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DIXIE DRAIN PHOSPHORUS REMOVAL

CITY OF BOISE PROJECT

by Erika Malmen, Perkins Coie LLP (Boise, ID)

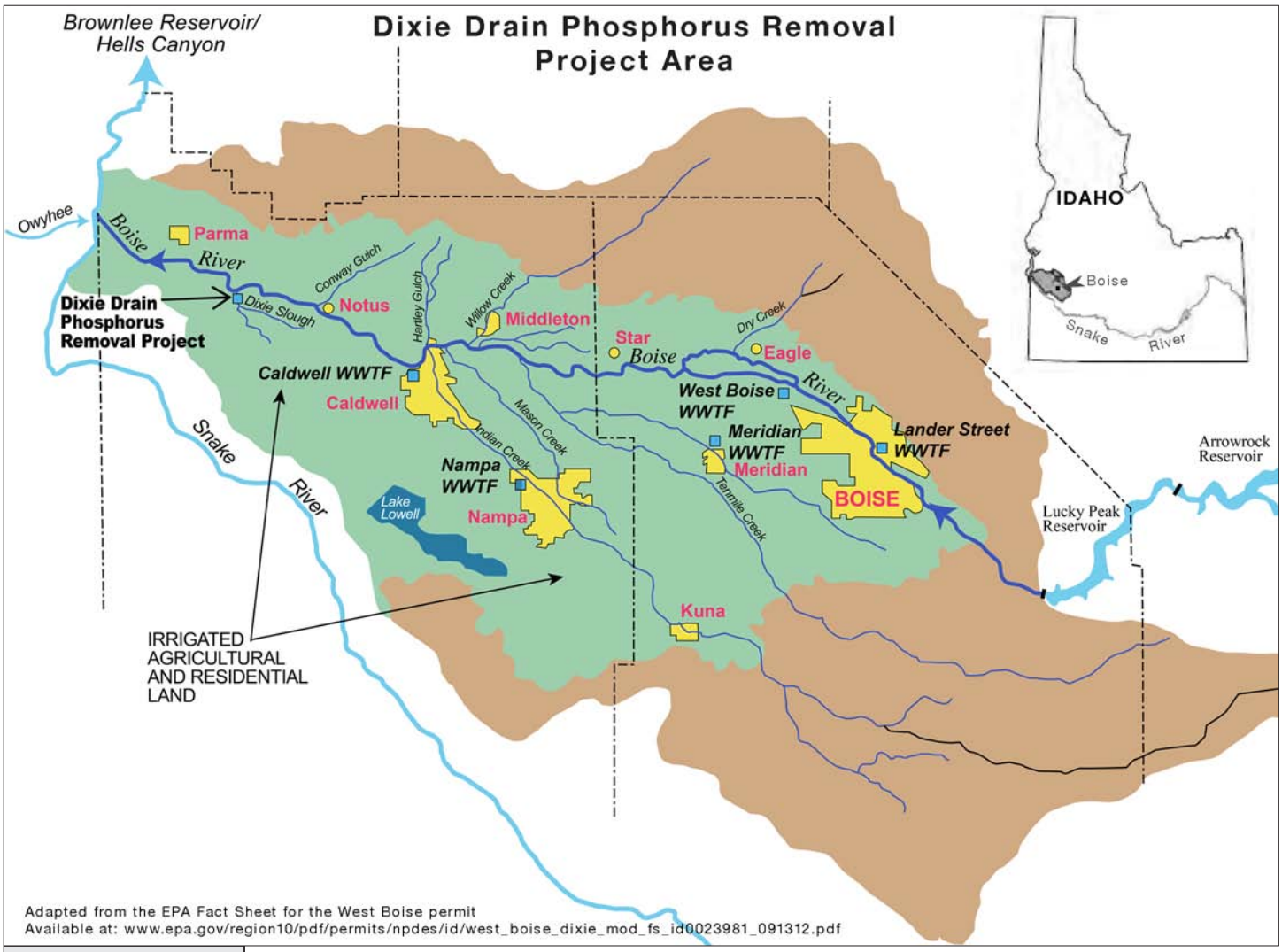
The City of Boise understood that phosphorus levels in the Snake River was an issue that must be addressed. The problem was that there was nothing the City could readily do about it. The science was apparently (and incredibly) undisputed. Even if the City upgraded its wastewater treatment facilities and reduced its phosphorus load to the Boise River, it would have little effect on phosphorus loads entering the Snake River. It became clear that the stakeholders would need to think outside the traditional Clean Water Act box in coming up with solutions to this problem. This article discusses the City of Boise's Dixie Drain Phosphorus Removal Project (Project), the National Pollutant Discharge Elimination System (NPDES) permitting process, and the process for obtaining the water right (permit) needed to operate the Project.

BACKGROUND

The Dixie Drain (or "Slough" — as it is sometimes called) is not as small in size as one might reasonably assume, nor is it located within the City of Boise, or even in Ada County. The Dixie Drain is located west of Boise in Canyon County, Idaho, and is considered a tributary to the Boise River (*see* map, page 2).

The Boise River system is a heavily managed river with a complex network of irrigation canals and drainage systems. All uses in the Boise River watershed contribute to its complexity. Phosphorus comes from a variety of sources, including: animal and human waste; disturbed soils on farms and construction sites; some industries; and fertilizer runoff from urban storm drains and agricultural lands. At various points in the mainstem Boise River, water is diverted for agricultural use and agricultural return flow is returned to the River. Irrigation flows are monitored by the Idaho Department of Water Resources (IDWR or Department). US Geologic Survey (USGS) gages provide long-term flow data at key locations. Due to the management regime and natural characteristics of the system, low flows occur at different times of the year depending on the location. The lowest flows at Parma, Idaho — near to where the Boise River flows into the Snake River — occur in August. Based on USGS gauge data, the 10th percentile flow for August is 350 **c**ubic **f**eet per **s**econd (cfs), and the mean August flow is 783 cfs. In the upstream reach near the West Boise Waste Water Treatment Facility (WWTF), the lowest flows occur in September.

Development of irrigated agriculture in the western Boise River Valley began in 1899 with the construction of private ditches and other conveyance facilities. The diversion and application of Boise River water was very successful initially, but late-season supplies were limited, and water-logging of lands was reported as early as 1904. However, it was soon recognized that subsurface water could be collected in deep drainage channels and subsequently added to the canal water supplies at lower elevations in the system. Thus, drain development provided additional water that could be utilized to enhance the water supply system while also providing rapid restoration of water-logged land and alkali removal through leaching and reduction of high water tables. In many cases, drainage channels were enhanced portions or additions to natural sloughs that were deepened to provide more effective groundwater drainage.



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Dixie Slough is a continuously flowing agricultural drain that discharges near the mouth of the Boise River (at Parma). During the summer months, the Slough consists of agricultural runoff and groundwater. During the winter months, the Drain may also include discharge effluent from the City of Greenleaf Wastewater Treatment Facility.

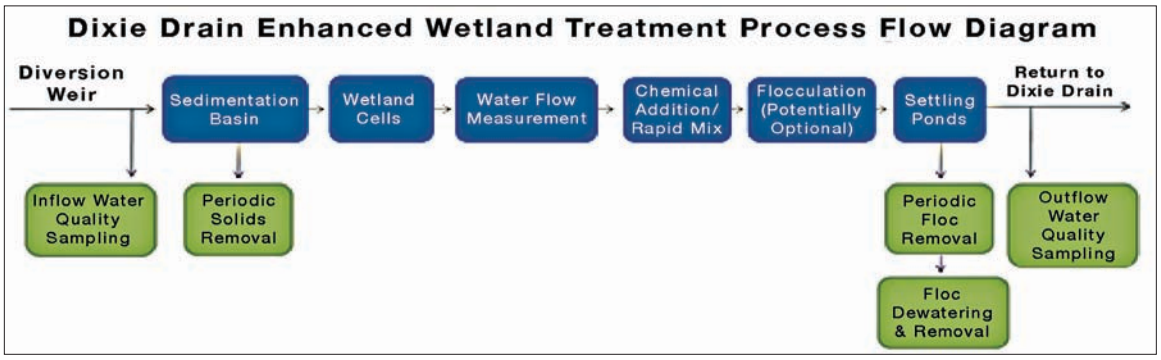
As will be discussed later in this article, the City of Boise (City) ultimately purchased approximately 49 acres of property in Canyon County, adjacent to the Dixie Drain, located approximately 0.25 miles upstream and southerly of the Dixie Drain's confluence with the Boise River. The City intends to use the property to develop an enhanced wetland treatment facility to remove total phosphorus and sediment loads from the Dixie Drain. In order to maximize the use of the 49-acre parcel while focusing on operational simplicity, the Dixie Drain treatment system was developed around a treatment train process.

The Dixie Drain treatment train process will include the following elements:

- Inflow diversion structure
- Inflow and outflow water quality sampling
- Unit processes
- Sedimentation basin
- Potential constructed vegetated treatment cells
- Coagulation — rapid mix basin, flocculation basin (potentially optional), and settling pond
- Water flow rate measurement
- Coagulant injection system
- Coagulant storage and equipment enclosure
- Floc removal and dewatering ("Floc" can refer to both the chemical added as well as the end product that settles after the mixing process)
- Floc disposal
- Outfall structure

Dixie Drain Project

Treatment Train



Peak Design Flow

Water up to the peak design water flow rate (200 cfs) will be diverted from Dixie Drain near the southern corner of the property into the sedimentation basin to begin the treatment train process. A diversion structure will be installed in the drain to convey water into the treatment system. Operable gates are planned to control the amount of water that is diverted through the treatment system.

Sediment

Larger sediment particles will settle by gravity in the sedimentation basin. Sediment collected in the sedimentation basin will include phosphorus and other pollutants. Water will discharge from the sedimentation basin through an open channel into the vegetated treatment cells. Additional phosphorus will be removed in the vegetated cells through additional particle trapping and nutrient uptake by soils and vegetation.

Flocculation

Water will discharge from the vegetated cells into the rapid mix basin. At this point: water flow rate will be continuously measured; coagulant (alum) will be automatically added to the water on a flow proportionate basis; and the water/coagulant solution will be mixed vigorously. Water may or may not then enter a flocculation basin, which will slowly mix the water to cause the precipitate to collide and form larger floc that will settle faster. The benefits of flocculation will be determined based on the results of additional pilot testing. Water will then enter the wet settling pond and floc will settle to the bottom of the pond. Floc that has settled to the bottom of the settling basin will be allowed to consolidate for some period of time to reduce the wet floc volume. Periodically, wet floc will be hydraulically dredged from the settling pond and dewatered. Elevated drying beds located on the 13-acre portion of the property on the west side of the drain will be used for floc dewatering. After treatment, water will be discharged back into the Dixie Drain.

Gravity Flow

The preliminary hydraulic design for the diversion structure contemplates a low elevation structure consisting of an inflatable water level control (bladder) with a controllable, lockable, outlet gate. Water level elevation control will allow adequate head (water volume pressure) to operate the components of the facility by gravity, with water to return to the Dixie Drain. No pumping is contemplated for the diversion. Measurement devices will be installed at the point of diversion and the City will measure inflow and outflow phosphorus concentrations in compliance with its NPDES permit.

TMDL Allocations

Snake River Hells Canyon and Lower Boise River TMDLs

In 1998, the **t**otal **m**aximum **d**aily **l**oad (TMDL) allocation for sediment and bacteria was completed for the lower Boise River. Under the federal Clean Water Act, TMDLs are established for water bodies not meeting water quality standards supportive of designated beneficial uses. The lower Boise River TMDL described how certain pollutants needed to be reduced in the Boise River to maintain beneficial uses of the river for fishing, recreation, and consumption. The Boise River TMDL's initial analyses indicated that phosphorus, a type of nutrient that causes water quality problems like algae blooms, was not at high enough concentrations to create problems for the lower Boise River. However, phosphorus is a problem for the Snake River downstream, and all the tributaries to the Snake River are required to reduce phosphorus under the Snake River-Hells Canyon TMDL (SR-HC TMDL). For the lower Boise River, that meant a reduction of more than 75 percent **t**otal **p**hosphorus (TP). Attainment of this target is measured at the mouth of the Boise River.

Snake River Impairment

After the US Environmental Protection Agency (EPA) approval of the SR-HC TMDL in September 2004, the task of developing TP allocations for tributary point and nonpoint sources — in order to attain the concentration-based tributary targets of 0.07 micrograms per liter (µg/L (equivalent to one part per million)) — fell initially to the Idaho Department of Environmental Quality (IDEQ) and the tributary **w**atershed **a**dvisory **g**roups (WAGs). The SR-HC TMDL anticipated that, in consultation with tributary WAGs, "existing or future tributary TMDL processes will distribute load allocations in the form of load allocations and/or waste load allocations within their specific watersheds…as an extension of the SR-HC TMDL process." The Lower Boise Watershed Council (LBWC) serves as the Lower Boise River WAG pursuant to its articles and bylaws, and Title 39, Chapter 36 Idaho Code. An Implementation Plan and eventually a trading framework was developed to attain the 0.07 µg/L target assigned to the Boise River by the SR-HC TMDL as measured at the mouth of the Boise River.

Erika Malmen/Perkins Coie LLP represented the City of Boise in obtaining the water right for the Dixie Drain Project and in the IDWR contested case proceeding described in this article.

Dixie Drain Project

Offset Approach

According to Paul Woods, (then) Environmental Division Manager for the City of Boise, and Robbin Finch, Water Quality Manager for the City, the City had long understood that there were opportunities to obtain much greater environmental benefit with a trade (or more precisely an offset) than with end-of-pipe treatment. These opportunities arise because of the way the Lower Boise system works from a "plumbing" standpoint. However, since the Lower Boise did not have a TMDL for phosphorus, this approach would need to be finessed with EPA and the City would need to embark on a campaign to educate EPA and other important stakeholders of the efficacy of this approach. To this end, City staff traveled to Seattle to meet with EPA Region 10 staff, and multiple presentations were made to entities such as: the National Association of Clean Water Act Agencies; the Water Environment Research Foundation; the Water Environment Foundation; and the Association of Idaho Cities — to name a few.

PROJECT DEVELOPMENT

The Dixie Drain Project concept, though essentially new to Idaho, was tried and true elsewhere in the US. Relating the experiences of successes elsewhere (such as the Apopka-Beauclair Canal downstream of Lake Apopka outside of Orlando, Florida) assisted with obtaining support from both sides of the political aisle, including Idaho Republicans Senator Jim Risch and Representative Mike Simpson, as well as the Idaho Conservation League. Finding support for the offset concept was one thing; finding the appropriate real estate so that the concept would work in practice was another.

Offset Site

The City started looking for an appropriate site in 2009. Multiple properties were evaluated. The site for an offset project needed to provide adequate potential to remove phosphorus from the Boise River sufficient to meet the criteria set forth in the City's NPDES permit. Meeting this need required: adequate and timely discharge; moderate to high phosphorus levels; suitable topography and access; suitable hydraulic and hydrologic conditions; water rights; and financial feasibility. The City recognized that it would be difficult to identify a property that could provide what the City needed in terms of an offset, given the SR-HC TMDL May-through-September compliance period.

Load & Flow Data

The City became aware that 49 acres near the mouth of Dixie Slough might be available and began its evaluation of the property. A physical inspection was conducted by City staff, and City public works staff reviewed and analyzed the existing Dixie Drain pollutant load and flow data (which fortunately was quite extensive). Dixie's location west of Boise and the outflow of the Drain into the Boise River made it uniquely qualified for a project locale. Topography of the proposed site is conducive to implementation of a gravity flow project so that energy consumption would be minimal. The location of the confluence of the Dixie Drain and the Boise River near the lower end of the Lower Boise system provides significantly more benefit for river water quality enhancement than return flow sites farther up-river. In December 2009, the City purchased the property.

Phosphorus Load

The Dixie Slough property was selected in large part because of its high phosphorus load to the Boise River. Data collected by USGS in 2000 and 2005 demonstrated a phosphorus concentration of 381 micrograms per liter (µg/L (equivalent to one part per billion)) for the period from May through September. The City collected phosphorus samples during May through September in 2010 and 2011. The data indicated that, based on a historical perspective, the Dixie Slough should have sufficient phosphorus load to sustain the project and meet the City's NPDES permit compliance obligations.

Alum Addition

The City's public works staff conducted additional due diligence, including extensive literature review and site visits, to further convince themselves that the project concept would work at Dixie. The literature indicated that because of the size of the Dixie site and the composition of the phosphorus in Dixie Drain (consisting primarily of dissolved phosphorus), chemical (alum) addition would be required to meet the City's reduction obligations. The City conducted laboratory jar testing and field pilot testing to demonstrate the viability of the alum addition technology. Alum can be a specific chemical compound or a class of chemical compounds. There are many alum coagulants commonly used today throughout the US; the most common forms include: aluminum sulfate; polyaluminum chloride; sodium aluminate; and aluminum chlorohydrate. The results of the City's testing demonstrate that the alum addition technology has a high degree of success, with removal efficiencies ranging from 60 to 75 percent. Follow-up pilot studies in 2011 found improved flocculants (a different alum) achieved 64 to 92 percent phosphorus removal rates.

Permit Modification

NPDES Modification

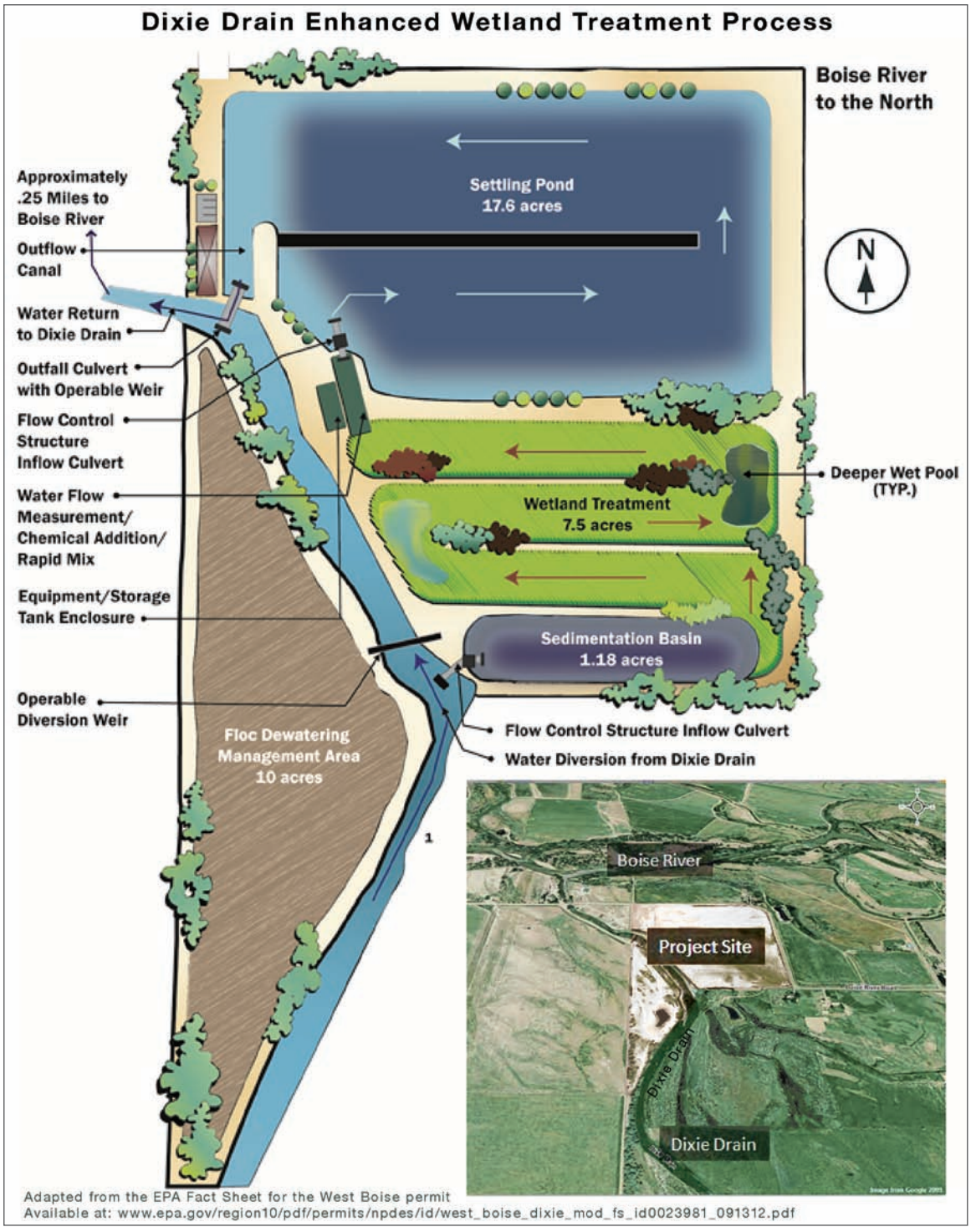
On September 6, 2012, the City submitted a request to modify West Boise NPDES Permit (ID-002398-1) to incorporate a Dixie Slough offset for phosphorus limits. As part of the modification request, the City identified a commitment to design, permitting, construction, pilot testing, and operation of the Dixie Drain Facility within the current permit cycle, provided that the current permit was modified with the offset. The offset allows the City to meet permit limits through a combination of treatment at the West Boise Facility and the Dixie Drain Facility. In addition, the City submitted information to EPA supporting a phosphorus offset at the Dixie Slough.

Dixie Drain Project

Offset Information

THE CITY'S SUBMITTED PHOSPHORUS OFFSET INFORMATION INCLUDED:

- information that would describe the offset — how it would be implemented, measured and monitored
- effluent and receiving water quality and quantity data
- new water quality modeling analyses, including modeling that demonstrates new phosphorus effluent limits would not adversely affect waters between the City of Boise and the Dixie Slough
- performance criteria for the Dixie Drain Facility
- results of two pilot studies demonstrating phosphorus removal at the Dixie Drain Facility
- water quality monitoring data for Dixie Drain Facility
- flow monitoring data for Dixie Drain Facility
- cost information for the Dixie Drain Facility and the West Boise Facility Upgrade
- modeling and data analysis for phosphorus removal improvements for the West Boise Facility during the interim period prior to achievement of the final phosphorus limit



Dixie Drain Project

Offset Allowance

Removal Ratio

Compliance Schedule

Permit Limits

Water Diversion Factors

TP Concentration

Safety Factor

The current West Boise Facility permit includes a final phosphorus effluent limit of 70 µg/L with a compliance schedule to meet that limit within 10 years from the effective date of the permit (by July 31, 2022). The current effluent phosphorus concentrations from the West Boise facility are 6,000 µg/L. The City is preparing to upgrade the treatment process to include **e**nhanced **b**iological **p**hosphorus **r**emoval (EBPR) and cloth filtration. EBPR should provide a phosphorus effluent concentration in the 500 µg/L range. With cloth filtration, the effluent should be in the range of 350 µg/L phosphorus.

The offset allows the West Boise Facility to discharge at 350 µg/L using EBPR and cloth filtration. The remaining phosphorus would be removed at the Dixie Drain Facility at a ratio of 1.5:1. Thus, for each pound of phosphorus the City discharges in excess of 70 µg/L, the City would be required to remove 1.5 pounds of phosphorus at the Dixie Drain Project. The ratio of 1.5 was determined based on the break-even scenario at which point the Net Present Value (NPV) of the Dixie Drain Facility would be the same as the NPV of upgrading the West Boise Facility to meet an end-of-pipe limit of 70 µg/L.

The City may begin using phosphorus removed at the Dixie Drain Facility to offset the West Boise effluent limits when the final TP effluent limits for West Boise must be achieved (10 years from the effective date of the permit). The Dixie Drain Facility must be capable of removing 136 pounds of phosphorus per day. This represents the amount required if the West Boise Facility were discharging at the highest effluent limit to prevent local impact at a build-out average monthly flow rate of 39.0 **m**illion **g**allons per **d**ay (mgd).

The permit also includes a compliance schedule for construction and operation of the Dixie facility by 2016. The compliance schedule requires that the City begin removing an average of 25 pounds per day of phosphorus when the facility begins operation in 2016. These interim removal requirements of 25 pounds per day may not be used to offset the interim total phosphorus effluent limits.

As noted in the fact sheet for the West Boise permit (available at: www.epa.gov/region10/pdf/permits/npdes/id/west_boise_dixie_mod_fs_id0023981_091312.pdf), the permit limits are designed to meet 70 µg/L TP in the south channel under low flow conditions in that location (219 cfs). During the July 2001 and August 2000 assessment periods, the flows in the south channel were substantially higher than this value (approximately 500 cfs and 700 cfs in July 2001 and August 2000, respectively). With the offset, the West Boise facility will be allowed to discharge phosphorus at concentrations that exceed 70 µg/L at the facility outfall. However, the phosphorus concentrations discharged from the West Boise Facility must not cause a local impact downstream of the West Boise Facility. EPA interprets this as an instream phosphorus concentration in the South Channel of the Boise River that does not exceed 70 µg/L under critical conditions after complete mixing with the flow in the river. To achieve this requirement, the permit includes flow-based average monthly limits at the West Boise Facility ranging from 252 to 350 µg/L phosphorus.

WATER RIGHT APPLICATION PROCESS

The Application

Prior to seeking NPDES permit modification, and based on the City's preliminary discussions with EPA with regard to the likely NPDES permit conditions — as well as the City's discussions with the Department — the City submitted Application for Permit No. 63-33467 (Application) to IDWR on January 5, 2011. The Application proposed the diversion of 200 **c**ubic **f**eet per **s**econd (cfs) of water from the Dixie Slough.

The factors involved in the request for 200 cfs include:

- Offset Ratio: The NPDES permit requirement that 1.5 pounds of phosphorus be removed from the Dixie Slough for every pound of phosphorus in excess of 70 µg/L discharged at the West Boise Wastewater Treatment Facility.
- Offset Removal Efficiency: The City believes it can reasonably achieve a TP removal efficiency of 70%. However, it should be noted that the response to adding more flocculent is not linear. Consequently, even minor increases in efficiencies can require exponentially more chemical addition.
- TP Concentration in the Dixie Slough: Observed daily values of TP in the Dixie Slough vary from 23I µg/L to 445 µg/L. Even though its NPDES permit establishes an average monthly limit for TP, the City chose to use the lowest observed daily value of 231 µg/L in its calculations as opposed to the lowest monthly average value of 278 µg/L, primarily because it is reasonable to assume (based on advances in fertilizer technology and more stringent Clean Water Act requirements) that concentration of TP in the Dixie Slough will decline over time, thus causing the lowest monthly average value to decline.
- Safety Factor: The City added 25% to its flow rate estimate to account for variability inherent in the offset removal efficiency, TP concentrations, and available flow. If any of those factors

Dixie Drain Project

Water Rights Issues

diminishes, the amount of treated water must *increase* to meet the monthly average offset ratio required by the NPDES permit. For example, meeting the target TP reduction of 137 lbs./day may not require a constant diversion of the requested 200 cfs. However, if a temporary flow deficit prevents meeting the target TP reduction, the City may need to divert the requested 200 cfs to "catch up" to the average monthly requirement established in the NPDES permit.

Protests

IDWR published the Application for public comment in late 2011 and early 2012. Protests to the Application were filed by: the City of Greenleaf; Riverside Irrigation District; G.O. Investments Idaho LLC (GO); and ERG Resources LLC (ERG). GO and ERG were aligned in their reasons for protest, and shared legal counsel and expert witnesses. On July 18, 2012, ERG applied for its own permit to appropriate water from the Dixie Slough for water quality improvement and other purposes.

Generally, the bases for the protests can be summarized as follows:

1) A water right may not be necessary for the purposes identified.
2) The Dixie Drain may not possess the required flow rate to sustain the requested water quantity.
3) The application for a water right is not in the public interest.
4) Implementation of the proposed water right may impact the upstream watershed users.
5) The project could impact the municipal water and wastewater systems of the City of Greenleaf.
6) City of Boise Project may impair the recapture of wastewater by Riverside Canal.
7) The project may impact the use of Dixie Slough as an emergency spillway by Riverside Canal.
8) Water use under the proposed permit should be recognized as wastewater.
9) Water quality improvement may not be a recognized beneficial use.
10) 200 cfs exceeds the treatment capacity of the proposed facility.
11) The proposed diversion will reduce the quantity of water under existing water rights.
12) The application is made for speculative purposes.
13) The proposed diversion is contrary to the conservation of water resources within the State of Idaho.
14) The proposed diversion will adversely affect the local economy of the watershed.

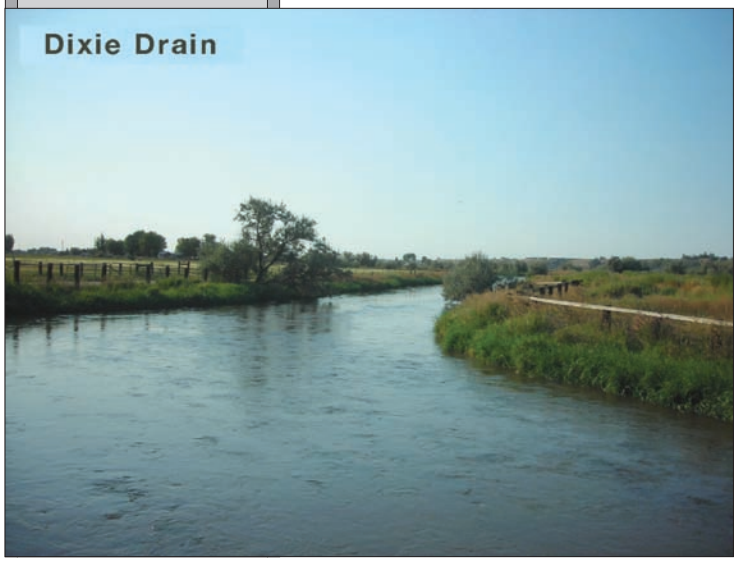
Supporting Petition

On January 3, 2013, the Idaho Conservation League (ICL) filed a Petition to Intervene (Petition). The Petition stated that ICL supports the City's Application and the Dixie Project because its members have interests in protecting and restoring the Boise River. ERG and GO opposed ICL's Petition, arguing that ICL has no direct or substantial interest in the proceeding, that ICL's participation would broaden the issues, and that ICL's interests are already being represented by the City of Boise. On April 9, 2013, after considering further arguments from all sides, the Department granted ICL's petition to intervene on a limited basis.

"Wasting" Water

One of Riverside Irrigation District's concerns was that, if the City were to get a water right, irrigators may be required to continue to "waste" water. "Wastewater" in an irrigation setting (as opposed to a municipal or industrial setting) refers to the excess water that runs off from irrigation use that is not consumed by a crop. The "wasting" of water is considered a natural consequence of irrigation use and there generally exists a right to "recapture" wastewater before it leaves its place of use. Other users cannot compel the irrigation user to continue wasting water. Riverside Irrigation District did not want to be put in a situation where its flexibility in its irrigation water uses or practices could be compromised.

Fortunately, the City and Riverside Irrigation District were able to come to an amenable solution to address Riverside's concerns (which primarily consisted of protest bases #6-#8 above). As a result, Riverside Irrigation District withdrew its protest on May 7, 2013, after the Department issued an order agreeing to impose the following condition on any permit issued in connection with the application:



> The source of this right is wastewater. The wasting of water may be discontinued at any time. This right remains subject to the right of the original appropriator, in good faith and in compliance with state laws governing changes in use and/or expansion of water rights, to cease wasting water, to change the place or manor [sic] of wasting it, or to recapture.

The City of Greenleaf's concerns were not vetted at the hearing, but Greenleaf participated in discovery and did not withdraw its protest. Greenleaf's primary concern was apparently the potential for the Dixie Project to affect its upstream WWTF. The remainder of this article discusses many, but not all, of the issues and arguments raised at the hearing on the City's Application.

Dixie Drain Project

The Hearing

On September 11-13, 2013, and November 19, 2013, the Department (via Hearing Officer Shelley Keen) conducted a hearing to obtain testimony and evidence about the City's Application.

Hearing Witnesses

The following witnesses testified at the hearing:

- Paul Woods, P.E., Environmental Division Manager for City of Boise
- Jeffrey Herr, P.E., of the consulting firm Brown and Caldwell, for City of Boise
- Charles E. Brockway, P.E., Ph.D., from Brockway Engineering, for City of Boise
- Justin Hayes, Program Director for the Idaho Conservation League
- Steve Martinez, Managing Member for ERG
- Greg Obendorf, Trustee for GO Trust
- Richard Kelsey, P.E., Technical Director and Program Manager for the consulting firm E.W. Wells Group, for ERG/GO
- Norman C. Young, P.E., of the consulting firm ERO Resources Corporation for ERG/GO

The hearing was appropriately focused on the statutory and regulatory requirements for obtaining a permit to appropriate water from the Department. Idaho Code§ 42-203A(5) lists the criteria the Department must consider when evaluating an application to appropriate water.

Permit Criteria

Idaho Code§ 42-203A(5) evaluation criteria are:

- Potential for injury to existing water right holders
- Sufficiency of the water supply
- Application is made in good faith and not for delay or speculative purposes
- Sufficiency of the applicant's financial resources
- Local public interest
- Conservation of water resources in Idaho
- Effects on the local economy

The criteria in Idaho Code § 42-203A(5) is evaluated as described in Rule 45 of the Water Appropriation Rules. According to Rule 40.04.c of the Rules, the applicant bears the ultimate burden of persuasion regarding all the factors set forth in Idaho Code § 42-203A.

"Beneficial Use"

The parties stipulated at the beginning of the hearing that: water quality improvement is a "beneficial use" of water under Idaho law; that the City has the financial resources to complete the Project; and that the last evaluation criteria (effects on local economy) does not apply to the City's Application, because it only applies to out-of-basin water transfers.

Injury to Existing Water Rights

No Injury Rule

The City presented testimony as well as the expert report of Dr. Brockway to show that the Dixie Project would not result in any injury to existing water rights. Title 42, Idaho Code and Rule 45 provide that no injury to an existing water right can occur as the result of approval and implementation of a new permit or transfer. Injury to a water right normally implies an adverse impact to water supply, availability, or quality. Because the City's use is considered non-consumptive, there are no expected impacts to surface or groundwater users in the vicinity of the Project.

Injury Condition

The only allegation of injury to existing water rights that was given serious attention by the Department was the Protestants' arguments and testimony with regard to potential physical impacts to an upstream diversion (the Iest Ditch) that could result from sedimentation in the Dixie Drain. The "owner" of the diversion and related water right, however, did not protest the City's Application. Nevertheless, the Department placed the following Condition of Approval on the City's Permit to ensure that no injury occurs to the upstream diversion/related water right:

> The right holder shall employ appropriate management techniques to prevent sedimentation in the Dixie Slough channel that interferes with the delivery of water into the Iest Ditch pursuant to Right 63-5179.

Sufficiency of Water Supply

Supply Sufficiency

Sufficiency of water supply is evaluated pursuant to Rule 45.01.b of the Water Appropriation Rules, which states:

> [T]he water supply will be determined to be insufficient for the proposed use if water is not available for an adequate time interval in quantities sufficient to make the project economically feasible (direct benefits to applicant must exceed direct costs to applicant), unless there are noneconomic factors that justify application approval.

Dixie Drain Water Rights

Water rights which list the Dixie Slough and tributaries as a source of water or point of diversion are primarily irrigation water rights. The total allowed diversion of water rights on the Dixie Slough and adjacent tributaries is12.51 cfs with 78 percent of that amount being irrigation rights. The total diversion of 12.51 cfs is equal to 5.8 percent of the May-September average Dixie Slough discharge of 214 cfs.

The reach of the Dixie Drain from the Riverside Irrigation District to the Boise River provides irrigation water for five water rights totaling 6.23 cfs. There are no points of diversion located between the

Dixie Drain Project

Project's point of diversion and its discharge back to the Dixie. There is only one senior irrigation water right for 0.19 cfs, which diverts from the Dixie Slough downstream of the proposed City of Boise site. This diversion equates to 1.0% of the average May-September flows. Except for stockwater rights and two wildlife rights totaling 2.15 cfs there are no other approved uses or diversions from this reach of the Dixie Drain and no instream or minimum flow water rights or filings are listed for the reach.

Drain Discharges

Discharge measurements are available for the Dixie Drain or Slough in USGS published data as measured at the gage near the Dixie Drain confluence with the Boise River, about 1200 feet downstream of the return flow from the Project. A frequency distribution analysis for the reported discharge during the May-September periods for 1986 through 2012 was performed by the City of Boise and reported in their analysis supporting the Application. Earlier measurements were made by USGS in 1970-71 at a point on the Dixie Drain about one mile south and one-half mile east of the current gauging station. The maximum discharge for the 1981-82 period was 390 cfs on October 4, 1981 and the minimum discharge was 70 cfs on December 11, 1981. The discharge is normally above 200 cfs during the irrigation season and decreases around October 1 to about half of the summer-time flow (100 cfs).

A discharge frequency analysis for the USGS gage on the Dixie Drain shows a 50% exceedance value of the average monthly flow of 214 cfs for the period May through September. This means that there is a flow rate of 214 cfs or more about 50% of the time during that May through September period. Similarly, the average monthly discharge for September is 218.8 cfs and the average monthly discharge for the period 1986 through 2013 exceeds the requested 200 cfs in all months (May-Sept.) proposed for treatment facility operation.

Operational Flow

The parties at least tacitly agreed, based on historical flow data, that the requested maximum diversion rate of 200 cfs is available about 50% of the time. ERG simply questioned whether the City's Project could effectively operate with less than 200 cfs.

The City presented testimony that the Project could indeed operate with less than 200 cfs. However, the City's expert, Jeff Herr, testified that the City should have requested more water than 200 cfs in order to ensure compliance with NPDES permitting requirements. Although ERG had argued that the City's Project would preclude its own project, the testimony of ERG expert Norm Young suggested the possibility that there may be adequate supply for both ERG's proposed project and the City's Project.

Application Is Made in Good Faith and Not for Delay or Speculative Purposes

Speculation?

In furtherance of its duty to demonstrate good faith and anti-speculation, the City presented testimony that there are no obvious impediments to successful completion of the Project, and that the City's NPDES permit approving the offset had been issued by EPA. Early on in Project development, the City had received conflicting feedback about which permit to pursue first — the water right or the NPDES permit. The City decided to pursue the permits simultaneously, and the fact that an NPDES permit had been issued for the Project was helpful with regard to the Department's evaluation of the prohibition against speculation.

Protestants ERG and GO nevertheless made several allegations with regard to the prohibition against speculation. For example, Protestants asserted that because the NPDES permit requires the removal of only 25 lbs./day TP until 2022, the City should be required to wait until 2022 to appropriate more water than needed to meet the immediate requirement. To bolster this argument, ERG and GO point out that if the City receives the requested permit, the City must submit proof of beneficial use within five years, which is well in advance of the year 2022.

Beneficial Use Proof

Testing Capabilities

The City argued and presented testimony that it intends to divert and beneficially use 200 cfs within the next five years. Nothing precludes the City from doing this, and the City has a clear need to test the capabilities of the Project well in advance of the escalated NPDES permit requirements, particularly given the severe monetary penalties (calculated per individual violation) for non-compliance with its NPDES permit required by the federal Clean Water Act.

The Department rejected the argument that the City's use was speculative based on NPDES TP removal requirements.

Beneficial Use Amount

The Department's Amended Preliminary Order states:

> …[w]hen it comes to cleaning up TP from the Boise River, more is better. ERG and GO assert that it is a basic tenet of Idaho water law that: 'You only get what you need.'…Actually, water rights are based on the amount of water needed *to accomplish a beneficial use*. If more beneficial use can be accomplished with more water, then the additional amount of water may be appropriated. The Applicant's NPDES permit is a minimum standard, not a maximum limit. If the Applicant is willing and able to address the TP above its immediate minimum requirement within five years in order to demonstrate to the EPA its ability to do so and to acquire a water right for the amount of water needed to do so, then it should be allowed to do so.

Order Granting Petition for Reconsideration; Amended Preliminary Order Approving Application (March 21, 2014), page 27.

Dixie Drain Project

Offset Ratio Adjustment

Good Faith Determination

Season of Use Limitations

Site Characteristics

Direct Effects

Pollution Allocation Questioned

Public Interest Served

ERG and GO's next argument in this realm was that the City's Application was speculative because the amount of water sought was based on the needs of municipalities that are no longer part of the proposed project. When the Application was submitted the diversion rate requested was intended for more municipalities than just the City of Boise.

As indicated above, the City submitted its Application before EPA approval of its NPDES permit modification. As the City's witnesses described, discussions with EPA about inclusion of other municipalities in an offset and the applicable offset ratio that would be required evolved over time. Initially, the offset ratio was expected to be 1:1. That changed, at least partially based on the fact that EPA apparently did not want to set a precedent that municipalities could save money by foregoing WWTF upgrades in favor of non-point source treatment. This explains why the Net Present Value calculation was requested by EPA and also why the offset ratio went up from 1:1 to 1:1.5. EPA ultimately declined to include other municipalities in the offset.

While the Department rightly acknowledged that the justification for requesting 200 cfs had changed, the Department recognized that the higher offset ratio essentially balanced out the removal of other municipalities from the Project.

The Amended Preliminary Order stated:

> [T]he rationale for the Applicant's request was not changed on the Applicant's whim. Rather, the EPA imposed a change in rationale on the Applicant. Therefore, although the rationale for the Applicant's request changed during pendency of the application, the Applicant submitted the application in good faith and the change in rationale behind the requested application was also in good faith.

Id. at 28.

ERG and GO further alleged that the City's request for a longer season of use than required by the NPDES permit was speculative. As the City's testimony explained, gradually bringing its facility online allows the City to collect and analyze data and adjust its operations so that it is operating efficiently by the May 1 annual start date required in the NPDES permit. The Department found that it was not speculative to begin diverting water and removing TP up to one month prior to May 1. However, the City was not able to successfully convince the Department that the entire month of October was needed for ramping down operations and other maintenance activities, and thus October 15 was imposed as the annual date the season of use ends for the Project.

Finally, ERG and GO presented testimony that the site chosen for the Dixie Project lacks the physical characteristics needed for the Project and thus the City's Application was speculative. These assertions were generally that the site was not large enough and that, based on groundwater levels, it would be difficult to operate the Project using gravity and prevent impacts to surrounding groundwater levels.

The City's expert, Jeff Herr, provided opposing testimony, asserting that the Project site was indeed suitable for the Project, based on his extensive experience with other similar phosphorus removal projects. Dr. Brockway, the City's other expert, was able to corroborate Mr. Herr's analysis.

The Department found that the City met its burden of persuasion regarding whether the Application was made in good faith rather than for delay or speculative purposes.

Local Public Interest

Idaho Code § 42-2028(3) defines "local public interest" as "the interests that the people in the area directly affected by a proposed water use have in the effects of such water use on the public water resource." The current definition of local public interest was adopted in 2003 and supersedes the evaluation criteria set forth in Rule 45.01.e of the Water Appropriation Rules, which dates back to 1993.

The Department found that improving the environmental health of the lower Boise River is in the local public interest. ERG and GO alleged that the application "proposes a diversion rate greatly in excess of the quantity needed to meet the City's phosphorus removal requirements, thereby limiting the feasibility of other projects seeking to remove phosphorus from the Dixie Slough ... ." *Id*. at 29. Protestants argued that limiting the feasibility of other projects would limit the potential for more phosphorus to be removed from the Dixie Slough. The essence of this argument is that others should be allocated a share of the phosphorus load in the Dixie Slough.

The Department was not persuaded by this argument, noting that "pollution is not a natural resource to be allocated among appropriators who will put it to some beneficial use. It is in the public interest for as much phosphorus as possible to be removed by the first project on the scene. Therefore, although there are other reasons described below to limit the ability of the Applicant's project to preclude alternative uses of the resource, the project should not be limited just so that other yet-to-be-proven water quality improvement projects may have some opportunity." *Id*. at 29.

The Department found that "the potential for a water resource to accomplish an alternative benefit is an appropriate component of the public interest review criterion." The Department rejected the protestants' argument, stating: "ERG and GO did not provide a compelling alternative vision for the water in the Dixie Slough, including tributary ground water, other than the potential for them or someone else to do the same thing proposed by the Applicant." *Id* at 29.

Dixie Drain Project

Subordination Condition

Nevertheless, in the Amended Preliminary Order, the Department found that it is not in the public interest to enable the City to use the priority date of its new water right to close the door completely on future economic development by the local landowners in the Dixie Slough drainage, finding that "[t]he people living in the Dixie Slough drainage are more local than the people of the City of Boise. Therefore, their potential interests should be considered and weighted heavily, as a matter of policy. In general, preventing future optimal use of the resource in favor of cleaning up the resource for the benefit of the City of Boise is not in the local public interest because the City of Boise has other options. Therefore, the proposed appropriation should be subordinate to future upstream water uses that would deplete the flow of the Dixie Slough unless the Applicant demonstrates, on a case-by-case basis, that its water quality improvement project outweighs proposed alternative uses of the public water resource. To protect its investment, the Applicant's proposed appropriation should have priority over other projects specifically designed to remove TP from the Dixie Slough." *Id.* at 29-30.

Limited Condition

The Department included the following Condition of Approval of the City's Application:

> This right shall be junior and subordinate to future upstream water rights authorizing the diversion and use of water from the Dixie Slough and its tributaries, including ground water. However, the right holder shall not be precluded from participating in the statutory process to demonstrate, on a case-by-case basis, that its water use should not be subordinate to a particular water use proposal. This right shall not be subordinate to future water rights for similar water quality improvement purposes and to water rights for hydropower. This right shall also not be subordinate to future upstream nonconsumptive water rights authorizing the diversion and use of water from the Dixie Slough and its tributaries, including ground water, if the return flows from the future upstream non-consumptive water rights discharge into a different water body, such as the Boise River, or return to the Dixie Slough downstream from the right holder's point of diversion, thereby making the water unavailable to this water right holder.

Id. at 33-34.

Subordination Impacts

On a practical level, this condition of approval imposing subordination means that other water rights that would normally be junior rights with later priority dates may not be shut off in times of shortage to satisfy the City's senior right. This subordination condition is troubling to the City on many levels. First, it appears to contradict the Department's finding that improving water quality in the Boise River benefits all nearby residents. The residents of the City of Boise are not getting any more water quality benefit than the residents of Parma or Fruitland. Second, there was no credible evidence presented at the hearing that upstream development was contemplated, inevitable, or even reasonably foreseeable. In other words, it seems entirely speculative for the Department to subordinate the City's use based on yet to be identified potential future Dixie Drain upstream development. Third, the City has been unable to locate any legal authority or other precedent for subordination, with the exception of hydropower rights. The Amended Preliminary Order indicates that the Department has imposed subordination in other contexts but provides no citation or authority. Finally, subordination of the priority date compromises certainty, and the City has invested substantial amounts of taxpayer dollars on the Dixie Project.

Preference Argument

It should be noted that, although the parties ultimately stipulated to water quality improvement as a recognized "beneficial use," it was not clear that the parties were in agreement about this until the first day of the hearing. Idaho regulations include a litany of identified beneficial uses, and water quality improvement cannot be found among them. Instead of arguing that water quality improvement was not a beneficial use, ERG and GO's position evolved into an argument that other uses should be considered superior to, or more valuable than, water quality improvement based on the public interest criteria. ERG expert Norm Young articulated this argument by referencing what he described as the "Swan Falls" factor.

Non-Consumptive Use

As many readers may know, Swan Falls dam is a hydropower generation project on the Snake River in southwest Idaho, near Murphy, owned and operated by Idaho Power Company. The dam was built in 1901 and is the oldest hydroelectric dam on the Snake River. Although the use of water for power generation at Swan Falls is non-consumptive in itself, some take the view that downstream non-consumptive rights should not limit upstream consumptive use/development. This view is embodied in the Swan Falls Agreement, and the related Snake River Basin Adjudication, which has to date spawned the perhaps most litigated and contentious issues in Idaho water law history. As the Amended Preliminary Order acknowledges "[t]he State of Idaho has a long, difficult history with large downstream water uses that could potentially prevent future economic development upstream. Witness Norman C. Young described this issue in his testimony." *Id*. at 1.

"Conservation"

Conservation of Water Resources in Idaho

The Idaho legislature implemented the conservation of water resources requirement for water appropriations in 1990.

The Department's Application Processing Memorandum No. 48 states:

> The term "conservation" is not defined in the legislative intent or in the amendment. ...Due to lack of stated legislative intent, the department will apply the criterion in terms of efficiency as

Dixie Drain Project

Water Use Efficiency

Efficiency Standard

Efficiency Impacts

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is generally suggested by the term. The requirement has been interpreted by the Department to require standards of water use efficiency so that the proposed beneficial use is accomplished while preserving as much water as possible for other benefits.

ERG and GO alleged, among other arguments in this context, that the City's use would prevent future appropriations of water for other uses. The City argued that this is a natural consequence of the "first in time, first in right" Prior Appropriation Doctrine which gives priority access to the earliest established beneficial uses. This doctrine is well established in Idaho, and was otherwise not unique to the City's proposed use.

The Department disagreed, finding that the City's appropriation could be detrimental to future optimal development of the resource if the City were to divert the requested diversion rate at all times without being reasonably efficient in its use of the water. Therefore, the Department concluded it should require an efficiency standard. Based on testimony about other phosphorus removal project efficiencies and the pilot studies conducted at Dixie, the Department conditioned approval of the Application on meeting a 70% overall annual phosphorus removal efficiency standard.

The Department stated this condition as follows:

> The right holder shall achieve an overall annual total phosphorus removal efficiency of 70%. By December 31 of each of its years of operation prior to submitting proof of beneficial use, the right holder shall submit to the Department a report showing:
>
> - The total annual volume of water diverted from the Dixie Slough.
> - The total phosphorus concentration at inflow and outflow.
> - The average monthly lbs./day of total phosphorus removal.
> - The overall annual total phosphorus removal efficiency.
>
> Should a water right license be issued in connection with this permit, the total annual diversion volume limit shall not exceed the amount consistent with a 70% total phosphorus removal efficiency.

Id. at 34.

Although the Department acknowledged that it would not be feasible to limit the City's diversions so as to meet specific efficiency at all times — because it cannot measure TP concentrations in real time — the Department reasoned that it should be possible for the Project to meet an overall annual efficiency standard by limiting the annual diversion volume for the water right (if and when it is licensed) to the volume actually diverted or to the volume needed to achieve an overall efficiency of 70%, whichever is less. The Department went on to note that a license, if issued, will require an annual diversion volume pursuant to Rule 35.01.j of the Department's Beneficial Use Examination Rules (IDAPA 37.03.02).

Similar to the subordination issue, the City has not been able to locate any precedent for this condition and considers it problematic and unnecessary. In the irrigation context, for example, the Department has not required irrigators to modify irrigation practices to use more efficient sprinkler irrigation or to plant crops that require less consumptive use. The City has an incentive to remove phosphorus pursuant to its NPDES permit, but this efficiency condition adds administrative and operational burdens on the City's Project. All water that is diverted will be put to a beneficial use regardless of the removal efficiency, and the City is concerned that less efficient water quality improvement projects, such as wetlands, will be deterred from development based on efficiency criteria.

CONCLUSION

Although this article highlights some of the challenges in permitting the Dixie Drain facility, it must be noted that the City is grateful to EPA and IDWR staff and many others for their assistance in getting this important Project off the ground. The City continues to conduct pilot testing and pursue development of the Project.

Looking ahead, the City has concerns that the efficiency requirement imposed by the Department in the City's permit will: result in incompatible operating directives; create unnecessary complications with regard to meeting the City's NPDES permitting requirements; and have negative policy implications for future water quality improvement projects. Other challenges may be centered on predictability of Dixie Drain phosphorus loads and surrounding development.

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Aquifer Recharge

MANAGED AQUIFER RECHARGE

PART II: LEGAL ISSUES IN THE WESTERN UNITED STATES

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INTRODUCTION

As noted in part one of this three-part series on laws and regulations affecting managed aquifer recharge in the western United States (*Managed Aquifer Recharge: An Overview of Laws Affecting Recharge in Several Western States, TWR* #127), expanding the use of aquifer recharge is becoming increasingly important for our growing, water-dependent, society.

A thorough understanding of the involved legal rights is necessary for establishment and operation of an effective and efficient managed aquifer recharge project. However, relevant laws addressing groundwater recharge remain relatively undeveloped in most states. Many questions remain largely unanswered.

Legal Issues

Legal questions concerning groundwater recharge include:

- Is recharging water into an aquifer a "beneficial use"?
- Can an overlying landowner prevent others from storing water in aquifers beneath his land without his consent?
- Is an entity trespassing when its recharged water runs under another person's land?
- Does the "Takings Clause" in the US Constitution's Fifth Amendment — requiring "just compensation" for private property taken for public purposes — apply to managed aquifer recharge projects, and if so, to what degree?
- If the aquifer storage space is limited, should some entities receive preferential treatment?
- Should a water user be required to substitute their water supply from another available source before making a "call" to protect their senior water right?
- Can a managed aquifer recharge project abandon or forfeit water that is put into an aquifer? If so, at what point is the right to use the water lost?
- Does a recharge project get credit for the water put into the ground? For example, can a recharge project put an acre-foot of water into an aquifer and be sure they will be able to remove an acre-foot from somewhere else?
- What water quality laws and regulations should apply to a managed aquifer recharge project?

This article will review these legal issues from the viewpoint of current approaches in various western states, addressing: whether recharge is a beneficial use; who owns the aquifer space; whether substitution is required; why water quality concerns are important; the potential for forfeiture and abandonment; and the importance of recharge credits.

STATES' LAWS & PROGRAMS

Many western states now have legislation that expressly authorizes managed aquifer recharge projects. This section gives an overview of some of the differing methods that Colorado, California, Arizona, and Idaho have adopted to address these legal concerns.

Beneficial Use

Beneficial Use

The requirement that water be put to a recognized beneficial use is a core aspect of western water law's Doctrine of Prior Appropriation. As such, making sure that managed aquifer recharge is considered a beneficial use is a threshold question that must be answered at the very beginning of any aquifer recharge project.

Nearly all of the jurisdictions examined for this article have deemed managed aquifer recharge a beneficial use. Idaho Code §42-234 unambiguously proclaims "the appropriation of water for purposes of ground water recharge shall constitute a beneficial use of water." Idaho Code Ann. §42-234. California, under Water Code §1242, proclaims "the storing of water underground…constitutes a beneficial use of water if the water so stored is thereafter applied to the beneficial purposes for which the appropriation for storage was made." In California, various local governments have also found groundwater recharge to be a beneficial use. For example, the San Francisco Bay Basin Water Board has stated that: "uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting saltwater intrusion into freshwater aquifers" is a beneficial use. *See Water Quality Control Plan for the San Francisco Bay Area* at: www.waterboards.ca.gov/rwqcb2/water_issues/programs/planningtmdls/basinplan/web/docs/bp_ch2+tables.pdf.

Aquifer Recharge

Indirect Recognition

Other states have found managed aquifer recharge a beneficial use by implication. Arizona has stated that "beneficial use shall be the basis, measure and limit to the use of water." Ariz. Rev. Stat. Ann. §45-141. Moreover, with Arizona's enactment of Underground Water Storage and Recovery Act of 1986 and the Underground Water Storage, Savings, and Replenishment Act in 1994, Arizona further defined the recharge program and guaranteed that the water recharged would be legally defined and be able to be recovered. Colorado requires a permit to extract artificially recharged water — which clearly infers that Colorado recognizes artificial recharge as a beneficial use of water. 2 Colo. Code Regs. 402-11:6. Thus, by limiting water uses to beneficial uses and allowing water to be used for recharge, the Arizona and Colorado statutes designate recharge as a beneficial use by implication.

Overall, as evidenced by the differing statutes, case law, and administrative regulations across the West, the question of whether aquifer recharge is a beneficial use appears to have been answered in the affirmative. Areas of law less clearly established include: 1) whether storing water in an aquifer is a Fifth Amendment "taking" of storage space; or 2) constitutes trespass. These two areas will be analyzed together in the following section, since the ability to bring either claim turns on whether the landowner has the exclusive right to the aquifer space under their land.

Aquifer Control

Ownership of Unused Aquifer Space

Do overlying landowners own or control the underlying usable space in aquifers such that they can prevent others from using it to store water, or at least exact a "rental" fee for such use? *See* Keil, Peter J., *Banking Groundwater in California: Who Owns the Aquifer Storage Space?*, 18. Nat. Res. & Env. 25 (Fall 2003). Proponents of managed aquifer recharge argue that unused aquifer space is a common property resource that can be utilized by any overlying landowner without obtaining consent of other overlying landowners and without paying compensation to them. Alternatively, challengers to managed aquifer recharge projects claim that overlying landowners own the aquifer space underneath their property, and therefore have the right to exclude others from utilizing that space; or at least require that they be compensated for the use of the aquifer space. The majority of these issues arise under either the Fifth Amendment's Takings Clause or, alternatively, in the form of trespassing claims. The Takings Clause is only applicable when a government entity is doing the recharge. If it is a private entity occupying the underlying aquifer through recharge, it is a question of trespass. For this article, takings claims and trespassing claims are analyzed together due to the close nature of the two claims.

"Takings" v. Trespass

Incursion of Space

Generally a property owner has the right to full enjoyment and use of his own property. When surface water is recharged, however, there is no ability to control the migration of the water through the strata beyond the property boundaries and thereby prevent an incursion of the space underlying the land of others. Under traditional property law, "any unauthorized physical invasion on or beneath another's property is a trespass that is compensable, even without actual damages." *Id* at 27. If the recharge project is being undertaken by a government entity, the entity is potentially exposing itself to liability for "taking" of subsurface property.

Water Rights Takings

The takings doctrine remains a highly disputed area of law within water rights litigation and has become a new front in the takings legal arena. *See* Owen, Dave, *Taking Ground Water*, 91 Wash. U. L. Rev. 253, 271 (2013). In general, "two observations can be made about takings litigation in the water rights context to date. First, most cases involve appropriative rights or rights that are similarly relatively well defined. Second, when courts have found a taking of water rights, it is generally because the government action has effectively destroyed the entire right." Craig, Robin Kundis, *Defining Riparian Rights As "Property" Through Takings Litigation: Is There A Property Right to Environmental Quality?*, 42 Envtl. L. 115, 125 (2012). Most takings tests look for physical invasions and direct appropriations of property, which result in a complete diminishment of value. *Taking Ground Water, supra*. Even more troubling, the Takings Clause seems to be in total flux regarding even the starting question of whether the regulation of water use is a physical or regulatory taking. One scholar, however, has proclaimed that "takings litigation can become a productive occasion for defining the status and nature of water rights." *Defining Riparian Rights, supra*. The Takings Clause, unlike other legal issues presented here, deals largely with precedent established by the United States Supreme Court, rather than by any particular state. The Takings Clause states that "private property [shall not] be taken for public use, without just compensation." U.S. Constitution, Amendment V.

Ownership Question: Storage Space

A threshold question to be answered in takings cases is whether the plaintiff actually owns the allegedly taken property. In the case of managed aquifer recharge, the Takings Clause does not actually involve the taking of the water itself. Rather, recharge involves the taking of the storage space that the recharged water is put into, i.e., the underlying aquifer. Under traditional property law it was believed that a landowner owned everything above and below his parcel of land. This common-law doctrine is best explained by the Latin phrase *cujus est solum ejus est usque ad coelom et ad inferos* (cujus doctrine), which translates to: "To whomsoever the soil belongs, he owns also to the sky and to the depths." Although

Aquifer Recharge

Common Sense

the leading US Supreme Court (Supreme Court) precedent dealing with the cujus doctrine focuses on air space, its stark language is instructive on how they viewed the cujus doctrine as a whole. *See United States v. Causby*, 328 U.S. 256 (1946). The Supreme Court stated that the cujus "doctrine has no place in the modern world. The air is a public highway…Were that not true, every transcontinental flight would subject the operator to countless trespass suits. Common sense revolts at the idea. To recognize such private claims to the airspace would clog these highways, seriously interfere with their control and development in the public interest, and transfer into private ownership that to which only the public has a just claim." *Id.* at 261. At the same time, those managing an aquifer recharge project must be aware that there is bound to be liability if injection of water causes harm — e.g., contamination of well water, flooding, etc.

Given their growing importance as a viable water management option, aquifer recharge projects could well become as important to society as air travel. As such, the idea of allowing a single landowner to interfere with the control and development of entire aquifers is against common sense and "has no place in the modern world." Subjecting a managed aquifer recharge project to potential liability from every overlying landowner would make any such project unfeasible. This development thus seems unlikely to be required due to the many benefits derived from recharging depleted aquifers. Unfortunately, the Supreme Court has not heard a case regarding the taking of aquifer space specifically — so different states must be examined for further guidance.

Colorado Decision

While it is still relatively unsettled as to who actually owns the aquifer storage space in most states, Colorado courts have definitively stated that "by reason of Colorado's constitution, statutes, and case precedent, neither surface water, nor ground water, nor the use rights thereto, nor the *water-bearing capacity of natural formations* belong to a landowner as a stick in the property rights bundle. *Bd. of County Com'rs of County of Park v. Park County Sportsmen's Ranch, LLP*, 45 P.3d 693, 707-710 (Colo. 2002)(emphasis added). In fact, in that case the court proclaimed that "the holders of water use rights may employ underground as well as surface water bearing formations in the state for the placement of water into, occupation of water in, conveyance of water through, and withdrawal of water from the natural water bearing formations in the exercise of water use rights." *Id.* The court did, however, place a limit on the right to use underground aquifer as storage: "When parties have use rights to water they have captured, possessed, and controlled, they may place that water into an aquifer by artificial recharge and enjoy the benefit of that water as part of their decreed water use rights, if the aquifer can accommodate the recharged water without injury to decreed senior water rights." *Id* at 693. The "no-injury" requirement expressed by the Colorado courts is a common theme throughout Prior Appropriation states.

No-Injury Rule

Water Distribution

Idaho courts have not specifically ruled on the ownership of the aquifer space, but they have briefly discussed the Takings Clause in the water law context. In *Nettleton v. Higginson,* two water districts were combined to make one and the watermaster was required to consider both creeks when making decisions on water delivery-calls. 558 P.2d 1048 (Idaho 1977). The plaintiff argued that by distributing the water as proposed he would not get his full use right, which constituted a taking of private property for public use without just compensation, contrary to Idaho's Constitution. The Court held that "the right of appropriation does not carry with it an unconditional guarantee of water regardless of the supply of water available" and that the taking in question was not a Fifth Amendment taking, per se, but was simply based on the users' relative priority dates: "The fact that his diversion must be shut off to allow those with an earlier priority to receive water cannot be complained of as being a violation of Article 1, § 14 of the Idaho Constitution." *Id.* The Court was dismissive of the takings argument and instead focused on Idaho policy considerations. The Court stated that "the entire water distribution system under Title 42 of the Idaho Code is to further the state policy of securing the maximum use and benefit of its water resources." *Id.* at 1048. Arguably, it is a fair assumption that aquifer recharge likewise would be viewed as helping to secure the maximum use and benefit of the state's water resources and therefore outside the Takings Clause realm.

Maximum Use & Benefit

"Natural" Storage

California does not have a statute directly bearing on aquifer recharge takings claims, but its courts have strongly suggested that takings claims and real property trespass claims do not apply to all managed aquifer recharge projects. In *City of Los Angeles v. City of Glendale*, the California Supreme Court upheld a municipality's right to store surface water in aquifers without overlying landowners' permission and without paying compensation. 142 P.2d 289 (1943). Aquifers were deemed an economical and efficient method of "natural storage." *Id.* at 294. The Court stated that "[E]arly in the history of [California], this court recognized the advantage of permitting the use of natural surface facilities…for the transportation of water…'It would be a harsh rule to require those engaged…to construct an actual ditch along the whole route through which the waters were carried, and to refuse them the economy that nature occasionally afforded.'" (citation omitted). *Id.* Thus, California, has authorized managed aquifer recharge "subject to the limitation that storage and withdrawal does not harm other groundwater users, including interference with natural recharge: '[n]o necessity is shown for interfering with this right to use the basin for storage, for there does not appear to be any shortage of underground storage space in relation to the demand thereof.'" (citation omitted). *Who Owns the Aquifer Storage Space, supra* at 28.

Storage Right

Aquifer Recharge

Gravel Pit Flooding

Another California case, *Niles Sand and Gravel Co. v. Alameda County Water Dist.*, 37 Cal.App.3d 924, 112 Cal.Rptr. 846 (1974), involved a local water district that was engaged in a continuous water recharge program within the basin, collecting water on the land surface and storing it "in sufficient quantity so that the pressure of its weight and density forces it to percolate through the underlying soil and into the basin proper. This process inevitably results in raising the underground water table." *Id*. at 37 Cal.App.3d 928-929. The raising of the water table flooded the pits of a local sand and gravel business, forcing the gravel company to pump water out of its pits. The gravel company argued that "they have the absolute right to use their land, to unlimited depths below its surface, because Civil Code section 829 vests in them 'the right to the surface and to everything permanently situated beneath...it.'" *Id*. at 932-933. The gravel company maintained that "the flooding of their pits below ground level, as a result of the district's water replenishment program, has interfered with their subterranean rights in their land, and with their sand and gravel business, so as to constitute a 'taking' or 'damaging' of their property which is for a public use and for which article I, section 14, therefore entitles them to compensation." *Id* at 933. The court, however, held that the recharge program served reasonable and beneficial purposes and that overlying landowners cannot object to a managed aquifer recharge project even if they suffer some harm.

Overlying Owners' Rights

Although California does not have a statute specifically acknowledging the ownership of aquifer storage space, the California Supreme Court has endorsed managed aquifer recharge programs. California does not recognize a proprietary right to an underlying aquifer on behalf of overlying owners. Overlying owners, therefore, cannot object to groundwater storage beneath their property absent a showing of harm to a recognized right associated with their property ownership. This harm could come in the form of interfering with the right to extract their correlative share of the aquifer's native yield or damage to property from elevated groundwater tables. *Who Owns the Aquifer Space?, supra*. It is important to keep in mind that California, unlike most prior appropriation states, recognizes the correlative rights doctrine. The court in *Niles, supra* at 934, explained the correlative rights doctrine: "…as between the owners of land overlying strata of percolating waters, the rights of each to the water are limited, in correlation with those of others, to his 'reasonable use' thereof when the water is insufficient to meet the needs of all." (citations omitted). For a more detailed explanation of the correlative rights doctrine, please see Part I of this article (*TWR* #127, page 20).

Correlative Rights

Shared Asset

It seems likely that the courts of all western states will ultimately determine that the unused storage space in an aquifer is a *shared asset*. Further, any entity — private or public — will probably be deemed able to use an aquifer for storage of recharged water. This ability to utilize an aquifer will, of course, still be contingent upon no actual injury to other groundwater users. In such circumstances, no entity — including overlying landowners — will be able to exclude others from using the aquifer storage space nor exact a "rental" fee for such use.

Priority Date

Allocation of Storage Space

Another question arises for states where more entities seek to store water than there is aquifer space available. Under such conditions, who has priority to use the aquifer storage space? Thus far the law offers little guidance in this regard. In Prior Appropriation Doctrine states, it seems logical that, lacking other explicit guidance, the priority date for the projects would govern the allocation of aquifer space. In other words, the date an entity begins the official process to obtain a permit for the project would become the project's priority date. Any later projects would have a junior (later) priority date and the project with a senior (earlier) priority date would be entitled to its allocation of aquifer space — i.e. if aquifer storage space is limited, the senior project would have the first right to utilize the space.

However, questions remain. It is not uncommon for more than one public entity to use a single aquifer for managed recharge purposes. What if two public entities are competing for the same space — how would priority apply? *See Aquifer Storage and Recovery: Lessons from the Western United States*, 45 RMMLF-INST 25 (1999).

Settlement Agreements

In an adjudicated basin, this legal uncertainty has been addressed through negotiation of detailed agreements, often in the form of a stipulated judgment. *Id.* If parties are unable, or unwilling, to come to a detailed agreement, the likely arena used to resolve the dispute will be the court system, in the form of eminent domain litigation. While a detailed explanation of eminent domain litigation is outside the scope of this article, each agency would likely have to establish that its project would result in the best use of the available aquifer storage space. *Id.* This could be done through a detailed and comprehensive cost-benefit analysis for the different managed aquifer recharge projects.

Agency Regulation Option

To avoid litigation between government entities, a state could find it appropriate to take another approach — authorizing a government agency to regulate the aquifer storage space as between public entities. This agency would provide regulations, policies, and oversight for public managed aquifer recharge projects. One current example of this approach is the extensive regulatory program for the allocation of underground storage in Arizona.

Aquifer Recharge

Source Substitution

Mandatory?

Groundwater/ Surface Water Priority

Reasonable Diversions Protected

Reasonable Means of Diversion

Introduced Quality

Substitution of Source by Senior Users

The National Water Commission recommended to states with heavy groundwater use impairing surface water appropriations that "where it is hydrologically indicated, maximum use of the combined resource should be accomplished by laws and regulations authorizing or requiring users to *substitute* one source of supply for the other." *Nat'l Water Comm'n, Water Policies for the Future: Final Report to the President and to the Congress of the United States* 233-34 (1973)(emphasis added). Typically, adhering to this recommendation requires surface water users to divert groundwater instead of surface water in order to satisfy their water right. There are times, however, when efficiency in water management may be better served by traditional groundwater users using surface water to fulfill their water rights — e.g., in times of surface water abundance. As discussed in Part I of this series of articles (*TWR* #127), Colorado and Idaho both require some sort of substitution plan, i.e. mitigation or augmentation plans, in certain situations. Requiring a substitution plan, however, is different than mandatory substitution required by the state. Mandatory substitution would almost certainly increase the value and need for managed aquifer recharge projects by increasing the overall demand for groundwater.

Colorado has discussed the idea of mandatory substitution, most prominently in the San Luis Valley. Colorado's Supreme Court specifically discussed the idea of mandating supply substitution in the 1984 case of *Alamosa-La Jara Water Users Protection Ass'n v. Gould,* 674 P.2d 914 (Colo. 1984). In order to meet the requirement of an interstate compact, Colorado's State Engineer called for the widespread shutdown of groundwater pumping in the San Luis Valley. Groundwater users challenged the State Engineer's proposed shutdown of wells and claimed that the senior surface appropriators had a duty to switch to diverting groundwater rather than to enforce their priorities against well owners. *Id.* The court sided with the groundwater pumpers and remanded the case back to the State Engineer to take into account all relevant factors. In the end, the State Engineer did not have to curtail the pumping for full interstate compact compliance. Douglas L. Grant, *Conjunctive Management of Hydrologically Connected Surface and Ground Water: The Problem of Sustainable Use*, 54 RMMLF-INST 14-1 (2008).

However, in 2004, the Colorado State Legislature directed the State Engineer to regulate the confined and unconfined aquifers in the San Luis Valley "so as to maintain a sustainable water supply in each aquifer system, with due regard for the daily, seasonal, and long-term demand for underground water." Colo. Rev. Stat. Ann. § 37-92-501 (2014). The Legislature expressly required that the State Engineer "not require senior surface water right holders with reasonable means of surface diversions to rely on underground water to satisfy their appropriative water right." *Id.* The Colorado Supreme Court approved these rules in 2008. *See Simpson v. Cotton Creek Circles*, *LLC*, 181 P.3d 252, 254 (Colo. 2008). Thus, surface water users are not required to augment their surface supply with groundwater but they are still allowed to. This is generally done through substitution or augmentation.

In Idaho, the Conjunctive Management (CM) Rules require that administrative enforcement of priorities can occur only when "material injury" has occurred and the water is being used efficiently and without waste. Similar to Colorado's requirement, Idaho's CM Rules require the Idaho Department of Water Resources (IDWR) to consider whether the senior water right could be filled without shutting down junior wells if the senior appropriators used "alternative reasonable means of diversion or alternative points of diversion, including the construction of wells or the use of existing wells…". CM Rule 42.01.g. The Idaho Supreme Court has even required, in one instance, that senior users interconnect individual wells or well systems across a project before a delivery call can be filled. In *A&B Irr. Dist. v. IDWR*, groundwater users "alleged that junior priority groundwater pumping from the ESPA had, since 1959, lowered the water table an average of twenty feet and up to forty feet in some areas, which resulted in a 126 cfs reduction of A & B's diversion rate." 284 P.3d 225, 229 (2012). The IDWR Director determined that A & B had to take reasonable steps to maximize use of interconnection to move water within the system *before* it could seek curtailment of, or compensation from, junior water right holders in order to fulfill their senior water rights. The Supreme Court found the Director did not act "arbitrarily or violate Idaho law when he found that A & B must work to reasonably interconnect some individual wells or well systems before a delivery call can be filed." *Id* at 241.

Water Quality

Protection of groundwater quality is a complicated area of law. Naturally, managed aquifer recharge projects raise a concern regarding the quality of the water introduced into the aquifer. While numerous activities can affect groundwater quality, managed recharge is a concern because it places large quantities of water into an aquifer. Widespread reliance on aquifers as a source of drinking water for vast populations emphasizes the importance of maintaining high quality water in the aquifers. In fact, groundwater accounts for nearly 95% of drinking water in some states (*see* www.deq.idaho.gov/water-quality.aspx). Water quality is regulated, to some degree, at both the state and federal level. This section will give an overview of the legal issues pertinent to managed aquifer recharge on both levels.

Aquifer Recharge

Federal Laws

Starting with federal law, there are two main acts that could potentially apply to managed aquifer recharge projects: 1) the Clean Water Act (33 U.S.C.A. § 1251); and 2) the Safe Drinking Water Act (42 U.S.C. §§300f-300j-9). The Clean Water Act (CWA) establishes the basic structure for regulating the discharge of pollutants into the water of the United States and regulating quality standards for surface waters. Section 301(a) of the CWA provides that, in the absence of a permit, "the discharge of any pollutant by any person shall be unlawful." 33 U.S.C.A. § 1311(a). The phrase "the discharge of a pollutant" is defined by § 502(12) as the "addition of any pollutant to navigable waters from a point source." 33 U.S.C. § 1362(12). Section 502(7) defines the term "navigable waters" as "waters of the United States, including territorial seas." 33 U.S.C. § 1362(7). Thus, the question arises whether an aquifer is considered a navigable water.

Hydrological Connection

Determining whether the CWA applies to a managed aquifer recharge project depends on whether the groundwater that is being recharged is hydrologically connected to surface water of the United States. The US District Court in Idaho was faced with this very question in *Idaho Rural Council v. Bosma*, 143 F. Supp. 2d 1169 (D. Idaho 2001). In *Bosma*, the issue to be determined was whether the defendant's alleged discharge of pollutants into groundwater hydrologically connected to plaintiff's artesian springs constituted a violation of the CWA. *Id*. The Court stated that "all courts agree — that the CWA does not regulate 'isolated/non-tributary ground water' which has no affect on surface water." *Id.* The Court held, however, that Congress did intend to regulate discharges into hydrologically connected groundwater which adversely affected surface water. *Id* at 1180. The Court tempered this far-reaching pronouncement with the acknowledgment that plaintiffs must "demonstrate that pollutants from a point source affect surface waters of the United States. It is not sufficient to allege groundwater pollution, and then to assert a general hydrological connection between all waters. Rather, pollutants must be traced from their source to surface waters, in order to come within the purview of the CWA." *Id*., quoting from *Washington Wilderness Coalition v. Hecla Mining Co*., 870 F.Supp. 983, 990 (E.D.Wa.1994).

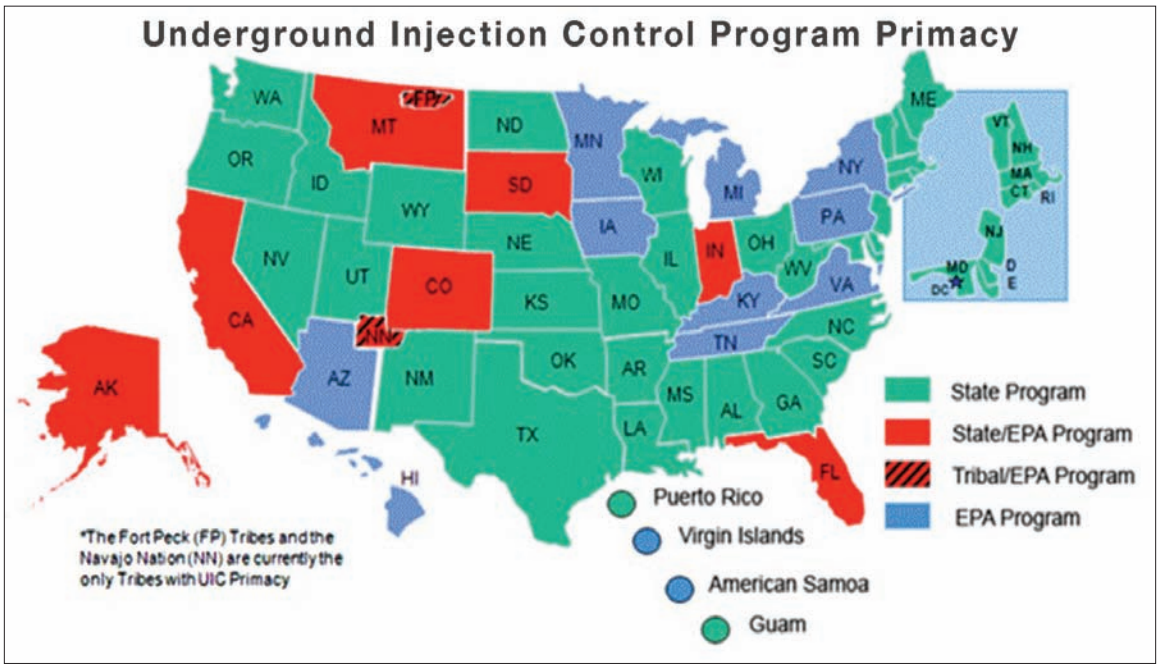
Causation Proof

Safe Drinking Water Act

The federal Safe Drinking Water Act (SDWA) is considered the main federal law regarding the quality of Americans' drinking water. The SDWA authorizes the US Environmental Protection Agency (EPA) to set national standards for drinking water to protect against both naturally-occurring and man-made contaminants. *See* http://water.epa.gov/lawsregs/rulesregs/sdwa/index.cfm. The SDWA deals largely with public drinking water systems, underground waste injection control, and "sole source" aquifers. *Law of Water Rights and Resources, A. Dan Tarlock,* § 4:34 (2014 ed.). (At least 10 aquifers nationwide have received "sole source" designation). [Editor's Note: EPA defines a sole or principal source aquifer as an aquifer that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas may have no alternative drinking water source(s) that could physically, legally and economically supply all those who depend on the aquifer for drinking water. EPA website at: http://water.epa.gov/infrastructure/drinkingwater/sourcewater/protection/solesourceaquifer.cfm].

"Sole Source" Aquifers

UIC Primacy



Aquifer Recharge

SDWA Authority

The DC Circuit Court described the SDWA regulatory regime thusly:

> The SDWA, 42 U.S.C. §§ 300f to 300j-9, directs the EPA to prescribe both primary and secondary maximum levels for contaminants in public drinking water systems. Primary regulations specify federally enforceable maximum [contaminant] levels (MCLs) for "contaminants which, in the judgment of the Administrator, may have any adverse effect on the health of persons." 42 U.S.C. § 300(f)(B). Secondary regulations (SMCLs), which are enforceable only in the discretion of the states, specify "maximum contaminant levels which, in the judgment of the Administrator, are requisite to protect the public welfare." 42 U.S.C. § 300f(2). *Nat. Resources Def. Council, Inc. v. E.P.A.*, 812 F.2d 721, 723 (D.C. Cir. 1987).

Underground Injection

EPA works closely with its regional offices, states, tribes, and other partners to protect public health through implementing the SDWA. The SDWA pays special attention to underground injection of fluids, as evidenced by the creation of the Underground Injection Control Program (UIC). The UIC Program is responsible for regulating the construction, operation, permitting, and closure of injection wells that place fluids underground for storage or disposal. The UIC Program requirements were developed by EPA and designed to be adopted by states, territories, and tribes. States, territories, and tribes can submit an application to EPA to obtain primary enforcement responsibility, or primacy. Agencies that have been granted this authority oversee the injection activities in their states. The requirements for primacy programs are outlined in the UIC regulations at 40 Code of Federal Regulations Part 145. *See* EPA UIC Program webpage: http://water.epa.gov/type/groundwater/uic/index.cfm.

Primacy Programs

Notably, the SDWA was created with the idea that the states could have primary enforcement responsibility, or primacy, over the UIC Program requirements. As shown in Figure I, states vary greatly with regards to EPA approved primacy programs but the majority have chosen full primacy. *See* http://water.epa.gov/type/groundwater/uic/Primacy.cfm. Among the states covered in this article, Idaho has full primacy, Colorado and California share primacy with EPA, and Arizona is the only western state that has no degree of SDWA primacy.

Injection Wells Regulation

Under the UIC Program, injection wells are categorized into six classes. Class V injection wells are "authorized by rule" (40 CFR 144). This means that Class V injection wells do not require a permit if they can be shown to not endanger underground sources of drinking water and comply with other UIC program requirements. As concerns aquifer storage and recovery, the no-endangerment requirement may mean that the water to be injected must meet the drinking water standards. Getting Class V status is important to a managed aquifer recharge project because the alternative permit processes are often costly. Currently, the EPA estimated that there are over 650,000 Class V wells in use nationwide. Common examples include septic systems, cesspools, and stormwater drainage systems. Although the vast majority of wells are unsophisticated shallow systems, a small number are Class V wells include aquifer storage and recovery wells. Thus, the quality of the water that is being used to recharge is of concern for a managed aquifer recharge project, if it wishes to avoid the complex regulation established under the SDWA. If an entity can ensure that the water received is of drinking water standard and does not threaten human health, a permit is not necessary. *Law of Water Rights and Resources, supra* at § 4:34.

Wastewater Use

In Idaho, groundwater quality is regulated by the Idaho Department of Environmental Quality (IDEQ). IDEQ has been granted primacy over both the SDWA and certain aspects of the CWA, and operates under the Idaho Rules for Public Drinking Water Systems. With regard to wastewater used for recharge, permits are required from IDEQ before reuse of the water. IDEQ has a wastewater program that "establishes standards for on-site wastewater systems (septic systems) and issues wastewater reuse permits limiting the amount of wastewater that may be land-applied for irrigation." When surface waters are "land applied with the intent to recharge an underlying aquifer" no permit is required — though IDEQ may require an approved program to monitor the water quality under Idaho Administrative Rule §58.01.16.600. The land application option provides an important exemption for managed aquifer recharge projects in Idaho because it reduces the overall cost of starting and maintaining the project. Injection wells, on the other hand, are regulated by the Idaho Department of Water Resources (IDWR) and a permit is required. (*See* IDEQ website: www.deq.idaho.gov/water-quality).

Land Application

Aquifer Categorization

Aquifers in Idaho are categorized so as to offer different levels of protection. This categorization is based on the "vulnerability of the ground water, existing and future beneficial uses of the ground water, existing water quality, and social and economic considerations." In Idaho, recharge project managers should be aware of what aquifer they are planning to recharge and the differing water quality standards of each. *See Idaho Ground Water Quality Plan*, at: www.deq.idaho.gov/media/462972-idaho_gw_quality_plan_final_entire.pdf.

Aquifer Recharge

Retrieval Timing

Abandonment or Forfeiture

"Use it or lose it" is a fundamental axiom of western water law. If an entity decides to store water underground through managed aquifer recharge, it must be able to retrieve that water at a later time. If retrieval of the recharged water occurs a number of years later, the entity may run into abandonment or forfeiture issues. Recall that water appropriation rights are considered usufructory rights (i.e. the right to use, as opposed to outright ownership of water) and may be lost due to non-use. *Law of Water Rights and Resources, supra* at § 5:89. Generally this occurs through either abandonment or forfeiture, depending on the governing statute in the jurisdiction of the water right. *Id.* "Although abandonment and forfeiture share certain common features, the two are distinct legal concepts. Abandonment is a common law doctrine involving the occurrence of: 1) an intent to abandon; and 2) an actual relinquishment or surrender of the water right." Moreover, the Idaho courts have found that the "the intent to abandon a water right must be evidenced by clear, unequivocal and decisive acts and mere non-use is not per se abandonment." *Sears v. Berryman*, 623 P.2d 455, 459 (1981). Forfeiture, on the other hand, is predicated upon the statutory declaration that all rights to use water are lost where the appropriator fails to make beneficial use of the water for a continuous [statutorily defined] period." *Id.* Under the Idaho Code, all rights to the use of water are forfeited by a failure to apply the water to a beneficial use for a period of five continuous years, in the absence of a valid defense that would excuse the forfeiture. Idaho Code Ann. §42-222(2).

Non-Use Period

Municipal Exception

Idaho courts created an exception to abandonment and forfeiture doctrines for municipalities. *Beus v. City of Soda Springs*, 107 P.2d 151 (Idaho 1940). In *Beus v City of Soda Springs*, the court proclaimed that a municipality may "acquire water for its municipal needs, but it is not required to [use that water] in order to avoid a loss of the water on a charge of abandonment." *Id* at 154. The Court further held that a city has the implied power to appropriate water for the "probable future demands of its population" and therefore to allow abandonment would essentially nullify this power. *Id.* Therefore, a municipality must only show a reasonable future need to obtain a water right for future use. This common law exception was codified by the legislature, as indicated below, to allow a municipality to determine the amount of water it needs for future use.

The Idaho legislature has created numerous exceptions to forfeiture.

Forfeiture Exceptions

Pertinent to managed aquifer recharge projects are the following exceptions:

1) If the water right is held by a municipal provider to meet reasonably anticipated future needs (as described above);
2) If the reason for the nonuse of the water is to comply with the provisions of a groundwater management plan;
3) If the water right is placed in the water supply bank or is retained in or rented from the water supply bank; and
4) If the water right held by an irrigation district, a Carey Act operating company, or any other company, corporation, association, or entity which holds water rights for distribution to its landowners, shareholders or members shall be lost or forfeited due to nonuse by such landowners, shareholders or members, unless the nonuse is subject to the control of such entity.
   [Editor's Note: The Carey Act of 1894 (also known as the Federal Desert Land Act) allowed private companies in the US to erect irrigation systems in the western states. 43 U.S.C. 641 et seq. The Act provided for an alternative disposal of public desert land, based on the determination that erecting large irrigation systems was too daunting for individual settlers].
5) If the nonuse results from the water right being used for mitigation purposes.

Idaho Code § 42-223.

Avoiding Forfeiture

Given these exceptions, it seems that a recharge project should be able to avoid forfeiture of their rights under current Idaho law. Idaho's explicit designation of groundwater recharge as a beneficial use of water seems to avoid the non-use issues entirely because there is no abandonment if the water is being used. However, so long as the entity can also prove that it falls under one of the above-mentioned exceptions, its recharged water would be "double-protected." For a private recharge project, there is a good argument that they also fall within exception #4, above. This is because a private recharge entity should be able to argue that it is holding water rights for distribution to its members and that the water is "subject to the control of the entity." Proving that the water is actually under the control of the recharge entity may be the difficult part because proving "control" of water that is under the ground seems a bit tenuous. However, the answer could hinge on the ability of the recharge project to be able to track the water and its movement in the aquifer. As computer modeling becomes more sophisticated and reliable, the control requirement

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will likely be easier to satisfy. Idaho may also need to consider expanding the application of the state water bank to include managed aquifer recharge — but this is outside the scope of this article. A private entity would also likely argue that #5, from above, is also an exception. However this could prove to not be the case, as will be discussed in the next section.

Recharge Credits and "Taxes"

Recovery

A managed aquifer recharge project is largely concerned with its ability to recover the water after it is recharged. While this may not be as important for public entities that are recharging for the public good, a private entity intending to store water underground is counting on being able to effectively and efficiently recover the stored water for use. If uncertainty exists about whether the water will be recoverable, potential investors may find the risks outweigh the potential rewards and, therefore, not invest in the project. In order to provide the certainty that is needed for privately managed recharge projects, states need to recognize "recharge credits" by establishing an accounting method for water added to an aquifer. Arizona has provided for the accounting of recharge water for decades.

"Transported" Water

The main goal of Arizona's Underground Water Storage, Savings, and Replenishment Program (UWSP) is to account for water stored underground so the water can be used in the future. In order to accomplish this, the UWSP has two primary purposes. Ariz. Rev. Stat. Ann. §§45-801.04-898.01). First, the UWSP promotes the use of renewable water supplies — such as effluent, surface water, and Central Arizona Project (CAP) water — by allowing for effective and flexible storage and recovery of those supplies. *Id* at § 45-801.01. Second, the UWSP provides for the efficient use of all water resources by allowing water to be "transported," that is, allowing a party to store a quantity of water in one location and recover the same quantity of water in another. *Id.* The UWSP also allows water users to accrue "long-term storage credits." When eligible water is stored underground for more than one year, long-term storage credits may be issued. Long-term storage credits are recharge credits earned in the process of storing water. These credits can be recovered in the future to be used for various reasons, including establishing an assured water supply or fulfilling replenishment obligations.

Long-Term Storage Credits

In Arizona, stored water is usually eligible for long-term storage credits when all of the following three requirements are met:

1) The water cannot reasonably be used directly
2) The water was not recovered on an annual basis
3) The water would not have been naturally recharged within an Active Management Area

Ariz. Rev. Stat. Ann. § 45-802.01(22).

Legal Character

Under Arizona's system, stored water always *maintains the legal character of the original source water*, regardless of where it is recovered or how it is used. Thus, if CAP water is stored, no matter where recovery occurs, the water is considered to be CAP water when it is recovered and may be used in any way that CAP water could be used. *See Recharge Credits and Accounting,* Arizona Department of Water Resources, at: www.azwater.gov/AzDWR/WaterManagement/Recharge/RechargeCreditsandAccounting.htm. Also, a holder of long-term storage credits may assign all or part of their credits to another. This creates a market for water stored underground, which in turn helps lead to the maximum usage of the scarce resource.

Assignment of Credits

Storage Tax

Uniquely, Arizona's UWSP program requires a cut, or a tax, on water stored in an aquifer. The statute provides that only 95% of the recoverable amount of the water that is stored is registered to a long-term account. This ensures that 5% of the water stored will remain in the aquifer and will provide a continued benefit to the aquifer as a whole.

This tax to benefit aquifer water accrual is required unless the stored water was:

1) Imported into the Active Management Area (AMA) through the efforts of the storer (no cut);
2) Stored outside an AMA and imported into a groundwater basin through the efforts of the storer (no cut);
3) Effluent stored at a constructed underground storage facility (no cut); or
4) Effluent stored at a managed underground storage facility (50% cut).

See Ariz. Rev. Stat. Ann. § 45-852.01.

Idaho Limitations

On the other end of the spectrum lies Idaho, which only recognizes recharge credits if they are created as mitigation for a delivery call (i.e., a call by senior water rights holders to curtail the use of junior rights holders in times of shortage) or for a new appropriation that has been filed as an application for permit. This does not mean, however, that entities are not trying to change this limitation. In 2012, a group of prospective recharge entities (hereafter referred to as the "Alliance") filed a *Request for Recognition of Recharge Credits* (Request). According to the Request, the purpose of the Alliance was "to develop,

Aquifer Recharge

Legislation Needs

Unresolved Legal Issues

implement, and maintain privately funded and managed programs to deliver recharge water to the Eastern Snake Plain Aquifer (ESPA) from the Snake River to enhance aquifer levels and discharge at strategic locations and to develop a market for the resulting mitigation credits." *Final Order Denying Request for Mitigation Credits, In the Matter of a Request for Recognition of Ground Water Recharge Credits in the Name of the Eastern Snake Plain Recharge Alliance,* IDWR (March 23, 2012). The Idaho Department of Water Resources (IDWR) denied the request for mitigation credits, stating that "there is no provision in Idaho law that allows the Director to authorize, much less approve, mitigation credits for applications for new water rights or transfers of existing water rights that have not yet been filed." *Id.* at 3. The Director did go on to explain IDWR's support for the parties' efforts at recharging the ESPA, and to suggest support for the parties' efforts in advancing legislation or formal rulemaking on the subject. Ultimately, the Director stated that without a specific procedural mechanism to authorize mitigation credits, the Director could not approve the request. In order for Idaho, as well as any other state, to promote managed aquifer recharge projects, suitable legislation or formal rulemaking allowing for recharge credits would be helpful. Without such legislation in place, a careful application of existing statutes is necessary, but as in Idaho, could result in denial of a project.

CONCLUSION

Managed aquifer recharge projects are indispensable for the continued maximum usage of a state's water resources. They provide much needed flexibility for enhancing maximum usage of water resources by significantly increasing the water storage capacity of a state. In the arid regions of the western United States, this increased storage capacity could mean the difference between a running water faucet and dried up wells. In order to provide the foundation needed to establish successful recharge projects, important legal issues including those discussed in this paper need to be considered and addressed. Unfortunately for many states, these important legal issues are not fully resolved and may require additional statutes, formal rulemaking, or litigation to provide certainty. However, with the ever-increasing awareness of the benefits of managed aquifer recharge, it seems only a matter of time before the legal landscape in many more western states evolves in the manner necessary to support efficient water markets — and truly efficient water markets will necessarily involve the use of aquifers as storage facilities.

An upcoming article in *The Water Report* will explore practical application of these legal issues in the development of managed aquifer recharge projects via public-private partnerships.

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Dave Tuthill has worked in the field of water resources throughout his professional career. During the period from January 1, 2007 through June 30, 2009, he served as Director of the Idaho Department of Water Resources (IDWR). Prior to that he spent 31 years working through the ranks in a variety of increasingly responsible positions for IDWR, in both the State Office and the Western Regional Office. These assignments provided direct and applied experience in most of IDWR's regulatory and water right programs. Dave was an active member of the US Army Reserve. He retired in June 2004 as a Colonel, Corps of Engineers, United States Army Reserve, with 30 years of Commissioned Service. Upon his retirement from the Idaho Department of Water Resources, Dave founded Idaho Water Engineering, LLC.

COLUMBIA RIVER TREATY OPTIONS

PROTOCOLS FOR TRANSBOUNDARY ADAPTIVE MANAGEMENT EXAMINED

Columbia Treaty Flexibility

EDITED/CONDENSED
from a Monk School of Global Affairs Program on Water Issues (University of Toronto) Bulletin summarizing "*Protocols for Adaptive Water Governance: The Future of Columbia River Treaty*" — a treatise by Nigel Bankes (University of Calgary) and Barbara Cosens (University of Idaho) which describes the flexibility potentially available to the Columbia River Treaty through examination of several other water-related transboundary treaties.

Transboundary Treaty

For fifty years, Canada and the United States have collaborated on and shared in the benefits of the Columbia River Treaty, a bi-national agreement that has been hailed as one of the most successful transboundary water treaties in the world. *See*: *The Columbia River, Basin, and Treaty*, Miller, *TWR* #101; *The Future of the Columbia River Treaty*, Bankes & Cosens, *TWR* #105; *The Columbia River Treaty*, Christensen, *TWR* #125.

Since coming into effect in 1964, the Treaty has protected communities from flooding and has generated hydropower for the Pacfic Northwest. With the opportunity for either Canada or the US to give notification to terminate the power provisions of the Treaty now in effect, governments and communities are asking, "Should we continue with the Treaty or should we consider changes? If we change it, how should we do it? Are there issues that can be addressed outside the Treaty?"

Changes Since Inception

There have been many significant and unpredicted changes since 1964 in the Columbia River Basin including changes in: energy markets; population growth and settlement patterns; environmental issues; public expectations of participation; the status of Tribes and First Nations; and climate impacts. These changes have led many to suggest that the Columbia River Treaty should be broadened to embrace values that go beyond its original areas of focus (flood prevention and hydro power generation) to include values such as: ecosystem function; fisheries; irrigation; water supply; and navigation.

Flexibility & Balancing

Because of the possibility that either party may terminate the power provisions of the Treaty, Canada (through the Province of British Columbia) and the US (through the "US Entity" that implements the Treaty) have carried out extensive reviews and have developed positions on what the future Treaty should contain and address. While there are differences between the two positions, both agree that flexibility is needed and there is a need to strike a balance between certainty and adaptability. Both agree that there are gains to be made through coordinated management of the Columbia River, and that such gains and benefits should be shared. Both recognize the need to involve Tribes/First Nations, communities and other regional interests during any negotiation process.

But while there is a general agreement among stakeholders that there needs to be improved flexibility to address unexpected changes in values or conditions and perhaps to add values beyond flooding and hydropower, there is no consensus on how we might achieve this and, indeed, whether we should do this within the Treaty process or outside of it.

Flexibility Examples

To address the question, the Program on Water Issues at the Munk School of Global Affairs at the University of Toronto worked with two experts in international law — Nigel Bankes from the University of Calgary and Barbara Cosens from the University of Idaho — to develop *Protocols for Adaptive Water Governance: The Future of the Columbia River Treaty*. Their paper explores how flexibility can be achieved through the Treaty and through other transboundary mechanisms. Through the lens of adaptive water governance, Bankes and Cosens examined existing models from both the international and domestic level to identify legal mechanisms that allow for flexibility and adaptive capacity in transboundary water agreements.

Protocols Paper

This bulletin provides a summary of their findings, highlighting five of the models they studied. It is intended to be read in conjunction with the Protocols paper, and the reader is encouraged to go to the paper to gain a fuller understanding. The paper can be accessed at http://powi.ca/.

1964 Columbia River Treaty

Flexibility & Limits

The Columbia River Treaty between Canada and the US focuses on flood protection and hydropower generation. It is implemented through designated Entities in both countries that implement the Treaty goals and optimize actual operations. Substantial flexibility in implementation of the Treaty has been achieved through supplementary agreements, Non-Treaty Storage Arrangements, ongoing Entity cooperation, and the fact that the Entities have authority to optimize arrangements as long as both parties benefit.

The limits to flexibility are due in part to the lack of a public process, the fact that the Treaty's Permanent Engineering Board is a technical body with no standing political governance institution, and the absence of a provision for regular review.

Columbia Treaty Flexibility

Colorado River Treaty

1944 Colorado River Treaty

The 1944 Treaty between the US and Mexico is focused on water allocation. It provides for a coordinating entity — the International Boundary and Water Commission (IBWC) — that has both technical and diplomatic functions.

A high degree of flexibility has been provided through the Minute process (the records of decisions that are made by and subsequently accepted by both federal governments) which has allowed the IBWC to add new values and address new challenges.

Shortcomings include the fact that the IBWC is a technical body with unclear authority for governance. Also, there is a lack of accountability because: oversight of the IBWC is unclear; there is uneven public involvement; and the upstream partner (the US) dominates the scope and outcome of the Minute process.

Boundary Waters Treaty of 1909 and International Joint Commission

The Boundary Waters Treaty between Canada and the US addresses boundary and transboundary waters.

The flexibility mechanisms under this treaty include the institution of the International Joint Commission (IJC) — a bi-national standing body that operates through a series of technical study boards. The reference jurisdiction of the IJC allows the governments to add to the contents of the original Boundary Waters Treaty by asking the IJC to address new issues and assist them in reaching agreement on those issues. Also, when the IJC issues an Order of Approval for a boundary or transboundary water project, it continues to supervise the Order and has the ability to review it to ensure that it responds to changing needs and interests.

The Boundary Waters Treaty has survived for over a hundred years without substantial amendment, although Canada and the US have supplemented it by negotiating separate agreements such as the Columbia River Treaty and the Great Lakes Water Quality Agreement.

Great Lakes Water Levels

Water levels on the Great Lakes are regulated by the Boundary Waters Treaty of 1909. The flexibility mechanisms in water level regulation include general treaty language that allows the inclusion of additional interests and values, the benefit of an institution (the IJC) which is a standing body with multiple sources of authority, the existence of an informed public, and the fact that geographic scale can be expanded.

The limits to flexibility include the reality that reviewing Levels Orders can take a decade or more due to the need to carry out studies and consult with stakeholders. Also, it is easier to add values than to change the priority of existing values, and experience shows that it is not possible to please everyone because there are always trade-offs to be made when regulating water levels. This experience raises the need for modest expectations and an incremental approach.

Great Lakes Compact and Agreement

Not every issue on which transboundary cooperation is sought requires a treaty. The Great Lakes Compact is a subnational agreement among eight states and two provinces in the Great Lakes Basin. It is focused on preventing new out-of-basin diversions and new large consumptive uses.

Flexibility may come from the internationally non-binding nature of the Compact and Agreement, which can allow experimentation. Such an approach affords local control over issues that must be tailored locally or that require local action.

Columbia Treaty Flexibility

Common Ground

Differences

Flexibility Options

Resolving Tensions

The internationally non-binding nature of the Agreement is also a limitation in that it requires some way to ensure that all parties play their role in implementation.

SUMMARY & CONCLUSIONS

The formal review processes of the Columbia River Treaty carried out by the Province of British Columbia and the US Entity reveal common ground on:

- the need for flexibility in future arrangements and implementation, particularly in the face of climate change, evolving energy markets, and population growth; and
- the desire to involve Tribes and First Nations as well as various interests in any future negotiation and implementation of an agreement.

At the same time there are significant differences between the two reviews relating to the treatment of ecosystem values and perhaps other values, the approach to sharing the benefits, and the assessment of what the Treaty requires for flood control after 2024.

The review of mechanisms to enhance flexibility and adaptive capacity in existing transboundary water agreements clearly demonstrates that there are a number of ways in which flexibility can be built into the Columbia River Treaty or achieved outside the Treaty. In addition, some of the models identified could serve to bridge differences between the parties on key issues such as the treatment of ecosystem values. There is always a tension in international agreements between certainty and flexibility.

Resolving tension requires governments to consider five elements:

- Institutions: Separating the governance function from technical implementation.
- Scale: Considering the appropriate level of agreements and their implementation to address particular issues. Not every issue on which transboundary cooperation is sought requires a treaty.
- Process: Providing for periodic review and public participation.
- Legitimacy: Assuring accountability, transparency, and participation of stakeholders.
- Constrained flexibility: Encouraging "win-win" solutions within the clearly defined boundaries of the agreement.

For Additional Information:

Barbara Cosens, University of Idaho College of Law, 208/ 885-6298 or bcosens@uidaho.edu

Protocols for Adaptive Water Governance: The Future of Columbia River Treaty — see http://powi.ca/

WATER BRIEFS

URBAN WATERS US

EPA GRANT PROGRAM RFP ANNOUNCED

On November 5th, the US Environmental Protection Agency (EPA), USDA Forest Service (USFS), the US Fish and Wildlife Service (USFWS), the Corporation for National and Community Service (CNCS), FedEx, Southern Company, Bank of America and PG&E announced their intention to solicit applications for the 2015 Five Star/Urban Waters Restoration Program which is managed by the National Fish and Wildlife Foundation (NFWF). The grant program is offered in conjunction with the Urban Waters Federal Partnership which gives priority to projects located in underserved, environmentally overburdened communities.

The Five Star & Urban Waters Restoration Grant Program seeks to develop community capacity to sustain local natural resources for future generations by providing modest financial assistance to diverse local partnerships. NFWF anticipates that approximately $2,000,000 in combined total funding will be available for projects such: wetlands creation and restoration; green infrastructure and stormwater management; citizen's science and volunteer water monitoring; projects that reduce or eliminate trash from entering waterways; coastal habitat, riparian, urban forest restoration and other water quality protection and restoration projects in local communities.

NFWF will host a webinar for potential applicants on November 18, 2014. This RFP closes February 2, 2015.

For info: www.nfwf.org/fivestar; Green Infrastructure Program: www.epa.gov/greeninfrastructure

COMPACT KS/NE/CO

DAMAGES & IMPORTED WATER

On October 14, the US Supreme Court (Supreme Court) heard oral arguments in *Kansas v. Nebraska and Colorado,* Case No. 126, Original. The issues in the case include deciding whether Nebraska violated an interstate compact apportioning the waters of the Republican River between Kansas, Nebraska and Colorado, and, if so, what relief is appropriate to remedy the violations. Kansas filed suit in the Supreme Court in 2010 to enforce the final stipulation settlement of 2003, which arose out of previous disputes.

Kansas maintains that Nebraska has violated the compact and failed to take actions necessary to avoid future violations, especially in the inevitable dry periods to come. Kansas' suit argues that Nebraska should be held in contempt of court for not obeying the court's 2003 order adopting the final settlement stipulation, the court should take action against Nebraska to ensure that Nebraska will not violate the compact again, and that Nebraska should pay damages to Kansas for violations of the decree.

In the oral argument, Stephen McAllister, the Solicitor General of Kansas, argued that Nebraska must comply with its compact obligations "every year, including the years when water is scarce. To achieve that goal, Kansas asked this Court to take two measures: First, award a significant of disgorgement [of profits] for Nebraska's massive gain from its compact violation; and second, decline to rewrite the detailed and complicated settlement agreement that the parties reached in 2002, an agreement that is full of compromises and concessions on all sides." *Transcript* at 3.

On the issue of damages, Justice Scalia noted that Kansas' remedy requested that, "you want to say I not only want what it cost me, what your violation cost me, but I want in addition to receive any benefits that you got from the violation." McAllister replied: "In order to stabilize the compact, we think that's…a recognized [contract remedy] in a situation where the master suggests that Nebraska gained at least, perhaps, 25 million from the breach. If it only has to pay Kansas 3.7, then the next time conditions are dry, there's little incentive [for Nebraska to comply with the compact], especially when it takes us 8 years basically to get from the point of breach to even the possibility of recovery…nothing but a substantial disgorgement award seems to really get their attention." *Id*. at 22-23.

Nebraska, through its Chief Deputy Attorney General David Cookson, asserted that the Supreme Court should "affirm the special master's report except for his award of exemplary damages that is not justified in this case." This position includes requesting the Supreme Court to "reform the Technical Appendix C, which is the accounting procedures [for the compact]." *Id*. at 34. As further noted by Cookson, the compact "accounting will not count imported Platte River water supply as part of the Republican River basin… ." *Id*. at 35.

For info: Transcript of Oral Argument available at: www.supremecourt.gov/oral_arguments/argument_transcripts/126,%20orig_n6io.pdf

CALIFORNIA DROUGHT CA

USE/CONSERVATION FIGURES

On November 4, California's State Water Resources Control Board (SWRCB) provided estimates of daily water use per person as the state continues dealing with its serious drought. "This new residential water use data, which is a first for the state, will inform localized conservation efforts and should start conversations in every community in California about the best and most judicious use of our precious water," said Felicia Marcus, Chair of the SWRCB.

The SWRCB was also informed on November 4 that the statewide conservation rate leveled off in September after three months of steady improvement. Total urban water conservation was 10.3% in September, compared with September 2013. That was down slightly from the 11.6% year-over-year conservation rate for August, prompting concerns from SWRCB members. The rates were 7.5% conservation in July and 4% in June (conservation rate is a comparison of the reporting month with the same month a year ago).

The report also found that in September, 87% of the water agencies reporting had instituted mandatory outdoor water use restrictions, a six percentage point increase from the August reporting period. Outdoor water use restrictions are a key requirement for urban water suppliers under the Emergency Water Conservation Regulation because outdoor watering

WATER BRIEFS

accounts for as much as 80% of urban water use in some areas.

The new reporting requirement, called residential gallons per-capita per day (R-GPCD), estimates daily water use by residential customers for nearly 400 urban water agencies statewide alongside the monthly conservation data. Both reports are a requirement of the Emergency Water Conservation Regulation adopted by the SWRCB in July and will be provided to the Board monthly by urban water suppliers, along with total water conservation for each month.

According to the R-GPCD data, water use varies widely by hydrologic region. At the low end, the San Francisco Bay region averaged 85.2 gallons per person per day. On the high end, the Colorado River region averaged 251.9 gallons per person per day.

R-GPCD is useful for tracking water use by an urban water supplier's residential customers and can help determine whether water supplier actions, such as irrigation restrictions, rebate programs, and rate design changes, are effective. SWRCB staff cautioned that R-GPCD data should not be used to compare water suppliers, or even hydrologic regions, unless relevant factors are taken into account. Those relevant factors include population density, population growth, temperature and evaporation rates, topography and socio-economic measures, such as lot size. Nevertheless, communities or areas with very high R-GPCD rates should evaluate instituting additional conservation measures. The SWRCB staff report also noted that high interest is continuing in the Turf Removal Program for both commercial and residential users. Chair Marcus' comments drew discussion among SWRCB members and direction to staff to begin planning for a water conservation workshop within the next 90 days to explore what if any additional conservation measures should be adopted if the drought continues.

In his January 17, 2014, Emergency Drought Proclamation, Governor Brown called for Californians to voluntarily reduce their water use by 20%. The trend of increasing reductions and specific local data shows that many California communities have met and exceeded the call to conserve, but more can and must be done to protect water supplies should the drought persist, according to SWRCB. The Emergency Water Conservation Regulation will be in effect until April 25, 2015, and may be extended if drought conditions persist.

For info: George Kostyrko, State Water Board, gkostyrko@waterboards.ca.gov; Report on R-GPCD available at: www.waterboards.ca.gov/waterrights/water_issues/programs/drought/conservation_reporting_info.shtml; Staff Presentation to State Water Board available at: www.waterboards.ca.gov/waterrights/water_issues/programs/drought/docs/emergency_regulations/uwc_pres110414_item6.pdf; *see* also Drought.CA.Gov

WATER MARKETS WEST

SHORTAGES MITIGATION ANALYSED

The Hamilton Project released an important paper entitled *Shopping for Water: How the Market Can Mitigate Water Shortages in the American West*, The Hamilton Project, Discussion Paper 2014-05 (October 2014). This paper is written by three experts in the field of water law: Peter Culp of Squire Patton Boggs, LLP; Prof. Robert Glennon of the University of Arizona College of Law; and Prof. Gary Libecap of the University of California, Santa Barbara.

With drought moving the dial from conflict to crisis, the paper focuses on "using market forces to facilitate the movement of water resources and to mitigate the risk of water shortages." *Id*. at 2. The paper begins by reviewing key dimensions of the problem and then turns to "five proposals to encourage the broader establishment and use of market institutions to encourage reallocation of water resources and to provide new tools for risk mitigation." *Id*.

The paper's Abstract lays out those proposals and is worth quoting extensively: "First, sensible water policy should allow someone who needs water to pay someone else to forgo her use of water or to invest in water conservation and, in return, to obtain access to the saved water. As a second step, state and local governments should facilitate these transactions by establishing essential market institutions, such as water banks, that can serve as brokers, clearinghouses, and facilitators of trade.

Third, water managers should support and encourage the use of market-driven risk management strategies to address growing variability and uncertainty in water supplies. These strategies include the use of dry-year options to provide for water sharing in the face of shortages, and water trusts to protect environmental values. New reservoir management strategies that allow for sophisticated, market-driven use of storage could build additional resilience into water distribution.

Fourth, states should better regulate the use of groundwater to ensure sustainability and to bring groundwater under the umbrella of water trading opportunities. Groundwater reserves are an important environmental resource and provide strategic reserves against drought, but proper management of groundwater is also critical to the development of markets. Markets cannot work effectively if users can delay facing the realities of local water scarcity through the unsustainable use of an open-access resource.

Finally, strong federal leadership will be necessary to promote interstate and interagency cooperation in water management, as well as to coordinate essential state-level gathering of data on water supplies and water use. In particular, the Bureau of Reclamation of the U.S. Department of the Interior plays a central role in water projects across the West, and its actions will be essential in confronting the crisis." *Id*.

For info: Paper available at: www.hamiltonproject.org/papers/shopping_for_water_how_the_market_can_mitigate_water_shortages_in_west/

TEXAS V. NEW MEXICO TX/NM

SPECIAL MASTER APPOINTED

On November 3, the US Supreme Court issued an order appointing A. Gregory Grimsal of New Orleans, Louisiana as the Special Master in *Texas v. New Mexico and Colorado*, Case No. 141, Original. As Special Master, Grimsal will have the "authority to fix the time and conditions for the filing of additional pleadings, to direct

subsequent proceedings, to summon witnesses, to issue subpoenas, and to take such evidence as may be introduced and such as he may deem it necessary to call for." Order, Nov. 3, 2014.

Special Master Grimsal is an attorney with the New Orleans firm of Gordon Arata McCollam Duplantis & Egan LLC. He practices in the area of commercial litigation (for which he has been named a "Best Lawyer" since 2008), with some concentration in the areas of general contract disputes, commercial real estate, commercial leases, risk management and casualty matters (including coverage questions and lost policy issues), and complex products liability litigation. He has litigated maritime lien ranking disputes, oil and gas royalty suits and environmental cleanup cases, as well as several high-profile First Amendment cases.

Additional information regarding this case will be provided in the December issue of *The Water Report*.
For info: www.scotusblog.com/case-files/cases/texas-v-new-mexico-and-colorado/

WATER CONSCIOUSNESS AZ

COMPETITION & PRIZE

The New Arizona Prize is a competition organized by the Arizona Community Foundation, Republic Media and the Morrison Institute for Public Policy, Arizona State University. Its aim is creating the Arizona of tomorrow — a "state in which innovation thrives, ingenuity is supported and the best thinking is harnessed to create long-term, positive solutions to persistent needs."

The $100,000 prize will be awarded in the Water Consciousness Challenge to a proposal for activities raising public awareness and understanding of the issue of water scarcity, attempting to ensure that the public recognizes the urgency of the warnings from state leaders and other experts. Teams are requested to propose a creative content strategy that relies primarily on digital mediums, with an emphasis on social shareability. The competition encourages teamwork, and student teams, as well as professionals from a range of disciplines, are encouraged to compete. One multi-disciplinary team will be awarded $100,000 to implement its proposal, but every team that submits an application will receive valuable feedback from credible authorities and chances to connect with others.

The Water Consciousness Challenge is described in a newly released Briefing Book that includes a detailed timeline for each phase of the competition, a copy of the application, and the Trait Scoring Rubric that judges will use to assess each completed application. Registration deadline is December 19, 2014, and the submission deadline is January 16, 2015.
For info: New Arizona Prize website at: www.newarizonaprize.org/

CURTAILMENTS LAWSUIT CA

DROUGHT DECISIONS CHALLENGED

On October 24, the Friant Water Authority and most of its member agencies (Friant), filed a petition for writ of mandate in Fresno County Superior Court contesting drought emergency decisions made by California's State Water Resources Control Board (SWRCB). The petition also named several state and federal agencies for their roles, including the California Department of Water Resources (DWR), the California Department of Fish and Wildlife, the federal Interior and Commerce departments, US Bureau of Reclamation (Reclamation), US Fish and Wildlife Service, and the National Marine Fisheries Service.

Friant's suit seeks "judicial review of a nine-month series of unilateral and unlawful decisions by the executive director of the California State Water Resources Control Board and then a fatally flawed decision by the State Board itself." Friant contends that SWRCB repeatedly failed to follow state law and its process failed to provide a hearing before depriving Friant of their water supplies. "Unfortunately, the State Board abdicated its responsibility to take action on petitions regarding critically important CVP water rights issues," the Friant petition said. "Instead, it allowed its executive director to make seriously deficient decisions beyond his authority that adversely affected the water supply for millions of Californians." The plaintiffs assert that "these illegal actions...dramatically curtailed the irrigation, municipal and industrial water supply for petitioners and have directly, immediately and adversely affected the livelihoods of the many communities and family farmers who depend on this water."

Friant's petition focuses on a series of State Board executive director orders issued in response to Temporary Urgency Change Petitions (TUCPs) filed in connection with drought conditions by DWR and Reclamation. These orders contributed to Reclamation's failure to meet its obligation to provide the San Joaquin River's senior water rights holders, the Exchange Contractors, with an adequate substitute supply of north state water. Instead, the Exchange Contractors were supplied much of the summer with water released from Friant Dam, a major cause of the Friant Division's first-ever zero allocation of CVP water.

Friant's petition takes issue with SWRCB's failure to honor water right seniority and imposition of "health and safety" use limitations on Reclamation's Delta water exports. The Congressionally authorized purposes of the Central Valley Project (CVP) do not recognize a "health and safety" limitation on water use, according to Friant. "The State Board is without authority or jurisdiction to adopt a water quality objective that requires Reclamation to consent to change the federally authorized purposes of the CVP," the petition asserts. "Additionally, the State Board is required to honor water rights priority in amending any water quality control plan by conducting a regulatory proceeding as well as an adjudicative proceeding to assign responsibility to the water users for meeting the water quality objectives of the plan." Friant also contends the state violated applicable law "by failing to consider and balance factors relating to the public interest" when approving the Drought Operations Plan.

Friant further contends, "A TUCP changing a water quality control standard cannot have the effect of authorizing a junior diverter...to take

WATER BRIEFS

water when senior water rights have not been fulfilled. ...Despite the clear legal obligation of Reclamation to protect its senior water rights holders, and the clear legal duty of the State Board to uphold and enforce California's water rights priorities when determining responsibility for meeting a water quality standard, both the TUCP Orders and the Order Denying Petitions abrogate this priority."

The latter assertion relates to a September 24 action, when SWRCB board members denied petitions for reconsideration filed by Friant and other agencies. That action "affirmed" all of Executive Director Howard's TUCP actions, Friant maintains. Friant's petition asks for "an immediate review of these decisions by the Court along with necessary declaratory and injunctive relief."

For info: Jennifer Buckman, Friant General Counsel, 916/ 804-0173 or www.friantwater.org

USFS GROUNDWATER WEST

WESTERN GOVERNORS' COMMENTS

On October 2, the Western Governors' Association (WGA) submitted comments to the US Forest Service (USFS) about its proposed directive on groundwater resource management, detailing why the measure has significant implications for Western states and their groundwater resources, and complaining about the lack of consultation. "This proposed directive was developed without any state consultation of which the Western Governors' Association (WGA) is aware," the letter notes. "We invite the USFS to work through WGA, Western States Water Council, and individual states to facilitate dialogue on ways to improve this (and any future) proposed directive."

The letter notes several areas of potential conflict with the USFS directive. In regard to authority over groundwater management, WGA pointed out that "Congress recognized states as the *sole* authority over groundwater in the Desert Land Act of 1877," and in 1935 the US Supreme Court reaffirmed that authority. The proposed directive could be construed to assert USFS ownership of state groundwater, according to WGA, and they are concerned about the potential for special use authorizations to supersede state authority. "States have the ultimate say in the management of their water resources and are best suited to speak to the unique nature of Western water law and hydrology." Letter at 1-2.

WGA also noted groundwater and surface water issues. "Another troubling concern in the proposed directive is the Service's rebuttable presumption that surface water and groundwater are hydraulically connected, regardless of whether state law treats these resources separately…The directive should defer to the laws of individual states in recognition of their authority over water management. Moreover, if groundwater and surface water are assumed to be hydraulically connected, there is the potential for misinterpretation of the directive to mean the Service's newly asserted management of groundwater resources should extend to surface water. To be clear, the states have the authority to manage both groundwater and surface water, and the USFS should fully recognize this in its proposed directive." *Id*. at 3-4.

The legal basis for the directive was questioned, especially as to "reserved rights." "The prospect of federal agencies claiming reserved rights to surface water is already a contentious affair, but suggesting the agency can assert such claims to groundwater is even more so. Reserved water rights have always been limited to surface water, and while there has been a long-standing debate as to whether they apply to groundwater, no federal court has extended the doctrine to groundwater." The WGA suggested that "mutually acceptable and innovative solutions" could be negotiated. *Id*. at 4.

The current capability of USFS to implement the work was another point made by WGA. "The directive requires USFS employees to consider groundwater in a variety of new situations. Yet…USFS has just four dedicated groundwater specialists to implement the proposed directive." *Id*. at 5.

For info: WGA website at: www.westgov.org/

STRONTIUM REGULATION US

EPA PRELIMINARY DETERMINATION

On October 20, EPA announced that it has made a preliminary determination to regulate strontium in the nation's drinking water. Strontium is a naturally occurring element that, at elevated levels, can impact bone strength in people who do not consume enough calcium.

A regulatory determination is a formal decision on whether EPA should initiate a rulemaking process to regulate a specific contaminant. The Safe Drinking Water Act requires that every five years, EPA develop a contaminant candidate list and then make a regulatory determination for at least five contaminants on the list. Based on available information, the agency has initially determined that strontium has adverse health effects. Strontium replaces calcium in bone, affecting skeletal development. Although strontium affects all life stages, infants, children, and adolescents are of particular concern because their bones are developing. Strontium has been detected in 99 percent of public water systems and at levels of concern in seven percent of public water systems in the country.

Four other contaminants (dimethoate, 1,3dinitrobenzene, terbufos, and terbufos sulfone) are either not found, or are found at low levels of occurrence in public water systems, thus requiring no regulation at this time.

These determinations are preliminary. EPA will evaluate public feedback following a 60-day public comment period and determine whether to issue a final determination to regulate strontium. If EPA makes such a determination, the Agency will begin the process of developing a proposed rule, with hopes of publishing the final regulatory determinations in 2015.

For info: http://water.epa.gov/scitech/drinkingwater/dws/ccl/ccl3.cfm

GREEN INFRASTRUCTURE US

NATIONAL "COLLABORATIVE"

On October 8, EPA and the White House Council on Environmental Quality announced the formation of a broad Collaborative to advance the use of green infrastructure in

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communities across the country. As part of the announcement, EPA released a Statement of Support outlining specific commitments from Collaborative members to advance cooperation and coordination around green infrastructure initiatives. The Collaborative will build capacity for green infrastructure by providing a platform for national stakeholders to: 1) leverage joint efforts to promote the multiple community benefits of green infrastructure; 2) share and build knowledge around emerging green infrastructure technologies and policy issues; and 3) facilitate shared inquiry into the best ways to encourage adoption of green infrastructure technologies at the local level.
For info: http://water.epa.gov/infrastructure/greeninfrastructure/gi_partners.cfm.

HIGH-FLOW RELEASE AZ

GLEN CANYON DAM / INNOVATIVE PROTOCOL

The Department of the Interior initiated its third high-flow release from Glen Canyon Dam on November 10th under an innovative science-based experimental protocol. The goal of the releases is to help restore the environment by creating flood-like conditions below Glen Canyon Dam, which rebuild sandbars that are important habitat and recreational resources.

During the 2014 **h**igh-**f**low **e**xperiment (HFE), high volumes of water will be released through Glen Canyon Dam's powerplant and four outlet tubes. The duration of the peak release of approximately 37,500 cubic-feet-per-second will be 96 hours. The annual release volume from Lake Powell will not change as a result of the 2014 HFE, no additional water will be released.

"Dams have impacts, but as we have learned over the last 50 years, we can operate Glen Canyon Dam in ways that both meet our demands for water and hydropower, but also achieve our goals for natural resources and recreation," said Deputy Commissioner for Operations Lowell Pimley.

Similar experimental releases have been conducted over the years. The releases include continued scientific research, monitoring, and data collecting along the Colorado River between Glen Canyon Dam and Lake Mead, while continuing to meet water delivery and hydropower needs. These successful experiments were the result of extensive collaboration among various agencies of the Department of the Interior, including: the US Geological Survey's Grand Canyon Monitoring and Research Center; Bureau of Reclamation; National Park Service; US Fish and Wildlife Service; and the Bureau of Indian Affairs — as well as the Colorado River Basin States.

The HFE protocol is part of the Interior Department's efforts to improve conservation of limited sediment resources in the Colorado River below Glen Canyon Dam. It is intended to improve understanding of how to better distribute sediment to conserve downstream environmental resources by allowing for multiple high-flow tests through 2020, while still meeting needs for water delivery and hydropower generation.
For info: www.usbr.gov/uc/rm/gcdHFE/index.html

AQUEDUCT TRANSFER UT

PROVO RIVER AQUEDUCT RECLAMATION TRANSFERS OWNERSHIP

On Friday, October 31st, the US Bureau of Reclamation, (Reclamation) acting under the provisions of the Provo River Project Transfer Act, transferred ownership of the Provo River Aqueduct to the Provo River Water Users Association (Association). The piping of the Provo Reservoir Canal has been a notable achievement, improving water delivery, water conservation, public safety, recreation, and the environment.

Transfer of ownership is the final step in a major project initiated by the Association in 1998. The project enclosed the former Provo Reservoir Canal, historically known as the Murdock Canal, which provides water for irrigation, municipal and industrial uses to several communities in both Utah and Salt Lake counties. The enclosure was completed in 2012, replacing the canal with the Provo River Aqueduct — a 21-mile long, 10.5-foot diameter pipeline stretching from the mouth of Provo Canyon to the Point of the Mountain in Salt Lake County.

"The Department of the Interior supports the transfer of facilities in cases where such projects create benefits for the new owner, other stakeholders and the general public," said Jennifer Gimbel, the Department of the Interior's Principal Deputy Assistant Secretary for Water and Science. "This transfer is a milestone achievement built on years of work amongst several partners."

The project will improve water quality, public safety, and recreation. Eight thousand acre-feet of the water conserved by the project will be used for flows to support the endangered June sucker, a fish species native only to Utah Lake and its tributary streams, and to provide benefits to other fish and wildlife.

"Today's celebration marks the conclusion of one of the most significant recent water projects in Utah," stated Keith Denos, General Manager of the Association. "We couldn't have made it to where we are today without commitment and cooperation from a wide range of stakeholders."

The five funding stakeholders — Provo River Water Users Association, Central Utah Water Conservancy District, Jordan Valley Water Conservancy District, Provo Reservoir Water Users Company, and Metropolitan Water District of Salt Lake and Sandy — along with numerous federal, state, local, and municipal agencies contributed to the successful completion of the title transfer and enclosure project.

Following completion of the canal enclosure, local partnerships and a $12 million grant from the Federal Highway Administration allowed for construction of the Murdock Canal Trail. This 17-mile, multi-use, paved trail passes through seven Utah County communities, from Orem to Lehi, and is referred to as the "crown jewel" of the county trail system.
For info: Wayne Pullan, Reclamation Provo Area Office Manager, 801-369-2778

CALENDAR

November 15 OR
Groundwater 101 Workshop, Portland. NECA-IBEW Training Ctr., 16021 NE Airport Way, 9am-1:00pm. Presented by Portland Water Bureau & Columbia Slough Watershed Council. For info: http://columbiaslough.org/index.php/events/event/71/

November 17 CA
Mono Lake at 20: Past, Present & Future Symposium, Sacramento. CalEPA HQ, 1001 I Street. Presented by UC Berkeley's Wheeler Institute for Water Law & Policy. For info: www.law.berkeley.edu/MonoLake20.htm

November 17 WA
Toxics Reduction Conference: Water Quality, Fish Consumption, Human Health, Stormwater & Sediment, Seattle. WA State Convention Ctr. For info: www.elecenter.com/conferences.htm

November 17-18 CA
Introduction to Groundwater & Watershed Hydrology Course, Davis. Buehler Alumni Ctr., UC Davis. Presented by Groundwater Resources Ass'n. For info: www.acwa.com/events/gra-introduction-groundwater-and-watershed-hydrology-course

November 17-21 TX
Water Management Aspects of Shale Plays Course, College Station. Teex Riverside Campus in Bryan. Presented by Next (Schlumberger Co.). For info: www.nexttraining.net/Sessions/Details/23365/Water-Management-Aspects-of-Shale-Plays.aspx

November 18 OR
Financial Planning for Water Utilities Workshop, Salem. Chemeketa Center for Business & Industry, 626 High St. NE. Presented by Oregon Section - Ass'n of Clean Water Agencies. For info: ACWA, gillaspie@oracwa.org or www.oracwa.org/

November 19 CO
History of Colorado Water Law & Legal Ethics in Water & Environmental Law Workshops, Denver. Colorado Water Congress Conference Room. For info: www.cowatercongress.org/cwt/external/wcpages/cwc_events/workshops.aspx

November 19-21 LA
Clean Water Act Compliance Workshop, New Orleans. Hilton Garden Inn French Quarter. For info: www.epaalliance.com/cleanwaterworkshop-nov14.html

November 20 AZ
Surface Water/Groundwater Interactions in Arizona: Physical Realities & Experiences in the Real World (Brownbag), Tucson. WRRC Sol Resnick Conf. Rm., 350 N. Campbell Ave. Speaker: James Leenhouts, USGS. For info: https://wrrc.arizona.edu

November 20-21 OR
Management & Remediation of Contaminated Sediments Course, Portland. University Place Hotel & Conf. Ctr. Presented by Northwest Environmental Training Ctr. For info: https://nwetc.org/course-catalog/rem-550-nov-20-21-2014

November 21 MT
Natural Resources and the Law Seminar, Missoula. Holiday Inn Downtown. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or www.theseminargroup.net

December 1 CO
A West That Works: Grass, Soil, Hope - Lecture by Courtney White, Quivira Coalition, Colorado Springs. Palmer Hall, Colorado College. Presented by State of the Rockies. For info: www.coloradocollege.edu/other/stateoftherockies/speakerseries/

December 2-5 OR
Oregon Water Resources Congress 2015 Annual Conference, Hood River. Best Western Hood River Inn. For info: www.owrc.org

December 2-5 CA
ACWA 2014 Fall Conference & Exhibition, San Diego. Manchester Grand Hyatt. Ass'n of California Water Agencies. For info: www.acwa.com/events/acwa-2014-fall-conference-exhibition

December 4-5 CA
California Environmental Quality Act Conference: Practice Guidance & Case Law, San Francisco. Hotel Nikko. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

December 5 WA
Water Law & the Public Trust - 4th Annual Water Law CLE, Seattle. 2100 - 24th Avenue S. Presented by Center for Environmental Law & Policy. For info: www.celpcle.brownpapertickets.com

December 5 CA
Habitat Conservation Plan Implementation Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, http://extension.ucdavis.edu/

December 6-7 NV
Western Governors' Association Winter Meeting, Las Vegas. Four Seasons Las Vegas. For info: www.westgov.org/

December 8 WA
Industrial Stormwater Workshop: Advanced Stormwater Case Studies, Vancouver. Presented by Environmental Coalition of South Seattle. For info: www.ecoss.org/stormwater_workshops.html

December 8-9 NV
Drought Impacts & Solutions for Water Supply: Western Governors' Drought Forum Meeting, Las Vegas. For info: http://westgov.org/drought-forum

December 8-12 VA
ACES 2014 Conference: Linking Science, Practice & Decision Making, Arlington. Crystal Gateway Marriott Hotel. Presented by A Community on Ecosystem Services. For info: http://conference.ifas.ufl.edu/aces/

December 9-10 OR
Northwest Environmental Conference & Trade Show, Portland. Red Lion on the River, Jantzen Beach. For info: www.amwa.net/event/2014-annual-executive-management-conference

December 9-12 NV
2014 National Ground Water Ass'n Exposition, Las Vegas. Las Vegas Convention Ctr. For info: www.NGWA.org

December 10 WEB
Transbasin Diversion Webinar: Part II - Profiling a Colorado Transbasin Diversion, WEB. Presented by the Colorado Water Congress, 9-10 am. For info: www.cowatercongress.org/cwt/external/wcpages/cwc_events/workshops.aspx

December 10-12 AZ
SPCC & Stormwater Compliance Workshop, Scottsdale. For info: www.epaalliance.com

December 11 OR
Is Environmental Law Broken: Alternatives to the Status Quo (Brownbag), Portland. White Stag Block, 70 NW Couch Street, Wayne Morse Ste. Presented by OSB Sustainable Future Section (Prof. Mary Wood, Presenter). For info: RSVP to: jan.flynn@tonkon.com

December 11 NV
Hydrogeology for Planners Workshop, Las Vegas. Las Vegas Convention Ctr. For info: www.ngwa.org/Events-Education/shortcourses/Pages/392dec14.aspx

December 11-12 OR
Within Our Reach Conference: Taking Stock & Scaling Up for a Healthier Willamette River, Corvallis. OSU Alumni Center. Presented by Willamette River Initiative.

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CALENDAR

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December 11-12 CA
Introduction to Aquatic Toxicology Training, Sacramento. Courtyard Marriott. For info: NW Environmental Training Center, https://nwetc.org/course-catalog/etox-410-sept-9-10-2014

January 9 WA
SEPA & NEPA Seminar, Seattle. WA State Convention Ctr. For info: Law Seminars Int'l, 800/ 854-8009, registrar@lawseminars.com or www.lawseminars.com

January 14 WEB
Transbasin Diversion Webinar: Part III - Changing Perceptions of Transbasin Diversions, WEB. Presented by the Colorado Water Congress, 9-10 am. For info: www.cowatercongress.org/cwt/external/wcpages/cwc_events/workshops.aspx

January 15-16 AZ
Tribal Water in the Southwest Seminar, Scottsdale. Courtyard Scottsdale Salt River. For info: Law Seminars Int'l, 800/ 854-8009, registrar@lawseminars.com or www.lawseminars.com

January 17-21 TX
2015 International Low Impact Development (LID) Conference, Houston. For info: www.asce.org/ewri/Conferences/

January 22-23 WA
22nd Annual Endangered Species Act Conference, Seattle. Hilton Seattle. For info: The Seminar Group, 800/ 574-4852, or www.theseminargroup.net

January 22-23 LA
Climate Change Law & Regulations: Planning for a Carbon-Constrained Regulatory Environment Institute, New Orleans. Hotel Monteleone. Presented by Rocky Mt. Mineral Law Foundation. For info: RMMLF, www.rmmlf.org

January 23 CA
Hydraulic Fracturing Conference, San Francisco. Hotel Nikko. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

January 24 CA
Wasted Water: Reasonable Use Law in 21st Century California - 11th Annual Symposium, San Francisco. Golden Gate University School of Law. For info: www.waterlawsymposium.com/

January 28-30 CO
Colorado Water Congress Annual Convention, Denver. Hyatt DTC. For info: www.cowatercongress.org/cwc_events/Annual_Convention.aspx

January 29 TX
Texas Wetlands Conference, Austin. Omni Southpark. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

February 2-3 TX
2015 Industrial & Commercial Water Reuse Conference, Austin. Hilton Austin. Presented by WateReuse Ass'n. For info: www.watereuse.org/industrial-commercial-2015

February 10-12 NM
Advancing Riparian Restoration in the West: Tamarisk Coalition's Annual Conference, Albuquerque. Hotel Albuquerque at Old Town. For info: www.tamariskcoalition.org/about-us/events/2015-conference

February 11 CA
Climate Change Litigation Seminar, San Francisco. Le Méridien. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net