The Water Report™
Water Rights, Water Quality & Water Solutions in the West

In This Issue:

Upcoming Stories:

Colorado River Demand Study

Watershed Fish Assessments

& More!

TAKINGS & WATER RIGHTS

APPLICABILITY OF THE TAKINGS CLAUSE TO WATER RIGHTS REGULATION
RECENT DEVELOPMENTS IN THE FEDERAL CIRCUIT

by Roderick E. Walston, Best Best & Krieger LLP (Walnut Creek, CA)

INTRODUCTION

This article will discuss the applicability of the Takings Clause of the United States Constitution to government regulation of water rights.

The article first discusses the Takings Clause itself, which prohibits the government from taking private property for public use without payment of compensation. The Takings Clause applies not only when government physically confiscates private property for public use, but also when government regulates property — if that regulation goes "too far."

The US Supreme Court (Supreme Court) has adopted a balancing test in determining whether a government regulation goes "too far" and thus falls within the scope of the Takings Clause. However, the Supreme Court has also held that if government regulation results in a "physical occupation" of the property the balancing test does not apply and the government is categorically liable for a taking of property under the Takings Clause.

Second, the article will discuss recent decisions of the Federal Circuit Court of Appeals (Appeals Court) addressing the question whether the Takings Clause applies to government regulation of water rights. These recent Federal Circuit decisions have held that the Takings Clause applies when the federal government imposes substantial restrictions on water rights pursuant to the requirements of federal law, such as some restrictions imposed under the Endangered Species Act (ESA). Indeed, the Appeals Court has held in some instances that the government regulation constitutes a "physical taking" of the water rights, and therefore subjects the federal government to categorical liability for compensation.

Thus, the Takings Clause provides a powerful constitutional remedy for the holders of water rights, where their rights are substantially restricted by the requirements of federal law, such as the ESA. It is important to note, however, that the Supreme Court has never addressed whether the Takings Clause applies to government regulation of water rights. Until the Supreme Court speaks to this significant constitutional question, the extent of Takings applicability will remain uncertain.

THE TAKINGS CLAUSE

The Takings Clause, contained in the Fifth Amendment of the Constitution, prohibits the "tak[ing]" of private property for public use without payment of compensation. The Supreme Court, in an early decision written by Chief Justice John Marshall, held that the Fifth Amendment applies only to the federal government, and not to the states. *Barron v. Mayor and City Council of Baltimore*, 32 U.S. 242, 250 (1833). Later, however, the Supreme Court held that many provisions of the Fifth Amendment — including the Takings Clause — were made applicable to the states by the Fourteenth Amendment of the Constitution, which was adopted after the Civil War. The Fourteenth Amendment prohibits "any state [from] depriv[ing] any person of life, liberty, or property, without due process

Takings

State Applicability

Property Appropriation

Regulatory Takings

Limited Regulation Allowed

Balancing Test

The Water Report
(ISSN 1946-116X)
is published monthly by
Envirotech Publications, Inc.
260 North Polk Street,
Eugene, OR 97402

Editors: David Light
David Moon

Phone: 541/ 343-8504
Cellular: 541/ 517-5608
Fax: 541/ 683-8279
email:
thewaterreport@yahoo.com
website:
www.TheWaterReport.com

Subscription Rates:
$249 per year
Multiple subscription rates available.

Postmaster: Please send address corrections to
The Water Report,
260 North Polk Street,
Eugene, OR 97402

of law." *Chicago, Burlington & Quincy R.R. Co. v. City of Chicago*, 166 U.S. 226, 239 (1897). Thus, the Takings Clause of the Fifth Amendment applies to the federal government, and, as incorporated in the Fourteenth Amendment, applies to the states as well.

The Regulatory Takings Doctrine

The Takings Clause has traditionally been applied when the government physically appropriates or seizes property, as when it exercises its powers of eminent domain to condemn property in order to build roads or schools, or to provide for public development projects. *Kelo v. City of New London*, 545 U.S. 469 (2005); see *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 441 (1982); and *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1014 (1992). Traditionally, the Takings Clause has not been applied when the government regulates property, rather than physically seizes it under its powers of eminent domain.

In *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393 (1922), the Supreme Court adopted the regulatory takings doctrine, which holds that the Takings Clause applies in some instances when the government regulates property. The Supreme Court, through Justice Oliver Wendell Holmes, stated that property owners may be entitled to compensation when the government regulates their property, if the regulation goes "too far." 260 U.S. at 415. The Supreme Court did not, however, define when government regulation goes "too far." The Supreme Court observed that, from the property owner's perspective, government regulation of private property may be tantamount to physical appropriation because in both cases the property owner may be unable to use his property for its normal, intended purposes. The Supreme Court also observed, though, that government does not have to pay for every burden of regulation that it imposes on the property owner: "government hardly could go on if to some extent values incident to property could not be diminished without paying for every such change in the general law," and therefore "some values are enjoyed under an implied limitation and must yield to the police power." 260 U.S. at 413. The Supreme Court subsequently explained the rationale of the regulatory takings doctrine, stating that its function is "to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole." *Armstrong v. United States*, 364 U.S. 40, 49 (1960).

In *Penn Central Transportation Co. v. City of New York*, 438 U.S. 104 (1978), the Supreme Court in effect established a balancing test entailing the consideration of certain factors in determining whether a property owner may be entitled to compensation for government regulation of his property. The Supreme Court stated that it had been "unable to develop any 'set formula'" for determining when government is required to compensate the property owner (438 U.S. at 124). Instead, it had considered certain factors in making this determination, including: (1) the "economic impact" of the regulation on the property owner; (2) the extent to which the regulation interferes with his "distinct investment-backed expectations;" and (3) the "character of the government action" — including whether the regulation amounts to a "physical invasion" of his property or promotes the "health, safety, morals, or general welfare." 438 U.S. at 124-125. Applying these factors, the *Penn Central* Court held that New York City had the right to place the Grand Central Terminal in historical site status without paying compensation to the terminal owner, even though the City's action prevented the owner from developing the property.

"Physical Takings"

The Supreme Court has held that the government is categorically liable for compensation in certain cases and that the *Penn Central* balancing test does not apply in such cases.

First, the government is categorically liable for compensation if its regulation amounts to a "physical invasion" or "occupation" of the property owner's property. *Loretto v. Teleprompter Manhattan CATV Corp*., 458 U.S. 419 (1982). In *Loretto*, the Supreme Court held that a New York statute requiring landlords to allow the installation of cable television facilities on the roofs of their apartment buildings amounted to a permanent "physical invasion" of their property because the cable facilities completely occupied the physical space where they were installed — even though that space was small. According to this ruling, a regulation authorizing a physical invasion of property is fundamentally different from other regulations of property use, because the property owner has been deprived of all use of the physically-invaded property. The government in such cases does not simply remove a strand from the bundle of sticks that comprise property, but instead takes a slice of each strand and effectively destroys all sticks. 458 U.S. at 435.

Second, the Supreme Court has held that government is categorically liable for compensation if its regulation deprives the property owner of "all economically viable use" of his property. *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1019 (1992). Under *Lucas* and its progeny, if the government regulation deprives the property owner of "all economically viable use" of property, the government is per

Takings

Property & Nuisance

"Exactions"

Penn Central Determinations

Agins & State Regulation

Public Policy Support

"Means-End" Test Rejected

se liable for the taking — but if the regulation deprives the property owner of less than "all economically viable use" of property, the government's liability depends on the *Penn Central* balancing test.

The Supreme Court has also held, however, that government does not have to compensate the property owner if the pertaining regulation is supported by "background principles of the State's law of property and nuisance" such that the restrictions on the property use "inhere in the title itself." *Lucas*, 505 U.S. at 1029; *see Agins v. City of Tiburon*, 447 U.S. 255, 260 (1980). This principle — that government does not have to compensate property owners for regulations that are consistent with "background principles" of state law — derives from and supplants the so-called "nuisance doctrine." The nuisance doctrine held that government did not have to pay for regulating property that amounted to a "public nuisance." *See, e.g., Mugler v. Kansas*, 123 U.S. 623 (1887), which held that Kansas was properly exercising its police power in prohibiting the public nuisance of manufacture and sale of intoxicating liquors. As *Lucas* stated, the "nuisance" doctrine was merely a "progenitor" of the Supreme Court's more recent takings jurisprudence. 505 U.S. at 1023-1024. In *Lucas*, the Supreme Court stated that whether a particular property use is a nuisance is highly subjective and often depends on the eye of the beholder.

The Supreme Court has adopted particular rules governing "exactions" of land use, that is, property dedications such as easements that the government requires as a condition for approving the use or development of property. In *Nollan v. California Coastal Comm'n*, 483 U.S. 825 (1987), and *Dolan v. City of Tigard*, 512 U.S. 374 (1994), the Supreme Court held that government may only impose conditions on exactions that have a "nexus" to, and are "roughly proportionate" to, the impact of the proposed development. Otherwise, the Supreme Court stated, government could impose property restrictions in the form of "exactions" that are disproportionate to the property use and that government could not directly impose under the Court's takings jurisprudence.

Distinction Between Takings Clause And Due Process Clause: The *Lingle* Decision

As noted, the Supreme Court in *Penn Central* adopted a three-factor test for determining whether the Takings Clause applies to government regulation of property.

THE *PENN CENTRAL* TAKINGS DETERMINATION FOCUSES ON:

- the "economic impact" on the property owner
- the extent of interference with his "distinct investment-backed expectations" and
- the"character of the government action"

In *Agins v. City of Tiburon*, 447 U.S. 255 (1980), the Supreme Court adopted a similar, but slightly different, test for determining whether the Takings Clause applies to government regulation of property. Under *Agins*, a state property regulation effects a taking if it:

(1) does not "substantially advance legitimate state interests"; or

(2) denies the property owner of "economically viable use" of his land.

447 U.S. at 260.

The second prong of the *Agins* test — relating to "economically viable use" — is similar to the *Penn Central* balancing test, which requires consideration of the "economic impact" on the property owner. However, the first prong of the *Agins* test — relating to whether the regulation substantially advances "legitimate state interests" — is different from the *Penn Central* balancing test and potentially authorizes the courts to subjectively determine whether, in the court's view, the regulation is supported by sound public policy — thus allowing courts to second-guess the wisdom of government property regulations.

In *Lingle v. Chevron U.S.A., Inc*., 544 U.S. 528 (2005), the Supreme Court overturned the *Agins* decision to the extent that it authorized consideration of whether the state regulation was supported by a "legitimate state interest." In that case, a federal district court in Hawaii held that a Hawaii statute that imposed rent controls on oil producers was not supported by a "legitimate state interest," and therefore Hawaii was required to compensate the oil producers for an unconstitutional taking of their property. The Hawaii court's decision was affirmed by the Ninth Circuit.

The Supreme Court, after granting review, reversed the Ninth Circuit decision. The Supreme Court held that the Takings Clause does not allow the courts to consider whether the government regulation is supported by a "legitimate state interest," and overturned *Agins* to the extent it said otherwise. The Supreme Court said that the *Agins* test — in allowing consideration of whether the state interest is "legitimate" — is equivalent to a "means-end test," which allows the courts to determine whether government property regulation is "effective in achieving some legitimate public purpose." 544 U.S. at 542. This inquiry, the Supreme Court said, "reveals nothing about the magnitude or character of the burden" that the property regulation imposes on the property owner, which alone relates to whether the property owner should be compensated for the burden. *Id.* The Supreme Court stated that the Takings Clause "presupposes that the government has acted in pursuit of a valid public purpose," and addresses only the question whether

Takings

Compensation Issue

Due Process Clause

Takings Summary

government must compensate the property owner for restrictions imposed on his property use. The Takings Clause "does not bar government from interfering with property rights, but rather requires compensation 'in the event of otherwise proper interference amounting to a taking.'" *Id*. at 543, quoting from *First English Evangelical Lutheran Church v. City of Los Angeles*, 482 U.S. 304, 315 (1987). The Supreme Court also stated that the *Agins* test "would require courts to scrutinize the efficacy of a vast array of state and federal regulations — a task for which courts are not well suited," and "would empower — and might often require — courts to substitute their predictive judgments for those of elected legislatures and expert agencies." *Id*. at 544. The Supreme Court noted that the courts can evaluate the efficacy of legislative regulations under the Due Process Clause, which suggests that the courts may invalidate government regulations — rather than merely require the payment of compensation — if the courts determine that such regulations fail to comport with substantive due process. *Id*. at 540.

To summarize, the Takings Clause applies — and therefore requires the government to compensate the property owner — when government regulation of property goes "too far," and the question whether government regulation has gone "too far" depends on application of the *Penn Central* balancing test. Notwithstanding, the Takings Clause also categorically requires the payment of compensation when the government "physically" occupies property or denies the property owner of "all economically viable use" of his property. The Takings Clause does not, however, allow consideration of the merits or "legitimacy" of the government regulation, and instead presupposes the legitimacy of the government regulation. The government regulation may, however, be invalidated under the Due Process Clause — although not the Takings Clause — if the regulation fails to satisfy due process requirements.

APPLICABILITY OF TAKINGS CLAUSE TO REGULATION OF WATER RIGHTS

FEDERAL CIRCUIT COURT DECISIONS

Tulare Lake Basin, et al. v. United States

Physical Takings

In *Tulare Lake Basin, et al. v. United States*, 49 Fed.Cl. 313 (2001), the US Court of Federal Claims held that the Takings Clause applies to water rights, and that government in some circumstances may be required to pay compensation to holders of water rights when it regulates their rights. The court held that a water right — including a water right based on contract — is a form of "property" within the meaning of the Takings Clause, and that the government has "physically taken" the water right, and therefore is categorically liable for compensation, when it reduces water deliveries in order to provide more water for endangered species under the ESA.

Background

Reduced Water Deliveries

In the *Tulare Lake*, the State of California, through the California Department of Water Resources (CDWR), entered into contracts with various California water districts that required CDWR to deliver water from the State Water Project (SWP) to the districts. Pursuant to the ESA, the National Marine Fisheries Service (NMFS) issued a biological opinion concluding that the operation of the SWP and the federal Central Valley Project (CVP) were jeopardizing an endangered species, the winter-run chinook salmon, which is located in California's Sacramento-San Joaquin Delta. The biological opinion recommended **r**easonable and **p**rudent **a**lternatives (RPAs) that effectively required the SWP and the CVP to reduce water deliveries to their contractors in order to prevent further jeopardy to the endangered species. Subsequently, the US Fish and Wildlife Service (USFWS) issued a biological opinion concluding that — unless the CVP and SWP operations were changed — the operation of the projects would cause jeopardy to another endangered species located in the Delta, the Delta smelt. As a result of the biological opinions, the CVP and SWP reduced water deliveries to the contracting water districts.

ESA-Forced Taking

Several SWP water district contractors then brought an action against the United States in the Court of Federal Claims, which has exclusive jurisdiction to award monetary damages against the US. The water districts argued that the US, by issuing biological opinions that forced the SWP to reduce water deliveries to the districts, had unconstitutionally taken their water rights without payment of compensation, in violation of the Takings Clause. They argued that the US was liable to them for the value of their reduced water supplies for a three-year period, from 1992 through 1994.

The Court of Federal Claims' Decision

Contracts = Property

The Court of Federal Claims, Judge John Wiese presiding, held that the US had unconstitutionally taken the plaintiff water districts' water rights, that the United States had "physically seized" their water rights, and thus that the US was categorically liable for compensation. 49 Fed.Cl. 313 (2001).

First, the court held that the plaintiff water districts' contracts with DWR were a form of "property" within the meaning of the Takings Clause. The court stated that although the State of California may have "title" to the water, "the right to the water's use is transferred first by permit to DWR, and then by

Takings

Ownership Interest (Use)

Reduction = Physical Taking

Right to Use

State Regulation v. Federal BiOp

***Tulare* Holdings**

Allocation for ESA Purposes

contract to end-users, such as the plaintiffs. Those contracts confer on plaintiffs a right to the exclusive use of prescribed quantities of water, consistent with the terms of the permits." 49 Fed.Cl. at 319. The court rejected the US' argument that the water districts are not entitled to compensation because the case merely involved a "frustration" of their contract rights, and that the Supreme Court had held, in *Omnia Commercial Co. v. United States*, 261 U.S. 502 (1923), that a takings claim cannot be predicated on acts that merely frustrate contract rights. The court held that *Omnia* was distinguishable because the contracts in the instant case conveyed an "ownership interest" to the plaintiffs, in the form of "the exclusive use of prescribed quantities of water," and, by contrast, the contract right in *Omnia* was "separate and distinct from the property" that was the subject of the contract in that case. 49 Fed.Cl. at 319. In effect, the court ruled that *Omnia* applies only where the contract does not convey a property right, and does not apply where, as in the instant case, the contract does convey a property right.

Second, the court held that the US' reduction of the plaintiffs' water supplies constituted a "physical taking" of their property rather than a "regulatory taking." The court stated that a restriction of the right to use water amounts to a complete appropriation of the right: "in the context of water rights, a mere restriction on use — the hallmark of a regulatory action — completely eviscerates the right itself since plaintiffs' sole entitlement is to the use of water." 49 Fed.Cl. at 320. The court stated that "[u]nlike other species of property, where use restrictions may limit some, but not all of the incidents of ownership, the denial of a right to the use of water accomplishes a complete extinction of all value." *Id.* Since the government had physically taken the water districts' rights rather than simply regulated them, the government was categorically liable for the taking of their rights.

Third, the court rejected the US' argument that "background principles" of state property law render the plaintiffs' contract water rights non-compensable. The court acknowledged that California, through its State Water Resources Control Board (State Board) has the right to reduce the plaintiffs' water rights under various principles of California law, namely the "reasonable and beneficial use" requirements of the California Constitution and statutes, and the public trust doctrine. The court stated, however, that the State Board had not reduced their rights during the period in question (1992-1994) by applying these principles of California law. Instead, their rights had been reduced as a result of the biological opinions issued by federal agencies under the ESA. The court stated that the although the state may have the right to reduce the water districts' rights, it did not do so here, and to conclude otherwise "would be tantamount to our making California law rather than merely applying it." 49 Fed.Cl. at 325.

In a subsequent proceeding, the court determined that the plaintiff water districts were entitled to compensation in the amount of $26 million. The US and the plaintiff water districts reached a settlement agreement, under which the US agreed to pay damages of $16.7 million and not appeal the Court of Federal Claims decision. The decision is now final.

Significance of Court of Federal Claims' Decision

THE *Tulare Lake* DECISION IS HIGHLY SIGNIFICANT, BECAUSE IT HOLDS THAT:

- the Takings Clause applies to government regulation of water rights
- that a contract water right is a form of "property" within the meaning of the Takings Clause
- that the government is categorically liable for compensation when it regulates such rights, because such regulation is a "physical taking" of the rights

The precedential value of the decision, however, is limited because the decision was rendered by the trial court and did not reach the appellate level.

Casitas Municipal Water District v. United States

In *Casitas Municipal Water District v. United States*, 543 F.3d 1276 (Fed. Cir. 2008), *pet. for rehearing en banc denied* 556 F.3d 1229 (2009), the US Court of Appeals for the Federal Circuit (Federal Circuit) held that the federal government had "physically taken" the water rights of a California water district by requiring the district to allocate a portion of its water supply for the benefit of an endangered species under ESA, and therefore the government was categorically liable for payment of compensation under the Takings Clause.

Background

In 1956, Congress authorized construction of the Ventura River Project (Project) in Ventura County, California. The Project includes the Casitas Dam and reservoir, and related facilities. The Casitas Municipal Water District (District) entered into a contract with the US, through the US Bureau of Reclamation (Reclamation), under which the US agreed to build the dam and the District agreed to repay the construction costs over a 40-year period. The District also applied for, and received, appropriative water rights permits from the State Board. The US completed construction of the Project and transferred it to the District. The project is now operated by the District.

Takings

Diversion Required

Physical v. Regulatory Taking

Sovereign Acts Doctrine

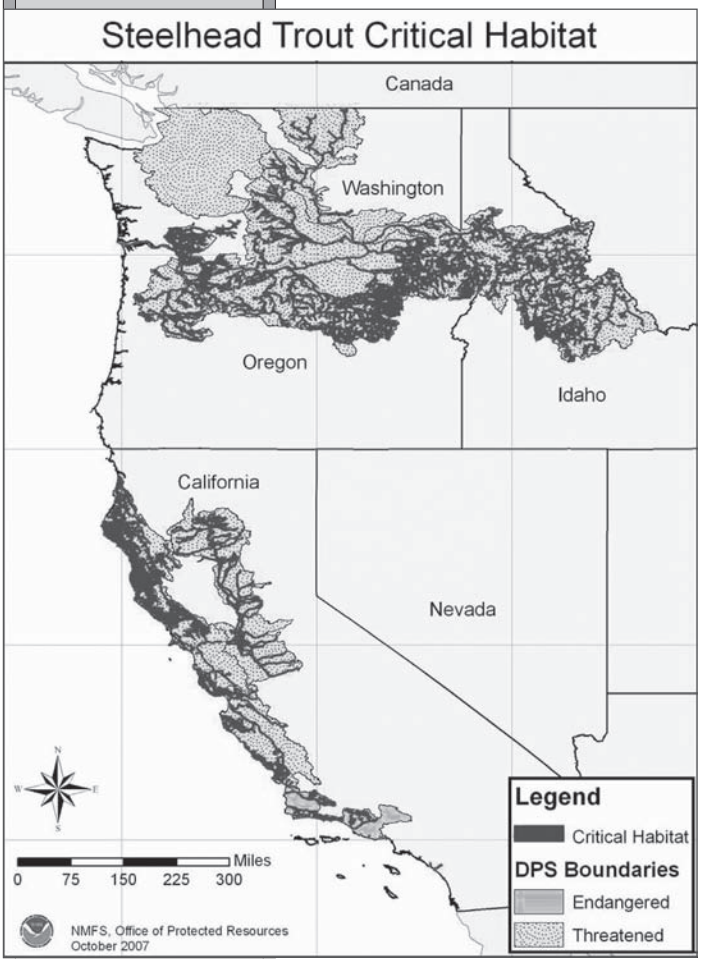
NMFS listed the West Coast steelhead trout, some of which are located in the Project's watershed, as an endangered species under the ESA. NMFS subsequently issued a biological opinion effectively requiring the Project to construct a fish ladder for the benefit of the endangered trout, and required the District to divert water from the Project to the fish ladder in order to protect the endangered trout. Reclamation, which had consulted with NMFS on operation of the Project, required the Project to meet the conditions in the biological opinion.

The District brought an action against the US in the Court of Federal Claims, alleging that: (1) the United States had breached its contract with the District by requiring the District to reallocate a portion of its water supply for the benefit of the endangered species; and (2) the government had unconstitutionally taken the District's water rights for the same reason.

The US filed a motion for summary judgment to dismiss the District's action. The US argued that — even assuming for the sake of argument that the District's water rights were a form of "property" within the meaning of the Takings Clause — the District could not prevail on its takings claim because the *Penn Central* balancing test did not support the takings claim. The District argued that the case must be analyzed as a "physical taking" rather than a "regulatory taking" and therefore the *Penn Central* balancing test did not apply. The District conceded that it could not prevail by application of the *Penn Central* balancing test. The trial court agreed with the US' argument and granted its summary judgment motion, and dismissed both the District's takings claim and its breach-of-contract claim.

The Federal Circuit's Decision

On appeal, the Federal Circuit partially affirmed and partially reversed the trial court's decision. The appellate court affirmed the trial court's decision dismissing the District's breach-of-contract claim. The appellate court held that regardless of whether the US breached its contract with the District, the US was absolved from liability under the sovereign acts doctrine. 543 F.3d at 1287. This doctrine holds that "the United States when sued as a contractor cannot be held liable for an obstruction of the performance of the particular contract resulting from its public and general acts as sovereign." *Id*., citing *Horowitz v. United States*, 267 U.S. 458, 461 (1925). This doctrine is "based on the theory that the two characters which the government possesses as a contractor and a sovereign cannot be thus fused," and that "the United States while sued in one character [cannot] be made liable in damages for their acts done in the other." 543 F.3d at 1287 (citations omitted). The court concluded that the sovereign acts doctrine applied because NMFS' biological opinion consisted of a "sovereign act" and therefore the US was not liable for its breach of contract. *Id.*



The Federal Circuit, however, reversed the trial court's ruling on the District's takings claim. 543 F.3d at 1288-1297. The Federal Circuit held that the District's claim must be analyzed as a "physical taking" rather than a regulatory taking claim, and therefore the US was categorically liable for a taking of the District's water rights. The court stated that — since the United States had required the District to build the fish ladder and physically divert a portion of its water supply from the Project into the fish ladder — the US "did not merely require some water to remain in stream, but instead actively caused the physical diversion of water away from the Robles-Casitas Canal," "thus reducing [the District's] water supply." *Id.* at 1291-1292. "Although [the District's] right was only partially impaired, in the physical taking jurisprudence any impairment is sufficient." *Id.* at 1292. The court stated that its decision was supported by a "trilogy of Supreme Court cases" that had applied the Takings Clause to water rights claims, citing *International Paper Co. v. United States*, 282 U.S. 399 (1931), *United States v. Gerlach Live Stock Co*., 339 U.S. 725 (1950), and *Dugan v. Rank*, 372 U.S. 609 (1963). 543 F.3d at 1289-1290.

The full court subsequently denied the United States' petition for rehearing en banc. 556 F.3d 1229 (2009), and the U S Solicitor General declined to seek Supreme Court review.

Takings

"Physical Taking" Finding

"Property" Issue

Affirmative Requirement Causing Physical Diversion

Significance of Federal Circuit's Decision

The Federal Circuit's decision in *Casitas* is important because it holds — as the Court of Federal Claims had held in the *Tulare Lake* case — that the government regulation of the water right must be viewed as a "physical taking" rather than a regulatory taking, and thus that the government is categorically liable for payment of compensation. Since the Federal Circuit — unlike the federal circuit courts — has nationwide jurisdiction, the Federal Circuit's decision establishes a precedent that has nationwide application.

The significance of the Federal Circuit's decision is, however, limited in effect in two important ways. First, the decision did not address whether the District's water rights are "property" within the meaning of the Takings Clause. The US had assumed for purposes of its summary judgment motion that the District's water rights were "property," and the Federal Circuit was not called on to decide this issue.

Second, the Federal Circuit held that the "physical takings" doctrine applies because the US had affirmatively required the District to build a fish ladder and divert a portion of its water to the fish ladder for the endangered species. As the court stated, the United States "actively caused the physical diversion of water away from" the canal. 543 F.3d at 1291-1292. The court did not consider whether the same takings analysis would apply where the US prohibits a water user from diverting water, and requires that the water be left in the stream for the benefit of an endangered species or for other purposes. The latter situation commonly arises in cases involving takings claims in the water rights context, as in the *Tulare Lake* case itself. Although the effect on the water user may be much the same regardless of whether the user is forced to affirmatively divert its water supply or instead is precluded from diverting its supply, the courts are more likely to apply a physical takings analysis in the former situation, where the government requires the user to take some affirmative action, as in *Casitas* itself, where the water user was required to build a fish ladder and divert water to it. Thus, *Casitas*, although highly significant, has limited relevance to situations that more commonly arise when the government restricts water uses under regulatory statutes such as the ESA.

Stockton East Water District, et al. v. United States

Breach of Contract

In *Stockton East Water District, et al. v. United States*, 583 F.3d 1344 (Fed.Cir. 2009), the Federal Circuit held that a California water district was entitled to compensation for the federal government's breach of a contract with the water district, where the government reallocated a portion of the district's contracted-for water rights in order to comply with a congressional statute mandating the reallocation. The court also held that the water district is entitled to pursue a takings claim even though it is also pursuing a breach-of-contract claim, although the court did not consider the merits of the takings claim.

Background

In *Stockton East*, two California water districts entered into contracts with Reclamation, under which Reclamation agreed to deliver water to the districts from the New Melones Dam, a component of the federal CVP. In 1992, Congress passed the Central Valley Project Improvement Act (CVPIA), which required Reclamation to reallocate a substantial portion of CVP water — about 800,000 acre-feet annually — for the protection of fish, wildlife, and water quality in the Sacramento-San Joaquin Delta. CVPIA, in effect, requires that Reclamation allow substantial water to remain in the Delta for the benefit of environmental uses in the Delta, rather than exporting the water to the contracting water districts for use elsewhere in California. Pursuant to CVPIA, Reclamation reduced its water deliveries from the New Melones Dam to the Stockton East water districts.

Contract v. Takings Claim

The Stockton East water districts brought an action against the US in the Court of Federal Claims, alleging, first, that the government had breached its water delivery contracts with the districts by reducing their water supplies, and, second, that the government had unconstitutionally taken their water rights for the same reason. The trial court dismissed the districts' breach-of-contract claim, and then, oddly, dismissed their takings claim because they had elected to pursue their breach of contract claim (although they had lost). The court held that the districts could pursue *either* the contract claim or the takings claim, but not both.

The Federal Circuit's Decision

THE CONTRACT CLAIM

Contract Holding

On appeal, the Federal Circuit overturned the trial court decision. Addressing the plaintiff water districts' breach-of-contract claim, the appellate court held that CVPIA does not excuse the government from meeting its contractual obligations to the districts, and therefore the government had breached the contracts and must pay damages. *Id*. at 1356-1368.

Takings

Contracts & Law Changes

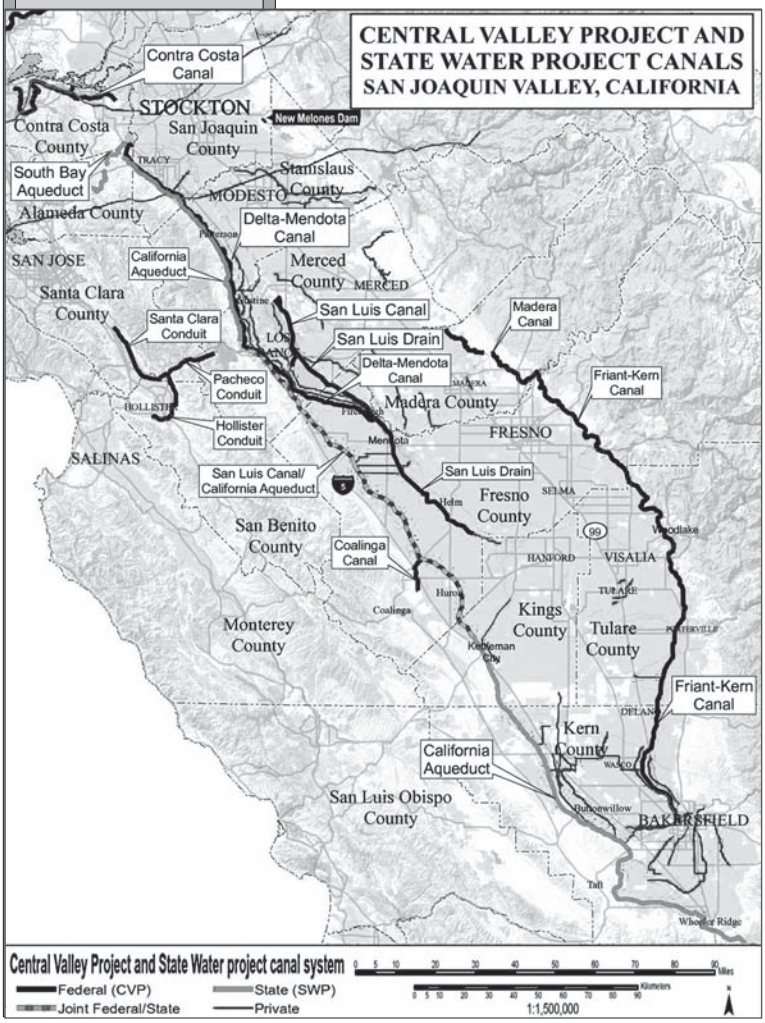
Shortage Clause

Sovereign Acts Defense Rejected

The US advanced several arguments in support of its position that it was not liable for breach of contract, and the Federal Circuit rejected all such arguments. First, the US argued that it did not breach the contracts because the contracts were inherently subject to any changes in federal law, such as the changes wrought by CVPIA. The Federal Circuit rejected the argument, holding that the contracts may be inherently subject to changes in state law but are not inherently subject to changes in federal law. The statutory requirements of CVPIA, the court held, cannot be read into the contracts, which were entered into before CVPIA was even adopted. *Id*. at 1357-1359.

Second, the US argued that it did not violate the contracts because the shortage provision in the contracts expressly absolved the US from liability for water shortages caused by "drought, or other causes…beyond the control of the United States," and the water shortages caused by CVPIA were "beyond the control of the United States." The Federal Circuit again disagreed, stating that the water shortages caused by the Act were within "the control of the United States," because the Act was passed by Congress, and Congress is a branch of the same federal government of which Reclamation is an agency. *Id*. at 1361. The Federal Circuit concluded that the contract language may absolve the US from liability for acts of nature, such as drought and sabotage, but not for acts of Congress.

Third, in the most far-reaching part of its decision, the Federal Circuit rejected the US' argument that it was excused from complying with the contracts under the "sovereign acts" doctrine — the same doctrine that the Federal Circuit in *Casitas* had held did excuse the United States from complying with the contract in *Casitas*. The US argued that CVPIA mandated Reclamation to reallocate a portion of the districts' contracted-for water supplies to the Delta, and that it was impossible for Reclamation to comply with this statutory mandate and also meet its contractual commitments to the districts. The Federal Circuit rejected the argument, holding that the US has the burden of proving that the sovereign acts doctrine applies and that the US had not met the burden. The US, the court stated, had not shown either that Reclamation's decision to reallocate New Melones water to the Delta was a public and general act or that it was impossible for Reclamation to comply with CVPIA and still fulfill its contractual obligations to the districts. *Id*. at 1366-1367. Thus, while the Federal Circuit had upheld the government's sovereign acts argument in *Casitas*, the Federal Circuit rejected the government's sovereign acts argument in *Stockton East*.



THE TAKINGS CLAIM

The Federal Circuit reversed the trial court decision dismissing the water districts' takings claim, and remanded the claim to the trial court for further consideration. *Id.* at 1368-1369. The appellate court held that the water districts were entitled to pursue both their takings claim and their contract claim, and had not forfeited the former by pursuing the latter. *Id.*

Significance of Stockton East Decision

The Federal Circuit's *Stockton East* decision is highly significant because it holds that the US must comply with its contracts even though Congress has passed a statute making it more difficult for the US to comply, and that the government is not relieved from its obligation to comply unless it can show by a preponderance of the evidence that it is "impossible" for the US to both comply with the statutes and honor its contractual obligations. The Federal Circuit's decision imposes a heavy, although not necessarily unsustainable, burden on the US to establish the basis for its "impossibility" argument. The Federal Circuit's decision in *Stockton East* places a much greater burden on the US in demonstrating "impossibility" than the court imposed in the *Casitas* decision.

Takings

Legal Title v. Right to Use

ESA Jeopardy

Reduced Deliveries

Right to Water Use

Klamath Irrigation District v. United States

In *Klamath Irrigation District v. United States*, 635 F.3d 505 (Fed. Cir. 2011), the Federal Circuit recently held that a water user may be entitled to pursue a takings claim based on its claimed right to beneficial and equitable use of water developed by a federal reclamation project — even though the federal government may have legal title to the water. The court held, however, that whether the water user has a right to beneficial and equitable use under such circumstances depends on state law, and therefore that the courts must examine state law in order to determine whether the water user has this right.

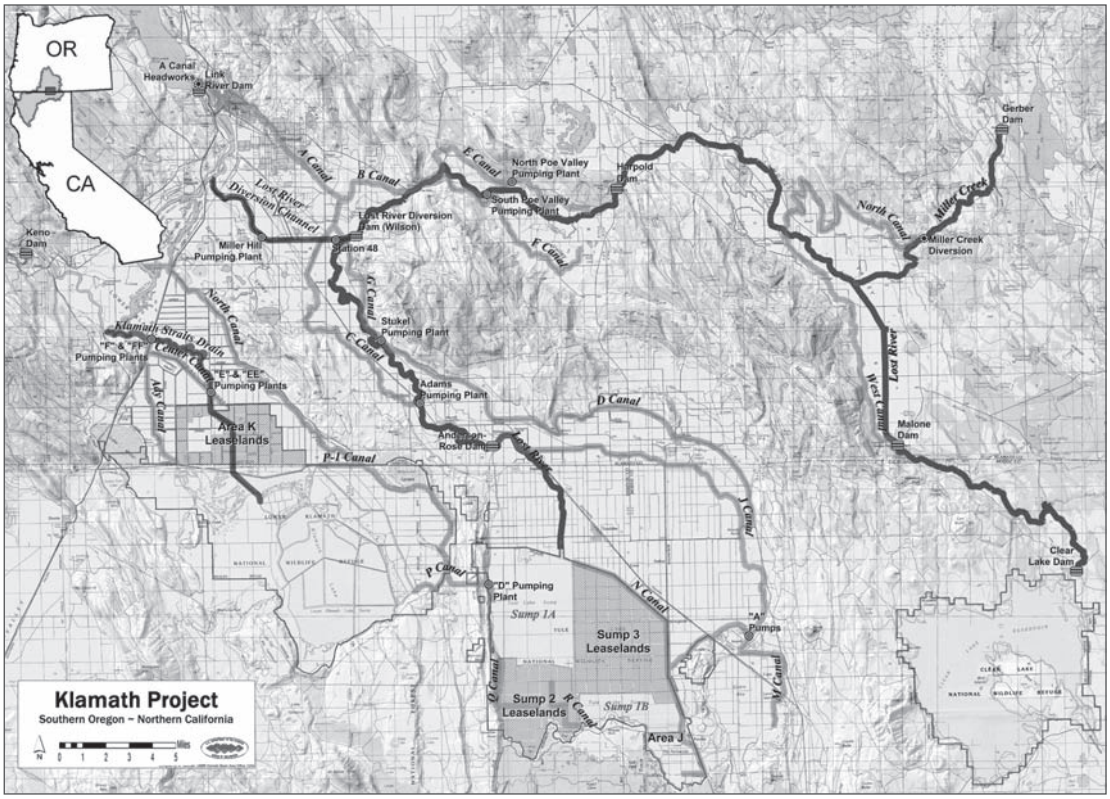
Background

Congress in 1905 authorized the Klamath Project, which was one of the first reclamation projects authorized under the Reclamation Act of 1902. The Klamath Project utilizes the waters of the Klamath River in southern Oregon, and provides water supplies to agricultural users and also provides water for environmental uses. Reclamation, which operates the Project, entered into water delivery contracts with the Klamath Irrigation District (KID), an organization that includes agricultural water districts that had contracted for delivery of Project water for irrigation uses.

Pursuant to the ESA, Reclamation consulted with both USFWS and NMFS regarding Reclamation's operation of the Klamath Project. USFWS and NMFS respectively issued biological opinions concluding that Project operations were causing jeopardy to endangered species in the Klamath River Basin, namely the coho salmon and the shortnose and Lost River suckerfish. The biological opinions effectively required Reclamation to reduce water deliveries to its contractors (irrigators) in order to provide additional water supplies for the endangered fish, and Reclamation accordingly reduced its water deliveries to the contractors.

The plaintiffs, consisting of water districts and landowners that were members of KID, brought an action against the US in the Court of Federal Claims, alleging that the US had unconstitutionally taken their water rights by reducing the water deliveries, and also alleging that the US had breached its contracts with the plaintiffs for the same reason.

The plaintiffs did not claim that they possessed legal title to Klamath Project water, or that the government had taken property to which they held legal title. They conceded that the US held legal title to the water under both the federal Reclamation Act of 1902, which authorized the United States to build and operate its reclamation projects, and Oregon law, which according to a 1905 Oregon statute allowed the United States to appropriate all unappropriated water in the Klamath River in order to serve the needs of the reclamation project. Instead, the plaintiffs argued that they had the right to beneficial and equitable use of Klamath Project water. In support of this argument, they cited the Supreme Court's decisions in



Takings

Ickes v. Fox, 300 U.S. 82 (1937), and *Nevada v. United States*, 463 U.S. 110 (1983), which had held that "appropriation was made not for the use of the government, but, under the Reclamation Act, for the use of the land owners." *Ickes*, 300 U.S. at 95; Nevada, 463 U.S. at 123. The plaintiffs argued that their right to beneficial and equitable use of project water was based on federal law, i.e., the Reclamation Act of 1902 as interpreted in *Ickes* and *Nevada*, and was also based on Oregon law, which recognized their beneficial and equitable rights.

Trial Court Decision

"Property" Ruling

The Court of Federal Claims, Judge Allegra presiding, rejected the plaintiff water users' takings claim. *Klamath Irrigation District v. United States*, 67 Fed.Cl. 504 (2005). First, the court ruled that the plaintiffs did not have "property," consisting of water rights, in the Klamath River under federal law. The plaintiffs argued that they had water rights under section 8 of the Reclamation Act of 1902, which provides that the right to use water is "appurtenant" to the irrigated lands and that "beneficial use" is "the basis, the measure, and the limit of the right." The court rejected the plaintiffs' argument, holding that section 8 does not create a property right under federal law but instead provides only that water rights must be acquired under state law. *Id*. at 519, citing *California v. United States*, 438 U.S. 645 (1978). The court held that the Supreme Court's decisions in *Ickes* and *Nevada*, although containing statements that the beneficial use of federal project water belongs to private landowners, did not contradict the Supreme Court's decision in *California v. United States* that section 8 requires that water rights be acquired under state law. 67 Fed.Cl. at 519-523.

Government Rights

Second, the court held that the plaintiffs did not have "property," consisting of water rights, under Oregon laws that were paramount to the government's water rights in the Klamath Project. *Id*. at 523-536. The court — noting that the Oregon Legislature had passed a statute in 1905 specifically authorizing the US to appropriate all surplus, unappropriated waters from the Klamath River for use in the Klamath Project — concluded that the government had paramount rights to the use of water under Oregon law.

Tulare Lake Criticism

The court also held that, with respect to water users claiming rights prior to enactment of the 1905 Oregon statute, Reclamation acquired these rights by contracts with the water rights holders, and in return granted contractual rights to these water rights holders. Therefore, those claiming pre-1905 rights stood in the same shoes as contractors who held post-1905 contractual rights with the government. 67 Fed.Cl. at 526-527. Regarding water users claiming post-1905 contract rights, the court held that these contract rights cannot form the basis of takings claims, because such rights are enforceable by actions for breach of contracts. *Id*. at 527-538. The court thus rejected the basis for the takings claim upheld by Judge Wiese in the *Tulare Lake* case, who held that a contract right can form the basis of a takings claim if the contract results in the conveyance of a property interest. Indeed, Judge Allegra criticized Judge Wiese's decision in *Tulare Lake*, stating that the decision "appears to be wrong on some counts, incomplete in others and, distinguishable, at all events." *Id*. at 538.

Thus, the trial court rejected the plaintiff water users' takings claim on grounds that they did not have cognizable "property" rights under either federal or state law.

Shortage Provision

In a subsequent proceeding, the trial court rejected the plaintiffs' breach-of-contract claim. *Klamath Irrigation District v. United States*, 75 Fed.Cl. 677, 695 (2007). The court noted that the water districts' contracts with Reclamation contained a shortage provision absolving the US from liability for water shortages in the Klamath Project, and that it was not clear that the plaintiffs could assert a valid breach-of-contract claim in light of the shortage provision. The court stated, however, that it need not address this question because the US was relieved from liability under the sovereign acts doctrine. 75 Fed.Cl. at 682. Under this doctrine, the court stated, the US is relieved from its contractual liability when it acts pursuant to a "public and general act" passed by Congress — since the ESA is a "public and general act" the United States is not liable under its contracts with the Klamath Project water districts in reducing water deliveries pursuant to the biological opinions issued under the ESA. *Id*. Although the plaintiff water districts argued that the government had not shown that it was "impossible" for the government to fulfill its contractual obligations while also complying with the statutory requirements, the trial court rejected the plaintiffs' argument on grounds that "impossibility of performance is not a factor to be taken into account in considering the sovereign acts doctrine." *Klamath Irrig. Dist. v. United States*, 635 F.3d at 522.

"Sovereign Acts" Relief Upheld

The Federal Circuit's Decision

THE TAKINGS ISSUE

State Law Issues

On appeal, the Federal Circuit — rather than reviewing the Court of Federal Claims' decision based on the record before the court — certified certain questions to the Oregon Supreme Court, to ascertain the Oregon Supreme Court's view of state law issues that the Federal Circuit believed needed to be answered in order to decide the plaintiffs' takings claim.

Takings

Right to Use (State Law)

Briefly described, the Federal Circuit asked the Oregon Supreme Court: (1) whether Oregon's 1905 statute — which authorized the federal government to appropriate all unappropriated Klamath River water in order to operate its reclamation project — precluded the plaintiffs' from asserting the right to beneficial and equitable use of project water; and (2) whether, in light of Oregon's 1905 statute, the plaintiffs in fact have the right to beneficial and equitable use of project water. *Klamath Irrig. Dist. v. United States*, 532 F.3d 1376 (Fed. Cir. 2008). Stated differently, the question was whether the plaintiffs have the right to beneficial and equitable use of Klamath Project water, despite the fact that the federal government has legal title to the water and that Oregon's 1905 statute authorized the US to appropriate all unappropriated water in the river.

Oregon Decision

In response, the Oregon Supreme Court held that: (1) Oregon's 1905 statute does not preclude the plaintiff water users from asserting the right to beneficial and equitable use of Klamath Project water; and (2) whether the plaintiffs actually have the right to beneficial and equitable use of the water depends on three factors: (a) whether they have actually applied the water to their lands for beneficial use; (b) the relationship between the United States and the plaintiff water users; and (c) whether the contracts between the US and the water users have altered their relationship. *Klamath Irrig. Dist v. United States*, 348 Or. 15, 227 P.3d 1145 (Or. 2010) (en banc).

Legal Title v. Right to Use

After receiving the Oregon Supreme Court's answers, the Federal Circuit then issued its decision addressing the plaintiff water users' takings claim in *Klamath Irrigation District v. United States*, 635 F.3d 505 (Fed. Cir. 2011). The court held, first, that in light of the Oregon Supreme Court's answers, the plaintiff water users are not precluded under Oregon's 1905 Act from acquiring a right to beneficial and equitable use of Klamath Project water, even though the United States has legal title to the water and the 1905 statute authorized the United States to appropriate all unappropriated water in the river. *Id*. at 517. The Federal Circuit held, second, that whether the water users actually have a right to beneficial and equitable use of the water depends on the factors described by the Oregon Supreme Court, relating, for example, to the contractual terms between the US and the water users. *Id*. at 517-518. The court stated that — since the Oregon Supreme Court had not decided whether the water users had the right to beneficial and equitable use, because the contracts were not before the Oregon Supreme Court — the Federal Circuit could not properly decide the issue, and the issue must be remanded to the Court of Federal Claims for further consideration. *Id*. at 519-520.

Adjudication Issue

The Federal Circuit also asked the Oregon Supreme Court whether — assuming that the plaintiffs have a right to beneficial and equitable use of project water — the plaintiffs were required to submit their claim in a currently-pending action in the Oregon courts that will adjudicate all water rights claims in the Klamath River. The Oregon Supreme Court answered the question in the negative, stating that a person who asserts only a beneficial and equitable property interest need not submit a "claim" in the water adjudication proceeding. Based on the Oregon Supreme Court's answer, the Federal Circuit held that the water districts were not required to submit their claim in the water adjudication proceeding. *Id*. at 519-520.

In sum, the Federal Circuit held that the plaintiff water districts can assert rights to beneficial and equitable use of project water — notwithstanding that the federal government has legal title to the water — but that *whether or not* the plaintiffs have such rights depends on state law. As applied in the Klamath case, that issue hinges on various factors, such as the nature of the contractual relationship between the government and the water districts.

THE CONTRACT ISSUE

Sovereign Acts Applicability

The Federal Circuit overturned the trial court's decision holding that the plaintiff water districts could not assert a breach-of-contract claim against the US. The US had argued that it was not liable for a breach of contract under the sovereign acts doctrine (government may not be liable for breach of contract if its ability to perform its contractual obligations has been hindered by a public and general act adopted by Congress). *United States v. Winstar Corp*., 518 U.S. 839 (1996). As the Federal Circuit noted, the sovereign acts doctrine is designed to balance the government's need for freedom to legislate with its obligation to honor its contracts. *Klamath Irrigation District*, 635 F.3d at 520.

Applicability Test

The Federal Circuit held that the applicability of the sovereign acts doctrine depends on a two-part test, and that the government has the burden of proof in showing that it meets both tests. First, the government must demonstrate that the act is a genuine public and general act that applies to the public at large, and that only incidentally falls on the government contractor, and is not designed to relieve the government from its obligation to perform its duties as a contractor. *Id*. at 521. Second, the government must demonstrate that it is "impossible" to perform its contractual duties as a result of the act, and that there are no alternative ways that the government can perform its contractual duties without violating the act. *Id*.

ESA Ruling

Applying the first test, the Federal Circuit affirmed the trial court's conclusion that the ESA — pursuant to which Reclamation reduced its water deliveries to the plaintiff water districts — was a public and general statute. *Id*. at 521-522. The ESA, the court found, applied generally to the public and was not adopted in order to relieve the government from its obligation to honor its contracts. *Id*.

Takings

"Impossibility of Performance"

Applying the second test, however, the Federal Circuit reversed the trial court's conclusion that "impossibility of performance is not a factor to be taken into account in considering the sovereign acts doctrine." *Id*. at 522. On the contrary, the court decided, the sovereign acts doctrine requires the government to demonstrate that it is "impossible" for the government to honor its contractual obligations while also complying with its statutory responsibilities, and that the burden of demonstrating "impossibility" rests on the government. *Id*. The Federal Circuit remanded the matter to the trial court for further consideration of whether it is "impossible" for the government to both honor with its contractual obligations to the plaintiff water districts and comply with its statutory responsibilities under the ESA. *Id*.

CONCLUSION

Unaddressed Questions

Although the Takings Clause prohibits government from taking property without payment of compensation, the US Supreme Court has never directly addressed the question whether the Takings Clause applies when government restricts the right to use water — as when the federal government restricts the right to use water under the Endangered Species Act, or a state agency restricts the right to use water under the state's water rights laws, the public trust doctrine, or other authority.

More specifically, the Supreme Court has not decided whether water is a form of "property" within the meaning of the Takings Clause, or, assuming that it is, whether the government regulation is supported by "background principles of state law," such that government would not be liable for an unconstitutional taking of property under the Supreme Court's decision in *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1029 (1992). The Supreme Court will likely address these questions in a future decision.

Takings Applicability Unsettled

In the meantime, the Federal Circuit has addressed the questions by holding that a water right is a form of "property" within the meaning of the Takings Clause, and that — at least when the federal government restricts the right to use water under authority of federal statutes, such as the Endangered Species Act — the government is liable for a taking of the right under the Takings Clause. Indeed, the Federal Circuit has held that government restrictions of the right to use water may constitute a "physical taking" of the right — thus subjecting the government to categorical liability for the taking of the right — and that, when the water right is based on a contract between the water user and the federal government, the government may be liable for a breach of contract under the sovereign acts doctrine.

Thus, the Federal Circuit has held that water users may have effective remedies against government restrictions of water rights under both constitutional and contractual principles. The Supreme Court has never addressed these questions, however, and until it does the applicability of the Takings Clause to water rights will remain an unsettled question of constitutional law.

For Additional Information:
Roderick E. Walston, Best Best & Krieger LLP, 925/ 977-3300 or Roderick.walston@bbklaw.com

Roderick Walston: After having spent his legal career as a government attorney, Mr. Walston recently joined the law firm of Best Best & Krieger LLP, in Walnut Creek, California. He specializes in natural resources law, environmental law and water law, and in appellate litigation.

Mr. Walston has served in several high federal and state legal positions:

- Deputy Solicitor and Acting Solicitor of the US Department of the Interior, in Washington, D.C. (2002-2004).
- General Counsel of the Metropolitan Water District of Southern California, in Los Angeles (2000-2002).
- Chief Assistant Attorney General of the State of California and head of the Public Rights Division. This division represents the State of California in litigation in natural resources, water, land use, environmental, antitrust, consumer protection, and civil rights law (1991-1999).
- Deputy Attorney General for the State of California (1963-1991).
- Law clerk to Judge M. Oliver Koelsch of the Ninth Circuit Court of Appeals (1961-1962).

Mr. Walston has argued several landmark cases in federal and state appellate courts, including seven cases in the US Supreme Court. Among other cases, he argued *California v. United States*, 438 U.S. 645 (1978), where the US Supreme Court held that federal water projects must comply with state water laws, and *National Audubon Society v. Superior Court*, 33 Cal.3d 419 (1983), where the California Supreme Court held that the public trust doctrine applies in the water rights context.

Mr. Walston is listed in "The Best Lawyers of America"; was named California's "Outstanding Public Lawyer of the Year" by the California State Bar (2004); and received the National Association of Attorneys General's "Best Brief Award" in 1997, for the best brief submitted to the U. S. Supreme Court that term. He has served as California's legal representative to the Western States Water Council, and as Chairman of the American Bar Association's Water Resources Committee. He has written numerous law review articles and has addressed many conferences on the subject of natural resources, environmental and water law.

Mr. Walston received his law degree from Stanford University and his undergraduate degree from Columbia University.

Takings

Author Rodrick Walston will be Co-Chair at two upcoming Water Law Conferences.

Colorado River Use

Basin Attributes

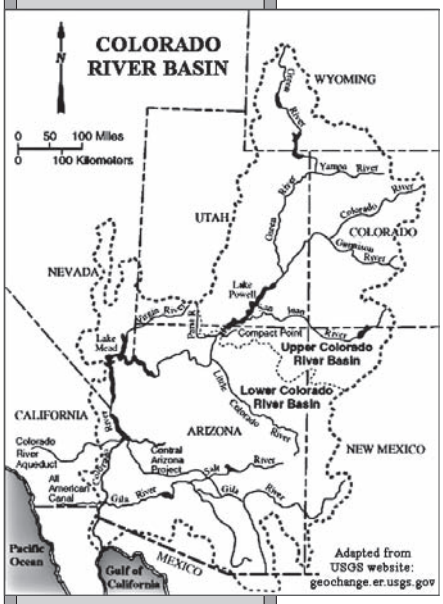
COLORADO RIVER WATER USES

21ST CENTURY SOLUTIONS FOR THE COLORADO RIVER BASIN'S UNBALANCED USES

by Drew Beckwith, Western Research Advocates (Boulder, CO)

INTRODUCTION

The Colorado River courses 1,400 miles from its headwaters in the Rocky Mountains of the United States to the Gulf of California in Mexico. More than 30 million people depend on the Colorado River for their water needs, as do four million acres of farmland. The two largest reservoirs in the United States and the largest irrigation canal in the world are just part of the historic infrastructure system that connects the river's supply to its consumptive users.



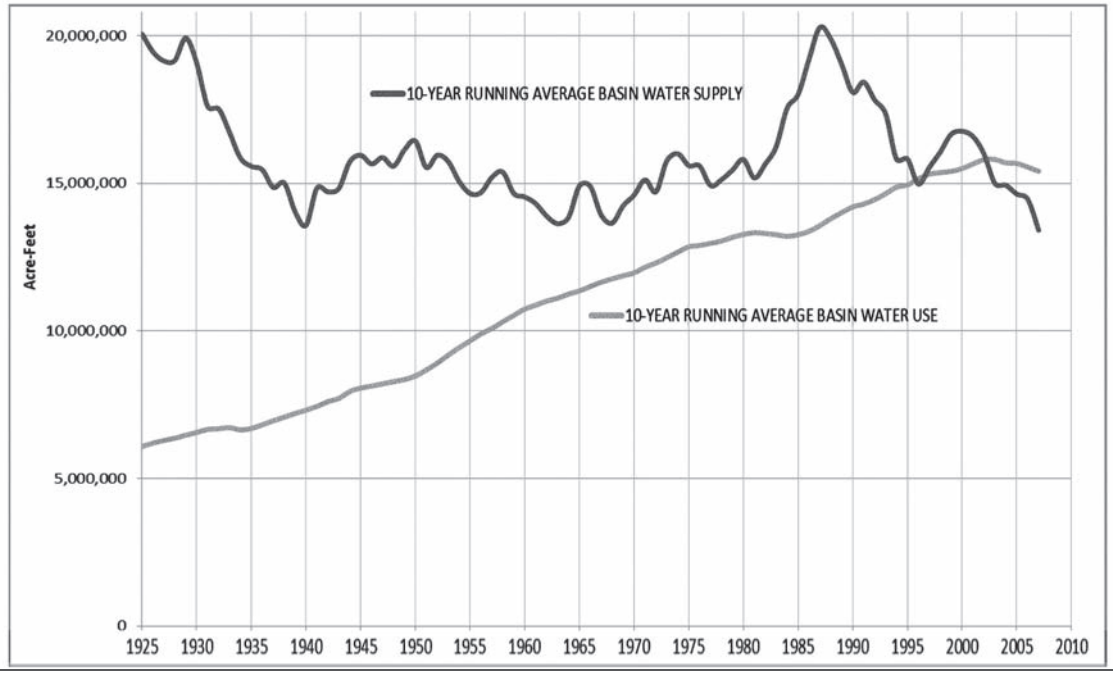
Equally important, the Colorado River Basin provides unparalleled aesthetic, recreational, and environmental values to the US as a whole. The Basin spans an area greater than 240,000 square miles that includes some of the most spectacular scenic landscapes and geological formations on the planet. The Basin supports world-class rafting and freshwater fishing industries, with the total economic value of fishing, hunting, and wildlife viewing calculated at more than 10 billion dollars annually. Kaval, Pamela. 2011. *Ecosystem Service Valuation of the Colorado River: A literature review and assessment of the total economic value of the Colorado River Basin*. Prepared for the Nature Conservancy

Unfortunately, there is not enough water in the Colorado River to meet the Basin's current water demands — let alone future demand increases from growing population or future supply reductions from climate change. The latest report from the US Bureau of Reclamation (Reclamation) clearly demonstrates that within the last decade, use of Colorado River water has exceeded the amount of water supplied (Figure 1); US Dept. of the Interior, Bureau of Reclamation. 2011. *Colorado River Basin Water Supply and Demand Study: Interim Report 1*. June.

The Colorado River is the lifeline of the Southwest and is, to a very real extent, the economic foundation of a significant portion of the western United States. Managing the over-allocated Colorado River in ways that are congruent with growing needs in the Basin — both consumptive and non — is thus a formidable but inescapable task.

Reclamation Study

Figure 1. Demands for Colorado River Water Now Outstrip Supply



Colorado River Use

Demand Increasing

TRADITIONAL v. 21st CENTURY APPROACHES

While agriculture is by far the largest consumptive water user in the Basin — and will likely remain so — Reclamation reports municipal and industrial demand increased by nearly 60 percent from 1971 to 1999. This trend continued through 2010, as evidenced by population in the Basin states growing at some of the most rapid rates in the United States (Table 1). Growth is projected to remain high for several more decades to come according to the US Census Bureau (2011 Apportionment data and population projections; available at: www.census.gov/).

Table 1. States in the Colorado River Basin Some of the Fastest Growing in the Nation – Trend Expected to Continue

State	2010 Population	2000-2010 Change	Rank in US	2000-2030 Projected Change	Rank in US
Arizona	6,392,017	+24.6%	2	+108.8%	2
California	37,253,956	+10.0%	22	+37.1%	13
Colorado	5,029,196	+16.9%	9	+34.7%	14
Nevada	2,700,551	+35.1%	1	+114.3%	1
New Mexico	2,059,179	+13.2%	17	+15.4%	26
Utah	2,763,885	+23.8%	3	+56.1%	5
Wyoming	563,626	+14.1%	13	+5.9%	44

As stakeholders in the on-going planning processes that seek to meet these growing municipal needs, the conservation community fully recognizes the importance of preparing for our water future. However, we are concerned that many traditional water supply strategies have resulted in adverse impacts to rivers and streams and their associated environmental, recreational, and economic values. Rather than continuing old patterns, 21st Century water development must: account for instream flow needs; minimize the adverse environmental impacts of water supply strategies; and improve streamflows or other environmental conditions on rivers that are already depleted.

Healthy, flowing rivers are among the West's most vital natural resources — nurturing the environment, supporting communities, powering the economy, and drawing residents and visitors alike to this region's world-famous natural areas. Maintaining a high quality of life in the West demands that we preserve our waterways.

Instream Flow Benefits

Water flowing in rivers and streams sustains a diversity of life, from fish, invertebrates, and a host of other species that live directly in the water, to birds and large mammals that rely on streams for habitat and food supplies. In the West, 65% of the species rely on the riparian and aquatic environment, which makes up less than 5% of the land area. Flowing rivers and streams also provide clean drinking water supplies, dilute water pollution, and support greenways in many communities, thus contributing to quality of life and the West's attractiveness to residents and businesses. Furthermore, healthy waterways are key to the region's outdoor recreation and tourism industries, which inject billions of dollars into the national economy (Table 2; Kaval, supra note 1).

Recreation & Tourism Contributions

Table 2. Fishing, Hunting, and Wildlife Viewing Contributed More than $10 Billion to the Economy in 2006

Basin State	Fishing		Hunting		Wildlife Viewing	
	Direct Expenditures	Flow-On*	Direct Expenditures	Flow-On	Direct Expenditures	Flow-On
Arizona	$813,921,000	$2,075,499,000	$327,370,000	$834,795,000	$850,337,000	$2,168,359,000
California	$29,696,000	$75,725,000	$20,092,000	$51,236,000	$103,263,000	$263,322,000
Colorado	$214,363,000	$546,627,000	$175,325,000	$447,078,000	$547,908,000	$1,397,166,000
New Mexico	$29,204,000	$74,470,000	$33,176,000	$84,599,000	$60,0004,000	$153,010,000
Nevada	$35,926,000	$91,611,000	$15,401,000	$39,273,000	$43,219,000	$110,209,000
Utah	$189,166,000	$482,374,000	$139,564,000	$355,887,000	$287,731,000	$733,715,000
Wyoming	$96,650,000	$246,458,000	$25,440,000	$64,873,000	$73,184,000	$186,620,000
Total	$1,408,926,000	$3,592,764,000	$736,368,000	$1,877,741,000	$1,965,646,000	$5,012,401,000
Total Direct Expenditures in the Basin: $4,110,940,000						
Total Flow-On Impact in the Basin: $10,482,906,000						

*Flow-On includes the indirect and induced impacts of the activity.

Colorado River Use

Water Planning

Yet today, many Western rivers and streams suffer from severely diminished stream flows. Developing additional water supplies to provide for a growing population threatens to make the problem worse. Water planning must quantify and meet instream flow needs with the same level of energy, enthusiasm, and financial resources applied to developing traditional supplies. Addressing instream flows must become wholly integrated into water planning efforts. No longer can rivers and streams only appear as an afterthought, bearing avoidable adverse impacts of water development projects. As we plan for a sustainable water future, instream non-consumptive needs must play a much larger role than they have in the past. These challenges require new ways of thinking and new tools.

Gone are the days when a utility knew exactly how much water a new dam could reliably provide. Huge unknowns surround the future price of energy that will be necessary to power long water pipelines. "Risk" and "uncertainty" are the new key words of water planning; "Stationarity [i.e. large-scale, expensive, inflexible, concrete and steel approaches] is dead" said Milly et. al. in 2008. Indeed, it would be a grave mistake to look for ways to increase the region's water security by simply subscribing to the same 20th Century thinking that caused the Basin's imbalance problem in the first place.

Sustainable Strategies

Thus, the challenge is how to forge an alternative, innovative path forward that breaks the habit of getting water at the expense of our rivers and streams. This ultimately boils down to managing our existing water supplies in better ways. Meeting growing municipal demands in the Basin during the 21st Century will require a strong combination of water efficiency, reuse, voluntary sharing with agriculture, and small structural projects. These strategies are the path forward to a sustainable water supply in the Colorado River Basin and can be accomplished in a manner that promotes responsible development while protecting our Western rivers and cultural heritage.

URBAN EFFICIENCY & WATER CONSERVATION

Demand Management

In practice, water conservation and water efficiency are virtually synonymous — involving a permanent reduction in per capita water usage as the result of long-term implementation of water saving practices and technologies. The practice of implementing water efficiency programs is often called "demand management" and it will be the future of water management in the Colorado River Basin. Efficient water use is one of the few variables in the Colorado River supply and demand equation that can be readily controlled and deliberately improved at will.

Water conservation is often the cheapest, fastest, and smartest way to gain "new" water supply. While conservation does not increase the total amount of water a provider can utilize, water that is saved through conservation can be put to other uses — in effect, stretching existing supplies. Conserved water can be used by a utility to: fulfill new customer demands; increase supply reliability; and provide additional flows to the environment.

Ancillary Benefits

Water conservation also creates ancillary benefits for a water utility. Reductions in per capita demand allow utilities to delay and/or downsize expensive new water source, treatment plant, and system expansion projects. Further water conservation benefits for utilities include: demonstrating leadership to the customer base; addressing community values; possible decreased operating costs (especially through decreased energy use) — and often results in mutual benefits to other water sectors. In addition, improving water efficiency is a "no-regrets" strategy that enables water providers to maintain local control of their water supply. Conservation is inherently flexible, able to move and shift focus as need dictates.

Achievement Options

Water efficiency can be achieved through a variety of practices and technologies. Conservation programs can be focused at the utility level, such as leak detection and repair, or at the customer level, such as rebates for more efficient washing machine. Conservation efforts can be price-based (e.g., adjusting water rates), or non-price-based (e.g., educating consumers about the value of water). City land use planning and state-level legislative efforts can also promote conservation. Conservation can be focused on indoor or outdoor measures, aimed towards commercial or industrial customers, and approached through regulatory or voluntary measures. In short, there is a multitude of ways to use water more efficiently.

FUTURE SAVINGS POTENTIAL

Water efficiency has already played an important role in supporting the growth of major cities that depend on Colorado River water — and more can be done. A recent Pacific Institute study shows that water efficiency practices executed over the last 20 years have reduced demands (or alternatively, stretched supply) in the Basin by 1.4 million acre-feet — a remarkable amount of water (Pacific Institute. 2011. *Municipal Deliveries of Colorado River Basin Water*). This was achieved by implementing consistent, yet modest, water efficiency programs and practices that reduced the total per capita water use in the Basin by an average of at least one percent for every year from 1990 to 2008.

Colorado River Use

1% Conservation Target

Published literature, state planning documents, consultant analysis, and the past experience of water providers clearly indicates that per capita water use can be significantly reduced over the next several decades through currently existing conservation techniques, practices, and technology. For example, see the discussion of published literature in *Filling the Gap: Commonsense Solutions for Meeting Front Range Water Needs,* Western Resource Advocates. Trout Unlimited, and Colorado Environmental Coalition. 2011. A conservation target of reducing demand at 1 percent every year is a realistic and cost-effective approach for municipal water providers — a target already achieved by many water providers and one adopted as a future goal by several more (*see* list of communities discussed in: Western Resource Advocates. 2009. *Water Conservation in Colorado: Analyzing Level 1, Current Conservation, and 1% per Year Scenarios*. Importantly, achieving a 1% per year reduction will not require measures, lifestyle changes, or landscaping modifications beyond those already being implemented in many communities across the West.

Achieving this level of reduction in per capita water use will require substantial effort and investment by water providers, as well as by state and local governments. There will be financial costs to achieving a high level of conservation savings, but they will be significantly cheaper than traditional approaches to water supply development. *See* Kenney, D. S., M. Mazzone, and J. Bedingfield. 2010. *Relative Costs of New Water Supply Options for Front Range Cities: Phase I Report*. University of Colorado Natural Resources Law Center, Western Water Policy Program. July. These savings will not happen overnight. However, just as water supply projects are not built by themselves, water conservation savings must be achieved through concerted effort, and multiple decades provide a substantial amount of time to implement effective conservation programs and attain real water savings.

IMPORTANT EFFICIENCY PROGRAMS

Conservation Tools

Three of the most promising water conservation practices are: water loss tracking and reduction; price-based tools; and strategic land use planning. All three will need to be maximized in order to achieve a 1% per year reduction in per capita use.

Addressing Water Loss

Loss Management Toolbox

Water lost from distribution systems — both from water physically leaking out of pipes (real losses), and from poor record keeping or meter inaccuracies (apparent losses) — is a major area for efficiency improvement. Reducing system losses allows less water to be withdrawn from a source and/or more water to make it to the end user. The water loss management toolbox includes, but is certainly not limited to: leak detection and repair programs; meter repair and replacement; water pressure management; water accounting practices and technologies; and comprehensive water system audits.

In the past, 10% was considered a general benchmark for system water loss. To better highlight the loss issue, a report by the American Water Works Association encourages its members to express water loss in terms of actual volume, as this quantity of water can be directly translated into lost revenue. Beecher, J.A. 2002. *Survey of State Agency Water Loss Reporting Practices*. Prepared for the American Water Works Association. This same report identified several key issue areas for water loss policies in a national survey it conducted on reporting practices by state agencies. The results of this survey for the Colorado River Basin, updated by Western Resource Advocates, suggest there is room for improvement in water loss policies within all states (Table 3).

States Comparison

Table 3. Arizona and California Have Adopted Strong Water Loss Reduction Policies Other Basin States Have Significant Room for Improvement

Water Loss Reduction Best Practice	AZ	CA	CO	NM	NV	UT	WY
Definition of Water Loss	X	X					
Water-Loss Policy	X	X			X	X	X
Accounting and Reporting Methods	X	X	X				X
Goals and Targets	X	X	X	X		X	
Planning Requirements	X	X	X		X	X	
Compilation and Publication of Loss	X	X					
Technical Assistance	X	X	X	X	X		
Performance Incentives Offered		X					
Auditing and Enforcement	X						
TOTAL	8	8	4	2	3	3	2

Colorado River Use

Price-Based Tools

Appropriate Rate Structures

Price-based tools, such as an increasing block rate structure, have been found to be the most effective method of reducing urban demand as compared to all other methods. Olmstead, S. M., W. M. Hanemann, and R. N. Stavins. 2003. *Does Price Structure Matter? Household Water Demand Under Increasing Block and Uniform Prices*. Yale University, School of Forestry and Environmental Studies. October. Water rates play an essential role in communicating the value of water to customers.

Water utilities must ensure that revenues from water sales are sufficient to recover supply costs, but the "value" of water also includes the social and environmental opportunity costs of losing other benefits of water in its natural state and location, including the loss of ecological and recreational values. Integrating all of these costs into a water rate structure is challenging (both financially and politically).

ATTRIBUTES OF PROPERLY DESIGNED RATE STRUCTURES INCLUDE:

- Providing water at low prices for basic and essential needs, so all customers can afford it
- Rewarding conserving customers with lower unit rates
- Encouraging efficient use by sending a strong conservation price signal
- Assigning supply and development costs proportionally to the customers who place the highest burden on the supply system and the natural supply sources
- Maintaining a stable flow of revenue to the water provider

Block Rates

Inclining block rates are generally the most effective at communicating the value of water to customers. With inclining block rate designs, the unit price for water increases as the volume of water consumed increases, with higher prices being set for each higher block of water use. Customers using low volumes of water are charged a modest price and are rewarded for conservation, while those using higher volumes of water pay higher prices. This approach provides a financial incentive to conserve and ensures that lower income consumers are able to meet basic water needs at an affordable cost.

Rate Structures

EFFECTIVE WATER CONSERVATION BLOCK RATE STRUCTURES SHARE SEVERAL KEY ELEMENTS:

- APPROPRIATELY-SIZED BLOCKS: For residential customers, the size of block 1 should be based on an efficient level of monthly indoor use. Block 2 should be based on the landscape needs of a moderately landscaped property. Additional blocks should capture inefficient or wasteful water use.
- BLOCK PRICE DIFFERENTIALS ARE MEANINGFUL: The change in price between blocks should be large enough to be noticed by customers when their usage bumps them into a higher rate block.
- AVOIDANCE OF HIGH FIXED SERVICE CHARGES: A high fixed service charge may provide more stable revenues, but it directly offsets the conservation incentives provided by increasing block rates.

Appropriate Land Use Planning

Smart Growth

Proper planning for the region's new residents is perhaps the greatest opportunity to secure water efficiency savings. New developments can be planned and built to use much less water than the status quo. However, this model has been slow to catch on.

Planning future development according to the principles of "Smart Growth" (e.g., redevelopments with smaller lots, live/work buildings, and communal park spaces) has the potential to drastically reduce water use, infrastructure costs, and water loss when compared to traditional western suburban sprawl. Burchell, R.W., et al. 2002. *Costs of Sprawl-2000*. Transportation Cooperative Research Program Report 74. National Academy Press.

Incentives

LOCAL PLANNING AGENCIES AND UTILITIES CAN INCENTIVIZE THIS STYLE OF DEVELOPMENT BY:

- Offering density bonuses
- Discounting tap fees
- Prioritizing funding for water-smart projects

Integrated Planning

Local governments and water providers are also on the front lines of integrating land use and water supply planning. These local entities would benefit from communicating more thoroughly about how their decisions impact one another. Including a water use element in a community's master plan, or basing future demand projections on land use patterns are just two of the ways these entities could improve their interaction.

In addition to incentives, passage of community ordinances will likely play a critical role in the implementation of water-smart development strategies.

Water-Smart Options

WATER-SMART ORDINANCES CAN:

- Require compact forms of development
- Limit outdoor irrigable area
- Ensure new developments demonstrate an adequate supply of water before approval
- Require the installation of high efficiency fixtures

Building in a water-smart fashion entails the use of high-efficiency indoor appliances and fixtures and the planting of regionally-appropriate landscapes. Several builders across the West are pursuing green building practices in new homes and are using measures like high-efficiency toilets, ENERGY STAR® appliances, and WaterSense® fixtures to differentiate their water-conserving homes in the market place. Homes landscaped according to the principles of xeriscape and that utilize smart irrigation controllers and

Colorado River Use

alternative sources of water supply (like rainwater harvesting), can drastically reduce outdoor water needs. These water-smart building techniques lock water savings into the home and do not require behavioral changes from homeowners, ensuring reduced water use into the future.

One example of a water-smart development is the Civano community in Tucson, Arizona.

Development Aspects

KEY WATER-SMART ASPECTS OF CIVANO'S DEVELOPMENT ARE:

- Mixed densities of mixed uses
- Relatively small residential lot sizes, averaging less than 5,000 square feet
- Comprehensive xeric landscapes on private lots and in common areas
- Reclaimed water delivery system serving all landscape irrigation
- 35 percent of development area is dedicated as open space

Per Capita Use Results

In 2007, the newest development within Civano reported an average use of 67 **g**allons **p**er **c**apita per **d**ay (gpcd), i.e., nearly half the rate of Tucson's overall average of 123 gpcd. It is important to recognize that the Civano development was made possible with the cooperation of Tucson Water, whose main subsidy to the project consisted of extending its reclaimed water service to the community (*See* http://cms3.tucsonaz.gov/water/reclaimed). Although the development required higher up-front costs to cover its water efficiency infrastructure, long-term benefits are expected from significant water and energy savings.

Water conservation and efficiency will play one of the largest roles in meeting future water needs across the Colorado River basin. These conservation savings can be used to meet new demands, increase supply reliability, and benefit healthy river flows. The path will not be easy — it will take concerted effort and require more integration — but the science of water efficiency is rapidly evolving and successes will continue to be achieved.

REUSE OF EXISTING SUPPLY

Water reuse is any arrangement that utilizes legally-reusable municipal return flows to increase water supply. Return flows (for municipalities) are water that returns to a river after being treated at a wastewater treatment plant or to alluvial aquifers via percolation.

REUSE CAN BE ACCOMPLISHED IN AT LEAST TWO WAYS:

Separate Pipes

1) PHYSICAL REUSE: return flows can be physically reused for non-potable and potable purposes (through a separate purple-pipe system).

Exchange Arrangements

2) SUBSTITUTION OR EXCHANGE: return flows can be reused under various substitution or exchange arrangements. An exchange, for instance, could occur where a junior user makes water available to a senior user that is owned by the junior (e.g., reusable effluent), in exchange for permission to use or divert an equivalent amount of water to which the senior user would otherwise be entitled.

Water providers across the West are rapidly improving their ability to fully reuse existing supplies. With the consumptive use rate of municipal deliveries near 50%, there is the theoretical potential to almost double a provider's supply. While this full opportunity may not exist in many areas due to legal considerations, reuse presents a significant opportunity for additional water supply to the Basin's municipal users.

Prairie Waters Project

Along the Front Range of Colorado, a 1999 state study estimated that Denver area water users were utilizing approximately 54,000 acre-feet of reuse water per year, less than half of the 133,000 acre-feet of reuse water potentially available. Colorado Depart. of Natural Resources, Colorado Water Conservation Board. 1999. *Metropolitan Water Supply Investigation Final Report*. January. One Front Range example of a utility's progress in developing reusable supplies since 2000 is Aurora Water's "Prairie Waters Project." This project collects the City of Aurora's wastewater return flows in the South Platte River from wells near the river's bank more than 30 miles downstream from the City. The water is then piped up to a purification facility, blended with other water supplies, and delivered to Aurora customers. The project is expected to increase water supply by 3.3 billion gallons annually.

Project Benefits

BENEFITS OF THE PRAIRIE WATERS PROJECT INCLUDE:

- Use of in-basin resource is cheaper, consumes less energy, and is better for the environment than purchasing and transporting water from outside of the basin
- Project was developed quickly, significantly reducing purchasing time and transaction costs
- Greatly reduces the demand on more energy-intensive filtration

(*See*: www.prairiewaters.org)

Groundwater Replenishment

Another example is California's Groundwater Replenishment System. This System is the world's largest wastewater purification system for indirect potable use. It is a cooperative project between the Orange County Water and Sanitation Districts. It treats wastewater for seawater intrusion protection and groundwater recharge that would have otherwise been discharged to the ocean. The System produces 70 million gallons of water every day — enough to meet the water demands of almost 600,000 residents in Orange County — and decreases the provider's dependence on water from the Sacramento-San Joaquin Delta and the Colorado River Basin. *See* Markus, *TWR* #59 for a detailed article on this system.

Colorado River Use

These types of water reuse projects create a locally-controlled, reliable supply of high-quality water that is drought resistant. In many cases, reuse projects use much less energy than the original source supply, as is the case for Southern California and the Las Vegas Valley. Reuse systems are successful where research, education, and monitoring are rigorously discussed with the public and one need only to look at Singapore for an indication of how far the technology can go for meeting future needs.

VOLUNTARY SHARING WITH AGRICULTURE

Ag/Urban Use Changes

Agricultural and urban land use patterns in the Colorado River Basin have changed over the last 30 years. Driven to some extent by urban areas expanding over farmland, but also other factors more directly related to agriculture, there has been a general reduction in agricultural water use across the Basin. Reclamation, *Colorado River Basin Water Supply and Demand Study*, supra. As the largest water user in the Basin, agriculture is a natural partner for the municipal sector to court in developing new water supplies.

Ag/Urban Sharing

While the agricultural community sometimes views the growing urban demand as a threat, it is also an opportunity. The major benefit of ag/urban sharing arrangements to agricultural interests is the ability to lease water at an attractive price on a schedule established well in advance of the actual re-allocations — without losing control of the resource. Innovative arrangements — such as rotational fallowing, interruptible supply agreements, water banks, crop shifting, and deficit irrigation — could also allow for temporary transfer of irrigation water to municipal uses without permanently drying up irrigated lands.

Temporary Transfers

Fallowing & Leasing

The coupling of voluntary land fallowing and water leasing is not unprecedented. For instance, it has been utilized on a small-scale in Colorado between the Fort Morgan Water Company and Xcel Energy, and on a large-scale in California between the Metropolitan Water District of Southern California and the Palo Verde Irrigation District. A large-scale fallowing program is currently being explored in the Arkansas Basin of Colorado under the name of "Super Ditch." *See* www.waterinfo.org/super-ditch.

These types of sharing arrangements must meet the needs of both the municipal and agricultural communities, but there is no formal template on how to move forward.

Agriculture's Priorities

Agricultural community water sharing concerns include:

- Transfers from agriculture to the municipal sector must be based on a willing buyer/willing seller model
- Temporary transfers must be protected against claims of forfeiture for non-use or loss of priority
- Transfers should be shareable among multiple participating farmers in order to provide flexibility
- Transfers must not affect the water supplies of non-participating farmers or ditch companies
- Market tiers and associated prices must be established to allow participation by entities with water of varying reliability

Municipalities are primarily concerned about permanency. Providers have difficulty constructing new infrastructure and selling taps if water supplies are not guaranteed for a substantial amount of time.

These concerns have been adequately addressed in the existing ag/urban sharing agreements, which can serve as a blue-print for future water sharing opportunities. In the future, the structure, if not the details, of agreements will need to be standardized to reduce time and administrative commitments necessary for both their negotiation and implementation. However, the potential of utilizing even a small percentage of the water agriculture currently uses is just too big an opportunity to dismiss for the future sustainability of all the Basin's water users.

CONSTRUCTED WATER PROJECTS

APPROPRIATE USE

Storage Capacity

Reservoirs have been part of the West's water development strategy since the late 1800s, in response to this region's highly variable stream flows. Today, the upper Colorado River Basin has a combined storage capacity of more than 30 million acre-feet in just the major Colorado River Storage Project reservoirs — not including the many hundreds of other smaller reservoirs located throughout the states. In the lower basin, reservoirs on the main stem of the Colorado alone can store an additional 30 million acre-feet. The traditional purpose for building these reservoirs has been to capture excess runoff, which occurs in large volumes and relatively infrequently. Consequently, traditional reservoirs are fairly large and located directly in a stream channel. In addition to their environmental impacts, such large, on-stream reservoirs have other major limitations.

Reservoir Short-Comings

Common reservoir drawbacks include:

- Cost: Reservoirs are costly to build and cannot easily be expanded incrementally in response to growing demands. Rather, they must be paid for and constructed "up front," which increases their financial risk and diminishes their economic feasibility.
- Over-appropriation: As a basin becomes over-appropriated, additional storage produces ever-diminishing returns, in terms of water yield, because unappropriated runoff occurs less frequently and storage carry-over periods become longer.

Colorado River Use

Pipeline Transfers

Smart Storage

Drew Beckwith is Western Resource Advocates' water policy manager. In that position, Drew works closely with water utilities, state officials, and partner organizations around the region to find sustainable ways to meet human water needs. He is responsible for the Water Program's research, legislative, and policy initiatives that aim to advance water conservation efforts and non-traditional water supplies across the Interior West. Prior to joining WRA in 2009, Mr. Beckwith worked in the private sector, performing water supply reliability analyses for utilities in Southern California, and for the University of California Cooperative Extension, helping agricultural growers reduce nutrient and pesticide loading into local waterways. Drew Beckwith holds a Master of Environmental Science and Management degree from UC Santa Barbara and a Bachelor of Arts degree in Geology from Colorado College.

- Evaporation: Evaporation losses compound the diminishing yield problem, becoming a major limiting factor in reservoirs' ability to provide relief, both over extended drought conditions and during severe droughts that occur every few decades.
- Sedimentation: Sedimentation of reservoirs further decreases yield and can only be remedied through the manual removal of accumulated sediment, which is both time-intensive and very costly.

New pipeline proposals for the transfer of water — becoming more popular in the traditional water supply planning dialogue — are marred by the same problems. This is because reservoirs are still needed to store any water transferred through a pipeline. Pipelines are also extremely costly to build and operate. The Colorado Water Conservation Board has explored the costs of six potential pipeline proposals in the state, determining that each one would cost in the range of $8-10 billion for capital costs alone. Colorado Depart. of Natural Resources, Colorado Water Conservation Board. 2011. *Colorado's Water Supply Future, Statewide Water Supply Initiative 2010*, Final Draft. February. Any new pipeline will also require a significant amount of energy to pump water over great distances — making operations and maintenance a significant part of ongoing costs. Furthermore, these proposals generally require pumping large quantities of water from remote areas of the Basin, where compact entitlement concerns (between States), water quality issues, relationships with neighboring states, and the local political unpopularity of these projects add to the list of hurdles.

With these limitations in mind, some water providers are increasingly developing "smart storage" — smaller reservoirs designed to optimize already-developed supplies. Smart storage is now commonly developed as a means for capturing and re-regulating reusable return flows, increasing the yields of exchange rights and augmentation plans, re-regulating the yields of changed irrigation rights to meet municipal demand patterns, and increasing yields from existing water rights. In some cases, existing traditional storage capacity has been rededicated to smart storage purposes, with resulting yield increases.

Recognizing there is a place for additional structural water development approaches, new projects should be built incrementally and with a precautionary approach. Throughout the on-going water planning processes in Colorado, the conservation community has recommended that future water supply management and development efforts adhere to a set of basic "smart principles." The smart principles are offered as a guide to assure protection of rivers and other natural resources against damage that often results from structural water supply projects.

Conservation community smart principles are:

- Make full and efficient use of existing water supplies and reusable return flows before developing new diversion projects.
- Improve use of existing water supply infrastructure by integrating systems and sharing resources among water users to avoid unnecessary new diversions and duplication of facilities.
- Recognize the fundamental political and economic inequities and the adverse environmental consequences of new transbasin diversions.
- Expand or enhance existing storage and delivery before building new facilities in presently undeveloped sites, and expand water supplies incrementally to better utilize existing diversion and storage capacities.
- Recognizing that market forces now drive water reallocation from agricultural to municipal uses, structure such transfers, where possible, to maintain agriculture and in all cases to mitigate the adverse impacts to rural communities from these transfers.
- Involve all stakeholders in decision-making processes and fully address the inevitable environmental and socioeconomic impacts of increasing water supplies.
- Design and operate water diversion projects to leave adequate flows in rivers to support healthy ecosystems under all future scenarios, even if water availability diminishes in the future as a result of climate change or other factors.

CONCLUSION

THOUGHTS ON THE PATH FORWARD

Water is critical to every component of life in the West. The high quality of life we enjoy is at risk, however, unless decision-makers shift to more innovative, balanced, and cost-effective approaches for supplying water to our growing population while sustaining our rivers and streams. We must look beyond old ways of thinking and change the mindset away from grandiose pipe dreams. None of the strategies described above are "new," there simply needs to be more focus and effort on implementing them at all levels of policy and planning. Our efforts moving forward should recognize that there are many 21st Century approaches for meeting future water needs, and the time is now to focus on real, achievable solutions.

For Additional Information:
Drew Beckwith, 720/ 763-3726 or dbeckwith@westernresources.org

Water Reuse

WATER REUSE IN THE WEST

INSTITUTIONAL RESTRAINTS

WESTERN STATES WATER COUNCIL REPORT

by Nathan Bracken, Western States Water Counsel (Salt Lake City, UT)

Introduction

Water Supply Benefits

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.

WSWC Report

The Western States Water Council (WSWC) has finalized a detailed report describing the institutional and other factors that affect water reuse in eighteen western states. The report — entitled "*Water Reuse in the West: State Programs and Institutional Issues*" — describes the various efforts and programs that western states use to address barriers and summarizes how states regulate reuse. WSWC prepared the report to serve as a resource for states and other interested parties seeking to encourage reuse and resolve the potential barriers associated with the practice. Although 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.

WSWC serves as a resource and advisor to the governors of 18 western states on water policy issues affecting the West. The governors are *ex-officio* members of the WSWC and appoint members to represent their individual states. Current members serve at the pleasure of their respective governors and include governors' staff, state natural resource department directors, state engineers, state water quality managers, assistant attorney generals, private attorneys, and other water experts.

Water Reuse in the West

State Specific Information

For each member state, this report contains information pertaining to:

- State laws and regulations governing reuse
- Available funding options for reuse projects
- Legal, political, technical, and institutional issues that encourage or discourage reuse
- 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 an appendix.

Common Barriers

State summaries show that the extent to which reuse occurs and the factors that encourage or impede it vary significantly 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.

States' Legal Frameworks

Appendix B of the report contains a table that identifies the laws, regulations, guidance documents, and other information regarding each state's legal and regulatory framework for water reuse.

The WSWC developed the report by surveying state regulators throughout the West. Among other things, many regulators reported that reuse can provide — or already provides — reliable water supplies to address growing water demands. At the same time, regulators identified a number of legal, institutional, and societal considerations that can impact reuse. These considerations include: public perception and acceptance; regulatory impediments; and available funding for projects. The report also finds that the degree to which these and other issues that encourage or discourage reuse varies considerably among states. Thus, it finds that there is no "one size-fits-all" approach for addressing barriers to reuse, and that

states wanting to encourage reuse will need to develop solutions and programs tailored to their specific circumstances. Nevertheless, the report notes that states can still learn from each other when determining how and whether to investigate institutional mechanisms for encouraging reuse. As noted above, one common finding is that governors, state legislatures, and relevant state agencies often play an important role in encouraging reuse, and many recent efforts aimed at removing barriers and encouraging reuse stem from some type of executive order, legislative directive, or administrative policy.

The report further finds that the development of effective state reuse efforts and programs may also require robust public participation and interagency coordination. For example, Arizona, California, Oregon, and Washington have each engaged in relatively recent reuse efforts in which state regulators from relevant agencies worked jointly with stakeholders in work groups or task forces to collaboratively develop ways of addressing barriers to reuse. Some of the reported benefits of this approach include: 1) expanding state knowledge of the issues affecting reuse; 2) additional resources to identify and address barriers; 3) increased coordination; and 4) greater public support for resulting laws, regulations, and polices.

A significant number of states also expressed concern about the best way to address emerging contaminants, particularly with respect to treatment and disposal methods. Moreover, there appears to be a fair amount of uncertainty about the state of the science regarding the human health impacts of these contaminants, and some states have expressed a desire for more studies on this topic.

Conclusion

In sum, the report finds that 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. It may also present communities with an alternate wastewater disposal method and help abate pollution by diverting wastewater effluent from sensitive water supplies. Although significant obstacles exist, the report finds that the scarcity of fresh water supplies and the abundance of wastewater from growing populations may make reuse more practical and cost effective. Increasingly stringent wastewater discharge requirements may also make reuse a more feasible or attractive alternative to treatment upgrades in some cases.

Report Availability

The University of California, Hastings College of Law will publish the report in the Spring 2012 edition of its *West-Northwest Journal of Law and Environmental Policy*. A pre-publication version is available at: www.westgov.org/wswc/publicat.html.
To request a hard copy, please contact Julie Groat at jgroat@wswc.utah.gov.

For Additional Information:
Nathan Bracken, WSWC, 801/ 685-2555 or nbracken@wswc.utah.gov

Nathan S. Bracken is Legal Counsel for WSWC and works with its members to develop and implement policies and initiatives on water issues affecting the western US. He has prepared and published a number of articles, reports, and white papers on western water issues and is the Editor of *Western States Water*, WSWC's weekly newsletter. He also participates in a variety of collaborative work groups focused on water-related issues, including climate change, Indian water rights, and water transfers. Prior to joining WSWC, Mr. Bracken worked in private practice as an attorney and mediator. He has a B.A. in English from Brigham Young University and a J.D. from the University of Utah.

WATER BRIEFS

HABITAT CONSERVATION US
FARMLAND CONSERVATION RESERVES
USDA'S CRP PROGRAM

The US Department of Agriculture (USDA) will distribute Conservation Reserve Program (CRP) rental payments to participants across the country. USDA's Farm Service Agency administers CRP, while technical support functions are provided by public and private sector partners. CRP is a voluntary program that helps agricultural producers safeguard environmentally sensitive land and provide millions of acres of habitat for game and non-game wildlife species. Participants enroll in CRP contracts for 10 to 15 years. Currently, total CRP enrollment stands at 29.9 million acres.

By reducing water runoff and sedimentation, CRP protects groundwater and helps improve the condition of lakes, rivers, ponds, and streams. Acreage enrolled in the CRP is planted to resource-conserving vegetative covers, making the program a major contributor to increased wildlife populations around the country.

The Commodity Credit Corporation (CCC) makes annual rental payments based on the agriculture rental value of the land, and it provides cost-share assistance for up to 50 percent of the participant's costs in establishing approved conservation practices.

USDA also issues non-rental CRP payments throughout the year. These payments include a 50 percent expense reimbursement for establishing and managing cover as well as incentive payments for enrolling eligible high priority conservation practices.

Beginning in October, producers holding 752,000 contracts on 417,000 farms began receiving an average CRP rental payment of $55.06 per acre. Producers will earn an average payment of $4,115 per farm enrolled in the program. Included in the totals are 414,000 contracts (5.1 million acres) for continuous CRP enrollments and 338,000 contracts (24.8 million acres) enrolled under general CRP. In all, the payments total approximately $1.7 billion.

For info: FSA site: www.fsa.usda.gov.

POLLUTED WATERS LIST CA
303(d) LIST SUBMITTED BY STATE

More of California's waterways are impaired than previously known, according to a list of polluted waterways submitted by the state to EPA. Following public comment, EPA finalized the additions on October 11. Increased water monitoring data shows the number of rivers, streams and lakes in California exhibiting overall toxicity have increased 170 percent from 2006 to 2010.

The federal Clean Water Act requires states to monitor and assess their waterways and submit a list of impaired waters to EPA for review (known as a "303(d) list"). The 2010 list is based on more comprehensive monitoring as well as new assessment tools that allow the state to evaluate larger quantities of data. The data showed several important trends including that many more beaches, both inland and coastal, are on the 2010 list because bacteria reached unsafe levels for swimming. This increase is largely driven by a more extensive review of data collected by counties.

California has some of the most magnificent rivers, lakes and coastal waters in the country. However, of its 3.0 million acres of lakes, bays, wetlands and estuaries, 1.6 million acres are not meeting water quality goals, and 1.4 million acres still need a pollution clean-up plan, known as a Total Maximum Daily Load (TMDL). Of the 215,000 miles of shoreline, streams and rivers, 30,000 miles are not meeting water quality goals, and 20,000 miles still need a TMDL. The most common contaminants in these waterways are pesticides and bacteria, followed by metals and nutrients. "This list of impaired waters is a wake-up call to continue the critical local and statewide work needed to heal California's damaged waters," said Jared Blumenfeld, EPA's Regional Administrator for the Pacific Southwest.

The numbers of listings showing pollutants in fish at levels too high for safe human consumption has increased 24% from 2006 to 2010, with the greatest increases seen in mercury. Rather than signaling an increase in fish contamination, this trend is due to California's recent statewide sport fish monitoring effort. Additionally, some pollutants such as DDT are no longer manufactured and are slowly decreasing in concentration over time. Waters identified as impaired by pesticides showed a 36% increase from the prior list, likely a result of the more thorough monitoring required under the State's Irrigated Lands Regulatory Program. Under this program, close collaboration between the Water Boards and the Department of Pesticide Regulation has resulted in reduced pesticide discharges to surface and groundwater.

Work is already underway in California to address hundreds of waters previously listed as impaired. EPA will continue to work with the state to develop and implement additional Total Maximum Daily Loads (TMDLs) to address the remaining waters.

For info: Supporting documents for EPA's listing decision available at: www.epa.gov/region09/water/tmdl/california.html; Concerning Total Maximum Daily Loads, see EPA's website: http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/index.cfm

NATURAL GAS WASTEWATER US
COALBED & SHALE DISCHARGES
EPA STANDARDS DEVELOPMENT

EPA announced a schedule on October 20 to develop standards for wastewater discharges produced by natural gas extraction from underground coalbed and shale formations. No comprehensive set of national standards exists at this time for the disposal of wastewater discharged from natural gas extraction activities. Over the coming months, EPA will begin the process of developing a proposed standard with the input of stakeholders.

Recent technology and operational improvements in extracting natural gas resources, particularly shale gas, have increased gas drilling activities across the country. Production from shale formations has grown from a negligible amount just a few years ago to almost 15% of total US natural gas production; this share is expected to triple in the coming decades. The sharp rise in domestic production has improved US energy security and created jobs. The administration is committed to ensuring that it continues to leverage these resources responsibly, including understanding any potential impact on water resources, according to EPA.

Currently, wastewater associated with shale gas extraction is prohibited from being directly discharged to waterways and other waters of the US. While some of the wastewater from shale gas extraction is reused or re-injected, a significant amount still requires disposal. As a result, some shale gas wastewater is transported to treatment plants, many of which are not properly equipped to treat this type of wastewater. EPA will consider

WATER BRIEFS

standards based on demonstrated, economically achievable technologies for shale gas wastewater that must be met before going to a treatment facility.

Wastewater associated with coalbed methane extraction is not currently subject to national standards for being directly discharged into waterways and for pre-treatment standards. Its regulation is left to individual states. For coalbed methane, EPA will be considering uniform national standards based on economically achievable technologies.

Information reviewed by EPA, including state supplied wastewater sampling data, have documented elevated levels of pollutants entering surface waters as a result of inadequate treatment at facilities. To ensure that these wastewaters receive proper treatment and can be properly handled by treatment plants, EPA will gather data, consult with stakeholders and solicit public comment on a proposed rule for coalbed methane in 2013 and a proposed rule for shale gas in 2014.
For info: EPA website: http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/

TOXIC POLLUTANTS STDS OR
FISH CONSUMPTION RATE APPROVED

On October 17, EPA approved Oregon's revisions to the Clean Water Act human health criteria for toxics in the state's water quality standards. The human health criteria for 113 toxic pollutants is based on a per-capita fish consumption rate of 175 grams/day (equivalent to 23 eight-ounce fish meals/month), nearly ten times the previous standard. The revised standards establish goals for Oregon's surface waters, including protecting sources of drinking water and helping ensure that fish from Oregon's waters are safe to eat. EPA's approval makes the revised state standards, including new NPDES permitting implementation policies, effective for state and federal Clean Water Act programs. Two other significant revisions approved by EPA are a revised variance provision for situations where a city or business operating under a water quality permit cannot meet discharge limits for a pollutant, and a new site-specific background pollutant criteria provision that will be used to account for background pollutants under certain circumstances.

"The State of Oregon, in partnership with the Confederated Tribes of the Umatilla Indian Reservation, conducted a thoughtful public dialogue with tribal governments, citizens, municipalities, industry and others to understand the issues associated with increasing the fish consumption rate used in your water quality standards…the State of Oregon and DEQ [Oregon Department of Environmental Quality] adopted revised criteria that will serve as a national and regional model," Dennis J. McLerran, Regional Administrator of EPA for the Pacific Northwest stated. *See* Soscia, *TWR* #84 for a detailed article on the revised standards.

In conjunction with revisions to the human health standards, DEQ revised certain water quality rules to clarify procedures and create new permitting tools (i.e. intake credits, a site-specific background pollutant criterion, and a revised variance rule) for implementing the standards. The revisions also addressed DEQ's coordination with the state Departments of Agriculture and Forestry in carrying out the agencies' roles related to nonpoint sources of pollution. DEQ worked with stakeholders to revise regulations to clarify that forestry and agricultural activities regulated under the Oregon Forest Practices Act and state Agriculture Water Quality Management Act must meet water quality standards and can be subject to Total Maximum Daily Load allocations where adequate data exists.
For info: DEQ website: www.deq.state.or.us/wq/standards/humanhealthrule.htm; EPA website: http://yosemite.epa.gov/R10/water.nsf/webpage/Oregon+Water+Quality+Standards

INSTREAM ATLAS WA
DRAFT TOOL RELEASED

The Washington Department of Ecology's Office of Columbia River (OCR) has a new tool to help find streamflow improvement projects that provide the most benefits to fish. Created with the help of the Washington Department of Fish and Wildlife, the *Columbia River Instream Atlas* (Atlas) identifies where fish may be struggling and why and where the most success with streamflow investments is possible. The Legislature created OCR in 2006 and tasked it with finding new water supplies to meet instream and out-of-stream water needs.

The Atlas looks at three important factors when making streamflow enhancement decisions: habitat, streamflows, and the amount of fish in a stream. The Atlas scores each of the factors for portions of streams (called reaches) located in eight of the most "fish critical" watersheds in eastern Washington. The scores allow projects to be tailored to make needed improvements and maximize returns.

For example, a good candidate for water enhancement might be a reach that scores low in fish utilization, poor in streamflows, and fair or good in habitat. A little extra water in that reach would provide a lot of benefit to fish. Alternatively, a reach that scores poor in habitat, low in fish utilization and poor or fair in streamflows would likely require habitat restoration before streamflow issues are tackled.

Before OCR funds any instream flow project, it must find a new water supply nearby to provide the water. The Office has developed nearly 150,000 acre-feet of new supply since 2006.

The Atlas is part of a larger *Columbia River Basin Long-Term Water Supply and Demand Forecast* (Forecast) OCR will publish this month. Both documents are currently available in draft form, which can be downloaded at the website shown below. OCR is accepting comments on the Atlas and the Forecast through October 31st.
For info: Ecology website: www.ecy.wa.gov/programs/wr/cwp/wsu_supply-demand.html

GROUNDWATER SURVEY CA
MANAGEMENT ACTIVITIES

The Association of California Water Agencies (ACWA) and the California Department of Water Resources (CDWR) are conducting a survey on groundwater management activities in California. The survey is aimed at compiling information on groundwater management efforts statewide to share with policy makers and stakeholders. The information is expected to be a powerful tool to illustrate that local and regional entities are effectively managing groundwater resources and that statewide permitting and oversight could be counterproductive to existing and planned local investments, according to ACWA.

The information will also help identify areas where local groundwater management needs to be expanded and where local agencies may need assistance to develop and implement sustainable groundwater management

WATER BRIEFS

activities. This is important to securing funding for groundwater projects. ACWA and CDWR are also interested in learning about groundwater banking projects to provide information for those who may want to learn more about this valuable water management tool.

CDWR partnered with ACWA to gather information for the groundwater content enhancements that will be included in California Water Plan Update 2013. CDWR recognizes the importance of groundwater to the overall water supply and quality portfolio and would like the next California Water Plan to include more detail and reflect as many basins and subbasins as possible that are covered by groundwater management plans.
For info: www.acwa.com/groundwater_survey; Danielle Blacet, ACWA, 916/441-4545 or Abdul Kahn, DWR, 916/651-9660

WATER LAW TREATISE OR OREGON WATER MANAGEMENT

Janet Neuman, considered one of the foremost water policy experts in the Pacific Northwest, has written a new book that details water law and water rights in Oregon. Neuman, now an attorney with the Portland law firm of Tonkon Torp, taught water law at Lewis & Clark law school since 1992 until recently. She is also past president of the Oregon Water Trust and currently serves on the board of The Freshwater Trust. Neuman served on the Western Water Policy Review Advisory Commission, which in 1998 released recommendations on the federal role in western water management.

Oregon Water Law: A Comprehensive Treatise on the Law of Water and Water Rights in Oregon provides an overview of the state's water resources, a brief history of Oregon water law, and a comprehensive discussion of the types of state water rights and how these rights are obtained, used, regulated, and reallocated. The book also discusses environmental issues, public rights to use water bodies, and court adjudications related to water use in Oregon. The book is intended as a reference for policy makers and a guide for both new and experienced lawyers practicing in such diverse areas as real estate, trusts and estates, tax, land use and environmental law.
For info: Janet Neuman, 503.802.5722 or janet.neuman@tonkon.com

ANIMAL FEED OPERATIONS US CAFO REPORTS PROPOSAL

On October 14, EPA proposed that **c**oncentrated **a**nimal **f**eeding **o**perations (CAFOs) submit a specific set of basic operational information so that EPA can more effectively carry out its CAFO permitting programs on a national level and ensure that CAFOs are implementing practices to protect water quality and human health. The proposal, which is part of a settlement agreement reached with the Natural Resources Defense Council, Waterkeeper Alliance, and the Sierra Club, will be open for public comment for 60 days after publication in the Federal Register. The National Pollutant Discharge Elimination System (NPDES), a part of the Clean Water Act, requires that CAFOs obtain a permit from EPA or authorized states before discharging any pollutants from their operations into a water of the United States. CAFOs that do not discharge pollutants do not need a NPDES permit. EPA's proposal does not change which CAFOs need permits under NPDES.
For info: EPA internet site: http://cfpub.epa.gov/npdes/afo/aforule.cfm

WETLANDS DECLINE US USFWS SURVEY

America's wetlands declined slightly from 2004-2009, underscoring the need for continued conservation and restoration efforts, according to a report issued recently by the US Department of the Interior's US Fish and Wildlife Service (USFWS). The findings are consistent with the USFWS Status and Trends Wetlands reports from previous decades that reflect a continuous but diminishing decline in wetlands habitat over time.

The report, which represents the most up-to-date, comprehensive assessment of wetland habitats in the US, documents substantial losses in forested wetlands and coastal wetlands that serve as storm buffers, absorb pollution that would otherwise find its way into the nation's drinking water, and provide vital habitat for fish, wildlife and plants.

The net wetland loss was estimated to be 62,300 acres between 2004 and 2009, bringing the nation's total wetlands acreage to just over 110 million acres in the continental United States, excluding Alaska and Hawaii. The rate of gains from reestablishment of wetlands increased by 17 percent from the previous study period (1998 to 2004), but the wetland loss rate increased 140 percent during the same time period. As a consequence, national wetland losses have outpaced gains. The net loss includes a combination of gains in certain types of wetlands and losses in other types, especially forested wetlands.

The southeast United States, primarily freshwater wetlands of the Atlantic and Gulf coastal plain, and the Lower Mississippi River experienced the greatest losses. Losses were also observed in the Great Lakes states, the prairie pothole region, and in rapidly developing metropolitan areas nationwide. The reasons for wetland losses are complex and reflect a wide variety of factors, including: changes in land use and economic conditions; the impacts of the 2005 hurricane season on the Gulf Coast; and climate change impacts.

This report does not draw conclusions regarding the quality or condition of the nation's wetlands. Rather, it provides data regarding trends in wetland extent and type, and it provides information to facilitate ongoing collaborative efforts to assess wetland condition. Further examination of wetland condition on a national level has been initiated by EPA in conjunction with the USFWS and other federal, state, and Tribal partners.

Wetlands provide a multitude of ecological, economic, and social benefits. They provide habitat for fish, wildlife, and a variety of plants. Wetlands are nurseries for many saltwater and freshwater fishes and shellfish of commercial and recreational importance. Wetlands are also important landscape features because they hold and slowly release floodwater and snow melt, recharge groundwater, act as filters to cleanse water of impurities, recycle nutrients, and provide recreational opportunities for millions of people.

The report, *Status and Trends of Wetlands in the Conterminous United States 2004-2009*, is the most recent of the five reports to Congress reporting on the status and trends of wetlands across much of the United States since the mid-1950s.
For info: USFWS website: www.fws.gov/wetlands/StatusAndTrends2009

CALENDAR

November 15 CA
Hydraulic Fracking Seminar, Santa Monica. Sheraton Delfina. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

November 15 AZ
GoGreen '11 Phoenix Conference, Phoenix. Phoenix Convention Ctr. West. For info: http://phoenix.gogreenconference.net/

November 15 WA
Nitrogen Contribution of Onsite Septic Systems to Hood Canal Estuary (Lecture), Seattle. 223 Anderson Hall, UW, 8:30-9:20am. Speaker: Prof. Mike Brett. For info: www.urbanwaters.org

November 16 IL
Cleaning Up Chicago's Rivers & Waterways Seminar, Chicago. Gleacher Ctr. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

November 16-18 AZ
National Water Resources Ass'n Annual Convention, Tucson. Loews Ventana Canyon. For info: NWRA, 703/ 524-1544 or www.nwra.org/

November 16-18 WA
Pacific Salmonid Spawning Habitat Restoration Course, Issaquah. Friends of the Issaquah Salmon Hatchery Learning Ctr. Presented by EOS Alliance. For info: www.eosalliance.org/

November 17 CO
Hydraulic Fracturing: Core Issues & Trends Workshop, Denver. Grand Hyatt. WEBCAST also. For info: Mark Holland, RMMLF, 303/ 321-8100 x106, mholland@rmmlf.org or www.rmmlf.org

November 17 CA
Sustainable Planning, Environmental Site Design & Development Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

November 22 OR
Conservation Easements/Water Quality & Toxics Seminar, LaGrande. Eastern Oregon University, Hoke 309. Sponsored by Water for Life & Schroeder Law Offices. For info: Helen Moore, WFL, 503/ 375-6003 or helen.moore@waterforlife.net

November 22 WA
Food Web Modeling in Puget Sound: Pushing the Limits & the Limits Pushing Back (Lecture), Seattle. 223 Anderson Hall, UW, 8:30-9:20am. Speaker: Chris Harvey, NOAA Fisheries. For info: www.urbanwaters.org

November 29 WA
Ecosystem Service Assessment of Bioextraction of Nitrogen Through Shellfish Aquaculture Harvest (Lecture), Seattle. 223 Anderson Hall, UW, 8:30-9:20am. Speaker: Katharine Wellman, Northern Economics. For info: www.urbanwaters.org

November 29-Dec. 2 OR
OWRC Annual Meeting, Hood River. Best Western Hood River. For info: Anita Winkler, Oregon Water Resources Congress, 503/363-0121 or www.owrc.org/

November 29-Dec. 2 CA
ACWA 2011 Fall Conference & Exhibition, Anaheim. Marriott Hotel. For info: Ass'n of California Water Agencies, www.acwa.com/content/event-registration

November 29-Dec. 2 NV
2011 NGWA Ground Water Expo & Annual Meeting, Las Vegas. Convention Ctr. Sponsored by National Ground Water Ass'n. For info: http://groundwaterexpo.com or www.ngwa.org

November 30-Dec. 3 CA
Groundwater Resources Management: Adaptation Measures to Water Scarcity - Second UNESCO-UCI 2011 Conference, Irvine. For info: Jean Fried, UC Irvine, jfried@uci.edu

December 1-2 AZ
Western Water Law Conference, Phoenix. Arizona Biltmore Resort. For info: CLE International, 800/ 873-7130 or website: www.cle.com

December 1-2 CO
Land Use: What Now? Seminar, Denver. Grand Hyatt. For info: CLE International, 800/ 873-7130 or website: www.cle.com

December 2 CA
Implementing Habitat & Natural Communities Conservation Plans Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

December 5 TX
Hydraulic Fracking Seminar, Austin. Omni Hotel at Southpark. For info: CLE International, 800/ 873-7130 or website: www.cle.com

December 5 CO
The Colorado River Basin & Climate: Perfect Storm for the 21st Century? (Speaker Series), Colorado Springs. Colorado College. Stephen Saunders & Jeff Lukas, Speakers. For info: www2.coloradocollege.edu/stateoftherockies/speakerseries.html

December 6 OR
Conservation Easements/Water Quality & Toxics Seminar, Klamath Falls. Sponsored by Water for Life & Schroeder Law Offices. For info: Helen Moore, WFL, 503/ 375-6003 or helen.moore@waterforlife.net

December 6 OR
Climate Solutions' 3rd Annual Oregon Dinner, Portland. Hilton Portland. http://climatesolutionsdinner2011.eventbrite.com/.

December 6 WA
Pre- and Post-Urbanization Sedimentary Reconstruction Record Reductions in Anthropogenic Burdens & the Current Status of Puget Sound Water Quality with Respect to Historical Trends (Lecture), Seattle. 223 Anderson Hall, UW, 8:30-9:20am. Speaker: Jill Brandenberger, Pacific NW National Marine Science Lab. For info: www.urbanwaters.org

December 7-8 OR
Northwest Environmental Conference & Tradeshow, Portland. Hilton Portland & Executive Tower. For info: NWEC, 503/ 244-4294 x208 or www.nwec.org

December 8 CA
Sustainable Planning, Environmental Site Design & Development Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

December 8-9 CO
Water Marketing: The Essentials of Buying & Selling Water Rights Conference, Denver. Grand Hyatt. For info: CLE International, 800/ 873-7130 or website: www.cle.com

December 8-9 OR
Oregon Land Use Law - 15th Annual Conference, Portland. World Trade Center Two. Live Webcast. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

December 8-9 CA
California Water Law Seminar, Sacramento. Hilton Arden West. For info: CLE International, 800/ 873-7130 or website: www.cle.com

December 9 WA
Washington Water Law & the Public Trust Conference, Seattle. The 2100 Bldg., 2100 24th Ave. S.. Sponsored by Center for Environmental Law & Policy. For info: CELP: cle@clep.org, 509/ 209-2899 or www.celp.org

December 9 AZ
WRRC Brownbag: Sandra Fabritz-Whitney, Director ADWR, Tucson. WRRC, 350 N. Campbell Ave., 12-1:30pm. Sponsored by Water Resources Reseach Center. For info: Jane Cripps, WRRC, 520/ 621-2526 or jcripps@cals.arizona.edu

December 10-13 FL
Ecosystem Markets 2012 Conference, Ft. Lauderdale. Mariott Harbor Beach. For info: Jhanna Gilbert, University of Florida, 352/ 392-5930, jhanna@ufl.edu or www.conference.ifas.ufl.edu/aces

December 14-16 NV
Colorado River Water Users Association Annual Conference, Las Vegas. Caesar's Palace. For info: www.crwua.org/

December 14-Jan. 25 WEB
Sustainable Water Management & Landscape Design Course, Internet. Sponsored by UC Davis. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

December 16 CA
GIS for Watershed Analysis: Intermediate Course, Davis. 1137 Plant & Enviro Sciences Bldg., UC Davis. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

December 20 OR
Conservation Easements/Water Quality & Toxics Seminar, Klamath Falls. Sponsored by Water for Life & Schroeder Law Offices. For info: Helen Moore, WFL, 503/ 375-6003 or helen.moore@waterforlife.net

The Water Report
Water Rights, Water Quality & Water Solutions in the West
260 N. Polk Street • Eugene, OR 97402

CALENDAR

(continued from previous page)

January 9 OR
Source Control Workshop, Portland. For info: Holly Duncan, Environmental Law Education Center, 503/ 282-5220, hduncan@elecenter.com or www.elecenter.com

January 10-13 FL
Environmental Awareness Bootcamp, Orlando. Buena Vista Suites. For info: EPA Alliance Training Group, 713/ 703-7016 or www.epaalliance.com

January 11 HI
Hawaii Water Law Seminar, Honolulu. YWCA. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

January 12 HI
Financing Renewable Energy Seminar, Honolulu. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

January 13 WA
SEPA & NEPA Seminar, Seattle. TENTATIVE. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

January 17 OR
Conservation Easements/Water Quality & Toxics Seminar, Baker City. Sponsored by Water for Life & Schroeder Law Offices. For info: Helen Moore, WFL, 503/ 375-6003 or helen.moore@waterforlife.net

January 19 AK
6th Annual Permitting Strategies in Alaska, Anchorage. Anchorage Convention Ctr. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

January 24 AZ
WRRC 2012 Annual Conference: Urbanization, Uncertainty & Water: Planning for Arizona's Second Hundred Years, Tucson. Student Union Memorial Ctr. For info: Jane Cripps, Water Resources Research Center, 520/ 621-2526 or jcripps@cals.arizona.edu

January 24-25 NV
Indian Water Rights & Water Law Class, Las Vegas. For info: www.falmouthinstitute.com or 800/ 992-4489

January 26 OR
Impacts of FEMA Floodplain Mapping: Regulatory Changes & Implications for Local Jurisdictions & Property Owners Seminar, Portland. World Trade Center. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

January 26-27 WA
Endangered Species Act Seminar, Seattle. Grand Hyatt. Live Webcast. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

January 26-27 DC
Natural Resources Damages Seminar, Washington. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

January 30 CO
Unheard Voices of the Colorado River Basin: Bringing Mexico & Native American Tribes to the Table (Speaker Series), Colorado Springs. Colorado College. Bidtah Becker & Osvel Hinojosa, Speakers. For info: www2.coloradocollege.edu/stateoftherockies/speakerseries.html

January 30-Feb. 2 FL
The Water & Wastewater Utility Management Conference 2012, Miami. Hyatt Regency. For info: Water Environment Federation, 800/ 666-0206 or WEFTEC website: www.weftec.org

January 30-Feb. 3 WA
11th Annual Stream Restoration Symposium, Skamania. Skamania Lodge. For info: River Restoration Northwest: www.rrnw.org

February 1 WA
Impacts of FEMA Floodplain Mapping Seminar, Seattle. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

February 2-3 AZ
Water Rights & Trading Regional Summit, Scottsdale. Montelucia Resort & Spa. Sponsored by WestWater Research & American Water Intelligence. For info: jmc@globalwaterintel.com

February 6 CO
Healthy Forests for the Colorado River Basin (Speaker Series), Colorado Springs. Colorado College. Harris D. Sherman, Speaker. For info: www2.coloradocollege.edu/