criterion for water management decisions. The code should also define the components of the public interest assessment. The inclusion of public interest criteria provides a mechanism for the state to balance the benefits of water development with other impacts to the resource and environment. These considerations often also provide a mechanism for public participation in water management

decisions. Particularly in western states, the inclusion of public interest criteria provides an important mechanism to consider non-consumptive needs in making water management decisions. Where public interest criteria are not included, they are often not part of the decision-making calculus.

💧 **Nevada Revised Statute § 533.370(2).** “[W]here its proposed use or change . . . threatens to prove detrimental to the public interest, the State Engineer shall reject the application and refuse to issue the requested permit.”

💧 **Nevada Revised Statute § 533.345(2)(b).** “The State Engineer shall approve the application if . . . The temporary change is in the public interest.”

💧 **Virginia Code § 9VAC25-210-370(D)(3).** “Based on an assessment by the board, this withdrawal, whether individually or in combination with other existing or proposed projects, does not cause or contribute to, or may not reasonably be expected to cause or contribute to: a. A significant impairment of the state waters or fish and wildlife resources; b. Adverse impacts on other existing beneficial uses; o c. A violation of water quality standards.”

💧 **Michigan Compiled Laws § 324.32723 (6).** Michigan provides that the department shall only issue a water withdrawal permit if two conditions are met: “The withdrawal will be implemented so as to ensure that the proposal will result in no individual or cumulative adverse resource impacts.”

C. Opportunity for public participation in decision making and to enforce public interest values

Water codes should provide for public participation to enforce public interest considerations in water management decisions. Public participation will help align water regulation with public values. Further, it can provide an important check on regulatory

actions to ensure that the public interest is being protected.

💧 **Colorado, Colorado Revised Statute § 37-92-302(1)(b).** “Any person, including the state engineer, who wishes to oppose the application may file with the water clerk a verified statement of opposition setting forth facts as to why the application should not be granted or why it should be granted only in part or on certain conditions. The statement of opposition may be filed on behalf of all owners of water rights who, by affixing their signatures to the statement of opposition, in person or by attorney, consent to being included in the statement and who may be detrimentally affected by granting of the application. The water clerk shall send a copy of the statement of opposition to the state engineer and the division engineer.”

D. Requirements for planning and data collection

Water resource planning and data collection are critical components of achieving more sustainable resource management. Planning requirements provide the opportunity to look holistically at water use across the state and are often the only time quantity and quality are considered together. In addition, planning can provide an opportunity to identify opportunities to amend state water laws to advance the public’s evolving values and goals. Finally, planning process can incorporate robust opportunities for public participation in framing state priorities for managing its water.

Data also plays a key role in sustainable resource management and is cited as a recurring hurdle in regulating within a sustainable yield. In the surveyed states, a lack of data arose both from unregulated uses as well as a lack of mandatory measuring and reporting requirements. Provisions should require both measuring and reporting requirements. Ideally, these should apply to all water users as exempting certain small users can result in large cumulative data gaps.

💧 **Virginia Code § 62.1-44.40(A).** “The Board, with advice and guidance from the Commissioner of Health, local governments, public service authorities, and other interested parties, shall establish a comprehensive water supply planning process for the development of local, regional, and state water supply plans consistent with the provisions of this chapter.”

💧 **Virginia Code § 62.1-44.40.** “The Board shall submit an annual report to the Governor and the General Assembly on or before October 1 of each year on matters relating to the state's water resources policy and the status of the state's water resources, including ground water.”

💧 **Virginia Administrative Code § 9VAC25-200-40(A).** Every nonexempt user other than crop irrigators shall have installed and shall operate a gaging device or methodology before commencing withdrawal and shall operate the device or methodology routinely thereafter. The gaging device or methodology shall measure the cumulative volume of water withdrawn at or near the source of withdrawal, or at the water treatment plant. Nonexempt crop irrigators shall comply with these measuring provisions by January 31, 1991, or before commencing withdrawal, whichever is later. Reporting. Every nonexempt user shall file with the board by January 31 of each year a reporting form, as prescribed by the board, completed insofar as it pertains to his withdrawal for the calendar year preceding. The information reported shall include the user's name, address, sources and locations of withdrawal, cumulative volume of water withdrawn each month of the calendar year, maximum day withdrawal and the month in which it occurred, and method of withdrawal measurement.

*Virginia exempts small quantity users under 9VAC25-200-30. These exemptions can cumulatively result in significant data gaps and states may wish to expand measuring reporting requirements beyond Virginia's thresholds.

E. Authority to adjust water use to address potential or actual overuse.

Water codes should allow for regulatory action to address unsustainable levels of water use. In many areas, water resources are already overallocated and experiencing unsustainable rates of use. Further, water resources are only anticipated to become further stressed due to climate change and continued population growth. Given current resource allocations and the likelihood of intensified water shortages, it is important to water codes authorize agencies to mitigate and correct past water resources decisions where those decisions do not advance the state's goals or values.

💧 **Virginia Administrative Code §§ 9VAC25-620-300, -310, 9VAC25-210-380.**

Authorizing the revocation and modification of existing permits to address uses that “endanger human health and the environment” or harms instream uses.

💧 **Nevada Revised Statute § 534.120(2).** “In the interest of public welfare, the State Engineer is authorized and directed to designate preferred uses of water within the respective areas so designated by the State Engineer and from which the groundwater is being depleted, and in acting on applications to appropriate groundwater, the State Engineer may designate such preferred uses in different categories with respect to the particular areas involved within the following limits: (a) Domestic, municipal, quasi-municipal, industrial, irrigation, mining and stock-watering uses; and (b) Any uses for which a county, city, town, public water district or public water company furnishes the water.”

F. Identification of the needs of future generations and environment as beneficial uses

Water codes should expressly recognize the use of water to meet the needs of future generations and the environment as beneficial uses. This framing is particularly important in states that limit water use to state-identified

beneficial uses. In these states, failure to expressly identify these as uses as beneficial can prevent water from being protected for instream purposes.

💧 **Code of Virginia § 62.1-44.3.** “In-stream beneficial uses . . . [includes] the protection of fish and wildlife resources and habitat, maintenance of waste assimilation, recreation, navigation, and cultural and aesthetic values” and “the preservation of in-stream flows for purposes of the protection of navigation, maintenance of waste assimilation capacity, the protection of fish and wildlife resources and habitat, recreation, cultural and aesthetic values.”

G. Mechanism to protect environmental flows

Maintaining sufficient water flows instream is a critical component of safeguarding a healthy ecosystem. In states adopting the prior appropriations framework, environmental flows are protected through the instream water rights model. Under this approach, states recognize environmental flows as protectable uses under the water code and issue water rights within the state’s priority system. These models face several hurdles including limitations on the quantity of water that can be acquired (often the minimum quantity necessary to preserve the use) and ongoing overallocation. Despite these challenges, where water rights are acquired, these models provide certainty by creating enforceable property interests that can be protected against injury from more junior users. Further, when coupled with flexibility to reallocate water (as described in section I), they can provide an effective framework for integrating environmental considerations into water codes.

In states with newer frameworks for water management, instream flows have been protected as part of the permitting process through the maintenance of certain baseflows and by conditioning water rights to protect instream uses.

💧 **Colorado, Colorado Revised Statute § 37-92-102-3(4)(c).** Recognizing “the need to correlate the activities of mankind with some reasonable preservation of the natural environment” established the Colorado Water Conservation Board. The agency is charged with identifying the “minimum stream flows or for natural surface water levels or volumes for natural lakes to preserve the natural environment to a reasonable degree.” To protect those minimum flows, the Board is authorized to acquire and hold instream water rights “[f]or the benefit and enjoyment of present and future generations.”

💧 **Virginia, Virginia Code § 62.1-248(1).** Requiring the state water board to “include a flow requirement appropriate for the protection of beneficial instream uses” in surface water permits. The level of flow required is based on “recreational and aesthetic factors and the potential for substantial and long-term adverse impact on fish and wildlife found in that particular surface water management area.”

💧 **Nevada, Nevada Revised Statute § 533.0241.** “For each basin in which there is groundwater that has not been committed for use, including, without limitation, pursuant to a permit, certificate or by any other water user in the basin, as of June 5, 2019, the State Engineer shall reserve 10 percent of the total remaining groundwater that has not been committed for use in the basin.”

H. Requirement to manage within safe yields

Water codes should require that water resources be managed within a safe yield—or a maximum quantity of water that can be withdrawn without depleting the resource. Defining and managing within a safe yield can assist in preventing overuse that is determinantal to the health of the resource and environment, and negatively impacts the long-term sustainability of the resource. While more common in groundwater codes, the safe yield concept should also be adopted as a parameter for surface water allocations.

Safe yields for groundwater may be defined as the quantity that can be recharged in a given year. For surface water, safe yields should be set to protect flows necessary to support environmental needs.

💧 **Michigan, Michigan Compiled Laws, § 324.31701.** Limiting water withdrawals to protect a set flow target in streams.

💧 **Nevada, Nevada Revised Statute 534.110(7)(b).** “If a basin has been designated as a critical management area for at least 10 consecutive years, except as otherwise provided in subsection 9, the State Engineer shall order that withdrawals, including, without limitation, withdrawals from domestic wells, be restricted in that basin to conform to priority rights.”

I. Flexibility to allow for the voluntary reallocation of water

Water codes should provide mechanisms to support the voluntary reallocation of water. In many places, water is already overallocated and rates of use are unsustainable requiring the reallocation of existing water rights to rebalance resource use. However, in these same locations, state-mandated reallocation and curtailment is challenged by existence of property interests in water rights. In these areas, voluntary reallocation is an important tool for redistributing water rights to meet environmental needs and protect the resource for future generations. Provisions may include allowing for temporary and permanent transfers of water rights instream, flexibility in managing water rights to be responsive to a more eradicate changing climate, and incentivizing conservation measures.

💧 **Colorado, Colorado Revised Statute § 37-83-105(2)(a).** “A water right owner may loan

water to the Colorado water conservation board for use as instream flows pursuant to a decreed instream flow water right held by the board for a period not to exceed one hundred twenty days.”

💧 **Colorado, Colorado Revised Statute § 37-83-103(b).** “Any period of nonuse of any portion of a water right shall be tolled, and no intent to discontinue permanent use shall be found for purposes of determining an abandonment of a water right for the duration that: (a) The land on which the water right has been historically applied is enrolled under a federal land conservation program; or (b) The nonuse of a water right by its owner is a result of participation in: (I) A water conservation program approved by a state agency, a water conservation district, or a water conservancy district; (II) A water conservation program established through formal written action or ordinance by a municipality or its municipal water supplier; (III) An approved land following program as provided by law in order to conserve water; (IV) A water banking program as provided by law; (V) A loan of water to the Colorado water conservation board for instream flow use []; or (VI) Any contract or agreement with the Colorado water conservation board that allows the board to use all or a part of a water right to preserve or improve the natural environment to a reasonable degree”

💧 **Nevada, Nevada Revised Statute § 533.325.** “[A]ny person who wishes to appropriate any of the public waters, or to change the place of diversion, manner of use or place of use of water already appropriated, shall, before performing any work in connection with such appropriation, change in place of diversion or change in manner or place of use, apply to the State Engineer for a permit to do so.”