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**ARTICLE:** Water Reuse in the West: State Programs and Institutional Issues. A Report Compiled by the Western States Water Council

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**LEXISNEXIS SUMMARY:**

... In particular, this report describes current reuse programs and efforts in each of the Council's eighteen member states, as well as the institutional issues and other factors that encourage or discourage reuse in those states. ... Reuse Laws and Regulations in Colorado The Colorado Water Control Act gives the Water Quality Control Commission ("WQCC"), which is the administrative agency responsible for developing state water quality policies, broad authority to promulgate regulations for the "reuse of reclaimed domestic wastewater for purposes other than drinking that will protect the public health and encourage the reuse of reclaimed domestic wastewater." ... Regulation 84 does not recognize water reuse as a beneficial use or purpose per se, but does indicate that it was developed "to further promote reuse of reclaimed domestic wastewater by providing a comprehensive framework which, when followed, will assure responsible management of operations and a product of quality compatible with the state's goals of protecting the public health and the environment." ... Issues Affecting Reuse in Nevada Important considerations affecting reuse in Nevada include: (1) whether there is public acceptance; (2) local government support; (3) the potential impacts to waters and the environment; (4) the availability of water; (5) the cost of fresh water; (6) the quality and treatability of wastewater; (7) the cost of additional wastewater treatment; (8) the risks to public health; and (9) how to address and protect unregulated pollutants and emerging contaminants such as endocrine disruptors, pharmaceuticals, and personal care products. ... Treatment standards, recycled water monitoring, irrigation buffers, and site access restrictions are among some of the controls used to protect public health. ... Water Reuse Urban Task Force and Barriers to Reuse In 2003, the Oregon Legislature passed Senate Bill 820, requiring ODEQ to work with interested parties to develop a report on the opportunities and barriers associated with wastewater reuse in urban areas. ... In most cases, South Dakota reports that permitting requirements in surface water discharge or solid waste permits do not inhibit the reuse of wastewater. ... Washington requires all permitted systems to submit monthly reports of their monitoring activities prescribed by their operating permits. ... Reuse Funding in Washington Reclaimed water projects in Washington are typically funded from multiple state and federal sources (e.g., SRF funds, USDA Agricultural Rural Development grants and loans, EPA Innovative and Alternative Treatment grants, etc.), along with local bonds. ... Subsequently, the Legislature directed the

agencies to look at several specific aspects of such a program, including consideration of a long-term dedicated funding program to construct reclaimed water facilities and to identify barriers to reclaimed water. ... It includes technical standards and best management practices, as well as procedures for the submittal and review of planning documents, water rights impairment assessments, and management of operating permits. ... Nine wastewater reuse projects currently use treated domestic wastewater and that such water is "usually immediately reused for irrigation" due to the arid nature of the state.

## **HIGHLIGHT: PREFACE**

Water scarcity has long been a reality throughout much of the arid West where the availability of water of suitable quality has a direct impact on growth and prosperity. Throughout much of the 21st Century, dams, reservoirs, canals, and other measures provided the water needed to accommodate the region's growing population and economic needs. However, rapid population growth coupled with drought, water-intensive energy development, climate conditions, and a number of other factors are now placing additional stressors on western water supplies. Not surprisingly, there is an increasing need and interest in many areas of the West to identify and develop alternative, sustainable water supplies.

To many, water reuse, or the use of treated effluent or wastewater for a secondary purpose, represents a vital means of satisfying increasing water demands in the face of decreasing supplies. For instance, water reuse figured prominently in a Congressional briefing on the future of alternative water and energy supplies that Representative Grace Napolitano of California held in September 2011 in conjunction with the WaterReuse Association. The perception of reuse's potential as a vital means of supplying increasing water demands was perhaps best encapsulated by one private industry expert at the hearing, who opined, "Reuse is the world's greatest untapped source of water." n1

Although the viability of reuse has increased in recent years, it is not a panacea. It continues to face a number of obstacles, including concerns related to public health, environmental contamination, the relatively cheaper cost of raw water supplies in some areas, and institutional and regulatory barriers, to name a few. In some cases, reuse may also entail unintended impacts, particularly to water rights holders, that must be considered when determining its suitability as a sustainable water supply.

Nevertheless, growing populations, a lack of new or inexpensive water supplies, and other driving forces continue to prompt states and private institutions to consider reuse. While the extent to which reused water is used and regulated varies widely across the West, many are embarking on efforts to address barriers and limitations through a diverse range of state-led initiatives, legislation, policies, and other endeavors. Among other efforts, 2010 and 2011 alone witnessed a state-led collaborative effort in Arizona to increase water reuse, a series of reports in Texas to improve public understanding of reuse, revisions to Idaho's water reuse rule to reduce burdens on the regulated community and educate the public, and legislation in Montana authorizing the regulation of wastewater from public sewage systems.

The Western States Water Council, which is an affiliate of the Western Governors' Association and serves as an advisor and resource to the governors of eighteen western states on water policy issues, commissioned this report to describe how western states regulate water reuse and what steps they are undertaking to further reuse, particularly with respect to institutional barriers. It primarily contains information collected from the western states in 2010 and early 2011 regarding their water reuse efforts and experiences. Ideally, by presenting this information in one common document, it is hoped that the report will serve as a resource that states and other interested stakeholders can use to address common issues and barriers regarding water reuse.

## **TEXT:**

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### I. Introduction

Water reuse can provide western states with a reliable supply of water to help address growing water demands. The practice is also becoming more practical and cost-effective given the scarcity of fresh water supplies, the abundance of wastewater created by growing populations, and increasingly stringent wastewater discharge requirements. However, while many states have expressed an interest in reusing water, a number of legal, institutional, and societal constraints can potentially hinder reuse.

In 2008, the Western Governors' Association adopted "Water Needs and Strategies for a Sustainable Future: Next Steps," which identified a number of policy objectives related to water management in the West, including a recommendation that the states investigate institutional mechanisms for furthering water reuse. n2 This report is a direct response to this recommendation and builds upon previous Council efforts that have broadly discussed barriers to reuse in the West. n3 In particular, this report describes current reuse programs and efforts in each of the Council's eighteen member states, as well as the institutional issues and other factors that encourage or discourage reuse in those states. This information is intended to help western states learn from each other as they work to carry out the report's recommendations.

[\*456] This report consists primarily of information that 18 western states provided the WSWC in 2010. n4 Although the author has updated this report to reflect a few key developments that have taken place since then, the majority of the information described below should be considered current as of 2010 unless otherwise indicated. While the terms and concepts associated with water reuse vary significantly across the West, "water reuse" for the purpose of this report refers to surface and/or groundwater that is used, treated or reconditioned, and then used again. It does not address water that is merely reused on a specific site without being treated or reconditioned.

For each member state, this report contains information pertaining to: (1) its laws and regulations governing reuse; (2) available funding options for reuse projects; (3) legal, political, technical, and institutional issues that encourage or discourage reuse; and (4) specific state efforts to encourage reuse or overcome barriers. Where applicable, a number of states also provided information on their existing water reuse projects, which is contained in Appendix B.

The summaries show that the extent to which reuse occurs and the factors that encourage or impede it vary considerably depending upon the individual circumstances of each state. Further, some states have highly developed regulatory programs specific to reuse, while others may not have any programs and may lack a statutory or regulatory definition for the practice. Nevertheless, states reported various common barriers, including inflexible and duplicative regulations, concerns about how to protect senior water rights, lack of funding, and health concerns among the general public. Common efforts to encourage reuse involve state funding mechanisms, public outreach, and state-sponsored workgroups to identify and overcome barriers. In general, the most effective state efforts appear to be those carried out at the direction of a governor or state legislature, and include significant collaboration with stakeholders to develop laws, regulations, and policies aimed at encouraging reuse.

## II. State Summaries

This section summarizes the survey responses received from member states. It focuses primarily on the institutional and other issues that encourage or discourage reuse, as well as the efforts of member states to encourage reuse or overcome barriers. Given this emphasis, the summaries do not endeavor to provide an exhaustive description of each state's legal and regulatory framework. Rather, they strive to provide a general overview of each framework in order to set forth the context needed to understand the issues and efforts that each state has identified. More information is also available in Appendix B, which contains a table that identifies the laws, regulations, guidance [\*457] documents, and other information regarding each state's legal and regulatory framework for water reuse.

### A. Alaska

Alaska reports that it does not have any laws or regulations pertaining to the types of water reuse that are the subject of this report. It also does not have any facilities that are using, treating, or reusing water.

### B. Arizona

Reuse is increasing in Arizona and the quality of reused water and the quantity of direct reuse has increased steadily since the state revised its regulations in 2001. In total, current estimates of use of reclaimed water for an allowed beneficial purpose total over 3% of statewide water use, while water reuse within the state's active management areas is over 6%. n5

#### 1. Reuse Laws and Regulations in Arizona

Arizona uses the term "reclaimed water," which it defines by statute as water that has been treated or reprocessed by a wastewater treatment plant or an onsite wastewater treatment facility. n6 The Arizona Administrative Code ("AAC") defines "direct reuse" as the beneficial use of reclaimed water for specified purposes. It excludes the following uses from this definition: "(1) the use of water subsequent to its discharge under the conditions of a National Pollutant Dis-

charge Elimination System (NPDES) permit; (2) the use of water subsequent to discharge under the conditions of an Aquifer Protection Permit (APP) issued under specified provisions of the AAC; or (3) the use of industrial wastewater or reclaimed water, or both, in a workplace subject to a federal program that protects workers from workplace exposures." n7 Reclaimed water that is used directly with no opportunity for public exposure is not considered "direct reuse." n8

The Arizona Department of Environmental Quality ("ADEQ") has jurisdiction over the state's reclaimed water program and has statutory authority to adopt rules with standards for reclaimed water conveyances and water quality [\*458] standards. n9 It operates a reclaimed water permit program that relies on general permits but also provides individual permits for those uses that do not fit into the general permit requirements. n10 The Arizona Department of Water Resources ("ADWR") regulates the water quantity aspects of reclaimed water. n11 It is also important to note that reclaimed water belongs to the party that produced it. n12 This means that it is not subject to the same water rights limitations as surface water and groundwater.

As for monitoring, individual reclaimed water permits and some individual permits have reporting requirements. For domestic wastewater, monitoring requirements are contained in individual APP's that are necessary for wastewater treatment plants to operate. n13 Individual permits are also required when industrial wastewater influences the characteristics of reclaimed water.

## 2. Reuse Funding in Arizona

In Arizona, municipalities, utilities, and end users provide funding for water reuse activities. The state's Water Infrastructure and Finance Authority is authorized to finance the construction, rehabilitation, and/or improvement of drinking water, wastewater, wastewater reclamation, and other water quality facilities and projects by providing below market interest rates on loans for eligible projects. n14

## 3. Issues Affecting Reuse in Arizona

Arizona's legal and regulatory framework has resulted in the construction and improvement of a number of high-performance sewage treatment plants. Reclaimed water is also distributed for a variety of uses to many hundreds of [\*459] end users, while reclaimed water distribution systems supply recharge facilities and irrigate golf courses, outside landscapes, parks, schoolyards and other agricultural, industrial, and power generation needs. In total, 59% of wastewater treatment plants within Arizona distribute reclaimed water for reuse. Reuse also occurs in every county. The state maintains that this is due in part to ADEQ's permitting program, which utilizes "an uncomplicated, yet protective" regulatory framework for reclaimed water that relies largely on simple end user permits. n15

However, additional potential for reuse exists, particularly outside of Arizona's active management areas ("AMAs"). n16 Although many plants are authorized to supply reclaimed water, not all of this capacity is currently being used. One principal factor that has historically limited the use of reclaimed water, both inside and outside of the AMAs, is that such water is usually produced at the lowest, downstream edge of a community. This means that it is costly, particularly in retrofit situations, to convey the water to high value reusers within the community. n17

There are also a number of possible opportunities for developing incentives or for better matching potential uses with available reclaimed water supplies. One example includes locating solar thermal electrical generation plants next to wastewater treatment plants where reclaimed water is not fully utilized. Some Arizona communities are also investigating decentralized wastewater treatment options in which smaller, high performance odor-free plants are located within their borders, thereby providing high-value uses with lower infrastructure costs. n18

## 4. State Efforts Regarding Reuse in Arizona

In August 2009, Arizona Governor Jan Brewer announced the formation of a "Blue Ribbon Panel on Water Sustainability" to identify and overcome obstacles to increasing water sustainability, with a focus on increasing water reuse, recycling, and conservation. n19 The Directors of ADWR and ADEQ, as well as the Chairman of the Arizona Corporation Commission ("ACC"), served as joint chairs of the panel. Forty members were also appointed to the Panel, representing legislative leadership, state agencies, local governments, city [\*460] governments, tribal governments, federal government, universities, and private utilities. n20

The Panel established five working groups, each of which was chaired by a panel member and open to the public to facilitate discussion on issues and involved a broad spectrum of stakeholders and experts. n21 The working groups focused on public perception and acceptance, regulations and permitting, infrastructure, and funding, among other things.

In November 2010, the Panel produced a substantive report based on the working groups' efforts. n22 To develop the report, the working groups held a total of fifty-eight meetings involving 320 individuals and produced a series of white papers. The report consolidated the issues and recommendations set forth in the white papers into eighteen sets of recommendations and sixty-eight sub-recommendations, which it organized into the following categories: (1) education/outreach; (2) standards; (3) information development and research; (4) regulatory improvements; and (5) incentives. n23

The Panel presented the report to the Governor, the Legislature, ADWR, ADEQ, and ACC for consideration in November 2010. Importantly, the report does not recommend new regulatory programs or major reconstruction of existing programs. Instead, it makes recommendations aimed at improving Arizona's existing toolbox of water management, education, and research capabilities. n24 Some of the report's recommendations regarding reuse that may be of interest to other states are summarized and described below.

#### a. Education and Outreach

The report found a general lack of understanding and miscommunication, which is affecting public awareness regarding the relationship between water availability, water resource management, water quality, economic development, environmental needs, and quality of life. n25 This miscommunication can be exacerbated by the varying definitions for reclaimed water and associated terminology that exist statewide. A lack of awareness of the availability of water reuse and water resource-related information (technologies and financial information) is also present in a number of forums as a critical issue for water conservation, water reuse, and water management efforts. n26

To address these obstacles, the report set forth a number of [\*461] recommendations, including:

- . ADWR and ADEQ should create a coalition to engage industry experts and utilize professional assistance to translate industry terminology into "an acceptable lexicon" for statewide use.

- . ADWR should create a state-hosted and easily accessible information portal with research-based information on water pricing, water supply, water quality, water management, water conservation and efficiency programs (including reuse), water harvesting, and education/technology information.

- . Public and/or private wastewater agencies should be encouraged to evaluate their ability to implement a reuse program in the next two years.

- . Develop a series of out-of-session meetings with stakeholders and legislators to discuss water resources and the programs that protect and enhance water sustainability.

- . ADWR, ADEQ, and ACC should conduct an outreach campaign to highlight the potential uses of reclaimed water that could include a state "Water Reuse Day" and the engagement of academics, local celebrities, and business partners as official spokespeople for reclaimed water. n27

Of note, the report finds that the presence of emerging contaminants can lead to a perception among the public that using reclaimed water is unsafe. n28 The number of compounds in use and an increased understanding of their potential impact on human health and the environment may also make developing water quality standards and regulations increasingly complex. The report finds that there is a need for the public, community leaders, water treatment professionals, and business and industry to understand and be aware of water quality issues and how their actions may impede reclaimed water use. n29 Among other things, it recommends expanding pharmaceutical take-back programs and media outreach, as well as funding research on the effects of trace organics in streams receiving wastewater, and the fate of trace organics in effluent discharge to surface water or infiltrated for groundwater replenishment. n30

#### b. Standards

The report identified a number of regulatory impediments to reuse, including: (1) a lack of comprehensive standardized technical criteria, (2) perceived redundancies in permit reporting requirements and the need for [\*462] greater understanding of the state's reuse programs on the regulated community; (3) the lack of a state-recognized and approved training and certification program for the operation of reclaimed water distribution systems, which could contribute to

negative public perceptions of reuse in the event of operator error; and (4) under-utilization of reclaimed water supplies. n31 Recommendations to address these issues include:

- . Initiate a stakeholder process to review and amend regulations as necessary to improve, enhance or encourage use, storage and exchange of recycled water.

- . Create a matrix of state, regional, and local infrastructure specifications and standards to identify similarities, inconsistencies, and gaps to develop recommendations on a "suite of standards" that would provide a common foundation of safety and establish good engineering practices for reclaimed water distribution systems. Create a Reclaimed Water Infrastructure Advisory Panel of state, county, local, and private experts to help develop the matrix.

- . Create an indirect potable reuse ("IPR") steering committee to further advance IPR's use by streamlining agency reviews, incorporating new technologies, and directing the IPR Advisory Panel. n32 Create an IPR Advisory Panel to focus on the effectiveness and implementation of new technologies and field studies.

- . ADEQ should facilitate the development of a reclaimed water distribution system operator system training program and associated certification.

- . Convene a stakeholder process to identify inconsistencies or conflicts among state regulatory programs. n33

#### c. Information Development and Research Agenda

The Panel noted that timely and accurate data is needed to develop rational regulations and standards that encourage reuse that increase public confidence in the use of reclaimed water. However, water permittees in Arizona generally submit their permit data manually. This can be a time consuming and inefficient process that can create real and perceived administrative requirements and costs that may cause some agencies and utilities to shy away from implementing a reuse program. n34

[\*463] To address these issues, the report recommends that ADEQ and ADWR initiate a process to review and revise permit and nonpermit data submittal requirements for necessary frequency consistency, as well as the applicability of monitoring requirements. Data would be submitted electronically and the agencies would develop a standard for an electronic data management system that would be available to all regulators, permittees, contractors, and the public. In creating the system, the agencies would utilize the participation of stakeholders, information technology professionals, and the regulated community. An intergovernmental agreement between the regulatory agencies could also help administer the development of the system. n35

Further, the report recommends the formation of a coalition between Arizona, California, Texas, Colorado, and Florida (considered by the report to be national leaders in developing reuse programs) along with the WateReuse Association, WateReuse Research Association, EPA, and other state and national institutions to develop a strategic research plan to answer questions pertaining to the development of new expanded uses of reclaimed water. n36

#### d. Regulatory Improvements

This section of the panel's report focuses on policy and rule changes needed to encourage the use of new water sources, including reclaimed water. One notable obstacle is the concern among some stakeholders that definitions in rules and statutes are inconsistent. The report also found that reuse and other permits do not adequately address unique situations, noting that the permit process may prohibit the use of reclaimed water for an environmental benefit because it is based on rigid standards that make the environmental use infeasible due to treatment costs. Further, the report noted that jurisdictional/duplication issues exist between ADEQ, ADWR, ACC, and counties. The report specifically noted that one county had taken an active role in permitting reuse sites in a manner similar to ADEQ, although ADEQ has not delegated its reclaimed water program to any county. Among other things, this duplication creates additional work, inefficient work flow, and increased transactional costs for regulatory agencies, reclaimed water providers, and end users. n37

Some of the recommendations aimed at addressing these issues include:

- . ADWR, ADEQ, ACC, and the counties should review statutes for inconsistencies in definitions and duplication of fees.

- . Update reclaimed water quality standards.

. Establish ratemaking guidelines that mirror the state programs currently in place for power utilities.

[\*464] . ADEQ should adopt a number of modifications to allow for more flexibility in its standards and permitting, including accommodating the use of reclaimed water for environmental purposes (habitat restoration, riparian preservation, environmental and ecosystem enhancement projects, etc.).

. ADEQ should determine if counties are duplicating programs and charging fees for programs that the state is also conducting.

. ADEQ should improve the interface between its various permitting requirements where reclaimed water is incorporated as a resource to support a public project involving overlapping programs with equally beneficial goals (e.g., reuse, recharge or multiple water sources, storm water management, etc.). n38

#### e. Incentives

In addition to identifying ways to improve regulations and standards, the report finds that incentives could provide added motivation to increase reclaimed water use. It specifically recommends developing, expanding, and promoting tax exemptions for the use of alternative water supplies, while also expanding the tax credit for reclaimed water infrastructure capital investment through legislation. n39

### C. California

California has a long history with reuse that dates back as far as the late 1800s, when farmers began using municipal wastewater for irrigation and others used it for landscape irrigation. n40 Given this history, the state has enacted comprehensive laws, regulations, policies, and programs regarding the practice. It is also state policy to promote the use of reused water to the maximum extent to supplement existing ground and surface water supplies to help meet the state's water needs. n41 Reuse has increased over the years and California estimates that it currently reuses approximately 724,000 acre-feet of water per year. n42

[\*465]

#### 1. Reuse Laws and Regulations in California

The California Water Code ("CWC") defines "recycled water" as water that, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur, and is therefore considered a valuable resource. n43 Statutes and regulations regarding the use of recycled water in California can be found in the CWC, California Code of Regulations ("CCR"), and the California Health and Safety Code. n44 The State Water Resources Control Board ("SWRCB") and nine Regional Water Quality Control Boards (collectively, "Regional Water Boards") regulate the water quality and quantity aspects of water reuse under the CWC, while the California Department of Public Health ("CDPH") regulates the public health aspects pursuant to CCR Title 22, Division 4, Chapter 3. n45 A 1996 Memorandum of Agreement ("MOA") between the Department of Health Services ("DHS"), SWRCB, and the Regional Water Boards regarding the use of recycled water divides the areas of authority and responsibility between these agencies. n46 It also includes methods and mechanisms needed to ensure ongoing and continuous future coordination of activities regarding recycled water use.

California permits recycled water activities from public entities and some private sources by issuing waste discharge requirements (WDR), individual water recycling requirements ("WRRs"), n47 Master Reclamation permits, or under SWRCB's statewide general permit. The Regional Water Boards determine which type of permit to issue depending on the project type, user type, and application area. They also consult with the CDPH when issuing WRRs, which contain public health related requirements.

Additionally, CDPH requires engineering reports under CCR Title 22 from the project proponents for project approval, which is a prerequisite for any [\*466] treated municipal reuse. n48 Once CDPH approves an engineering report, the appropriate Regional Water Board will issue a WDR, which includes reclamation requirements. SWRCB does not issue WDRs for reuse facilities but enrolls entities applying for water recycling projects with entire landscape irrigation use under its landscape irrigation general permit. n49

Recycled water activities with an agricultural or industrial water source are permitted differently than activities with domestic wastewater sources, and the Regional Water Boards will permit such activities by issuing a WDR. An agricultural water source does not require treatment if it meets the agricultural water quality for reuse. Conversely, in-

dustrial source water must meet treatment standards and effluent limitations, be limited to crop irrigation uses, and meet CDPH requirements. WDRs issued to an industrial facility that recycles its water contain WRRs, which the Regional Water Board establishes in coordination with CDH. Further, secondary treated domestic wastewater effluent that meets CDPH criteria is also recycled through certain crop irrigation practices under WDRs issued by the Regional Water Boards. n50

All of the water reuse permit types contain a set of monitoring requirements. The sampling frequency varies and depends on a number of factors, such as the facility type, threat to water quality, treatment type, and constituents of concern. The reporting frequency also varies and could be monthly, quarterly, or annually. Technical reports are submitted to the permit issuing authority, which is either one of the Regional Water Boards or SWRCB. n51

## 2. Reuse Funding in California

SWRCB operates a Water Recycling Funding Program ("WRFP"), which promotes water recycling by providing technical and financial assistance in the form of grants and loans to agencies and other stakeholders to support research and project planning, design, and construction. n52 Since the late-1970s, the [\*467] WRFP has distributed close to \$ 151 million in planning and construction grants and approximately \$ 611 million in low-interest loans for water recycling projects. n53

Projects are usually funded on a "readiness to proceed" basis and the amount of the grants and loans available for funding varies from year to year. n54 Funding for the program comes from three sources. The first is from California's Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Proposition 50), which authorizes grants for water recycling projects that meet the goals and objectives of the California Bay-Delta Program ("CALFED"), among other things. The second is the state's Clean Water State Revolving Fund ("SRF") Loan Program, which provides low-interest loans to public agencies for planning, design, and construction of projects that recycle water to replace the use of the state and/or local supply. The third is the state's Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act (Proposition 13). n55 The funds for construction grants and loans from Proposition 13 have essentially been exhausted. However, a small amount of money comes into the program from loan repayments, which provides the source of the funds for the planning grant program. These grants are relatively small at \$ 75,000, which means that repayment funds are sufficient to maintain the program. n56

## 3. Issues Affecting Reuse in California

Overall, California reports that its legal and regulatory framework encourages water recycling. The CWC specifically states that the use of potable water for non-potable uses is an unreasonable use of water where suitable recycled water is available. n57 There is also political support for recycled water use, and the Water Quality Control Plan (Basin Plan) of each Regional Water Board emphasizes recycled water in its respective basins by requiring project proponents to first consider reclaiming treated wastewater whenever there is sufficient agricultural land available for reuse. n58

Nevertheless, California notes that there are some aspects of its framework that can discourage reuse. One such aspect is the fact that requirements may vary among the Basin Plans of each region. n59 California also [\*468] reports that the following requirement set forth in the CWC may also discourage recycling:

The owner of a waste water treatment plant operated for the purpose of treating wastes from a sanitary sewer system shall hold the exclusive right to the treated waste water as against anyone who has supplied the water discharged into the waste water collection and treatment system, including a person using water under a service contract, unless otherwise provided by agreement. n60

California states that it is not aware of any interstate compacts or other agreements that conflict with its water reuse laws and policies, noting that many compacts expressly state that a settlement act should not be construed to alter the applicability of state water law or procedures. n61 Although the issue of recycled water may arise during negotiations over the allocation of interstate waters, most of these issues typically relate to the allocation of recycled water rather than the state's ability to regulate such water. For example, the Truckee River Operating Agreement specifies that certain parties may not claim a right to effluent from wastewater treatment facilities that is attributable to certain categories of water use. n62 At the same time, the California-Nevada Interstate Compact, which Congress has not ratified, also states that the reuse of allocated water is not prohibited.



#### 4. State Efforts Regarding Reuse in California

California has long supported laws and policies to promote water recycling. n63 In 2002, the California Department of Water Resources ("DWR") formed a Recycled Water Task Force as directed by legislation (Assembly Bill 331) to evaluate the state's framework of state and local rules, regulations, ordinances, and permits to identify opportunities for and obstacles to increasing the safe use of recycled water. The Task Force was a cooperative effort between DWR, SWRCB, and CDPH. Its forty-person membership also represented federal, state, and local government interests, as well as public health professionals, private sector entities, environmental organizations, academics, and others. n64

In 2003, the Task Force issued a final report to the Legislature, which estimated that California had the potential to recycle up to 1.5 million acre-feet of water per year, which could free up enough water to meet approximately 30% [\*469] of the household water needs associated with projected population growth. It also noted that California would need to invest nearly \$ 11 billion in infrastructure to produce and deliver the recycled water, but that these costs would be generally comparable to other supply options. In addition, the report identified 26 issues with respective recommendations intended to help the Legislature, state government, public agencies, and other stakeholders address obstacles, impediments, and opportunities for California to increase its recycled water usage. These recommendations targeted actions at various levels and were not restricted to legislative actions or statutory changes. Further, many were intended for state or local agencies to implement without additional legislative authorization or mandates. n65

Some of the report's recommendations that may be of interest to other states include:

- . Local agencies should engage the public in active dialog and participation using a community value-based decision-making model in planning water recycling projects.
- . State government should take a leadership role in encouraging recycled water use and improve policy consistency within the different branches of state government.
- . The state should develop comprehensive education curricula for public schools, while institutions of higher education should incorporate recycled water education into their curricula.
- . The state should develop a water issues information program, including water recycling for radio, television, print, and other media.
- . The state should investigate alternative approaches within its existing framework to achieve more consistent and less burdensome regulatory mechanisms affecting the incidental runoff of recycled water from use sites.
- . The state should create a uniform interpretation of state standards in state and local regulatory programs.
- . The state should expand funding sources to include sustainable state funding for research on recycled water issues.
- . The state should encourage an integrated academic program on one or more University campuses for water recycling research and education.
- . A revised funding procedure should be developed to provide local agencies with assistance in potential state and federal funding opportunities. n66

[\*470] The Task Force's report has also informed subsequent state efforts. In 2006, the Legislature enacted Assembly Bill 371, which included a statement that CDPH, DWR, SWRCB, and the Regional Water Boards should take appropriate action to implement the recommendations of the Task Force's report. The bill also required the California Department of Transportation to install piping appropriate for recycled water use in any of its landscape irrigation projects if it receives notification from a recycled water producer that recycled water will be provided for those projects within ten years. n67

Subsequently, the SWRCB adopted a "Recycled Water Policy" in 2009 that is aimed at increasing the use of recycled water from municipal wastewater sources. Among other things, it adopts a goal for California to increase its use of recycled water over 2002 levels by at least one million acre-feet per year by 2020, and by at least two million acre-feet by 2030. It also defines the roles of SWRCB and the Regional Water Boards and sets forth criteria aimed at streamlining the permitting process and maximizing consistency. n68

The policy also called for the creation of a "blue ribbon" advisory panel to guide future actions relating to emerging contaminants or "chemicals of emerging concern" ("CECs"). n69 In 2010, a Chemicals of Emerging Concern Advisory Panel consisting of six experts was formed to provide guidance for developing monitoring programs that assess the po-

tential threats of emerging contaminants from various recycling practices, including indirect potable reuse via surface spreading, indirect potable reuse via subsurface injection into a drinking water aquifer, and urban landscape irrigation. n70 In June 2010, the Panel provided recommendations to SWRCB and CDPH, which it developed by soliciting stakeholder input and considering public comments. n71 The report includes the following four "products" intended to assist the state as it refines its recycled water policy: (1) a conceptual framework for determining which [\*471] CECs to monitor; (2) application of the framework to identify a list of chemicals that should be monitored presently; (3) a sampling design and approach for interpreting results from CEC monitoring programs; and (4) priorities for future improvements in monitoring and interpretation of CEC data. n72

Other recent efforts of note include municipal wastewater recycling surveys in 2002 and 2010, n73 the issuance of SWRCB's landscape irrigation general permit in 2009, and a 2007 WRF strategic plan that set forth the goal of promoting and funding economically feasible water recycling projects that result in a statewide public benefit. n74 With respect to public education, SWRCB also holds workshops regarding water recycling and related issues. SWRCB and its Office of Public Participation use these forums to inform the public and address public misunderstanding and fear about water recycling.

#### D. Colorado

Water reuse has a long history in Colorado, with the municipalities of Colorado Springs and Aurora having operating reuse projects since the 1960s. The state does not sponsor a water reuse program and municipal or private entities sponsor all of the state's reuse projects. In recent years, the state has seen a dramatic increase in the number of reuse projects, and there are currently twenty-three entities discharging reused water, most of which began operation after 2000. n75

##### 1. Reuse Laws and Regulations in Colorado

The Colorado Water Control Act gives the Water Quality Control Commission ("WQCC"), which is the administrative agency responsible for developing state water quality policies, broad authority to promulgate regulations for the "reuse of reclaimed domestic wastewater for purposes other than drinking that will protect the public health and encourage the reuse of reclaimed domestic wastewater." n76 Colorado's reuse rule (Regulation 84) uses the term "reclaimed water," which it defines as "domestic wastewater that has received secondary treatment by a domestic wastewater treatment works and [\*472] such additional treatment as to enable the wastewater to meet the standards for approved uses." n77

Regulation 84 does not recognize water reuse as a beneficial use or purpose per se, but does indicate that it was developed "to further promote reuse of reclaimed domestic wastewater by providing a comprehensive framework which, when followed, will assure responsible management of operations and a product of quality compatible with the state's goals of protecting the public health and the environment." n78 Case law interpreting Colorado's legal framework for water rights also recognizes the importance of reusing trans-basin water to extinction. n79 Approved uses for domestic wastewater under the regulation include specified landscape irrigation, fire protection, industrial uses, and commercial uses. n80

An entity ("treater") wishing to put reclaimed domestic wastewater to use must submit a "letter of intent" to the Water Quality Division of the Colorado Department of Public Health and Environment ("Division"), which has jurisdiction over the water quality aspects of reuse. n81 These letters, which are equivalent to applications, must include an affirmation that the treater's reuse activities will not "materially injure water rights." n82 If the Division approves the letter of intent, it will issue a "notice of authorization" ("NOA") authorizing the treater's proposed actions and setting forth the conditions of operations, including approved types of use, reuse water quality requirements, and monitoring and reporting requirements. Once a facility obtains an NOA, it can then have site owners (users) submit their own letters of intent to receive and use reused water. If the site is approved, then the site will receive an NOA. The Division of Water Resources within the Colorado Department of Natural Resources has jurisdiction over the water quantity aspects of water reuse. n83

The Division regulates water reuse under Regulation 84. All facilities that distribute reclaimed water must monitor for E. coli and total suspended solids or turbidity. The frequency of the monitoring depends on the type of reuse activity and associated water quality requirements. Treaters of reclaimed water are also required to inspect a representative number and type of users each year and submit their monitoring results to the Division and note significant violations in annual reports. n84

Colorado reports that there are several activities where water may be reused that are not regulated as water reuse. Such activities include graywater, [\*473] agricultural reuse, and the blending of raw water into reclaimed water. Wa-

ter reuse activities with an agricultural water source or industrial water source that result in application of the water to land or a discharge to surface or groundwater are required to obtain a discharge permit. n85

## 2. Reuse Funding in Colorado

Municipalities have funded most of Colorado's reuse projects through bonding or borrowing, and these projects generally support themselves through the sale of reuse water. Reuse projects are also eligible for SRF funding and some projects have been financed through this mechanism, though no specific portion of the available funding is set aside exclusively for reuse projects. n86

The Division, which completed the survey for Colorado, also indicated that it is unaware of any specific situations where funding has prevented a reuse project from moving forward and reports that it does not appear that additional financial incentives for larger communities are necessary. n87 However, it did note that some smaller communities may not have been able to implement reuse projects due to a lack of available financing. Thus, it stated:

It would be helpful to have a source of "cheap" (grant/low-no interest loan) funding for smaller communities with water rights that would allow reuse as they typically do not have capital on hand to support the planning, design, and other pre-construction costs for a reuse project. n88

## 3. Issues Affecting Reuse in Colorado

Colorado noted that the recent "explosive growth" in reuse projects indicates that its political and regulatory processes encourage reuse and that the financial costs of projects have not significantly inhibited new or expanded projects. This is due in part to the fact that the state developed its regulatory framework regarding water quality and public health protection to be simple and straightforward to encourage the reuse of water wherever feasible. Moreover, reuse has been well-accepted and has enjoyed long-term, political support in Colorado for a number of reasons, including the state's arid climate and relatively long history with the practice, as well as the leadership provided by early municipal practitioners. n89

The requirement in Regulation 84 that all letters of intent affirm that a treater's reuse activities will not harm water rights have also prevented reuse projects from creating conflicts with interstate water compacts and water rights. [\*474] However, Colorado did acknowledge that treaters must have the water rights to direct water to reuse, which could inhibit reuse in certain situations. n90

Colorado further noted that obtaining resources for the Division to timely issue notices of authorization to treaters and users, provide assistance, conduct inspections, and take enforcement action where necessary is one of the most important issues regarding water reuse in Colorado. The Division indicated that it does not see a need for a revision of the state's reuse statute because it gives broad authority to AQCC. However, it would like to see changes in Regulation 84 to authorize additional uses and to further streamline the regulation provided it receives additional resources to support the outcome of such changes. n91

The state has not addressed organic contaminants in reclaimed water. However, treaters have begun to look at the need to develop educational information and material as this issue is expected to become more important in the future. n92

## 4. State Efforts Regarding Reuse in Colorado

Colorado has not been formally involved in the promotion of reuse projects and the Division is not aware of any specific reuse plans that are part of the state's overall water plan. Instead, private and municipal entities implement all of the reuse projects found within the state. n93

Of note, Colorado has worked with the Joint Water Reuse Committee of the Rocky Mountain Section of the American Water Works Association and the Rocky Mountain Water Environment Association (Joint Committee) to develop proposals that ultimately led to the statutory authority that authorized AQCC to promulgate reuse regulations and expanded the scope of use of reclaimed domestic wastewater. For instance, when Regulation 84 was first promulgated in 2000, it limited the use of reclaimed domestic wastewater to landscape irrigation. Since that time, the Division and the Joint Committee have made a number of requests to AQCC for the purposes of considering additional uses of reclaimed

water and other changes to Regulation 84. AQCC has since adopted a number of these changes, including changes that expanded the authorized uses of reclaimed domestic wastewater to include commercial, industrial, and fire protection uses. n94

[\*475]

#### E. Idaho

In Idaho, there are thirty-seven industrial and eighty-six municipal permitted sites. The overall trend for reuse has increased since the creation of the state's reuse program in 1988. Common methods of using treated wastewater in Idaho include land application for irrigation, commercial toilet flushing, dust control, and fire suppression. In 2009, the state reports that its reuse permitting program generated 8.5 billion gallons of water and removed 5.6 million pounds of nitrogen, 1.5 million pounds of phosphorus, and 146.6 million pounds of COD. n95

##### 1. Reuse Laws and Regulations in Idaho

Idaho uses the term "recycled water," which it defines as water that has been treated by a wastewater treatment plant and is used in accordance with its "Recycled Water Rules." n96 Idaho also recognizes the use of recycled water for beneficial uses. n97 Idaho's recycled rules establish the procedures and requirements for reclamation and reuse facilities and require anyone wishing to land-apply or otherwise use wastewater to obtain a wastewater reuse permit from the Idaho Department of Environmental Quality ("IDEQ") before constructing, modifying, or operating a wastewater reuse facility. IDEQ issues two types of permits - industrial permits to regulate reuse of wastewater from such operations as food processing facilities and municipal permits to regulate reuse of wastewater that contains treated sewage. n98

Municipal reuse in Idaho may be used for irrigation purposes, such as farmlands, orchards, golf courses, cemeteries, parks, playgrounds, schoolyards, and other areas. Due to the nature of this recycled water and its potential exposure to humans and animals, Idaho applies specific treatment requirements to municipal recycled water such as monitoring requirements that include mandatory bacterial sampling. Permittees must also meet other measurable criteria, depending on whether the municipal recycled water may come in contact with edible or inedible portions of raw food crops, fruit, fodder, seed, and processed food crops. n99

[\*476] To minimize the potential negative impacts of reuse, IDEQ's water reuse permits require monitoring and reporting determined by site-specific environmental and operational parameters. n100 In particular, permittees must submit an annual water reuse site performance report that includes an interpretative discussion of daily, weekly, and monthly monitoring data (wastewater characteristics, hydraulic loading, groundwater, soils, etc.) related to environmental impacts. The purpose of the monitoring is to provide a timely and cost effective assessment of both wastewater treatment process operations, as well as the impacts of operation and management activities on groundwater, surface water, soil resources, and crop health. Monitoring information also provides feedback to determine wastewater land treatment changes that should be made to manage environmental impacts as needed. n101

It is important to note that Idaho's Recycled Water Rules do not apply to livestock truck washing facilities, feedlots, dairies, and mining. n102 Further, the rules do not apply to the incidental use of recycled water for landscape irrigation at a wastewater treatment plant subject to certain conditions. n103 Idaho's "Wastewater Rules (Section 58.01.16 of its Administrative Code)" cover some of these excluded activities, while the Idaho Department of Agriculture's rules govern dairies. n104

##### 2. Reuse Funding in Idaho

Water reuse activities in Idaho are typically funded like other wastewater facilities in the state. Funding options include state and federal loan programs, cash savings, and federal grant projects. IDEQ provides both grant and loan opportunities for wastewater treatment facilities on an annual basis. Grants are provided to aid in facility planning efforts and IDEQ funds the grants with \$ 250,000 each year. A fifty-fifty match is required. IDEQ also offers loans at low rates with repayment terms of up to twenty years. The FY2010 fiscal year funding for loans was \$ 47.1 million. IDEQ does not know how much of this funding will be dedicated to reuse efforts until the individual grants and loans are finalized. n105

##### 3. Issues Affecting Reuse in Idaho

In Idaho, the issues that drive alternate effluent management options for water reuse often result from regulatory requirements and include stringent Total Daily Maximum Load ("TMDL") allocation, more restrictive NPDES [\*477] permits, and wastewater treatment system upgrades. Funding for reuse projects can be an issue and Idaho notes that convincing rate payers of the importance of infrastructure needs can be a challenge. Issues of concern include total dissolved solids, phosphorus, groundwater contamination, buffer zones, and storage. n106

Historically, there have been odor and groundwater issues with some water reuse sites. However, there is continuing improvement. Currently, all reuse permits prohibit plants from creating public health hazards or nuisance conditions including odors. Permittees must develop nuisance odor management plans that outline specific design considerations, operation and maintenance procedures, and management practices to minimize the potential for or limit odors. Plans must also include procedures for responding to odor incidents and notifying the public if an incident occurs. n107

IDEQ recognizes that current wastewater treatment methodologies were not designed to remove microconstituents of emerging concern (including pharmaceuticals and personal care products). The risk associated with chronic low dose exposure for many of these chemicals is largely unknown because exposure and toxicity data is still being collected and evaluated. EPA and IDEQ also have not established Maximum Contaminant Limits for these microconstituents, so they are currently unregulated. There are currently no groundwater or surface water quality standards associated with these microconstituents. n108

Idaho further reports that IDEQ currently is not implementing or planning to implement a program to monitor these microconstituents of emerging concern in groundwater, surface water, or drinking water due to funding limitations. However, IDEQ is striving to keep pharmaceuticals out of the state's water resources by encouraging responsible disposal of unused medication. Specifically, IDEQ has supported multiple outreach projects such as pharmaceutical take-back programs to support the message of not disposing drugs into sewers. n109

#### 4. State Efforts Regarding Reuse in Idaho

In March 2011, Idaho enacted a number of significant revisions to its water reuse rule in response to comments from stakeholders that the previous nomenclature and requirements may have been too strict. The revisions were intended for clarification purposes rather than scientific reasons, and are aimed at facilitating a more efficient implementation of the rule. They are also aimed at reducing the economic burdens on the regulated community and helping the [\*478] public better understand recycled water requirements. n110 Some of the key changes include:

- . Changing the name of the rule from "Rules for the Reclamation and Reuse of Municipal and Industrial Wastewater Rules" to "Recycled Water Rules."
- . Replacing the previously-used term "reclaimed wastewater" with "recycled water."
- . The addition of language to allow for the continuation of expiring reuse permits under certain conditions.
- . Changing the duration of a reuse permit for a fixed term of not more than ten (10) years.
- . Revisions to clarify language, reduce redundancy with other rules, and increase efficiency.
- . The addition of language to establish the mechanism for a reuse permit transfer and for temporary cessation or closure of operations. n111

IDEQ developed the revisions based on discussions and concerns raised during the rulemaking process. Specifically, it published a notice in April 2010 and made the draft rule available for public review. The public participated in the rulemaking process by attending three public meetings and submitting written comments, which IDEQ considered. n112

To encourage reuse, IDEQ hosts an annual water reuse conference to bring together representatives from cities, counties, states, and federal agencies, as well as consultants, developers, industry experts, operators, and other professionals to network and discuss key issues related to water reuse in Idaho and the West. Idaho has held this conference for the last seven years, and over 200 people attended the conference in 2010 and 2011. n113 Of note, the agency has created an extensive reuse guidance document intended to be a dynamic information source that evolves as new technology becomes available or expands as additional issues of concern are researched and developed. n114 A reuse guidance committee comprised of IDEQ and stakeholders drives the process that was established to provide input on system requirements

## F. Kansas

Over 140 communities and facilities in Kansas are authorized to reuse treated wastewater for applications such as irrigating turf on golf courses and parks. n115 Utilizing wastewater for irrigation in the western half of the state is also fairly common. Nevertheless, the state reports that reuse has not had a "very high profile." n116

### 1. Reuse Laws and Regulations in Kansas

Kansas' laws and regulations do not contain definitions for water reuse or a synonymous term. However, the state's water laws do recognize water reuse/reclamation as beneficial uses of water. For instance, the Kansas Water Appropriation Act ("KWAA") states that "all water" n117 is dedicated to the use of the people and that the Chief Engineer shall not approve any application submitted for the proposed use of fresh water "in any case where other waters are available for such proposed use and the use thereof is technologically and economically feasible." n118 Its regulatory definition for "waste of water" also includes the diversion or withdrawal of water that is not "used or reapplied to a beneficial use." n119

The Kansas Department of Health and Environment's ("KDHE") Bureau of Water regulates the public health concern aspects of reuse in Kansas, while the Division of Water Resources within the Kansas Department of Agriculture regulates the water use aspects. KDHE's programs are related to public water supplies, wastewater treatment systems, the treatment and disposal of sewage, and nonpoint sources of pollution. In addition, KDHE's minimum standards for the design of water pollution control facilities include guidelines for agricultural application of wastewater and sludge. n120

Certain NPDES permits have special conditions governing the use of effluent for irrigation, as well as monitoring requirements. For example, the City of Colby has a permit that authorizes it to use treated wastewater to irrigate baseball diamonds and soccer fields but prohibits it from using the water for [\*480] irrigation of crops produced for direct human consumption. Among other things, the city must also post signs around the fields indicating that reclaimed wastewater is used to irrigate the grass. The permit also requires Colby to monitor and test treated wastewater for any calendar month during which landscape irrigation is used and to submit monitoring reports on or before the twenty-eighth of the following month. n121

Of note, Kansas' rules and regulations require that the extent of consumptive use by a water right may not be increased significantly after the perfection period has expired. Municipal use is generally presumed to be fully consumptive, and quantification of consumptive use is typically only made upon filing an application to change the point of diversion, place of use, or use made of water. When a municipality releases water back into the system through wastewater effluent discharges, that water becomes available for appropriation. If impairment of an existing downstream right occurs, determination of who has the right to use water follows the prior appropriation doctrine rather than ascertaining whether upstream cities have increased their consumptive use and consequently reduced return flows. Kansas further reports that it would not knowingly approve a new application that would be primarily dependent upon "return flows" from another source or user unless conditioned upon availability of the return flows. n122

### 2. Reuse Funding in Kansas

Water reuse projects in Kansas are funded "locally, if at all." n123 The state does not provide financial assistance in the form of grants or loans, but did note that federal grants for wastewater reuse from concentrated animal feeding operations ("CAFOs") and other types of reuse "may be helpful incentives." n124

### 3. Issues Affecting Reuse in Kansas

Reuse's "low profile" in Kansas means that the state's legal and regulatory framework remains relatively untested. However, if Clean Water Act ("CWA") requirements become more stringent, reuse may present a lower cost option than treatment upgrade. n125 Such a scenario could test the state's framework and reveal additional factors that encourage or discourage reuse.

Kansas' water plan does include a "high priority issue" focused on the role of reuse in water conservation in the Lower Arkansas River Basin, where a total [\*481] of eleven communities and commercial facilities are authorized to reuse treated wastewater. n126 The plan notes that renewable fuel production is a growing industry in the Basin and may present opportunities for industrial reuse. n127 Irrigation also accounts for nearly 75% of all reported water pumped or diverted in the Basin and the plan suggests that reusing water for irrigation and agricultural land "could have

a significant impact on water use in this region." n128 Other opportunities include using reused water to irrigate recreational facilities such as parks and golf courses and recharging aquifers. n129

On the other hand, the plan identifies a number of potential obstacles. First, protection of human health is "the primary concern" when developing and implementing a wastewater reuse program. n130 KDHE has identified a number of standard management practices for the reuse of treated domestic wastewater for instances in which the wastewater will be applied to public areas such as golf courses or parks. n131 Examples of protective practices include an increased degree of disinfection, only applying treated wastewater when public access is restricted, and posting signs warning against swimming in or drinking ponded wastewater. n132

Second, the plan reports that the public's perception of utilizing reclaimed water to augment potable water sources, even in an indirect manner, has prevented implementation of some projects. For example, in its survey response, Kansas noted that a proposal in Wichita to blend and treat effluent from its landfill as a raw supply source was scuttled due to public outcry over perceived health concerns. Given this type of public perception, the plan recommends, "Community involvement and public education is an important component in developing large scale wastewater reuse projects in the basin." n133

Third, the plan acknowledges that water reuse and the associated change in water returned to the natural system may impact instream habitat. The Lower Arkansas Basin is home to numerous threatened and endangered species, including six fish. The plan states, "consideration of the potential impacts to instream habitat and species viability is needed to ensure that water conservation measures do not negatively impact instream use." n134

[\*482] Fourth, salt accumulation may also be a factor when evaluating the potential for reuse, especially on golf courses and in agricultural irrigation. According to the plan, water softening and other activities can add substantial amounts of sodium chloride to the wastewater, and typical wastewater treatment processes often do not remove or manage inorganic salts. Thus, "facilities choosing to irrigate with treated wastewater may need to alter plant species selections or use other methods to address total dissolved solids, sodium and salinity in effluent." n135

Lastly, the plan notes that the use and disposal of pharmaceuticals and personal care products in sewer systems and surface water is an "emerging concern" for wastewater treatment. Plants are designed to remove conventional pollutants like suspended solids and biodegradable compounds but are not designed to remove low concentrations of synthetic pollutants, such as pharmaceuticals. Depending on the purpose and application, the plan advises that the affect and mitigation of these contaminants should be considered. n136

#### 4. State Efforts Regarding Reuse in Kansas

Kansas does not have a formal program to promote reuse. However, the "high priority issue" in its state water plan for the Lower Arkansas River Basin notes:

The State of Kansas should identify strategies for implementation of an institutional and regulatory framework to better utilize reclaimed water as a valuable water resource that should be used efficiently and effectively. n137

With respect to the Lower Arkansas River Basin, the plan states that the Basin's population is expected to grow by more than 38% by the year 2040, and that water reuse may "provide an alternative supply while conserving current and future supplies to better serve the projected demands. n138 It also makes the following recommendations regarding possible state actions to encourage water reuse in the Basin:

- . Provide public education on water reuse in irrigation, industry, municipal and domestic uses, and encourage communities to build in reuse as part of their plans to meet future demand.
- . Where appropriate, establish the promotion and encouragement of water conservation and reuse as formal basin-specific objectives.
- . Facilitate storage of seasonal reclaimed water from streamflow [\*483] (including aquifer storage and recovery).
- . Facilitate interagency coordination to ensure water reuse activities and permits remain in compliance with Kansas Water Appropriation rules and regulations and stream habitat issues are discussed.
- . KDHE should evaluate the potential impact of water reuse of downstream users and stream habitat.

. Encourage the use of reclaimed water in lieu of other water sources in the agricultural irrigation, landscape irrigation, industrial/commercial/institutional and indoor water use sectors.

. Link reuse to regional water supply planning including integrated water resources planning. n139

## G. Montana

### 1. Reuse Laws and Regulations in Montana

Montana requires a water right permit for any water put to a beneficial use, such as domestic, irrigation, stock, industry, or other uses. The state does not recognize water reuse as a beneficial use per se. Instead, whether a certain use of water is a "beneficial use" is determined by the actual use rather than the source from which the water comes. n140

Montana's Water Rights Bureau within the state's Department of Natural Resources and Conservation issues water rights permits, while the Department of Environmental Quality ("MDEQ") regulates the use of wastewater through the Montana Public Water Supplies, Distribution and Treatment Act and the Montana Water Quality Act. n141 All point sources of wastewater discharge must obtain and comply with Montana Pollutant Discharge Elimination System permits, which are designed to protect the receiving water quality at the point of discharge. n142

MDEQ has adopted a circular that contains design standards for public sewage treatment facilities, which includes an appendix that sets forth standards to be used for the design and review of projects involving spray irrigation of sewage effluent from a public sewage treatment facility. Among other things, it includes different requirements for: (1) spray irrigation of food crops; (2) fodder, fiber, and seed crops; (3) landscape irrigation for golf courses, [\*484] cemeteries, freeway landscapes, and other areas where the public has similar access; and (4) landscape irrigation for parks, playgrounds, school yards, unrestricted golf courses, and other areas with similar public access. n143 The criteria also require the spray irrigation site to be at least 100 feet away from any water supply well. n144

Of note, in March 2011, the Montana Legislature passed H.B. 52, which amended *Section 75-6-103 of the Montana Code* to require the Montana Board of Environmental Review to regulate reclaimed wastewater from public sewage systems, and authorizes the adoption of treatment standards and monitoring, record keeping, and reporting requirements. n145 It also amends section 75-6-102 to define "reclaimed wastewater" as "wastewater that is treated by a public sewage system for reuse for private, public, or commercial purposes." n146 The bill became effective on October 1, 2011. n147

### 2. Issues Affecting Reuse in Montana

In Montana, the water rights aspects of water reuse figure prominently. Any reuse of water must be permitted so that senior water users depending on a water source will not be adversely affected. The state's Water Rights Bureau has also opined that water reuse should only be promoted if there will not adversely affect senior water users. n148

### 3. State Efforts Regarding Reuse in Montana

MDEQ requested and supported HB 52 as a means of promoting reuse and as an alternative to discharge when appropriate. MDEQ regards wastewater reuse as a means of helping to improve impaired waterways when no detrimental impact on senior water rights or the environment would result. MDEQ is presently preparing updated design standards and administrative rules [\*485] to implement HB 52 and further address reuse alternatives. n149

The Water Rights Bureau noted that it neither encourages nor inhibits water reuse. Instead, its primary focus is on the impairment to senior water rights. If an applicant can show water is available for reuse, it will issue a water right permit. n150

## H. Nebraska

Reuse is becoming more popular in Nebraska as surface water quality criteria become more stringent. The state reports that this "allows our small towns to have an alternative to surface water discharge and have the added benefit of beneficial reuse." n151

### 1. Reuse Laws and Regulations in Nebraska



Nebraska recognizes reuse as a beneficial use but its statutes and regulations do not have a specific term for the practice. The Nebraska Department of Environmental Quality (NDEQ) regulates reuse pursuant to its NPDES program under the federal CWA. Chapter 12 of NDEQ's "Title 119 - Rules and Regulations Pertaining to the Issuance of Permits under the National Pollutant Discharge System" provides two procedures designed to permit and authorize the land application of effluent and/or single pass noncontact cooling water and/or biosolids. n152

The first of these procedures is "authorization by rule," which allows land application of effluent and/or single pass noncontact cooling water and/or biosolids pursuant to an NPDES permit, provided the activity observes all of the requirements, conditions, limitations, and prohibitions contained in Chapter 12 or any other relevant regulations contained in Title 119. All of these facilities likely have lagoon structures that are inspected approximately every five years. At that time, all records are reviewed to determine compliance. n153

The second procedure pertains to "site-specific land application authorization." If a land application site and/or the land application material cannot satisfy the necessary requirement, contained in Chapter 12 and Title 119, the applicant may submit an application for a site specific land application permit and/or site specific language to be placed in an NPDES permit for an individual wastewater treatment facility. NDEQ determines whether to approve [\*486] the permit on a case-by-case basis. n154 These facilities are also inspected every five years for minor operators and every year for major operators. Permitted facilities are required to send their compliance information to NDEQ on a quarterly basis. n155

## 2. Reuse Funding in Nebraska

Municipal treatment plant effluent reuse is encouraged and funded in Nebraska in the same manner as other municipal wastewater treatment facilities, meaning through state revolving funds ("SRF") funds, the U.S. Department of Agriculture ("USDA"), or private funds. Occasionally, grants from Section 319 of the CWA and/or the Drinking Water SRF Source Water Protection set-aside grants are also available. n156

## 3. Issues Affecting Reuse in Nebraska

Nebraska does not report any political, regulatory, financial, or other factors that inhibit water reuse. It also notes that it receives "very few" complaints from the public regarding reuse activities. n157

However, the state does report that the activity of reuse through the NPDES program may come into conflict with other regulatory agencies such as the Nebraska Game and Parks Commission, Fish and Wildlife Service, or one of the state's Natural Resources Districts. Primarily, this conflict comes into play in areas where consumptive use is restricted either due to threatened and endangered species or ground/surface water protection from depletion. The agencies generally resolve these conflicts through consultation. n158

As for emerging contaminants, Nebraska states: "We currently don't address them and probably will not until they become part of our surface water standards." n159

## 4. State Efforts Regarding Reuse in Nebraska

Nebraska reports that it does not have a state-sponsored program to encourage reuse. Nevertheless, water reuse is "becoming much more popular" as more stringent surface water quality criteria have provided smaller towns with an alternative to surface water discharge. n160

To encourage reuse, Title 119 strives to make the permitting process "less [\*487] onerous." As mentioned previously, under the "land application by rule approach," Title 119 sets forth an expedited process that allows entities with NPDES permits to use reused wastewater for irrigation without obtaining a site-specific permit, provided the activity meets specified requirements. n161

## I. Nevada

Nevada notes that it has generally seen an increased interest in the reuse of treated effluent. Local agencies have appropriated effluent for golf course and crop irrigation, while several cities use treated effluent for irrigation, dust control, and industrial cooling purposes. n162 The state currently reports over 80 reuse projects.

### 1. Reuse Laws and Regulations in Nevada

Nevada has no "formal" water reuse programs, has no specifically defined term for reuse, and does not recognize reuse as a beneficial use or purpose. n163 Nevertheless, the Nevada Administrative Code ("NAC") does contain a legislative declaration that promotes the use of effluent "where that use is not contrary to the public health, safety or welfare, and where that use does not interfere with federal obligations to deliver water of the Colorado River." n164 The state has also defined the term "treated effluent," adopted regulations that establish various "approved uses" for five "reuse categories," and issued guidance documents for the reuse of treated effluent. n165 The guidance documents use the term "reclaimed water," which means "domestic wastewater that has been treated to secondary treatment standards and disinfected to levels necessary ... for the chosen method of reuse." n166

[\*488] These regulations also state that the Nevada Division of Environmental Protection within the Department of Conservation and Natural Resources must issue a permit for the use of treated effluent. As part of the permitting process, permittees must submit for review and approval an effluent management plan. State regulations also recognize five reuse categories for "approved uses" of treated effluent, each of which contains different requirements for bacteriological quality. n167

Nevada monitors the reuse of treated effluent through quarterly reporting and periodic site inspections, among other things. The frequency and scope of the monitoring varies. However, in many cases there is monthly monitoring with quarterly reporting requirements. n168

## 2. Reuse Funding in Nevada

Reuse activities in Nevada are funded locally. The state does provide financial assistance in the form of grants or loans for the reuse of treated effluent. n169 The state further reports that it is not currently considering financial or other incentives to promote reuse at the state level. n170

## 3. Issues Affecting Reuse in Nevada

Important considerations affecting reuse in Nevada include: (1) whether there is public acceptance; (2) local government support; (3) the potential impacts to waters and the environment; (4) the availability of water; (5) the cost of fresh water; (6) the quality and treatability of wastewater; (7) the cost of additional wastewater treatment; (8) the risks to public health; and (9) how to address and protect unregulated pollutants and emerging contaminants such as endocrine disruptors, pharmaceuticals, and personal care products. Nevada maintains that these considerations have both encouraged and hindered reuse. n171

## 4. State Efforts Regarding Reuse in Nevada

Nevada does not have a formal reuse program. Moreover, it opines that its legal and regulatory framework neither inhibits nor encourages reuse. Instead, the Division sees its role as regulating the discharge of pollution through proper regulation and permitting. n172

The state is also considering the development of Indirect Potable Reuse [\*489] ("IPR") guidance and regulatory changes. As part of this consideration, the Division is looking at outside assistance to develop a document on the state of the knowledge for IPR that is based on the conditions and experiences specific to Nevada. The document would hope to summarize: (1) an identification of what has been done in the state, including categories of reuse and associated regulatory requirements; (2) the hydrogeologic characterization for Nevada and the benefits/constraints to IPR; (3) the existing or potential contaminants of concern and their health impacts; (4) any studies on fate and transport; (5) treatment technology availability/suitability and/or management approach; and (6) public perceptions and outreach. n173

## J. New Mexico

Water reuse is relatively common in New Mexico, and the majority of the state's large-and medium-sized municipalities are practicing some form of reuse. The number of municipalities seeking to perform reuse or increase their reuse is also growing steadily. n174

### 1. Reuse Laws and Regulations in New Mexico

Although reuse is recognized as a beneficial use, it is not well defined by statute or regulation. Nevertheless, "reclaimed water" is the nomenclature used in the groundwater discharge permits that govern the environmental and public health protection aspects of reuse in New Mexico. n175 However, this wording does not appear in the relevant statutes

and regulations. n176 Further, New Mexico states that its Water Quality Act ("WQA") does encourage the beneficial reuse of water but does not set forth specific requirements. n177

For the most part, New Mexico regulates reclaimed water use through [\*490] groundwater discharge permits issued pursuant to its Water Quality Control Commission ("WQCC") regulations, which the New Mexico Environment Department ("NMED") provides. n178 To obtain a permit, applications must be submitted to NMED and go through a process that includes public notice to adjacent property owners and general publication. Once NMED has prepared a draft permit, it will provide notice of the draft availability and a 30-day comment period will commence. If NMED does not receive adverse comments or hearing requests, it will issue a permit. n179 NMED considers all comments and grants hearings based upon "significant public interest." New Mexico reports that the current permit process takes approximately six months to one year for uncontested permits and significantly longer for permits in which a hearing is held. n180

Within NMED, the Ground Water Quality Bureau, n181 Liquid Waste Program, n182 and Drinking Water Bureau n183 each regulate a different water quality aspect of reuse. The New Mexico Construction Industries Division within the state's Regulation and Licensing Department regulates the design and construction of reclaimed water supply systems and back-flow prevention as it relates to public health, sanitation, and cross connection control. The New Mexico Office of the State Engineer and Interstate Stream Commission regulate the water quantity aspects of reuse.

New Mexico generally regulates agricultural and industrial wastewater sources generated from dairy, mining, and energy production activities with discharge permits issued pursuant to its WQCC regulations. However, the state typically considers these discharges to be "waste disposal" as opposed to reuse. [\*491] Consequently, permit conditions for these activities are different than for domestic wastewater reuse. n184

Public and private water reuse permittees monitor their reuse activities in accordance with the specific conditions of their permits, which differ for large and small municipal systems that practice high contact irrigation reuse. NMED has authority to collect compliance samples at facilities, but does so infrequently. However, NMED does conduct site inspections and reports that it inspects approximately 50% of permitted reuse facilities and sites each year. n185

## 2. Reuse Funding in New Mexico

In New Mexico, reuse projects are generally funded through SRF funding, USDA grant/loan funds, Community Development Block Grants, state legislative appropriations, EPA funding, and private funding sources. n186

## 3. Issues Affecting Reuse in New Mexico

New Mexico reports that increased funding for reuse projects would likely have the most profound effect in promoting reuse. It also noted that some regulatory changes could encourage reuse. For example, New Mexico's current regulatory framework combines reuse projects with all other discharges for groundwater permitting. The framework's public notice process was conceived as a means of including the participation of individuals that could be adversely affected by "disposal" of wastes and envisions relatively rural settings. However, for large municipal entities seeking to permit relatively benign (but widespread) above ground irrigation reuse projects, the public notice process can be very burdensome. Thus, the state opines that changes to the public notice process for reuse dischargers could reduce the permitting burden, and could be done in a manner that ensures that public participation in the permitting process is preserved or even enhanced. n187

The state's Ground Water Storage and Recovery Act (enacted in 1999) allows governmental and quasi-governmental entities to create a bank of water than can be utilized under a permitting system that is outside of a specific water right. n188 This legislation creates a water rights permitting approach to Aquifer Storage and Recovery ("ASR"). The overall ramifications for water rights holders [\*492] are not yet clear, but New Mexico is poised to enact ASR as a water management strategy. The requirements for the treatment, quality, and monitoring of reclaimed wastewater used in ASR projects have not been completely determined. As a result, NMED is addressing these issues on a case-by-case basis for the current ASR projects under development. n189

NMED has encountered difficulty in permitting water reuse projects for the state's largest cities, such as Albuquerque, in part because of WQCC regulation's public notice issues noted above, and in part because of the need to issue multiple permits to each individual entity using reclaimed water (end users). In response, NMED has altered its permit approach for the largest municipalities when specific treatment techniques are employed and very high water quality can be achieved. This new approach involves issuing a permit only to the treatment facility, not to each of the end users.

This allows flexibility in adding new locations to the reuse system and in providing reclaimed water to private properties, although NMED prohibits the municipalities from providing reclaimed water directly to individual residences in this approach. City ordinances control many of the aspects that a standard permit would otherwise address, such as signage and irrigation management. NMED has issued a permit to Albuquerque under these conditions. It is expected that over time, this could become the preferred path for permitting large municipal reclaimed water systems. n190

A regulatory gap may exist for projects that intend to utilize reclaimed domestic wastewater for a direct potable water source. NMED's Drinking Water Bureau regulates potable treatment and distribution systems, and their regulations partially extend to source waters. However, where direct reuse for potable supply is implemented, it is possible that no agency will have authority over the wastewater treatment and reclamation systems because the treated water does not discharge to the environment. The other challenge with these projects is that the state and federal drinking water regulations did not envision reclaimed wastewater as a source water and therefore do not take into account threats posed by failure of the reclamation system. n191

Unplanned surface water augmentation has been ongoing in New Mexico for many years through surface water discharges governed by NPDES permits. However, these situations typically occur with significant dilution and environmental barriers prior to potable water intake structures. Projects that utilize reclaimed wastewater as a major input into surface water reservoirs (Surface Water Augmentation) are being considered in New Mexico. In these situations, NPDES permits will be required for the discharge to the reservoir and the state's Drinking Water Bureau will regulate the drinking water treatment and distribution systems. However, at times, the vast majority of the reservoir's [\*493] contents could be reclaimed wastewater and these systems could approach direct potable reuse. This will eliminate the dilution and environmental barrier common to unplanned surface water augmentation, potentially increasing the risk to water supplies. It is unclear whether additional monitoring or controls will be added or required through regulatory means. n192

New Mexico further indicates that a system that rewards entities for offsetting potable water demand by implementing reuse would be beneficial. Currently, reuse is often viewed as a "new" source of water that allows expansion of water use, sometimes beyond sustainability. A financial incentive that encourages the use of reused water to offset potable demand would maximize the benefit of reuse. However, it is not clear how best to implement such an incentive. n193

As for emerging contaminants, New Mexico's regulatory agencies are largely awaiting studies on whether micro-constituents represent a threat to public health or the environment, as well as EPA guidance on this subject. n194

#### 4. State Efforts Regarding Reuse in New Mexico

New Mexico does not have an overarching program aimed at promoting reuse and its state water plan does not directly address reuse. Nevertheless, NMED routinely highlights the benefits of reuse and promotes reuse projects. It also attempts to instruct the public on the rationale for reuse and a reasonable reuse standard aimed at ensuring public safety through public meetings, hearings, presentations, and other outlets. n195 In addition, NMED has participated in the New Mexico Water Reuse Committee, which is affiliated with the Rocky Mountain Section of the Water Environment Federation. n196

##### K. North Dakota

North Dakota has seen an increase in requests to reuse wastewater due to limited quantities of water available in select regions of the state. n197

##### 1. Reuse Laws and Regulations in North Dakota

North Dakota does not define water reuse, nor does it have specific [\*494] statutes or regulations dedicated to reuse. The state does recognize reuse as a beneficial use on a case-by-case basis. The North Dakota Department of Health ("NDDH") is the state agency with jurisdiction over reuse and regulates the activity through its wastewater treatment program. NDDH has also issued guidelines for using treated domestic wastewater from municipal domestic sewage treatment plants to irrigate public property such as parks and golf courses, as well as construction purposes such as soil compaction, dust suppression and washing aggregate. n198

North Dakota does not currently regulate organic contaminants in reused water.

##### 2. Reuse Funding in North Dakota

North Dakota has "no real funding avenues" for water reuse projects but notes that projects may be eligible for SRF funding. n199

### 3. Institutional Issues Affecting Reuse in North Dakota

North Dakota identified "water quality concerns" as its most important issue regarding water reuse and notes that using wastewater for irrigation practices is dependent on localized conditions, such as weather. n200

### 4. State Efforts Regarding Reuse in North Dakota

NDDH does not have a formal program to promote water reuse. However, the State Engineer encourages water reuse as an alternative in areas that are water short. NDDH also promotes reuse on an informal, case-by-case basis by making itself available to the public to address concerns. In particular, the state notes: "When we get a request, there are concerns from the public, but if you get the information out on the project, most concerns are addressed." n201

## L. Oklahoma

Reuse is uncommon in Oklahoma. However, a 2008 survey issued to municipal and rural water suppliers as part of its comprehensive water plan does shed some light on the extent of reuse in the state. Of the 561 survey respondents, twenty-four providers indicated that they currently reuse treated wastewater and 411 indicated that they do not reuse treated wastewater. Thirteen providers also indicated that they plan to increase or initiate water [\*495] reuse. Eleven of the largest forty-six responding providers (those serving more than 10,000 people) indicated that they reuse treated water, and eight of the forty-six largest providers reported that they plan to initiate or increase water reuse. In 2007, responding providers reported annual total reuse of approximately three billion gallons. n202

### 1. Reuse Laws and Regulations in Oklahoma

Oklahoma does not have a water reuse program nor does it define "reuse." Its laws and regulations are not specific to reuse and do not make a distinction between ambient waters and reused waters. In particular, the state notes: "As all waters are considered 'waters of the state,' and by default 'waters of the nation,' there is no distinction between waters from a pipe and waters from rain." As a result, its legal and regulatory framework is essentially "blind" to reuse and does not necessarily inhibit or encourage the practice. n203

Nevertheless, Oklahoma does allow land application of municipal and industrial wastewater for the purpose of beneficial use (e.g., crop irrigation). The Oklahoma Department of Environmental Quality permits these activities pursuant to the Oklahoma Discharge Elimination System ("OPDES"). The permitting process is slightly different for municipal and industrial wastewaters, but the state limits both to applications for agronomic rates. n204

Some industrial facilities also use wastewater for dust suppression, in which case there can be no runoff from the suppressed areas. The state further reports that a power plant in southwest Oklahoma purchases treated sanitary wastewater from the town of Lawton. The plant uses the wastewater for cooling purposes, which is then returned to a lake that discharges into a nearby stream. Oklahoma regulates the activity under the OPDES program and the discharges are not treated any differently from other discharges. n205

Oklahoma does not conduct specific monitoring relative to reused waters and the Oklahoma Water Resources Board ("OWRB") and Office of the Secretary of the Environment also have regulatory responsibilities related to reuse. n206

### 2. Reuse Funding in Oklahoma

Oklahoma reports that there are no unique funding incentives for water reuse. It also does not provide financial assistance for reuse projects through [\*496] grants and loans. n207

### 3. Institutional Issues Affecting Reuse in Oklahoma

Oklahoma identified cumulative water quality impacts and CWA compliance as having the largest impact on reuse. It specifically noted that the CWA is "unforgiving" regarding the release of waters not meeting the state's water quality standards. n208 For instance, Oklahoma reports that one municipality had investigated the possibility of using its municipal wastewater to fill water hazards on a golf course from which it would subsequently irrigate the greens. Ulti-

mately, this did not occur because of the water quality requirements associated with this discharge. Increased "flexibility" in the application of NPDES permits to discharges into states waters would also be helpful, provided such water is beneficially reused and "any discharge to a water of the nation [meets] CWA requirements." n209

#### 4. State Efforts Regarding Reuse in Oklahoma

Water reuse is a specific item that Oklahoma is discussing in its state water plan. n210

##### N. Oregon

Interest in recycled water use continues to develop in Oregon. As of 2009, Oregon had permitted more than 120 recycled water use projects, and the Oregon Association of Clean Water Agencies has identified recycled water use as a top priority for its members. Revised administrative rules adopted in 2008 have also led to a number of proposed reuse projects, including seven new recycled water projects and ten requests for upgrades to recycled water systems or irrigation improvements.

#### 1. Reuse Laws and Regulations in Oregon

Oregon's regulations specifically set forth a policy "to encourage the use of recycled water for domestic, agricultural, industrial, recreational, and other beneficial purposes in a manner which protects public health and the environment of the state." n211 The Oregon Department of Environmental Quality [\*497] ("ODEQ") also operates a statewide program that encourages and regulates various types of reuse, including "recycled water" and "industrial wastewater." n212

##### a. Recycled Water

"Recycled" water refers to treated effluent generated from a municipal wastewater treatment system that, as a result of treatment, is suitable for a direct "beneficial purpose." n213 Oregon uses the term "reclaimed water" to refer to water that has been used for municipal purposes, has been treated in a sewage treatment system, and is suitable for a direct beneficial purpose or a controlled use that could not otherwise occur. n214 These two terms are nearly synonymous and "recycled water" includes "reclaimed water."

Oregon requires municipal wastewater treatment plants to obtain a water quality permit from ODEQ in order to reuse water. This includes the development of a comprehensive recycled water use plan that details site and facility specific requirements. The Environmental Public Health section of the Oregon Health Authority also reviews proposals to reuse less treated recycled waters (Classes C and D) to address protection of public health. ODEQ's reuse regulations define end uses and water quality standards for those uses. n215

Oregon allows effluent to be put to beneficial uses through a registration process without the need to acquire a new water right. There are no fees or formal approval associated with this process. n216 Oregon case law also holds that a water right holder may recapture wastewater that remains on his or her land, and re-apply that water to the original beneficial use in the location authorized under the water right without any additional authorizations. Oregon courts have further ruled that organizations such as irrigation districts or municipalities may capture waste or seepage water before it enters a natural waterway and before it leaves the boundaries of the district. This allows municipalities to capture water that has been delivered, such as treated effluent, industrial wastewater, or [\*498] irrigation runoff, and reuse it within the authorized area. n217

Within this framework, a person intending to use recycled water must file a reclaimed water registration with OWRD. OWRD does not conduct a public interest review for reclaimed water registration, but reclaimed water registration may be subject to a notice requirement. OWRD will also notify persons with water rights that may be affected by reuse of the wastewater effluent under certain circumstances. n218 Affected water right holders will have the preference to use the reclaimed water if they show that the cessation of municipal discharges impairs their ability to obtain water under their water right.

Recycled water use plans specify site monitoring requirements and individual facilities monitor water quality at a frequency required by rule or permit. n219 Monitoring is also done in accordance with a wastewater treatment system owner's NPDES or Water Pollution Control Facilities ("WPCF") permit. Monitoring and oversight of individual recycled water use programs by ODEQ occur during routine compliance inspections.

Of further note, Oregon recognizes the existence of organic contaminants in recycled water, but has not adopted any specific policies or regulations pertaining to them. ODEQ may include additional permit limits or conditions, or

both, if it determines or has reason to believe additional requirements for the use of recycled water are necessary to protect public health or the environment or both. n220

#### b. Industrial Water

"Industrial wastewater" refers to treated effluent from an industrial process, manufacturing or business, or from the development or recovery of any natural resource. Agriculturally-processed water derived from the processing of [\*499] fruit, vegetables, or other food products, is an example of this type of water. n221

Oregon allows water from industrial and agricultural sources to be reused for irrigation purposes and requires a general or individual permit issued by ODEQ or Oregon Department of Agriculture ("ODA"). n222 State guidance describes general reuse requirements for industrial sources, n223 while water quality permits, regulation, and federal regulation set forth the requirements for CAFOs. n224 All industrial reuse and CAFO permits require the development of a water management plan that accounts for hydraulic and nutrient loading, and must be approved by the agency with program authority.

### 2. Reuse Funding in Oregon

The Clean Water SRF loan program provides low-cost loans for the planning, design, or construction of various water pollution control activities in Oregon. ODEQ administers the program and any public agency in Oregon is eligible for a loan. Eligible agencies include cities, counties, sanitary districts, soil and water conservation districts, irrigation districts, and various special districts. n225

Oregon's Infrastructure Finance Authority helps communities develop infrastructure, public facilities, and address utility and economic development infrastructure needs through the following programs:

- . "Community Development Block Grants" are available to non-entitlement cities and counties for a variety of community facilities and public works projects.

- . "Special Public Works Funds," provide funding for construction and/or improvement of infrastructure needed to support industrial, manufacturing, and certain types of commercial development.

- [\*500] . "Water/Wastewater Financing" for the construction and/or improvement of water and wastewater systems to meet state and federal standards. n226

Additionally, the Oregon Legislature passed Senate Bill 1069 in 2008, directing OWRD to provide grants for studying the feasibility of water conservation, reuse and storage projects, including the analyses of long-term environmental consequences. n227

### 3. Issues Affecting Reuse in Oregon

#### a. General Issues Affecting Reuse

The major reuse issues affecting reuse in Oregon are: (1) water conservation and water rights; (2) water quality and the environment; and (3) public health. From a water rights perspective, a potential barrier to municipal water reuse may exist if a municipality intends to reuse effluent that would otherwise be discharged into a natural waterway. Specifically, the municipality may be prohibited from reusing the effluent if downstream water right holders can demonstrate that discontinuation of the discharge will impair their ability to obtain water under their water rights. This determination will depend upon the number of years the municipality has discharged the effluent, as well as the percentage of water the discharge has historically contributed to the live flow of the waterway. n228

From a water quality and environmental perspective, Oregon does not allow recycled water used for irrigation purposes to result in adverse effects to groundwater or surface water or reduce the productivity of the land application site. Primary concerns focus on ensuring that water application rates meet crop needs and do not exceed the capacity of the site, which could result in surface runoff or subsurface leaching into groundwater. Recycled water quality (i.e., chemical characteristics) may also require special consideration when irrigation occurs in a state-designated groundwater management area, on marginal soils, or is used for artificial groundwater recharge. The state reviews these issues on a case-by-case basis under these circumstances. n229

Public health issues with recycled water use primarily focus on exposure to pathogens, and include the generation of aerosols as well as maintaining water quality to minimize pathogen regrowth in storage and distribution systems.

Treatment standards, recycled water monitoring, irrigation buffers, and site access restrictions are among some of the controls used to protect public health. Additional conditions to ensure the protection of public health, such as [\*501] maintaining a chlorine residual or site-specific irrigation controls, are considered on a case-by-case basis. n230

b. Water Reuse Urban Task Force and Barriers to Reuse

In 2003, the Oregon Legislature passed Senate Bill 820, requiring ODEQ to work with interested parties to develop a report on the opportunities and barriers associated with wastewater reuse in urban areas. In response, ODEQ convened a "Water Reuse Urban Task Force" composed of interested parties and stakeholders to identify opportunities and barriers. The Task Force released a report in 2004 that identified factors that encourage reuse, barriers, possible incentives, and recommendations. n231 Factors encouraging reuse included:

- . As surface water sources become fully appropriated, new water users must seek alternative supplies.
- . Population and economic growth exert demands on the state's fixed water supply.
- . Increased costs for producing and distributing drinking water.

The Task Force also identified three major categories of barriers to reuse. Under the first category, "agency rule interpretations," it found "a lack of coherent state policy" as an overarching barrier to water reuse. The Task Force noted that each agency had its own mandates, rules, and policies, and that there was "limited coordination" among agencies. Moreover, it found that applicants for reuse permits encountered varying interpretations of reuse regulations from within and among agencies. Without a consistent statewide water reuse policy, the report reasoned that state agencies did not have incentives to encourage reuse. n232

Second, the Task Force reviewed Oregon's reuse regulations, emphasizing the need for greater regulatory flexibility and questioning the need for water reuse plans when the highest level of water treatment standards is satisfied. It also discussed the possible need for a process to establish a level of treatment that will be acceptable for completely unrestricted non-potable uses. With respect to possible barriers, the report noted that the state's reuse regulations could be improved to better address more allowable end uses in urban and rural areas. n233

[\*502] Third, the Task Force identified economic impediments as a "large barrier" to water reuse, noting: "If a major source of reuse water is a centralized water treatment facility, the costs of piping to end users may be considerable." The report also found that widespread urban water reuse could have the paradoxical effect of increasing the costs to consumers of supplying potable water. In particular, potable water providers must maintain extensive delivery infrastructure such as pipes valves, pumps, and storage tanks. Decreases in demand for potable water that result from reuse will only generate a marginal reduction in the overall delivery cost for potable water, but "may well raise the per gallon cost for consumers simply to cover the fixed-cost infrastructure." n234

Fourth, the Task Force report found that there "remain substantial obstacles to broad public acceptance of water reuse." At the time of the report, Oregonians viewed water treated to a lower standard than drinking water with great suspicion. It noted that regulatory language such as "reclaimed wastewater" or "reclaimed sewage" served to reinforce this skepticism and that "understandable neutral language" could be helpful. n235

Based on these findings, the report made a number of recommendations, including: n236

- . Oregon should develop a "clear and coherent" state policy promoting water reuse done in a manner protective of human health and the environment. Such a policy could be in the form of an executive order from the Governor or appropriate action from the Legislature.
- . The State regulatory agencies should establish internal and external mechanisms to coordinate efforts to encourage water reuse.
- . Affected state agencies should collaborate to develop guidance that clearly describes how water reuse projects move through Oregon's regulatory and permitting process.
- . A manual of Best Management Practices for water reuse projects should be compiled as a tool for reuse project developers, municipalities, and others.
- . In developing new policies and reviewing existing regulations, water quality treatment standards should be developed in a way that more appropriately matches defined end uses which should be included in the standards.



. State agencies could remove stigmatizing language from regulations and utilize public education and outreach to explain the benefits of reuse.

[\*503] The report also identified a number of financial and regulatory incentives to help developers and communities consider reuse. Some of these included:

- . Tax credits and exemptions for projects that reuse water.
- . Expanding existing state loan programs, such as the SRF program to encourage municipalities to provide water for reuse.
- . Creating incentives through Oregon's statewide Land Use Planning program.
- . Working towards providing varying levels of water quality commensurate with the intended use, with the understanding that meeting drinking water standards is not always necessary for all water uses (e.g., using potable water to irrigate a golf course). n237

Of further note, a 2009 academic study on water reuse in Corvallis, Oregon, provided some insight into the factors that influence public acceptance of water reuse. Among other things, the study found that sustainability was the largest factor influencing acceptance and that other factors included trust in the city, prior knowledge of wastewater, gender (depending on use), and education. Ninety-three percent of respondents found Oregon State University scientists to be the most credible source of information concerning the use of treated wastewater. Other university scientists were second with 78%, followed by city reports of regular testing at 78%, the Oregon Department of Health at 77%, ODEQ at 75%, and EPA at 61%. The study also described the types of water reuse applications that the public saw as "very favorable" or "favorable," with 89% approving of utilizing recycled water to irrigate business park landscapes and 33% approving of the use of recycled water to irrigate edible crops. n238

#### 4. State Efforts Regarding Reuse in Oregon

In 2005, Governor Ted Kulongoski responded to the Task Force's request for a "clear and coherent" state policy promoting reuse by signing Executive Order 05-04, which stated:

[\*504]

The State of Oregon shall promote policies and programs to encourage and support water reuse, to work together to overcome institutional and regulatory barriers and funding constraints, to ensure protection of public health and environmental quality, to encourage public acceptance of water reuse, and to help this state meet overall water needs. n239

The Order also indicated that Oregon would strive to improve its policies and internal operations to encourage more reuse by:

- . Requiring the state agencies that participated in the Task Force to review agency policies and rules, as they are revised, and make appropriate revisions to remove potential regulatory barriers and to encourage water reuse.
- . Making ODEQ responsible for coordinating with other state agencies, businesses, non-profit organizations, local governments, and citizens to develop guidance describing the regulatory and permitting requirements for water reuse projects.
- . Ordering ODEQ, ODWR, and the Oregon Department of Human Services to coordinate outreach activities that encourage water reuse and to meet annually to determine whether agency procedures and permitting activities are consistent with the Order.
- . Ordering ODEQ and other relevant agencies to work together to resolve issues with other state agencies relative to reuse and to collaborate and allow pilot projects that are protective of public health and the environment. n240

The Oregon Legislature and ODEQ have also taken the following actions to address the issues cited in the 2004 Task Force report:

- . In 2006, ODEQ, ODA, ODWR, and other state agencies signed a memorandum of understanding (MOU) that set forth each agency's responsibilities pertaining to the approval of water reuse projects. The MOU also described other agency actions to promote water reuse. n241 Currently, the agency is preparing a recycled water use plan checklist and case studies portraying several types of recycled and industrial water reuse projects throughout the state. n242

[\*505] . In 2008, the Environmental Quality Commission's adopted revised Recycled Water Use rules that specifically identify over 30 beneficial purposes for which treated effluent from municipal wastewater treatment facilities may be used. In doing so, the Commission expressed a strong interest in continuing efforts by ODEQ to further encourage recycled water use. n243

. ODEQ has developed a number of reuse guidance documents for staff and the public. In particular, ODEQ developed guidance in 2009 to assist staff involved with the permitting of recycled water projects. n244

Additionally, the Oregon Legislative Assembly passed H.B. 3369 in 2009, directing OWRD to lead the development of a state-wide, integrated water resources strategy. An overarching goal of the strategy is to provide policy guidance and recommended actions to help Oregon meet its current and future water needs in terms of water quantity, water quality, and ecosystem functions. When completed, it is anticipated that the strategy will encourage the implementation of water reuse projects to help meet the state's water supply needs. n245

## O. South Dakota

South Dakota reports that a "handful" of municipalities and industries are land applying wastewater to irrigate crops and golf courses. Most CAFOs also use land applications of wastewater. Although reuse is not increasing significantly for municipalities and industries, the state has seen a substantial increase in the number of CAFOs over the last ten years. n246

### 1. Reuse Laws and Regulations in South Dakota

South Dakota does not have any laws or regulations concerning reuse and the state does not have any specific language relating to water reuse. Instead, its laws advocate that water be put to a beneficial use to serve the general welfare of the state and that the waste or unreasonable use of water be prevented. Nevertheless, a 1975 South Dakota Attorney General's Office opinion does provide some guidance regarding the reuse of municipal sewage effluent. [\*506] It reasoned that land application of wastewater by a municipality is valid under the original appropriation and does not require an additional permit to irrigate, provided that the water is used for municipal purposes and the use does not affect downstream prior appropriators. n247

The South Dakota Department of Environment and Natural Resources regulates the water quality aspects associated with municipal and domestic wastewater, industrial wastewater, and CAFOs. The Department's Surface Water Quality Program regulates the land application of treated municipal and domestic wastewater via NPDES permits (referred to as a "surface discharge" permit). n248 Industrial wastewater satisfies the statutory definition of solid waste and the Department regulates industrial wastewater through its Waste Management Program via solid waste permits. These permits are required for any land application, irrigation, or other reuse of industrial wastewater. As with surface water discharge permits, a solid waste permit will set conditions to ensure the protection of human health and the environment. South Dakota also uses a general permit to regulate CAFO reuse under the authorities of its Surface Water Discharge permitting program. n249

The state's discharge permits require the development of best management practices plans to ensure proper application of the wastewater. Depending on the type of wastewater, water quality and/or soil sampling is required to ensure that permit conditions are met. South Dakota also issues these permits for five years at a time and reviews and revises the permit conditions as needed. Permit parameters and the nature of the wastewater may result in requirements for facilities to report water quality and/or soils on a monthly or quarterly basis. n250

Of note, South Dakota does not regulate water reuse as an appropriation of water, which means that the allowable quantity of water is not specifically regulated. In addition, the state reports that there are industries that have begun reusing wastewater internally. For example, some ethanol plants and meat packing plants reuse cooling waters for plant clean-up or other uses. The [\*507] Department does not regulate this type of internal reuse. n251

### 2. Reuse Funding in South Dakota

Water reuse projects in South Dakota currently qualify for funding under state funding programs such as EPA's SRF programs. As long as they meet the applicable funding program eligibility requirements, water reuse projects can also compete for state financial assistance just like any other water or wastewater project. n252

South Dakota reports that the Department receives dedicated water funding revenues of about \$ 10 million annually. The state is also a minimum allocation state for EPA's SRF programs, which means that it receives 0.5% and 1.0% respectively of the Clean Water SRF and Drinking Water SRF Congressional appropriations. n253

### 3. Issues Affecting Reuse in South Dakota

The most important issue regarding reuse in South Dakota is the need for adequate storage. The state explains:

South Dakota recently experienced a drought cycle, during which time wastewater reuse served as an effective way to manage both low water levels for farmers and dispose of wastewater for the facilities. However, during wet years, many facilities have trouble with storage. Over the last two years, there has been an increase in precipitation and a decrease in temperatures, leading to higher water levels and less evaporation in storage ponds. At the same time, many farmers had less of a need to land apply treated wastewater. Therefore, during a time when water levels were increasing in the storage pond, the facilities had fewer options for land application and disposal of the wastewater. n254

Financial factors also drive water reuse. The state specifically noted, "If it costs less to dispose of wastewater than to treat it sufficiently and discharge directly into a water source, then the facility will consider land disposal." For CAFOs, the rising cost of fertilizer in recent years has also provided a financial incentive to reuse wastewater. n255

In most cases, South Dakota reports that permitting requirements in surface water discharge or solid waste permits do not inhibit the reuse of wastewater. Most operators understand the need for the requirements and the state strives to ensure that the requirements "make sense" and protect human health and the environment. However, there is one statutory solid waste permit [\*508] provision that requires legislative approval for large scale solid waste facilities that dispose or incinerate over 200,000 tons of solid waste per year. n256 This provision has likely inhibited some water reuse for industrial facilities and a small number of industrial facilities have proposed land application in excess of 200,000 tons per year, which means that they would need approval from the South Dakota Legislature before the Department could issue a solid waste permit. Some facilities have reevaluated their land application plans in light of this requirement. n257

At this point, the Department has not required testing of emerging contaminants. However, it does require facilities to employ best management practices, such as proper application rates, berms to prevent runoff, and incorporation into the soil to prevent surface and groundwater contamination. The state maintains that these efforts will help prevent organic contaminants from entering waters. n258

### 4. State Efforts Regarding Reuse in South Dakota

South Dakota does not have an active program promoting water reuse. Nevertheless, the Department has worked with industries and communities to address individual concerns and provide water quality testing to demonstrate the effectiveness of wastewater treatment and land application. n259

#### P. Texas

Texas' reuse regulatory program focuses on two types of water reuse - direct and indirect. Direct reuse refers to the use of wastewater effluent that has been directly conveyed from the wastewater treatment plant to the place of use via pipelines, storage tanks, and other infrastructure. Indirect reuse refers to water that is discharged into a watercourse and subsequently re-diverted for a beneficial purpose or use. The Texas Commission on Environmental Quality's ("TCEQ") Water Quality Program regulates direct reuse and the agency's Water Rights Program regulates indirect reuse. n260

Texas reports that direct reuse of treated wastewater is fairly common and that it has seen a recent increase in the number of entities requesting authorization under the reclaimed water program. Currently, there are 251 active municipal reclaimed water authorizations and 105 industrial reclaimed water authorizations, with an unknown number of industrial entities and facilities reusing graywater. A recent survey of water reuse producers also revealed that in 2010 about 101,000 acre-feet per year was used as direct reuse [\*509] and 76,000 acre-feet per year was used as bed and banks permitted indirect reuse in Texas. n261

An increase in wholesale distribution or sale among Texas entities is also possible, which could raise questions of how to regulate the practice in the most effective manner. Indirect reuse is also becoming more common and Texas has witnessed an increase in applications as water needs are often greater than existing supplies. n262

### 1. Reuse Laws and Regulations in Texas

Texas' water quality regulations govern direct reuse, n263 which includes the use of treated municipal wastewater, graywater, and treated industrial wastewater. n264 The TCEQ regulates all aspects of direct reuse that does not pertain to crude oil and natural gas activities. n265 The state authorizes direct reuse via an individual authorization or directly by state rule. It also issues individual authorizations for direct reuse of municipal wastewater. As for industrial reclaimed water, the location where direct reuse occurs, the processes generating the reclaimed water, and the quality of the water dictate whether an individual authorization or authorization directly by rule will apply. Reuse of graywater is authorized directly by rule. n266

Authorizations issued for the direct reuse of municipal reclaimed water require the submittal of monthly discharge monitoring reports ("DMRs"). Self-monitoring of effluent occurs at a frequency of once per week or twice per week depending on the level of the treatment and uses of reclaimed water. Authorizations issued for the direct reuse of industrial reclaimed water require monitoring for various constituents on a case-by-case basis and at varying [\*510] frequencies. Texas does not require DMRs under the industrial program. n267 Graywater reuse is subject to specific conditions and monitoring in certain instances, which is retained on site. n268

Agricultural sources are not included in TCEQ's reclaimed water program. TCEQ regulates CAFOs via the issuance of individual Texas Pollutant Discharge Elimination System or state-only permits. Reclaimed water authorizations for municipal, industrial, and graywater operations are handled differently.

The Texas Water Code authorizes indirect reuse but does not include a specific definition. It does define return flow and reuse. n269 However, Chapter 11 of the Texas Water Code does provide when state authorization is required. n270 A person interested in indirect reuse must obtain a bed and banks authorization under *Texas Water Code Section 11.042*. This section requires an authorization to use the bed and banks of a river or stream to convey water for diversion and subsequent reuse. The statute requires protection of water rights holders that may have relied on that water being in the stream. Environmental impacts must be considered and special conditions may be included in the authorization. TCEQ regulates the indirect reuse of treated wastewater through the water rights permitting program. The requirements for a bed and banks permit apply to all uses of the reuse water. n271

For indirect reuse, monitoring of compliance with permits depends on whether the permit is located in an area administered by a watermaster and whether the permit includes specific reporting or monitoring requirements. Outside of a watermaster area, the enforcement of water rights is strictly complaint driven. Within a watermaster area, staff is available to inspect water rights operations on a daily, weekly, or monthly basis. In these areas, a permittee must notify the watermaster prior to diverting water. Most new permits for reuse of return flows require that the permittee develop and maintain an accounting plan ensuring that only return flows are diverted. n272

[\*511]

### 2. Reuse Funding in Texas

Administering cost-effective financial programs for constructing water supply, wastewater treatment, flood control, and agricultural water conservation projects is the responsibility of the Texas Water Development Board ("TWDB"). Water reuse projects are eligible for funding under several of the TWDB-administered programs. These include the SRFs, Water Infrastructure Fund, State Participation Fund, and Water Development Fund. n273

Texas reports that there is a need to establish funding mechanisms that specifically address the challenges of starting up a reclaimed water system. A major challenge for implementing direct, nonpotable reclaimed water projects is funding for constructing the initial infrastructure. During the initial stages of nonpotable systems, the projects often do not generate adequate revenue to pay for the cost of constructing and operating the systems. Similarly, obtaining funding for advanced treatment facilities that may be required for some indirect potable reuse projects is also a challenge. n274

Funding actions of the TWDB require a finding of consistency of the proposed funding action with the State Water Plan. The current plan, Water for Texas 2007, projects that 14% of the state's new water supplies needed by 2060 will be from water reuse. The estimated cost for those facilities is \$ 4 billion.

### 3. Issues Affecting Reuse in Texas

Texas identified a number of unresolved legal issues involving both direct and indirect reuse that have caused some degree of uncertainty. For direct reuse, the state reports that its current direct reuse program does not specifically authorize the indoor reuse of graywater in individual residences. This issue is currently being explored. n275

There are a number of unresolved issues involving indirect reuse, including: (1) whether the reuse of return flows, after discharge to a stream, is a use of state water subject to the laws of prior appropriation or subject to a different regulatory scheme; (2) whether return flows derived from different sources of water should be treated differently for purposes of evaluating a request to reuse the return flows; (3) who can obtain indirect reuse rights; (4) whether Section 11.042 is inconsistent with Section 11.046 of the Water Code (unused water is returned to the stream and is subject to appropriation by others); and, (5) what type of analysis must be done to determine the impact on [\*512] other water right holders and the environment? n276

At a work session in 2005, the TCEQ Commissioners decided that for surface water-based return flows, staff should consider the application as one for unappropriated water. However, the Commission did not decide how the analysis should be done to determine if the authorization should be issued. Interestingly, Texas notes that these questions can inhibit some applications because of the uncertainty, but can encourage others because those applicants view the uncertainty as flexibility in the statute. As of April 2011, an application is being considered by TCEQ that may answer some of these questions. n277

### 4. State Efforts Regarding Reuse in Texas

Texas encourages direct reuse of treated wastewater through its reclaimed water program. Specifically, the permitting program is streamlined to eliminate the need for public notice and potentially lengthy, contested case hearings. The municipal reclaimed water program requires no fees for submittal of applications and there are no annual fees. Likewise, the industrial reclaimed program directly authorizes certain reclaimed water reuse directly by rule, negating the need to submit applications and obtain authorizations. When an application is required to be submitted, a minor \$ 100 fee is required and no annual fees are assessed. Texas regulations also authorize graywater reuse with no application or fee requirements. n278

TCEQ recently adopted rules to authorize construction and operation of reclaimed water production facilities along a municipality's wastewater collection system. n279 This encourages reuse of reclaimed water on a more economical basis via construction of smaller wastewater treatment plants closer to the demand for reclaimed water.

As for public education, TCEQ has an extensive outreach program related to water quality programs, including the direct reuse program. Specifically, TCEQ hosts a Water Quality Advisory Work Group, which is a voluntary group comprised of professionals, the regulated community, and the public at large that meets quarterly to discuss issues related to water quality, wastewater permits, and wastewater standards. n280 A similar stakeholder group, the Water Rights Advisory Work Group, addresses water rights permitting issues. It provides TCEQ with expanded knowledge and resources to help with permitting [\*513] issues. n281 Additionally, TCEQ regularly speaks at regional and state level conferences and seminars on reuse programs, while the Texas Water Development Board utilizes educational programs that explain water reuse and the need for additional supplies.

As noted previously, there are unresolved issues relating to whether indirect reuse is a new appropriation of water and what types of water availability analyses should be performed. To help address some of this uncertainty, TCEQ encourages applicants for indirect reuse water rights permits to meet with staff to discuss the application process.

Additionally, TWDB recently completed a project entitled "Advancing Water Reuse in Texas," which produced three reports to address public awareness of water reuse in the state. The first provided basic information about water reuse in Texas, including how it can be used beneficially, its history, and its future importance as a water supply management strategy. n282 It also identified major challenges to advancing water reuse, including water rights, balancing ecological and human needs, funding, water quality, and public outreach and awareness. n283 A second report reviewed the state of technology associated with implementing water reuse projects, n284 while a third report identified and prioritized water reuse research topics to advance water reuse in Texas. n285

As for emerging contaminants, the Texas Legislature passed two bills (H.B. 3753 and S. 1757) in the 81st Legislative Session that require TCEQ to establish a work group to investigate pharmaceuticals in relation to current disposal

methods. This work group has been formed and findings will be reported to the legislature prior to the next session. The reclaimed water program currently does not specifically address pharmaceuticals and emerging contaminants.

#### Q. Utah

In general, water reuse projects are uncommon in Utah and it does not appear that such projects will see significant growth in the near future. n286 As of 2011, the state has approved 11 water reuse projects, all of which are publically owned treatment works ("POTWs") or sewer improvement districts.

[\*514]

##### 1. Reuse Laws and Regulations in Utah

Utah's "Wastewater Reuse Act," also known as "73-3c" (adopted under H.B. 38 in the 2006 Utah Legislature) governs reuse and describes how the state approves reuse activities. n287 It defines "reuse water" as "domestic wastewater treated to a standard acceptable under rules made by the Water Quality Board" ("WQB"). n288 The Legislature enacted H.B. 38 to address how the state should regulate POTWs. This effectively applied the term "water reuse" to a narrower scope of projects with the following characteristics: n289 (1) the project sponsor must be a POTW or a sewer improvement district; (2) the project must gain approval from WQB, the State Engineer, and virtually all entities which ever had an interest in the designated water right for the project; n290 (3) the source water rights must be identified as "municipal" water rights; and (4) the new reuse cannot effectively enlarge the underlying municipal water rights without being given a new junior priority date.

The Legislature recognized that some projects may be necessary for some POTWs, but may also not be approvable by all interests. Thus, it gave WQB a "dispensation" to allow an entity to change its point of discharge for: (1) treatment purposes; (2) to enhance the environment; (3) to protect public health, safety, or welfare, or (4) to comply with rules WQB created or a POTW's discharge permit. Under these circumstances, WQB does not need to fulfill all of the approval requirements for a reuse project and needs only to consult with the State Engineer. In operating parlance, these changes in point of discharge are considered to be "disposal" projects instead of "water reuse" projects. n291 Reuse activities with an agricultural or industrial water source are not considered to be "water reuse" and are approved differently. n292

Utah's Division of Water Quality ("Division") within the state's Department of Environmental Quality and the State Engineer both must approve water reuse projects. The Division issues reuse operating permits for reuse facilities and [\*515] reviews the treatment process and application parameters to satisfy water quality, environmental, and human health concerns. n293 Reuse operating permits require self-monitoring in which entities sample reused effluent on either a daily, weekly, monthly, or quarterly basis and report their results on a monthly or annual frequency. In certain situations, the Division may randomly sample reused effluents to verify the self-reporting and permit compliance. The State Engineer reviews projects for conformance with water rights and quantity issues and will issue an approval letter for acceptable projects. n294

##### 2. Reuse Funding in Utah

If wastewater treatment infrastructure is included in a reuse project for a public entity, that entity may qualify for SRF assistance for low-interest loans or grants to fund the project. Otherwise, the sponsoring entity usually funds the project. The state reports that high costs for reuse water as compared with other available raw water sources could create challenges in justifying project costs during the public funding process. Up to several million dollars each year are available for assistance in funding wastewater treatment projects in Utah. n295

##### 3. Institutional Issues Affecting Reuse in Utah

There are three main issues that inhibit water reuse in Utah. First, the state has a well-developed water storage and supply infrastructure, which means that the current costs of raw supply water are significantly lower than the costs of reused water. Second, Utah requires a relatively high quality of water for reuse, especially in areas accessible to the public. This means that treatment costs are high compared to available, less-expensive raw water supplies and the economic justification for reuse projects has generally proven to be difficult. Third, Utah reports that its legal/water rights framework is inhibitory to the development of water reuse projects.

With respect to the third issue, 73-3c increased the number of entities with standing to approve or deny water reuse projects, thereby rendering approval of such projects more difficult. The requirement that the rights identified for reuse cannot expand the underlying water right without receiving a junior priority date can also impose a number of limitations that can inhibit reuse. Specifically, the underlying rights must allow for the new uses, the quantity of water used cannot increase over the amount the underlying rights allow, and the location of use must be the same as the location allowed by the underlying rights. Some Utah regulators have opined that one way to encourage water reuse in Utah would be [\*516] to give treatment entities more latitude in how to utilize or dispose of their effluent. Under such a scenario, the proponent would only have to seek the approval of the State Engineer and WQB for project approval. n296

Section 73-3c has also created uncertainty about the types of projects that qualify as "water reuse." Prior to the law's enactment in 2006, most projects that land applied treated effluent or disposed of it through means other than a direct discharge into surface waters were considered to be "water reuse" projects. However, H.B. 38 applied the term "water reuse" to a narrower scope of projects and many of the older projects are now considered to be "disposal" projects. As previously noted, WQB can allow some POTWs to change their point of discharge. However, questions remain as to the latitude WQB has in determining whether a project is a "change of point of discharge" disposal project as opposed to a "water reuse" project. There is also a question of whether using treated effluent for snowmaking is a discharge to surface waters. n297

Utah has not experienced environmental problems or issues associated with the reuse of properly treated domestic wastewater effluents. It also does not expect that any human health or surface/groundwater contamination problems will develop from reuse projects. However, certain full scale and pilot projects have demonstrated that the salinity concentration in reclaimed water may adversely affect the long-term viability of the soils at some reuse sites. Although such an occurrence is not eminent, soil fertility problems could possibly result from the long-term application of saline effluents. n298

To date, Utah is studying the issues involved with emerging contaminants. However, before embarking on concrete measures and rule making regarding these contaminants, it is waiting for the formation of a national consensus or policy on the risks posed by them, and how to treat and dispose of these substances. n299

Reuse projects may affect downstream water supplies by reducing flows to the downstream water systems. If that was the case, the State Engineer would need to exert his authority to maintain the required flows in the stream.

#### 4. State Efforts Regarding Reuse in Utah

Utah does not have a formal state program to promote or encourage water reuse. Instead, project sponsors are usually responsible for promoting the acceptability of an individual project and conducting any public outreach and education that may be needed.

Although the state does not have a formal program, in 2005, the Utah [\*517] Division of Water Resources published a supplement to the Utah State Water Plan that focused entirely on water reuse. n300 The purpose of this report was to establish a basic understanding of water reuse technology within the state and encourage its adoption as necessary.

#### R. Washington

In 1992, the Washington Legislature passed the Reclaimed Water Use Act ("Act"), which provided a statewide program for the treatment and management of wastewater resources for new uses. n301 Among other things, the law encourages the use of "reclaimed water" by requiring its consideration in watershed planning, water supply planning, and wastewater planning. It also declares that reclaimed water is not considered wastewater and directs the Departments of Ecology and Health to take steps necessary to administer, develop, and encourage reclaimed water use. n302 Since the Act's adoption, 24 reclaimed water facilities have been permitted and this number will likely increase by 50% in the next five years.

##### 1. Reuse Laws and Regulations in Washington

The Act defines reclaimed water as water derived from wastewater with a domestic wastewater component that has been adequately and reliably treated, so that it can be used for beneficial purposes. n303 It also includes definitions for "agricultural industrial process water" n304 and "industrial reuse water." n305 As for permitting, the Act provides specific authority to permit both privately and publicly owned and operated reclaimed water systems. Ecology's Water

Quality Program is the primary agency responsible for permitting and reviews the environmental quality aspects of reclaimed water. Ecology's Water Resources Program reviews water right impairment aspects, while Health's Office of [\*518] Shellfish and Water Protection reviews public health aspects. n306

Washington requires all permitted systems to submit monthly reports of their monitoring activities prescribed by their operating permits. The state may also arrange site visits to the permitted locations as necessary and violations may trigger enforcement action. n307

## 2. Reuse Funding in Washington

Reclaimed water projects in Washington are typically funded from multiple state and federal sources (e.g., SRF funds, USDA Agricultural Rural Development grants and loans, EPA Innovative and Alternative Treatment grants, etc.), along with local bonds. Reclaimed water projects also compete with wastewater treatment projects for state funding and federal pass-through dollars. n308

Of note, four demonstration projects were constructed from 1999 to 2000 with financial assistance from the state legislature. The state also enacted a specific grant program in 2008 to provide \$ 5 million for planning and construction. n309

## 3. Issues Affecting Reuse in Washington

Washington identified a number of issues affecting reuse. First, its previous permitting process inhibited reuse due to the uncertainty and risk that resulted in part from the lack of a comprehensive administrative rule governing reuse. Specifically, the state's reclaimed water program had matured to a point where the guidance and policy documents that it used to permit projects are no longer adequate for the state's planning, review, and permitting purposes. n310

Second, the cost of building infrastructure to move water from reclaimed water plants to customers is another significant challenge to the distribution and use of reclaimed water. Therefore, there is a need to find incentives to assist with the planning and construction of reclaimed water facilities.

Third, there is a need for public education and outreach to better explain the role of reclaimed water in water management. However, current budget constraints have limited Washington's reclaimed water education and outreach [\*519] efforts. Nevertheless, it does maintain a website with factual information intended to encourage the use of reclaimed water. n311

The state further reported that it has experienced a debate regarding the appropriate approach to permit increased consumptive use resulting from the process of reclaiming water, as well as the impacts on existing water rights. n312 One perspective is that any consideration of impairment of existing water rights from reclaimed water is unfair because the state initially granted a water right for use of the water. Moreover, other changes in consumptive use by a water supplier or wastewater discharger can occur without any concern for impairment of existing uses. On the other hand, some have argued that any new consumptive use of the water through reuse should go through the process needed to acquire a completely new water right.

The state's current law lies between these two theoretical approaches. Reclaimers do not need to apply for a new water right to increase their consumptive use, even in closed basins. However, they may not impair existing water rights downstream of the discharge point unless compensation or mitigation is agreed to by the affected water right holder. Washington notes that this protects existing water rights, including instream flows, which are considered water rights. It also "severely limits" use of reclaimed water in some parts of the state. n313

Another issue pertaining to reuse waters is that the current law limits consideration of impairment to water rights that are downstream of the former wastewater discharge point. For typical water rights permits, the state considers impairment for all water rights within a particular water body. This consideration is based solely on priority rather than location relative to the discharge point.

In sum, Washington reports that it is striving for balance between supporting new uses of water through reuse and protecting existing water rights. In some situations, it will favor one goal over the other depending on the facts of the particular circumstance.

## 4. State Efforts Regarding Reuse in Washington



In 2006, the Washington Legislature directed Ecology to coordinate with Health to adopt a comprehensive rule on all aspects of reclaimed water use by December 2010. The overall goal was to develop a "Reclaimed Water Program" through rule, guidance, and statute that runs smoothly and consistently, while protecting public health and the environment to make reclaimed water available [\*520] to help meet future water requirements. Subsequently, the Legislature directed the agencies to look at several specific aspects of such a program, including consideration of a long-term dedicated funding program to construct reclaimed water facilities and to identify barriers to reclaimed water. n314

To assist in the creation of the rule, the Legislature directed Ecology and Health to form a stakeholder Rule Advisory Committee ("RAC"). RAC consisted of a broad range of state agency officials and other interested parties representing various stakeholder groups, including those potentially affected by the rule and parties with technical expertise and knowledge. RAC also held regular meetings that were open to the public. n315

In 2010, RAC produced a draft rule that describes the division of responsibilities between Ecology, Health, and the reclaimed water provider. It includes technical standards and best management practices, as well as procedures for the submittal and review of planning documents, water rights impairment assessments, and management of operating permits. n316 The rule also incorporates stakeholder comments, and was the subject of a "Reclaimed Water Workshop" that Ecology hosted in October 2010 to discuss the permitting of existing facilities to illustrate how it will implement the draft rule through permits. n317

However, before the draft rule was finalized, Governor Christine Gregoire issued Executive Order 10-16 in November 2010, ordering the suspension of all noncritical rule development and adoption through December 31, 2011. n318 Governor Gregoire then signed legislation in May 2011 that would provide regulatory relief to cities and counties from several environmental rules that had passed both houses of the legislature, delaying reclaimed water rulemaking until July 2013. n319 Ecology will use the delay to focus on developing guidance on [\*521] reclaimed water to answer stakeholder concerns. Ecology and Health will also continue to use existing authority to permit reclaimed water. n320

Nevertheless, the process RAC used to develop the draft rule is still informative even if the rulemaking process has been temporarily halted. Specifically, during the rule development process, a number of issues came to the forefront, including: (1) removing barriers to the use of reclaimed water; (2) streamlining the permitting process; (3) funding; (4) technical standards; and (5) water rights issues. To investigate these issues, Ecology formed the following task forces: n321

a. Reclaimed Water Technical Advisory Panel (TAP)

TAP provided information and recommendations for RAC and Ecology to consider when updating existing reclaimed water technical standards, design criteria, and monitoring requirements. It consists of water reuse experts from the Pacific Northwest Clean Water Association, academia, and state government familiar with Washington. n322

b. Water Rights Advisory Committee

The Committee consisted of representatives from local governments, utilities, and stakeholders to assist Ecology in examining and finding appropriate solutions to water right issues. Among other accomplishments, the Committee developed a step-by-step process to assess and address potential impairments and developed a working definition of "water right impairment" that combines existing water right policy, rule, and case law. n323

c. Long Term Funding Sub-Task Force

The Sub-Task Force provided recommendations for a long-term dedicated funding program to construct reclaimed water facilities. This ten-member sub-task force includes representatives from Ecology, Health, city, county, water-sewer district utilities, environmental, and business communities. n324 In 2007, the Sub-Task Force issued a report to the Legislature that reviewed financing [\*522] tools for reclaimed water in other states, especially Arizona, California, Florida, and Texas. The report concluded that existing sources of grants, loans, and self-financing may likely continue to be the major means of financing future reclaimed water projects, but also identified the following potential sources of direct revenue or capitalization of grant and loan funds for reclaimed water projects: n325

. General bond obligations can provide grants to write down the construction costs of new or expanded facilities or can be directed to existing or new loan funds such as the SRFs for water and wastewater.

. Enact legislation that dedicates designated sources of revenue for water reclamation.

- . Legislative appropriations from general tax revenues.
- . A carefully targeted state tax or fee on water withdrawals or consumption, with appropriate exemptions for health related consumption, to provide revenues for reclaimed water projects. n326
- . Voluntary contributions that utilities collect from ratepayers and funnel into a capital fund to invest in sustainable water infrastructure, including reclaimed water. n327 Under such a program, water or wastewater utility customers could choose to purchase sustainable water infrastructure, including reclaimed water, for a percentage of their annual water use.
- . Using SRF guaranty authority to expand the number of projects financed. The CWA and Safe Drinking Water Act both allow states to "guarantee, or purchase insurance for, local obligations where such action would improve credit market access or reduce interest rates." n328 Using this authority would not constitute a new source of revenue but could extend overall capacity of SRFs to finance local reclaimed water projects.
- . Leveraging the capacity of an SRF to provide loans to qualifying [\*523] projects, including reclaimed water projects, at below market rates.
- . States have considerable discretion in establishing priorities for SRF investments in projects and could grant priority points for projects that incorporate reclaimed water.
- . Using private activity bonds, which local governments use to provide debt financing for projects that significantly benefit private users (e.g., water and sewer projects) and are normally payable solely from payments made by the private user or the property financed. States and municipalities could choose to favor or require reclaimed water facilities as a condition of making private activity bonds available. States could also prioritize caps on these bonds to favor projects that incorporate reclaimed water.
- . Utilizing tax increment financing, which is a method of facilitating development or redevelopment of defined areas of property by utilizing future tax revenues to pay for necessary improvements. Under this method, local officials designate an area for improvement and then earmark any future growth in property tax revenues in that district to pay for predetermined development expenditures. Such expenditures could theoretically include reclaimed water projects.
- . Investing state pension funds in innovative projects that could include reclaimed water. While the pension funds need to achieve a reasonable rate of return for investors, the investment may be on more favorable terms than might be otherwise available from private sources, especially if the transaction were structured in a way that the overall return was satisfied by other aspects of a larger project in which the pension fund is investing.
- . In areas where reclaimed water projects are planned and there is a Superfund or brownfield site that is being redeveloped, it may be possible to invest responsible-party funds to help implement the reclaimed water project.
- . Federal highway funds can be used to deal with water quality issues in conjunction with projects. If a reclaimed water project is planned in the vicinity of a federally funded project and it could meet the required criteria, some of the project funds might be allocated to assist with reclaimed water project.
- . The federal New Markets Tax Credit Program allows taxpayers to receive a credit against federal income taxes for making quality equity investments in designated Community Development Entities (CDEs). Where reclaimed water projects are planned in areas where there is an active CDE, there may be an opportunity to work with CDE and target businesses to finance reclaimed [\*524] water-compatible infrastructure in their projects.
- . Many nonprofit organizations use affinity cards to raise funds for their programs, and government-supported environmental funds have been designated to receive funds from such credit card purchases. Under such a system, a credit card company could donate a certain percentage of the interest earned on certain purchases to funds that support reclaimed water projects and education efforts.
- . Sales of special license plates could provide states with additional funding for reclaimed water projects and efforts.

#### d. Removing Barriers Rule Sub-Task Force

This Sub-Task Force identified and recommended actions to increase the promotion of reclaimed water as a water supply and water resource. Among other things, the Sub-Task Force considered: (1) staffing levels, resources, and roles within Ecology and Health; (2) optimizing organizational structure; (3) unresolved reclaimed water use legal issues; and

(4) a more appropriate name to describe reclaimed water. n329 As part of this effort, the Environmental Law Institute issued a report in 2007 on possible incentives that Washington, municipalities, and utility districts could adopt to encourage the use of reclaimed water. The report reviewed different tools that are available in Washington and other states and identified the following, nonexhaustive list of possible practices: n330

- . Mandates that require the use of reclaimed water in appropriate circumstances.
- . Planning requirements in which all locally adopted plans include consideration of reclaimed water zones or favor reclaimed water where it is or reasonably available. n331
- . Create a regional agency with growth management, transportation, air quality, water, and potentially other planning, environmental management, and financing authority to assure that reclaimed water and other alternate water sources are included in federal, state, and local mandated planning.
- . States could use their authority to condition permission to develop new areas on the construction of adequate facilities [\*525] (water, sewer, sidewalks, etc.) to require the installation of reclaimed water facilities and piping if an analysis shows that reclaimed water is available or will be available in a reasonable time.
- . Using zoning tools, such as incentive, inclusionary, cluster, environmental, overlay, floating, mixed use, or performance zoning or unit development provisions, to set aside an area of a municipality for development of reclaimed water uses. n332
- . Enacting statutes that encourage or require that provisions be made for reclaimed water in planning for expanding water supply capacity. n333
- . Using better agency coordination and training, use of performance codes, and changes in legal liability to address barriers in health and building codes.
- . Creating an insurance program to reduce the risks associated with investments made by developers, who might balk at pre-installing reclaimed water-compatible facilities if such efforts are not required or will not be for a considerable amount of time. The report identifies SRFs, which have broad authorization for conduit financing by municipalities for a broad array of facilities, as a possible source of capital for such programs.
- . Simplifying requirements that apply to reclaimed water. The report cites amendments to the California Water Code that authorized regional boards to issue master reclamation permits to a producer and/or distributor of recycled water in lieu of prescribing individual water reuse requirements for reclaimed water users. n334

Two of the Sub-Task Forces addressed the issue of organic contaminants in reclaimed water and recommended not adopting any specific water quality contaminant levels until additional scientific research supports such standards. They also recommended that the state conduct investigative research that includes voluntary monitoring for wastewater, drinking water, storm water, and any other environmental entity these contaminants may impact.

[\*526]

## II. Wyoming

Reuse is not uncommon and is increasing in Wyoming. Nine wastewater reuse projects currently use treated domestic wastewater and that such water is "usually immediately reused for irrigation" due to the arid nature of the state. Wyoming also has larger amounts of wastewater from agricultural operations and mineral (primarily oil and gas) that are treated and reused.

### 1. Reuse Laws and Regulations in Wyoming

Wyoming recognizes reuse as a beneficial use and its regulations use the term "reuse of treated wastewater," which means "domestic sewage discharged from a treatment works after completion of the treatment process." n335 In general, municipalities have an inherent right to use their wastewater discharges however they see fit, but the Wyoming Supreme Court has held that multi-state compacts can supersede those rights. n336

Chapter 21 of the Wyoming Department of Environmental Quality's ("WDEQ") Water Quality Rules and Regulations is a specific regulation for domestic wastewater reuse and establishes standards that address the primary health concerns associated with the reuse of treated wastewater. n337 WDEQ's Water Quality Division (the Division) regulates

the health and water quality protection aspects associated with reuse, while the State Engineer's Office regulates the water rights aspects.

The state regulates wastewater reuse from agricultural sources through the nutrient management plans that are part of its NPDES ("WYPDES") program. It also uses the WYPDES program and WDEQ rules to regulate Coal Bed Methane-produced water. n338 Water reuse regulators must self-monitor, with occasional [\*527] inspection from the Division.

## 2. Reuse Funding in Wyoming

Reuse activities in Wyoming receive funding through the Wyoming Water Development Commission with mineral tax revenues and through the SRF program. However, the state notes, "The fact that the EPA does not consider agricultural reuse to be "categorically green" under the SRF programs is a hindrance." Wyoming also provides both grants and loans. Because of the scarcity of water in Wyoming, any practical project will usually receive funding. n339

## 3. Issues Affecting Reuse in Wyoming

In the past, public concerns regarding the safety of reused water have posed challenges for reuse projects in Wyoming that involved irrigation in public areas. For example, in the 1990s the City of Casper attempted to irrigate soccer fields with reused water. However, a citizen group led a movement that successfully stopped the plan. n340

More recently, extensive community education starting at the grass roots level has proven to be successful in lessening public concerns. In the early 2000s, the City of Cheyenne successfully implemented a reuse project after a successful education campaign aimed at "soccer moms." Wyoming notes: "Because it was a time of drought, the case was presented to them basically as "do you want hard brown soccer fields or nice, safe, green soccer fields irrigated with reused water?" Green grass carried the day." n341

As mentioned previously, interstate compacts can supersede the ability of municipalities to use their wastewater discharges as they see fit. In particular, Wyoming reports that the Platte River Compact "severely limits" wastewater reuse along the North Platte River because treating the water discharge to the river has proven "far less expensive than [the] legal expenses [needed] to attempt to resolve interstate issues to allow wastewater reuse." n342

Wyoming's sparse population and its status as a headwaters state means that emerging contaminants are not concentrated in its waters. Further, because most reused water is used for irrigation purposes, the state's high oxygen and UV levels that result from its high altitude break down the emerging contaminants very quickly. n343

[\*528]

## 4. State Efforts Regarding Reuse in Wyoming

Although Wyoming does not have a formal program to encourage reuse, Chapter 21 of its "Water Quality Rules and Regulations" states:

It is the intent of these regulations to encourage and facilitate the productive and safe reuse of treated wastewater as a viable option in the management of the state's scarce water resources. The use of treated wastewater for non-potable purposes through "source substitution" or replacing potable water used for non-potable purposes is encouraged. n344

## III. Conclusion

The greatest forces that appear to be driving reuse in the West include population growth, water scarcity, and a lack of readily available or inexpensive water supplies. The abundance of wastewater produced from growing populations, increasingly strict discharge requirements, and recent technological improvements have also made water reuse more practical and cost effective for many states and municipalities. As the Environmental Protection Agency ("EPA") noted in 2004, "water reclamation and reuse have almost become necessary for conserving and extending available water supplies." n345

However, before assuming that water reuse can solve all of the West's water supply challenges, it would be prudent to investigate the potential hazards and barriers associated with the practice. States are uniquely positioned to play a lead role in investigating these issues given their primary responsibility for water resource allocation and water rights. Indeed, many recent efforts in Arizona, California, Oregon, and Washington to address adverse impacts and remove barriers associated with reuse have stemmed from gubernatorial executive orders, legislative directives, and state agency policies.

Obviously, the types of issues affecting the practice vary considerably among the western states and states will need to develop solutions and programs tailored to their specific circumstances. Nevertheless, there is still much states can learn from each other in determining how and whether to investigate institutional mechanisms for encouraging reuse. One common theme that emerges from this report is that effective state reuse policies and programs will likely require robust public participation and interagency coordination. In particular, many state efforts to address barriers have employed a model in which state regulators from relevant agencies work jointly with stakeholders in work groups or task forces to collaboratively develop ways of identifying obstacles and making recommendations to encourage reuse. Some of the possible benefits of this approach include: (1) expanding state [529] knowledge of the issues affecting reuse; (2) additional resources to identify and address barriers; (3) increased coordination; and (4) greater public support or buy-in for resulting laws, regulations, and policies.

Ultimately, reuse will likely continue to grow in importance as a means of conserving and extending available water supplies as the demand for water increases in the West and elsewhere. It may also present communities with an alternate wastewater disposal method and help abate pollution by diverting effluent from sensitive water supplies. Ideally, this report will serve as a resource to those states seeking to encourage reuse and resolve the potential barriers and hazards associated with the practice.

#### **Legal Topics:**

For related research and practice materials, see the following legal topics:

GovernmentsState & Territorial GovernmentsWater RightsReal Property LawWater RightsBeneficial UseReal Property LawWater RightsGroundwater

#### **FOOTNOTES:**

n1. The Future of Alternative Energy and Water Supplies - Public, Private Partnerships Congressional Briefing Hosted by Rep. Grace Napolitano, 112th Cong. (Sept. 22, 2011) (statement of Gretchen McClain), <http://www.ustream.tv/recorded/17435501>.

n2. Western Governors' Assn., Water Needs and Strategies for a Sustainable Future: Next Steps V (2008), available at <http://www.westgov.org/wswc/water%20needs%20&%20strategies-6'08%20final.pdf>. The Council serves as an advisor and resource to the governors of 18 western states on water policy issues.

n3. Craig Bell & Jeff Taylor, Water Laws and Policies for a Sustainable Future: A Western States Perspective 99 (2008), available at [http://www.westgov.org/wswc/laws%20&%20policies%20report%20\(final%20with%20cover\).pdf](http://www.westgov.org/wswc/laws%20&%20policies%20report%20(final%20with%20cover).pdf); Chad Shattuck, Water Reuse in the Western United States 16 (2002) (on file with author) (investigating the general legal, social, and institutional constraints to water reuse common in the West). See also U.S. Env'tl. Protection Agency, Guidelines for Water Reuse, Appendix B (2004), available at <http://www.epa.gov/nrmrl/pubs/625r04108/625r04108.pdf>. The Environmental Law Institute has also prepared a number of reports that address various aspects of the legal frameworks pertaining to reuse in the West. Western Water Program Project, Environmental Law Institute, [http://www.eli.org/Program\\_Areas/western\\_water\\_projects.cfm](http://www.eli.org/Program_Areas/western_water_projects.cfm) (last visited Feb. 11, 2012).

n4. The following individuals assisted Council staff in preparing the survey and this report: Tracy Hofmann, New Mexico State Engineer's Office; Rick Huddleston, Idaho Dep't of Env'tl. Quality; John Kennington, Utah Div. of Water Quality; and Jim McCauley, Wash. Dep't. of Ecology.

n5. Blue Ribbon Panel on Water Sustainability, Final Report 15 (2010) [hereinafter Blue Ribbon Panel], available at [http://www.adwr.state.az.us/AzDWR/waterManagement/documents/BRP\\_Final\\_Report-12-1-10.pdf](http://www.adwr.state.az.us/AzDWR/waterManagement/documents/BRP_Final_Report-12-1-10.pdf).

n6. *Ariz. Rev. Stat. § 49-201(32)* (LexisNexis 2010).

n7. *Ariz. Admin. Code. § R18-9-701(1)* (2010).

n8. *Id.* For instance, Arizona reports that there are a number of power plants and industrial facilities that use reclaimed water for cooling or other water supplies that do not qualify as "direct reuse," and therefore do not require a reclaimed water permit. Arizona, Survey Response, 2 (April 5, 2010) (on file with author).

n9. *Ariz. Rev. Stat. §§49-203(A)(6), 49-221(E)* (LexisNexis 2010). The regulations appear in *Ariz. Admin. Code §§R18-9-601 - R18-9-720* and *§§R18-11-301 - R18-11-309*. Arizona also reports that the Groundwater Section of ADEQ's Water Quality Division regulates reuse and that ADEQ has not delegated the program to any counties or other agencies, although some may claim authority under local health codes.

n10. All permit requirements and general permits are adopted in rule at *Ariz. Admin. Code §§R18-9-70 - R18-9-720*. Arizona includes graywater use within the reclaimed water permit program and has adopted a general permit for residential graywater use that provides guidelines for safe use.

n11. Arizona, Survey Response, 3 (April 5, 2010) (on file with author).

n12. *Id.*

n13. Arizona requires Aquifer Protection Permits (APPs) if one owns or operates a facility that discharges a pollutant directly to an aquifer, to the land surface, or to the area between an aquifer and the land surface in such a manner that there is a reasonable probability that the pollutant will reach an aquifer. ADEQ issues both general and individual APPs. See *Ariz. Rev. Stat. §§49-241 - 49-252*; *Ariz. Admin. Code §§R18-9-101 - R18-9-403* (setting forth the statutes and rules regarding APPs).

n14. Arizona, Survey Response, 4 (April 5, 2010) (on file with author).

n15. Blue Ribbon Panel, *supra* note 5, at 15-17.

n16. The 1980 Arizona Groundwater Code created five AMAs, which are subject to regulation pursuant to the state's Groundwater Code. Areas outside of the AMAs are not subject to the Groundwater Code. Active Management Areas (AMAs) and Irrigation Non-expansion Areas (INAs), *Ariz. Dep't. of Water Resources*, <http://www.adwr.state.az.us/AzDWR/WaterManagement/AMAs/>.

n17. Blue Ribbon Panel, *supra* note 5, at 15- 7.

n18. *Id.*

n19. Arizona, Survey Response, 3 (April 5, 2010) (on file with author); see also Blue Ribbon Panel on Water Sustainability, Ariz. Dep't. of Water Resources, <http://www.adwr.state.az.us/AzDWR/waterManagement/BlueRibbonPanel.htm>.

n20. Blue Ribbon Panel, supra note 5, at vi - vii; see also Blue Ribbon Panel on Water Sustainability, supra note 19.

n21. Blue Ribbon Panel, supra note 5, at vi.

n22. Id. at v.

n23. Id. at vi.

n24. Id.

n25. Id. at 22.

n26. Id. at 22-25.

n27. Id. at 134.

n28. Id. at 24.

n29. Id.

n30. Id. at 134.

n31. Id. at 26-29.

n32. Indirect potable reuse is defined as the injection of advanced treated reclaimed water into the saturated zone of a potable source water aquifer. Id. at 27.

n33. Id. at 135.

n34. Id. at 30-33, 136.

n35. Id.

n36. Id.

n37. Id. at 34-37.

n38. Id. at 136-138.

n39. Id. at 38, 139.

n40. State Water Res. Control Bd., Strategic Plan: January 2007-December 2008 9 (2007), available at: [http://www.swrcb.ca.gov/water\\_issues/programs/grants\\_loans/water\\_recycling/docs/strategicplan2007.pdf](http://www.swrcb.ca.gov/water_issues/programs/grants_loans/water_recycling/docs/strategicplan2007.pdf) [hereinafter Strategic Plan].

n41. See *Cal. Water Code* §§13521 - 13522, 13550(a) (Deering 2011) (establishing a state policy supporting the use of recycled water).

n42. E-mail from Mary Miles Prince, Assoc. Dir., Vanderbilt Law Library, to Edward C. Brewer, III, Assistant Professor of Law, Salmon P. Chase Coll. of Law (Sept. 26, 1999, 06:15 CST) (on file with author); See also Paul Anderson et al., *Monitoring Strategies for Contaminants of Emerging Concern ii* (2010), available at <http://www.sccwrp.org/ResearchAreas/Contaminants/ContaminantsOfEmergingConcern/RecycledWaterAdvisoryPanel.aspx>.

n43. *Cal. Water Code* § 13050(n) (Deering 2010). The term "recycled water" and "reclaimed water" have the same meaning. *Cal. Water Code* § 26.

n44. Water quality control plans (basin plans) may also contain the recycled water use policy of Regional Water Boards. See *Cal. Water Code* §§13050 - 13057, 13575 - 13583; *Cal. Code Regs. tit. 22 §§60301 - 60357* (2012) (setting forth California's statutes and regulations regarding water recycling).

n45. California, Survey Response, 1-3 (Nov. 17, 2010) (on file with author).

n46. Memorandum of Agreement Between the Dep't of Health Serv. and the State Water Res. Control. Bd. (Feb. 25, 1996), available at [http://www.swrcb.ca.gov/water\\_issues/programs/water\\_recycling\\_policy/docs/1996\\_moa.pdf](http://www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/docs/1996_moa.pdf).

n47. Anyone who recycles or proposes to recycle water, and who uses or proposes to use recycled water, must file a report with the appropriate Regional Water Board. *Cal. Water Code* § 13522.5 (Deering 2010). If a Regional Water Board determines that it is necessary to protect public health, safety, or welfare, it may prescribe water recycling requirements where recycled water is used or proposed to be used. *Cal. Water Code* § 13523.

n48. *Cal. Code Regs. tit. 22* §§60323 - 60331 (2012).

n49. State Water Bd. Order No. 2009-0006-DWQ (2009). The SWB only enrolls those public entities in its general permit that produce tertiary treated disinfected effluent for landscaping and for other specified uses. Regional Boards can also enroll an entity in the statewide general permits if it receives the application and the project proponent is a public entity (i.e., municipalities) that produces tertiary treated disinfected effluent and meets the terms and conditions of the general permit. See *Statewide General Permit for Landscape Irrigation Uses of Municipal Recycled Water*, State Water Resources Control Board (Aug. 2, 2010), [http://www.swrcb.ca.gov/water\\_issues/programs/water\\_recycling\\_policy/landscape\\_irrigation\\_general\\_permit.shtml](http://www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/landscape_irrigation_general_permit.shtml).

n50. California, Survey Response, 4 (Nov. 17, 2010) (on file with author).

n51. *Id.* at 4-5.



n52. It also provides grant funding to assist public agencies with feasibility studies and planning efforts. Construction projects may also receive funding with a combination of grants and loans. Privately owned water utilities regulated by the Public Utilities Commission may apply for construction grants. See Water Recycling Funding Program (WRFPP), State Water Resources Control Board (May 31, 2011), [http://www.swrcb.ca.gov/water\\_issues/programs/grants\\_loans/water\\_recycling/index.shtml](http://www.swrcb.ca.gov/water_issues/programs/grants_loans/water_recycling/index.shtml).

n53. Strategic Plan, *supra* note 40, at Foreword.

n54. California, Survey Response, 8 (Nov. 17, 2010) (on file with author).

n55. *Id.*

n56. State Water Res. Control Bd., Water Recycling Program Funding Guidelines 1-2 (2008), available at [http://www.waterboards.ca.gov/water\\_issues/programs/water\\_recycling\\_policy/docs/final\\_wrfppguidelines071508.pdf](http://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/docs/final_wrfppguidelines071508.pdf).

n57. *Cal. Water Code § 13550(n)* (Deering 2010).

n58. California, Survey Response, 6-7 (Nov. 17, 2010) (on file with author).

n59. *Id.*

n60. *Cal. Water Code § 1211* (emphasis added).

n61. California, Survey Response, 2 (Nov. 17, 2010) (on file with author).

n62. *Id.*

n63. See Strategic Plan, *supra* note 40, at 14 (providing a historical overview of California policies aimed at promoting water recycling).

n64. Recycled Water Task Force, Water Recycling 2030: Recommendations of California's Recycled Water Task Force xi-xvi (2003), available at [http://www.water.ca.gov/pubs/use/water\\_recycling\\_2030/recycled\\_water\\_tf\\_report\\_2003.pdf](http://www.water.ca.gov/pubs/use/water_recycling_2030/recycled_water_tf_report_2003.pdf).

n65. *Id.*

n66. *Id.*

n67. Strategic Plan, *supra* note 40, at 15.

n68. State Water Res. Control Bd., Recycled Water Policy 1-4 (2009), available at [http://www.waterboards.ca.gov/water\\_issues/programs/water\\_recycling\\_policy/index.shtml](http://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/index.shtml).

n69. *Id.* at 12- 4.

n70. Paul Anderson et al., *Monitoring Strategies for Contaminants of Emerging Concern* i-vi (2010), available at <http://www.sccwrp.org/ResearchAreas/Contaminants/ContaminantsOfEmergingConcern/RecycledWaterAdvisoryPanel.aspx>. The Panel consists of six experts with expertise in the following fields: biochemistry, analytical chemistry, civil engineering, epidemiology/risk assessment, ecotoxicology, and human health toxicology. Specific questions the Panel has been charged with addressing are: (1) what are the appropriate constituents to be monitored in recycled water, and what are the applicable monitoring methods and detection limits; (2) what toxicological information is available for these constituents; (3) would the constituent list change based on level of treatment; (4) what are the possible indicators (i.e., surrogates) that represent a suite of emerging contaminants; and (5) what levels of emerging contaminants should trigger enhanced monitoring in recycled, ground or surface waters. *Id.*

n71. *Id.* at ii-vi.

n72. *Id.*

n73. See *Municipal Wastewater Recycling Survey*, State Water Resources Control Board (2011), [http://www.swrcb.ca.gov/water\\_issues/programs/grants\\_loans/water\\_recycling/munirec.shtml](http://www.swrcb.ca.gov/water_issues/programs/grants_loans/water_recycling/munirec.shtml).

n74. Strategic Plan, *supra* note 40, at 21. The plan was intended to guide the WRFP for calendar years 2007-2008 and set forth the following "strategic projects:" (1) develop an economic/financial analyses guidance; (2) develop beneficiary pays framework guidance; (3) perform project performance analyses; (4) develop standard operating procedures; (5) develop a training program; and (6) promote, coordinate, and finance water recycling statewide efforts.

n75. Colorado, Survey Response, 3 (June 21, 2010) (on file with author).

n76. *Colo. Rev. Stat. § 25-8-205(1)(f)* (2010).

n77. 5 Colo. Code Regs. § 1002-84.5(14) (2010).

n78. 5 Colo. Code Regs. § 1002-84.21(B).

n79. Colorado, Survey Response, 1 (June 21, 2010) (on file with author).

n80. 5 Colo. Code Regs. § 1002-84.8.

n81. 5 Colo. Code Regs. § 1002-84.6(A).

n82. 5 Colo. Code Regs. § 1002-84.6(A)(7).

n83. Colorado, Survey Response, 2 (June 21, 2010) (on file with author).

n84. *Id.* at 3.

n85. *Id.* at 1.

n86. Id. at 5.

n87. Id.

n88. Id.

n89. Id. at 4.

n90. Id.

n91. Id. at 6.

n92. Id. at 5.

n93. Id. at 3, 6.

n94. Id. at 4.

n95. Idaho, Survey Response, 4 (Sept. 27, 2010) (on file with author).

n96. Idaho Admin. Code r.58.01.17 (2011). See also *Idaho Code Ann. § 39-115* (2010) (setting forth pollution control permit requirements).

n97. Idaho Admin. Code r.58.01.17. Recognized beneficial uses include but are not limited to domestic water supplies, industrial water supplies, agricultural water supplies, navigation, recreation, wildlife habitat, and aesthetics. The beneficial use depends upon actual use, the ability of the water to support a nonexisting use now or in the future, and its likelihood of being used in a given manner. The use of water for the purpose of wastewater dilution or as a receiving water for a waste treatment facility effluent is not a beneficial use. Idaho Admin. Code r. 58.01.17.200.03.

n98. Idaho, Survey Response, 3 (Sept. 27, 2010) (on file with author).

n99. Idaho Admin. Code r.58.01.17.100.500; Idaho Admin. Code r.58.01.17.100.600.

n100. Idaho, Survey Response, 5 (Sept. 27, 2010) (on file with author).

n101. Id. at 3.

n102. Idaho Admin. Code r.58.01.17.100.02.

n103. Id.

n104. Idaho, Survey Response, 2 (Sept. 27, 2010) (on file with author).

n105. Id. at 6-7.

n106. Id. at 4.

n107. Id. at 5.

n108. Id. at 6.

n109. Id.

n110. Idaho Department of Administration, IDAPA 58.01.17.1001, "Rules for the Reclamation and Reuse of Municipal and Industrial Wastewater" (Sept. 1, 2010 - Vol. 10-9), available at <http://adminrules.idaho.gov/bulletin/2010/09.pdf#P.470>.

n111. Id.

n112. See Idaho Department of Administration, IDAPA 58.01.17.1001, "Rules for the Reclamation and Reuse of Municipal and Industrial Wastewater" (April 7, 2010 - Vol. 10-4), available at <http://adminrules.idaho.gov/bulletin/2010/04.pdf>.

n113. Idaho, Survey Response, 5 (Sept. 27, 2010) (on file with author).

n114. Idaho Dep't of Env'tl. Quality, Idaho Guidance for the Reclamation and Reuse of Municipal and Industrial Wastewater (2007), available at <http://www.deq.idaho.gov/permitting/water-quality-permitting/recycled-water.aspx>.

n115. Kansas Water Office, Lower Arkansas River Basin High Priority Issue: The Role of Reuse in Water Conservation 2 (2009), available at [http://www.kwo.org/Kansas\\_Water\\_Plan/KWP\\_Docs/VolumeIII/LARK/Rpt\\_LARK\\_BPI\\_Role\\_Reuse\\_KWP2009.pdf](http://www.kwo.org/Kansas_Water_Plan/KWP_Docs/VolumeIII/LARK/Rpt_LARK_BPI_Role_Reuse_KWP2009.pdf).

n116. Kansas, Survey Response, 5 (Sept. 27, 2010) (on file with author).

n117. *Kan. Stat. Ann.* § 82a-702 (LexisNexis 2010).

n118. *Kan. Stat. Ann.* § 82a-711(a) (emphasis added).

n119. Kan. Admin. Regs. § 5-1-1(kkkk) (2010) (emphasis added). Kansas' regulations also state that the Chief Engineer shall require the construction of surface brine storage facilities in cases where it is not technologically feasible to "utilize poorer quality water" for the development of underground storage in mineralized formations and fresh water must be used. Kan. Admin. Regs. § 5-3-5b.

n120. Kansas, Survey Response, 4 (Sept. 27, 2010) (on file with author).

n121. City of Colby Kansas Water Pollution Control Permit and Authorization to Discharge under the Nat'l Pollutant Discharge Elimination System, Kan. Permit No. M-UR06-OO02 (Jan. 18, 2008) (on file with author).

n122. Kansas, Survey Response, 4 (Sept. 27, 2010) (on file with author).

n123. Id. at 7.

n124. Id. at 6.

n125. Id.

n126. Kansas Water Office, Lower Arkansas River Basin High Priority Issue: The Role of Reuse in Water Conservation 2 (2009), available at [http://www.kwo.org/Kansas\\_Water\\_Plan/KWP\\_Docs/VolumeIII/LARK/Rpt\\_LARK\\_BPI\\_Role\\_Reuse\\_KWP2009.pdf](http://www.kwo.org/Kansas_Water_Plan/KWP_Docs/VolumeIII/LARK/Rpt_LARK_BPI_Role_Reuse_KWP2009.pdf).

n127. Id.

n128. Id.

n129. Id. at 2-3.

n130. Id. at 3.

n131. Id.

n132. Id.

n133. Id.

n134. Id.

n135. Id.

n136. Id.

n137. Id.

n138. Id.

n139. Id. at 4. With respect to the fourth recommendation, the plan intends to improve the coordination of the Kansas Department of Agriculture's Division of Water Resources and the Kansas Department of Wildlife and Parks.

n140. Shattuck, *supra* note 3, at 16.

n141. Montana, Survey Response, 2 - 3 (April 6, 2010) (on file with author).

n142. Montana Pollutant Discharge Elimination System (MPDES), Montana Dep't of Env'tl. Quality (2011), <http://deq.mt.gov/wqinfo/mpdes/default.mcp.x>.

n143. Montana Dep't of Env'tl. Quality, Circular DEQ-2: Design Standards for Wastewater Facilities B-2 - B-3 (1999), available at [www.deq.mt.gov/wqinfo/Circulars/DEQ2.PDF](http://www.deq.mt.gov/wqinfo/Circulars/DEQ2.PDF).

n144. The circular states: "It was assumed in the development of these standards that the industrial component of the influent wastes is relatively small compared with the discharge of toxic substances regulated by an effective pretreatment program." Id. at B-1.

n145. H.B. 52, 62nd Leg., 2011 Reg. Sess. (Mt. 2011).

n146. Id.

n147. Detailed Bill Information for H.B. 52, Montana Legislature (2011), [http://laws.leg.mt.gov/laws11/LAW0203W\\$BSRV.ActionQuery?P\\_BLTP\\_BILL\\_TYP\\_CD=HB&P\\_BILL\\_NO=52&P\\_BILL\\_DFT\\_NO=&P\\_CHPT\\_NO=&Z\\_ACTION=Find&P\\_SBJ\\_DESCR=&P\\_SBJT\\_SBJ\\_CD=&P\\_LST\\_NM1=&P\\_ENTY\\_ID\\_SEQ=](http://laws.leg.mt.gov/laws11/LAW0203W$BSRV.ActionQuery?P_BLTP_BILL_TYP_CD=HB&P_BILL_NO=52&P_BILL_DFT_NO=&P_CHPT_NO=&Z_ACTION=Find&P_SBJ_DESCR=&P_SBJT_SBJ_CD=&P_LST_NM1=&P_ENTY_ID_SEQ=).

n148. Montana, Survey Response, 3 (April 6, 2010) (on file with author).

n149. Email from George Mathieus, Administrator, Mont. Dep't of Env'tl. Quality - Planning, Prevention and Assistance Div., to Nathan Bracken, WSWC Legal Counsel (Jan, 12 2012) (commenting on draft of WSWC water reuse report).

n150. Nebraska, Survey Response, 3 (April 2, 2010) (on file with author).

n151. Id. at 4.

n152. Title 119, Ch. 12 Neb. Admin. Code § 001 (2010).

n153. Nebraska, Survey Response, 3 (April 2, 2010) (on file with author).

n154. Title 119, Ch. 12 Neb. Admin. Code § 001.02.

n155. Nebraska, Survey Response, 3 (April 2, 2010) (on file with author).

n156. Id. at 5.

n157. Id. at 4.

n158. Id. at 3.

n159. Id. at 4.

n160. Id.

n161. Title 119, Ch. 12 Neb. Admin. Code § 001.01.

n162. Shattuck, *supra* note 3, at 17.

n163. For reservoirs, the Nevada Code states: "Effluent discharged from the point of the final treatment from within a sewage collection and treatment system shall be considered water as referred to in this chapter, and shall be subject to appropriation for beneficial use under the reservoir-secondary permit procedure described in this section. *Nev. Rev. Stat. § 533.440(3)* (2011).

n164. *Nev. Rev. Stat. § 533.024*.

n165. The term "treated effluent" refers to "sewage that has been treated by a physical, biological or chemical process." *Nev. Admin. Code § 445A.2748* (2011). The term does not include graywater. See also *Nev. Admin. Code §§445A.70 - 445A.280, §§2762 - 2771* (2010) (setting forth regulation for the use of treated effluent).

n166. Nevada Div. of Env'tl Prot., Bureau of Water Pollution Control, WTS-1A: General Design Criteria for Reclaimed Water Irrigation Use iii, available at <http://ndep.nv.gov/bwpc/wts1a.pdf>; Nevada Div. of Env'tl Prot., Bureau of Water Pollution Control, WTS-1B: General Criteria for Preparing an Effluent Management Plan iii, available at <http://ndep.nv.gov/bwpc/wts1b.pdf>. The guidelines also state that other terms for "reclaimed water" include "treated effluent, reuse water, and recycled water." *Id.*

n167. *Nev. Admin. Code §§445A.2762 - 445A.2771* (2011).

n168. Nevada, Survey Response, 7 (May 26, 2010) (on file with author).

n169. *Id.* at 10.

n170. *Id.* at 9.

n171. *Id.* at 8.

n172. *Id.*

n173. *Id.* at 9.

n174. New Mexico, Survey Response, 7 (March 2, 2010) (on file with author).

n175. The Construction Industries Division of New Mexico is updating the New Mexico Plumbing Code and is considering the terms "recycling water" or the current term "reclaimed water." *N.M. Code R. § 14.8.2.27* (LexisNexis 2010). The Plumbing Code addresses the use of reclaimed water for toilet flushing and the design/installation of systems for this purpose. *Id.* In addition, the state's Liquid Waste Disposal and Treatment regulations authorize the use of "effluent that meets secondary treatment standards for subsurface irrigation." *N.M. Code R. § 20.7.3.805*. The state's Water Quality Act defines "graywater" as "untreated household wastewater that has not come in contact with toilet waste and includes wastewater from bathtubs, showers, washbasins, clothes washing machines and laundry tubs, but does not include wastewater from kitchen sinks or

dishwashers or laundry water from the washing of material soiled with human excreta, such as diapers." *N.M. Stat. Ann. § 74-6-2(A)* (LexisNexis 2010).

n176. N.M. Code R. § 20.6.2 (LexisNexis 2010); *N.M. Stat. Ann. §§76-6-1 - 76-7-17* (LexisNexis 2010).

n177. New Mexico, Survey Response, 2 (March 2, 2010) (on file with author).

n178. N.M. Code R. § 20.6.2; see also New Mexico Environmental Division, Above Ground Use of Reclaimed Domestic Wastewater (2007), available at [http://www.nmenv.state.nm.us/gwb/documents/NMED\\_REUSE\\_1-24-07.pdf](http://www.nmenv.state.nm.us/gwb/documents/NMED_REUSE_1-24-07.pdf).

n179. Should an applicant propose a reuse activity that NMED is unwilling to permit, NMED can formally deny the application and the applicant can appeal the decision to WQCC. However, New Mexico indicates that it is more common for NMED to discuss its concerns with the applicant and attempt to persuade the application to propose an approvable use of the reclaimed water. New Mexico, Survey Response, 5 (March 2, 2010) (on file with author).

n180. *Id.* at 5.

n181. The Ground Water Quality Bureau issues discharge permits for domestic waste over 2,000 gpd and all other waste types covering above ground reuse (irrigation, fire suppression, toilet flushing, snow making, cooling water, etc.) and aquifer storage and recovery projects. *Id.*

n182. The Liquid Waste Program issues liquid waste permits for the discharge and subsurface reuse of residential and commercial domestic waste under 2,000 gpd, as well as the use of up to 250 gpd of graywater at small residential and commercial sites. Permits primarily address public health concerns. *Id.*

n183. The Drinking Water Bureau oversees public water supplies. Where indirect and direct potable reuse is implemented, the drinking water regulations intersect reuse through source water protections. *Id.*

n184. NMED is currently in the process of rulemaking from the Dairy Industry in accordance with legislation that the state's Legislature passed in 2009. The outcome of the rulemaking process could significantly change the regulation of this discharge type. *Id.* at 5-6.

n185. *Id.* at 6.

n186. *Id.* at 9.

n187. New Mexico indicates that there is "at least a possibility that this change could be enacted over the next 3-5 years." *Id.* at 7.

n188. *N.M. Stat. Ann. §§72-5A-1 - 72-5A-17* (LexisNexis 2010).

n189. New Mexico, Survey Response, 3 (March 2, 2010) (on file with author).

n190. *Id.* at 3-4.



n191. Id. at 4.

n192. Id.

n193. Id. at 8.

n194. At least one aquifer recharge project in New Mexico is actively investigating the occurrence and removal/destruction of micro-constituents. The state reports that others have declined to do so. Studies have been conducted on contaminant occurrence in NPDES discharges and receiving streams, although these are not considered reuse. Id. at 8-9.

n195. Id. at 8.

n196. Id. at 7.

n197. North Dakota, Survey Response, 3 (Jan. 18, 2010) (on file with author).

n198. N.D. Dep't of Health, Guidelines for Using Treated Wastewater in Construction (on file with author); N.D. Dep't of Health, Criteria for Irrigation with Treated Wastewater (on file with author).

n199. North Dakota, Survey Response, 3 (Jan. 18, 2010) (on file with author).

n200. Id. at 2.

n201. Id. at 3.

n202. Okla. Water Resources Bd., Oklahoma Comprehensive Water Plan 2011 Update: Provider Survey Summary Report 3.5 (2009), available at [http://www.owrb.ok.gov/supply/ocwp/pdf\\_ocwp/WaterPlanUpdate/OCWPPProviderSurveyReport.pdf](http://www.owrb.ok.gov/supply/ocwp/pdf_ocwp/WaterPlanUpdate/OCWPPProviderSurveyReport.pdf).

n203. Oklahoma, Survey Response, 2 (March 1, 2010) (on file with author).

n204. Id. at 4.

n205. Id.

n206. Id.

n207. Id. at 3.

n208. Oklahoma further reports that there are situations in which less "treatment" may be acceptable prior to the reuse of wastewater in certain water cooling reservoirs provided the discharges from the reservoirs meet water quality standards. Id. at 3.

n209. Id.

n210. Okla. Water Resources Bd., *supra* note 203 at 3.5.

n211. Or. Admin. R. 340-055-0007 (2009). See also Id. R. 340-055-0005 - 340-055-0030 (setting forth the state's primary reuse regulations).

n212. ODEQ also regulates graywater (shower and bath waste, sink water, etc.) under its program. Since graywater typically does not include treatment, it is not addressed in this report. See *Water Quality: Water Reuse Program*, Oregon Dept. of Env'tl. Quality (2011), <http://www.deq.state.or.us/wq/reuse/graywater.htm>.

n213. Or. Admin. R. 340-055-0010 (2009).

n214. *Or. Rev. Stat. § 537.131* (2009).

n215. Oregon regulations define four reclaimed water quality levels that range from Class A, which requires advanced treatment, to Class D, which can be obtained through simple biological treatment. Classes B and C represent intermediate levels of treatment. Higher levels are allowed for a greater number of uses and require less management restrictions. Or. Admin. R. 340-055.

n216. These aspects of Oregon's legal framework stem from the passage of S. 204 in 1991, which represented the state's first major step towards encouraging water reuse of treated municipal effluent. Oregon, *Survey Response*, 3 (March 2, 2010) (on file with author).

n217. Oregon reports that municipalities can reuse this water for uses that would normally occur under a municipal water right, without acquiring new water right permits or other authorizations. *Id.*

n218. The circumstances include: (1) if the municipality discharged wastewater into a natural waterway for five or more years; (2) the discharge constitutes more than 50% of the average flow of the waterway; and (3) the discharge would cease as a result of the reuse. *Id.* at 6.

n219. Monitoring frequency varies for different classes of water, with higher classes (e.g., Class A at once per day) requiring more frequent monitoring than lower classes (e.g., Class D at once per week). Or. Admin. R. 340-055 (2009) (setting forth monitoring frequencies).

n220. In a context broader than organic contaminants in recycled water, ODEQ is undertaking an effort in response to legislation (SB 737) to develop a list of priority persistent bioaccumulative toxins that have a documented effect on human health, wildlife, and aquatic life. It provided a progress report to the state legislature in June 2010. See *Water Quality: Senate Bill 737*, Oregon Dept. of Env'tl. Quality (2011), available at <http://www.deq.state.or.us/wq/SB737/>.

n221. Or. Dep't of Env'tl. Quality, *Water Reuse: Using Our Water Wisely*, 1 (Dec. 2011), available at <http://www.deq.state.or.us/wq/pubs/factsheets/reuse/waterreuse.pdf>.

n222. Or. Admin. R. 340-045 (setting forth regulations for NPDES and WPFC permits).

n223. See *Water Quality: Water Reuse Program*, Oregon Dept. of Env'tl. Quality (2011), <http://www.deq.state.or.us/wq/reuse/industrial.htm>. Oregon reports that the most commonly reused industrial wastewaters originate from food processing activities that range from large-scale industrial processes (e.g., potato processing) to smaller activities (e.g., fruit packing or viticulture). Food processing waters often include

nutrients, such as nitrogen, which may be used to supplement or replace some of the chemical fertilizer used in agriculture. However, the physical, chemical, and microbiological properties of industrial wastewater can vary widely based upon the type of industrial activities. Some industrial wastewaters may contain high concentrations of salts, metals, or other constituents that may limit reuse applications.

n224. Or. Admin. R. 340-051 (2009).

n225. Oregon, Supplemental Survey Response, 8 (June 1, 2010) (on file with author).

n226. Id.

n227. S.B. 1069, 74th Leg., Spec. Sess. (Or. 2008), available at: <http://www.wrd.state.or.us/OWRD/LAW/docs/SB1069-Ch.13.pdf?ga=t>.

n228. Oregon, Survey Response, 9 (March 2, 2010) (on file with author).

n229. Id.

n230. Id.

n231. Oregon Dep't. of Env'tl. Quality and the Urban Reuse Task Force, Implementation of Senate Bill 820 7 (Dec. 2004) [hereinafter Task Force Report], available at <http://www.deq.state.or.us/wq/pubs/reports/sb820report.pdf>.

n232. Id. at 8-9.

n233. Id. The report specifically noted that urban landscaping, industrial and commercial applications could be listed in a revised regulation along with the appropriate water quality requirements. This, it reasoned, would expand the types and locations of reuse projects and conserve more potable water for drinking water purposes.

n234. Id. at 9.

n235. Id. at 10.

n236. Id. at 11 - 13.

n237. Id. at 9-10.

n238. Karen DuBose, Graduate Student at Oregon State University, Presentation at the Oregon Water Resources Commission Meeting (Nov. 2009) (Describing the results of a study on public acceptance of reuse in Corvallis, Oregon) (on file with author). "Very favorable" and "favorable" results for other reuse applications included: (1) irrigating golf courses - 88%; (2) flushing toilets in public buildings - 88%; (3) irrigating non-edible agriculture - 86%; (4) using recycled water to cool buildings - 82%; (5) using recycled water in industrial processes - 81%; (6) irrigating public parks - 78%; (7) supplying fire hydrants - 77%; (8) supplying car wash businesses - 67%; and (8) irrigating school grounds - 65%. See also Karen DuBose & Brent Steel, Ore. State Univ., *Water Reuse in Corvallis: Modeling Public Acceptance and a Plan for Public Involvement* (May

2009), available at <http://water.usgs.gov/wrri/08grants/progress/2008OR100B.pdf> (discussing the results of a study on the public acceptance of reuse in Corvallis, Oregon).

n239. Oregon Governor's Office, Exec. Order No. 05-04: Water Reuse as an Integral Component of Economic Development, Water Conservation, and Environmental Sustainability in Oregon (2005), available at <http://governor.oregon.gov/Gov/pdf/EO0504.pdf>.

n240. Id.

n241. Interagency Memorandum of Understanding on Water Reuse (2009), available at <http://www.deq.state.or.us/wq/reuse/docs/mou.pdf>.

n242. See Oregon Dep't. of Env'tl. Quality, Water Reuse Program: Recycled Water (2010), available at <http://www.deq.state.or.us/wq/reuse/recycled.htm>; Oregon Dep't. of Env'tl. Quality, Water Reuse Program: Industrial Water (2010), available at <http://www.deq.state.or.us/wq/reuse/industrial.htm>.

n243. Or. Admin. R 340-055, available at [http://arcweb.sos.state.or.us/pages/rules/oars\\_300/oar\\_340/340\\_055.html](http://arcweb.sos.state.or.us/pages/rules/oars_300/oar_340/340_055.html).

n244. Or. Dep't. of Env'tl. Quality, DEQ Internal Management Directive: Implementing Oregon's Recycled Water Rules, (2009), available at <http://www.deq.state.or.us/wq/pubs/imds/RecycledWater.pdf>.

n245. Or. Water Resources Dep't., Integrated Water Resources Strategy, available at [http://www.wrd.state.or.us/OWRD/LAW/Integrated\\_Water\\_Supply\\_Strategy.shtml](http://www.wrd.state.or.us/OWRD/LAW/Integrated_Water_Supply_Strategy.shtml).

n246. South Dakota, Survey Response, 5 (Dec. 23, 2009) (on file with author).

n247. Op. Att'y Gen. S.D. 75-177, 1 (1975).

n248. These permits contain requirements to protect human health and the environment, the specifics of which depend on the potential for runoff or human contact. In addition, surface discharge permits require permittees to develop a nutrient management plan to ensure that nutrients in the wastewater are properly reused and not over applied. The department also requires plans and specifications for wastewater reuse projects and has developed design criteria for the reuse of treated domestic wastewater. The criteria are available at <http://denr.sd.gov/documents/designnumber.pdf>.

n249. The permit regulates the application of wastewater to ensure proper application of the water and require site restrictions and a nutrient management plan to ensure that the wastewater is beneficially reused and not over applied. Bacteria and nutrients are the primary concerns with CAFO wastewater.

n250. South Dakota, Survey Response, 4 (Dec. 23, 2009) (on file with author).

n251. Id. at 3-4.

n252. Id. at 6.

n253. Id.

n254. Id. at 4.

n255. Id. at 5.

n256. *S.D. Codified Laws* §§34A-6-53 - 34A-6-54 (2010).

n257. South Dakota, Survey Response, 6 (Dec. 23, 2009) (on file with author).

n258. Id.

n259. Id. at 5.

n260. Texas, Survey Response, 4 (March 3, 2010) (on file with author).

n261. Tex. Water Dev. Bd., *Water for Texas 2* (July 2011), available at <http://www.twdb.state.tx.us/publications/shells/WaterReuse.pdf>.

n262. Texas, Survey Response, 6 (March 3, 2010) (on file with author).

n263. Title 30 of The Texas Administrative Code, Chapter 210 regulates the direct reuse of treated industrial, treated municipal wastewater, and graywater. Additional rules related to the operation of reclaimed water production plants (commonly referred to as satellite plants) are located in 30 Texas Administrative Code, Chapter 321, Subchapter P. *Texas Water Code Section 26.0311* and *Texas Health and Safety Code Section 341.039* regulate the use of graywater.

n264. Texas' reclaimed water program does not regulate industrial facilities that recycle treated wastewater back into processes at a facility. Municipal and industrial facilities that hold individual wastewater permits under the Texas Land Application Permit (TLAP) are also not considered to be reuse facilities. Texas, Survey Response, 2 (March 3, 2010) (on file with author).

n265. The Railroad Commission of Texas regulates direct reuse of treated wastewater from crude oil and natural gas activities. Id. at 4.

n266. Id.

n267. Any violation of effluent limitations contained in an authorization to use industrial reclaimed water will result in suspension of the authorization. Id. at 5.

n268. Id.

n269. "Return water or return flow" refers to that portion of state water diverted from a water supply and beneficially used that is not consumed as a consequence of that use and returns to a watercourse. Return flow includes sewage effluent. Reuse refers to the "authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that the water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water." 30 Tex. Admin. Code § 20 297.1 (2010).

n270. *Tex. Water Code Ann. § 11.042* (2010).

n271. *Id.* at 2.

n272. *Id.* at 6.

n273. *Tex. Water Dev. Bd., History of Water Reuse in Texas* 22 (Feb. 2011), available at [http://www.twdb.state.tx.us/innovativewater/reuse/projects/reuseadvance/doc/component\\_a\\_final.pdf](http://www.twdb.state.tx.us/innovativewater/reuse/projects/reuseadvance/doc/component_a_final.pdf); *Tex. Water Dev. Bd., State Loan Program Texas Water Development Fund II (DFund)*, <http://www.twdb.state.tx.us/financial/programs/twdf.asp>.

n274. *Id.* at 21.

n275. *Texas, Survey Response*, 3 (March 3, 2010) (on file with author).

n276. *Id.* at 2-3.

n277. *Application of the Brazos River Authority for Water Use Permit 5851 Before the State Office of Administrative Hearings*, TCEQ Docket No. 2005-1490-WR. SOAH Docket No. 582-10-4184.

n278. *Texas, Survey Response*, 6-7 (March 3, 2010) (on file with author).

n279. The rules are found at 30 *Tex. Admin. Code. § 321* (2010).

n280. For more information on the Water Quality Advisory Work Group, please see [http://www.tceq.state.tx.us/permitting/water\\_quality/stakeholders/WQ\\_advisory\\_group.html](http://www.tceq.state.tx.us/permitting/water_quality/stakeholders/WQ_advisory_group.html)

n281. *Id.*

n282. *Tex. Water Dev. Bd., supra note 262*, at 4.

n283. *Id.* at 21-22.

n284. *Tex. Water Dev. Bd., State of Technology of Reuse* (Aug. 2010), available at [http://www.twdb.state.tx.us/innovativewater/reuse/projects/reuseadvance/doc/PhaseB\\_final.pdf](http://www.twdb.state.tx.us/innovativewater/reuse/projects/reuseadvance/doc/PhaseB_final.pdf).

n285. *Tex. Water Dev. Bd., Water Reuse Research Agenda* (Feb. 2011), available at [http://www.twdb.state.tx.us/innovativewater/reuse/projects/reuseadvance/doc/component\\_c\\_final.pdf](http://www.twdb.state.tx.us/innovativewater/reuse/projects/reuseadvance/doc/component_c_final.pdf).

n286. *Utah, Survey Response*, 6 (June 2, 2010) (on file with author).

n287. *Utah Code Ann. §§73-3c-101 - 73-3c-401* (2010).

n288. *Utah Code Ann. § 73-3c-102*. It also defines "water reuse project" as a "project for the reuse of domestic wastewater that requires the approval by the Water Quality Board ... and the State Engineer ..." Id.

n289. Prior to 73-3c, Utah's state water plan defined "water reuse" as "the direct use of wastewater, which involves the application of some degree of treatment, and the planned use of the resulting effluent for a beneficial purpose." Utah, Survey Response, 2 (June 2, 2010) (on file with author).

n290. This group would include the chain of all conveyors and users from the original water rights holders to the end users of the reuse water. Any person whose water may be replaced may also reject the project.

n291. The inference is that the facility has a significant need to implement the discharge with few, if any, other viable options to dispose of its effluent.

n292. The Utah Department of Agricultural approves agricultural water sources projects, while the Division approves industrial waters source projects for quality, health, and environmental concerns on a case-by-case basis.

n293. The Division has rules governing these concerns, which are located in Utah Admin. Code R317-3-11 (2010). If infrastructure construction is involved, the Division will also require a construction permit prior to construction.

n294. Utah, Survey Response, 4 (June 2, 2010) (on file with author).

n295. Id. at 8.

n296. Id. at 6.

n297. Id. at 4.

n298. Id. at 6.

n299. Id.

n300. See Utah Div. of Water Res., *Water Reuse in Utah* (2005), available at <http://water.utah.gov/WaterReuse/WaterReuse.pdf>.

n301. Jim McCauley, Denise Lahmann & Katherine Cupps, Wash. Dep't of Env'tl. Quality, *Washington's Reclaimed Water Program - Evolving From Guidelines to Rule 2*, available at [http://conferences.wsu.edu/conferences/waterland/proceedings/6\\_Paper\\_McCauley.pdf](http://conferences.wsu.edu/conferences/waterland/proceedings/6_Paper_McCauley.pdf).

n302. Id.

n303. *Wash. Rev. Code § 90.46.010* (LexisNexis 2010).

n304. "Agricultural industrial process water" means water that has been used for the purpose of agricultural processing and has been adequately and reliably treated, so that as a rule of that treatment, it is suitable for other agricultural water use. Id.

n305. "Industrial reuse water" means water that has been used for the purpose of industrial processing and has been adequately and reliably treated, so that as a result of that treatment, it is suitable for other uses. Id.

n306. Washington notes that some types of water may be recycled onsite for certain purposes and considered exempt from the Act. For example, a facility producing disinfected secondary effluent may use that product onsite without obtaining a separate reclaimed water permit. Also, secondary effluent may be used to irrigate nonfood crops as a land treatment system permitted under Section 90.48 of the Washington Code.

n307. Washington, Survey Response, 4 (June 1, 2010) (on file with author).

n308. Id. at 7.

n309. Id. at 5.

n310. McCauley et al., *supra* note 302, at 13.

n311. Reclaimed Water Use Rule Development Process, Department of Ecology - State of Washington, <http://www.ecy.wa.gov/programs/wq/reclaim/ruledevelpmnt.html> (last visited Feb. 12, 2012).

n312. Washington, Survey Response, 2 (June 1, 2010) (on file with author).

n313. Id. at 3.

n314. Wash. Dep't of Ecology, Focus on Reclaimed Water: Reclaimed Water Rule Adoption 1 (2010) [hereinafter Ecology Focus Report], available at <http://www.ecy.wa.gov/pubs/1010011.pdf>. As part of the legislation, the Washington Legislature adopted changes to state law on the consideration of potential impairment of downstream water rights by reclaimed water facilities. However, the Governor vetoed that section and directed Ecology to work with legislative leadership to address water rights impairment from water reuse projects.

n315. Wash. Dep't of Ecology, Rule Advisory Committee (2010), available at <http://www.ecy.wa.gov/programs/wq/reclaim/reclaimadvcomm.html>.

n316. Ecology Focus Report, *supra* note 315. The draft rule is available at <http://www.ecy.wa.gov/programs/wq/reclaim/OTS3438version4.pdf>.

n317. Wash. Dep't. Of Ecology, Reclaimed Water Use Rule Development Process (2010), available at <http://www.ecy.wa.gov/programs/wq/reclaim/ruledevelpmnt.html>.

n318. Exec. Order No. 10-06 Suspending Non-Critical Rule Development and Adoption (Nov. 2010), available at [http://www.governor.wa.gov/execorders/eo\\_10-06.pdf](http://www.governor.wa.gov/execorders/eo_10-06.pdf). The order was intended to focus the state's staff resources on direct service delivery, while also promoting economic recovery by providing a stable and predictable regulatory environment for small businesses and local government. Id.

n319. H.B. 1478, 62nd Leg., 2011 Reg. Sess. (Wa. 2011).



n320. Wash. Dep't. Of Ecology, Rule-Making Suspension - Decision Updates (2010), available at [http://www.ecy.wa.gov/laws-rules/suspension\\_update.html#delayed](http://www.ecy.wa.gov/laws-rules/suspension_update.html#delayed).

n321. Ecology Focus Report, *supra* note 315, at 1.

n322. Wash. Dep't. Of Ecology, Reclaimed Water Technical Advisory Panel (2010), available at <http://www.ecy.wa.gov/programs/wq/reclaim/technicalpanel.html>.

n323. Wash. Dep't of Ecology, Water Rights Impairment Standards for Reclaimed Water: Stakeholder Views and Ecology Recommendations v-vi (2009), available at <http://www.ecy.wa.gov/pubs/0911027.pdf>.

n324. Wash. Dep't. of Ecology, Long Term Funding Sub-task Force (2010), available at <http://www.ecy.wa.gov/programs/wq/reclaim/longtermfunding.html>.

n325. Langdon Marsh, Env'tl. Law Inst., Report on Funding and Financing for Reclaimed Water Facilities 6 - 12 (2007), available at <http://www.ecy.wa.gov/programs/wq/reclaim/advisorycommittee/Funding/ELI%20Report%20Funding%20and%20Financing.pdf>.

n326. The report cites a "flush fee" that Maryland adopted in 2005, which adds \$ 2.50 per person a month to the utility bills of property owners who use the public sewer system. *Id.* at 7.

n327. This concept is based on existing green energy voluntary surcharges collected by utilities in which customers can choose to purchase new, renewable energy for a percentage of their annual electricity use. The proceeds are invested in projects like wind farms, geothermal, or tidal energy projects in which the utility participates.

n328. FWQA (P.L. 100-4), Title VI, § 603(d)(3); FSDWA (P.L. 104-182), § 1452(3)(f).

n329. Wash. Dep't. Of Ecology, Removing Barriers Rule Sub-Task Force (2010), available at <http://www.ecy.wa.gov/programs/wq/reclaim/removingbarriers.html>.

n330. Langdon Marsh, Env'tl. Law Inst., Report on Incentives for Reclaimed Water 1 - 7 (2007), available at <http://www.ecy.wa.gov/programs/wq/reclaim/incentivesreclaimed.pdf>.

n331. The report noted that municipalities are generally free to adopt such provisions on their own, in the absence of a state mandate. *Id.* at 2-3.

n332. *Id.* at 3-4. Other land use tools identified in the report include: rezoning for higher density, density bonuses, exemptions from impact fees or special assessments, minimum lot sizes, infill development, adaptive reuse, historic preservation grants and tax credits, special use districts as for transit oriented development, tax abatements, credits or waivers, and grants of public land.

n333. *Id.* at 4-5.

n334. *Id.* at 6 (citing *Cal. Water Code* § 13523.1 (2010)).

n335. 020-080 Wyo. Code R. § 021(3)(y) (Weil 2010).

n336. In *Thayer v. City of Rawlins*, the Court addressed the principle of the prior appropriation doctrine that an appropriator is continually entitled to the flow of the stream as it existed at the time of his appropriation. *594 P.2d 951 (Wyo. 1979)*. Under that principle, one making a new appropriation must be aware of how many senior users are already present on that stream and how much water they have appropriated prior to his or her use, and must expect his or her use to always be subject to those conditions. *Id.* However, that appropriator can also expect anyone later acquiring rights to the same stream to do so only in a way that leaves the stream at the senior's headgate in the same condition as it existed at the time of his or her appropriation. *Id.* In *Thayer*, the Court held that this principle did not apply to introduced water brought in from an outside (trans-basin) source and clarified that a water user who adds water to the natural flow of a stream is entitled to take that same "imported" water back out for her or her own use, even though a senior priority on the same stream may be left without water as a result. *Id.*

n337. 020-080 Wyo. Code R. § 021(1)(a).

n338. There are very large quantities of coal bed methane discharged in Wyoming. Some are used for irrigation, livestock water, and groundwater recharge, while others go "down the river." Email from Lou Harmon, Manager, Wyoming Water and Wastewater Program, to Nathan Bracken, WSWC Legal Counsel (June 17, 2010) (on file with author).

n339. *Id.*

n340. *Id.*

n341. *Id.*

n342. *Id.*

n343. *Id.*

n344. 020-080 Wyo. Code R. § 021(1).

n345. U.S. Env'tl. Prot. Agency, *Guidelines for Water Reuse*, 200-2006 (2004).