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COLORADO RIVER AGREEMENT & SOUTHERN CALIFORNIA WATER

by William Hasencamp, Metropolitan Water District of Southern California (Los Angeles)

Introduction: Historic Agreement

Facing record drought conditions and the potential for cutbacks in water deliveries in the near future, in April 2007, the seven states of the Colorado River Basin signed a historic agreement to better manage the water supplies of the River. The agreement establishes a cooperative forum for the states to implement new water management programs to help water districts cope with continued drought conditions.

KEY COMPONENTS OF THE AGREEMENT INCLUDE:

- the ability for states to store water in Lake Mead during years when it is not needed and recover later in dry years
- the ability for states to invest in system efficiency programs and receive a portion of the saved water
- the ability for states to use the Colorado River system to transfer water from one area of a state to another

The agreement also lays out new operating rules for the largest reservoirs on the Colorado River, Lake Powell and Lake Mead, to reduce the threat of shortages. For the Metropolitan Water District, the agreement will allow the Colorado River Aqueduct that supplies water to Southern California to flow full when the water is needed during dry periods.

Background

The Metropolitan Water District (Metropolitan) is the regional water wholesaler to six counties on the coastal plain of Southern California. Metropolitan was created by an act of the California legislature in 1928, primarily to build and manage an aqueduct from the Colorado River to its service area. In the 1960s, Metropolitan entered into a contract with the California Department of Water Resources to receive water from the California State Water Project, which supplies water from the Sacramento-San Joaquin Delta to agricultural and urban users in central and southern California. Metropolitan owns five water treatment plants and delivers both raw and treated water to its customers.

Metropolitan has 26 member agencies, which are either cities or local water districts, and serves a total population of more than 18 million residents. The region continues to grow at a rapid pace, with an annual population increase of about 220,000. The regional economy of the service area amounts to more than $800 billion dollars per year. A 37-member board of directors governs Metropolitan, with each member agency having at least one representative on the board.

Colorado River

Imported Water

Aqueduct Capacity

Reservoir Storage

Southern California is a semi-arid region, with Los Angeles receiving 15 inches of rain annually and San Diego averaging 10 inches per year. The majority of that rain occurs during the winter season, with the coast of Southern California averaging less than 1 inch between May through October. Although the region maximizes its use of local water supplies, imported water supplies are critical to maintain the current population and economic engine of the region. In addition to the Colorado River Aqueduct and the State Water Project, the City of Los Angeles owns and operates the Los Angeles Aqueduct, delivering water from the Eastern Sierra Nevada to Los Angeles.

Colorado River Aqueduct Deliveries to Southern California

During drought periods, most notably during 1976-77 and 1987-92, Southern California experienced reduced deliveries from both the State Water Project and the Los Angeles Aqueduct. During 1977, the driest year on record in Northern California, deliveries from the Sacramento Delta and Eastern Sierra were one-fifth of the historic amounts. Yet during both of those severe droughts, the Colorado River Aqueduct (see map, below) flowed at full capacity without any threat of being cut back. This aqueduct has a capacity to deliver 1.25 million acre-feet each year, and it did so during the two major droughts in recent California history, buffering the impact of the dry conditions.

The principal reason the Colorado River has been immune to the past dry conditions is because of the large amounts of storage on the system. At 26 **m**illion **a**cre-**f**eet (MAF), Lake Mead is the largest reservoir in the United States and Lake Powell upstream is just a tad smaller at just over 24 MAF. When full, the Colorado River storage system holds 60 MAF of water — four times the average annual flow of the Colorado River, which has made the River "drought-proof" during the dry periods that plagued the rest of California.

SOUTHERN CALIFORNIA WATER DELIVERY

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Colorado River

1922 Compact

1928 Allocations

Lower Basin Use

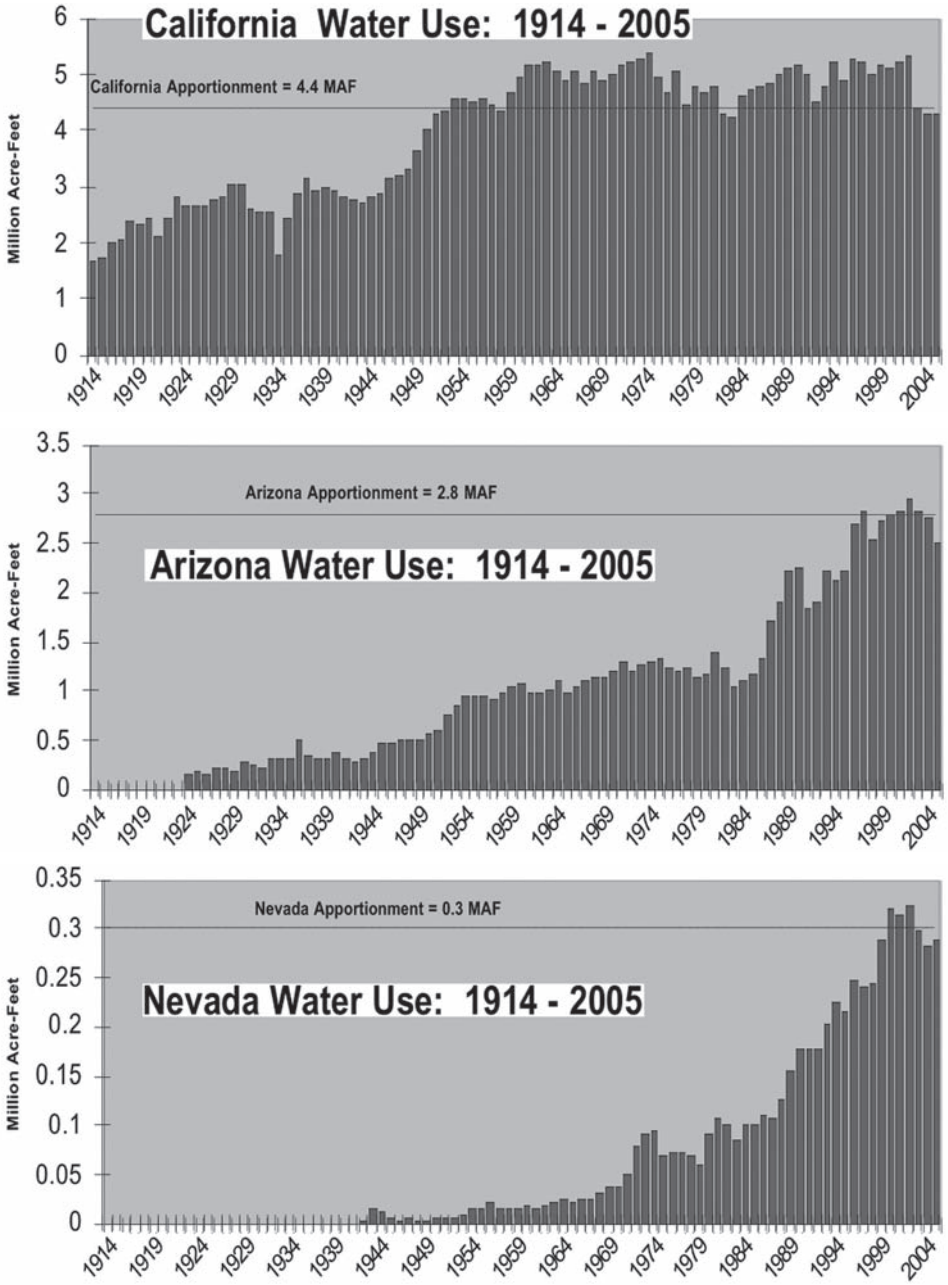
LOWER BASIN HISTORIC USE CHARTS

Dividing the Waters of the Colorado River

During the early part of the twentieth century, the Colorado River Basin States were concerned with California's rapid development of the Colorado River. In order to secure water supplies for the future, the states entered into a compact to divide the waters of the Colorado River among the seven Basin States. The Colorado River Compact, signed in 1922, allocated 7.5 MAF each to the Upper Colorado Basin (Colorado, New Mexico, Utah, and Wyoming) and to the Lower Colorado Basin (Arizona, California, and Nevada).

In 1928, the Boulder Canyon Project Act divided up the 7.5 MAF of water allocated to the Lower Colorado Basin as follows: Arizona-2.8 MAF; California-4.4 MAF; and Nevada-0.3 MAF.

These agreements also allowed one state to put to beneficial use any of the allocated water that was not used by another state in any given year. Subsequent to Boulder Canyon Project Act enactment, Arizona and Nevada were only using a fraction of their water allocations. As a result, additional water was made available to California. For example, in 1985 Arizona was still only using 1.2 MAF of its 2.8 MAF allotment. Similarly, in that same year, Nevada was only using 0.1 MAF. These circumstances left unused water available for California. In 1985, California used 4.8 million acre-feet of the water allocated to all three Lower Division States — i.e. 400,000 acre-feet more than its basic apportionment. The charts below show the historic use of water by the three Lower Division States:



Colorado River

Seven Party Agreement

Metropolitan Limitation

Reliance on Surplus

AG-to-Urban Transfers

Conservation

Land Fallowing

Colorado River Flow

The California Plan

When Metropolitan made plans to build an aqueduct to the Colorado River in the late 1920s, it knew that the capacity of the Colorado River Aqueduct, along with the other water diversions in the state, would exceed California's apportionment of 4.4 MAF. It also anticipated that it would be decades, if ever, before the other states would be using their full allotments. Consequently, there would be additional supplies available to California. The users of Colorado River water within California entered into an agreement that would dictate how water would be allocated within California in the event of a cutback in water supplies. The Seven Party Agreement was entered into in 1931 among the seven parties that had rights to Colorado River water. This Agreement was based on the "first in time, first in right" priority system which typifies western water law. Parties to this Agreement included: the Imperial Irrigation District; the Coachella Valley Water District; and the Palo Verde Irrigation District. As a result of these agencies having diverted Colorado River water earlier than Metropolitan, they were all were given higher priority access to Colorado River water than Metropolitan. Under this Agreement, if and when California was limited to 4.4 MAF, Metropolitan's ability to divert water would be reduced from 1.25 MAF per year to 0.55 MAF per year.

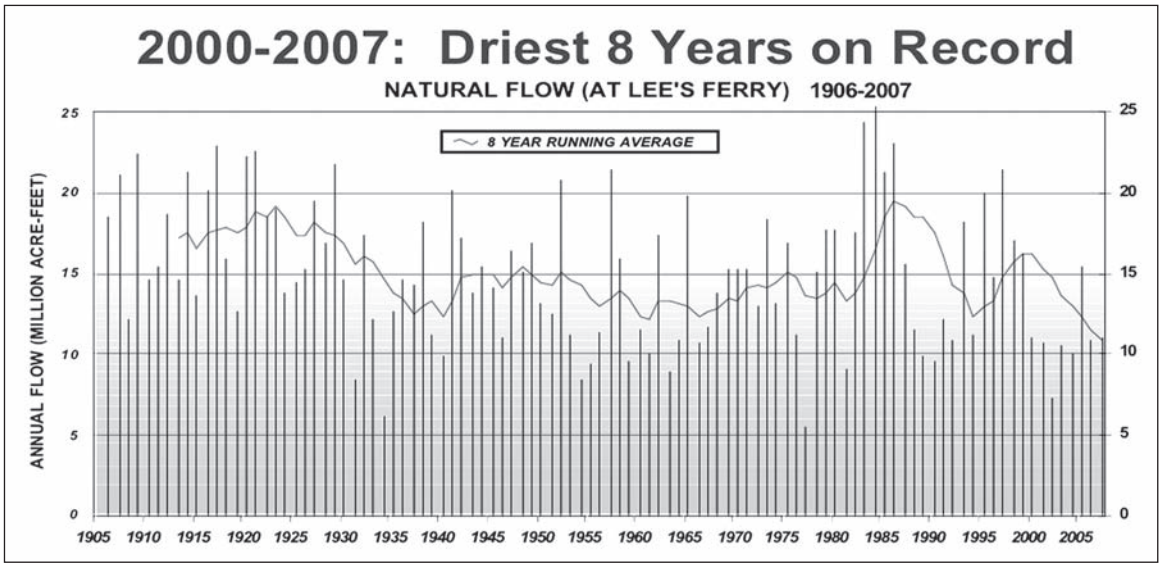
California was able to divert more than its basic apportionment of 4.4 million acre-feet from the early 1950s through the year 2002, and Metropolitan's Colorado River Aqueduct had the capability to deliver its full capacity each year. In the mid-1990s, however, Colorado River water use within Arizona and Nevada was rapidly increasing. It became apparent that each state would soon be using their full apportionment. The Colorado River Basin States were concerned that California had grown reliant on the surplus Colorado River water and might not reduce its use when no additional supplies were available. They put pressure on California to develop a plan to demonstrate how it would deal with a cutback of Colorado River supplies — from the 5.2 MAF it had been diverting in the 1990s down to its 4.4 MAF basic apportionment.

In response to the impending water supply cutback, California's Colorado River water users developed California's Colorado River Water Use Plan, which outlined how California would live within its basic apportionment over time.

This Plan had two major components:

1) implementation of agricultural to urban water transfers that gradually increased over time
2) establishment of rules providing more liberal access to surplus water (providing a "soft landing" for the state)

The first component of this Plan involved four major transfers of water from agricultural to urban uses in Southern California. These transfers were made available through implementing water conservation measures and land fallowing programs. The agricultural conservation measures included: canal lining programs; installing sprinkler irrigation systems; and recovering agricultural runoff for reuse. Metropolitan's principal land fallowing program is with the Palo Verde Irrigation District, in which Metropolitan pays farmers on a voluntary basis to fallow a portion of their land at Metropolitan's call. As part of the program, Metropolitan contributed $6 million into a Community Improvement Fund to offset the potential economic impacts of the fallowing program. Volunteer boards from the local communities determine how the money is spent within each community, targeting small business and job training programs. The agricultural-to-urban water transfers are scheduled to increase over time and will eventually provide 400,000 acre-feet of water to Metropolitan per year.



Colorado River

"Special Surplus Water"

The second component of this Plan provided for the delivery of "special surplus water" exclusively to Metropolitan. In consideration of Metropolitan being the water agency that was to take the brunt of the cutback, "special surplus water" was made available in amounts needed to fill the Colorado River Aqueduct provided that Lake Mead was more than 62% full. The availability of this water was made contingent on California implementing the agricultural-to-urban water transfers described above on schedule. If the transfers proceeded as planned, the special surplus water was to remain available through the year 2016. Water supply models run in the year 2000 suggested that Lake Mead would likely remain above the levels needed to provide this surplus through the 16-year period. Thus, in the year 2000, it appeared that the California Plan would prevent Metropolitan from experiencing reduced water supplies from the Colorado River Aqueduct for the foreseeable future.

Impacts of Declining Storage

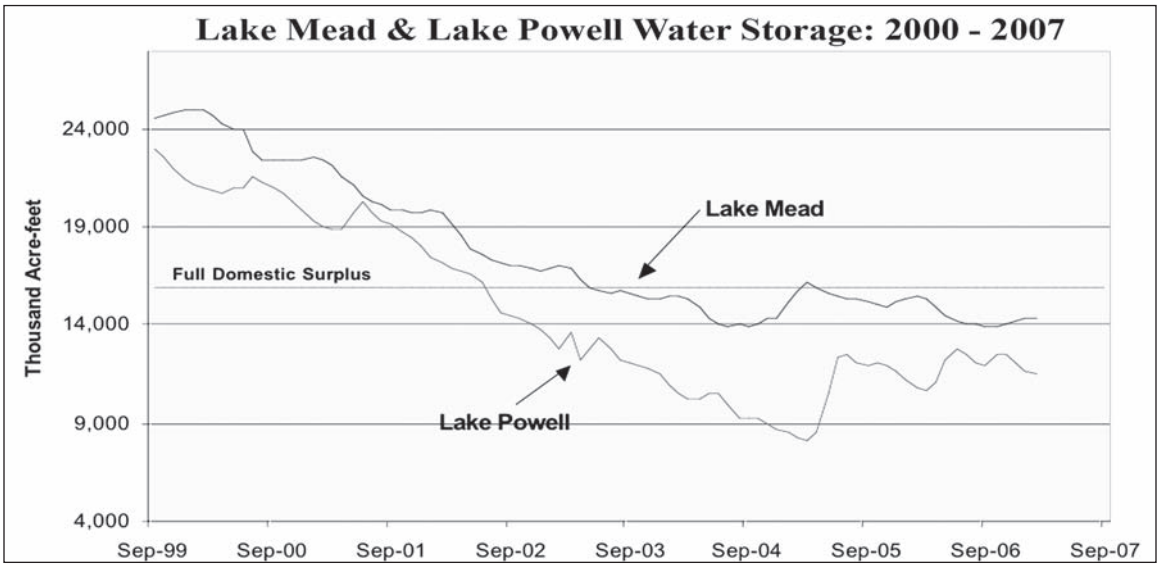
Severe Drought Conditions Limit California's Supply

In the year 2000, severe drought conditions began to affect the Colorado River Basin. Year after year the drought continued to expand, breaking new low-flow records as it went. Currently, the period 2000 – 2007 represents the driest eight-year period on record for the Colorado River Basin, dating back to when flow records began in 1903 (see chart, previous page). In the year 2000, the combined storage of Lakes Powell and Mead was nearly 48 MAF. By the end of 2007, however, that combined storage level is expected to be 24 MAF. Within a few years of the drought's onset, Lake Mead fell below the level that would provide special surplus water to Metropolitan (see chart below). As a consequence — and despite implementing a plan a few years earlier that was designed to keep the Colorado River Aqueduct full — in 2003 Metropolitan's Colorado River water supplies were cut in half. For the first time in 50 years, California was forced to live within it's 4.4 MAF apportionment.

State Water Project Supply

This cutback could have spelled disaster for Southern California, but it did not. In fact, most people were not aware of the loss of Colorado River water. Metropolitan weathered the cutback by a combination of both good management and good luck. Metropolitan was lucky in that its other principal supply — the State Water Project from Northern California — was not experiencing drought conditions when the Colorado River cutback occurred. In fact, the opposite was true: the years 2003, 2005, and 2006 were very wet years in Northern California and State Water Project supplies were plentiful. Metropolitan benefited from good management in that it had developed water storage programs to handle dry year conditions — even though this storage was developed for dry years on the State Water Project, not cutbacks in the Colorado supplies. These storage programs included development of the largest storage reservoir in Southern California (Diamond Valley Lake, holding over 800,000 acre-feet of water). Regardless of initial motivation, these programs proved instrumental to the region's adapting to the cutback. In addition, Metropolitan's investments in water conservation, water recycling, and groundwater recovery have proved invaluable during the last few years. To date, Metropolitan has invested over $1.5 billion in these regional water programs, which produce more than 1,000,000 acre-feet of reduced demand for imported water annually. With all of these factors in place, Metropolitan is prepared to live with reduced flows in the Colorado River Aqueduct.

Reducing Demand



Colorado River

Shortage Issues

Interior's Motivator

Management Changes

Key Benefits

GW Banking

New Regulating Reservoir

Surplus Water

New Storage Abilities

Historic Agreement Among the Basin States

With the Colorado River Water Use Plan in place, California has completed the transfers it needed to make to live within its basic apportionment of Colorado River water. Even with the loss of surplus water, the agricultural transfers will continue to increase through time and help replace much of the water that has been lost due to drought conditions. As drought conditions continued in the Colorado Basin, however, it became apparent that the other states had water supply issues that needed to be addressed. No criteria were in place to determine when a shortage should be declared and to what level apportionments would be adjusted to should delivery reductions occur. The State of Nevada was rapidly outgrowing its basic apportionment and needed new water supplies. Lake Powell had fallen to its lowest level since it was initially filled and it was feared that it could run out of water in the near future, obligating the Upper Basin states to reduce their use to meet downstream requirements.

Initially, the Basin States retreated to their specific legal positions to protect each state's self interest. Arizona went a step further, introducing legislation to change the priority system of the Colorado River so as to put Arizona on a priority level equal with California. It became apparent, however, that the Colorado River Basin States would fare much better by cooperating with each other instead of entrenching themselves within their legal positions. The US Secretary of the Interior began a process to implement water shortage guidelines for the Lower Basin, essentially telling involved states that either the states could come up with a shortage plan or the federal government would fashion one for them.

In late 2005, the Colorado River Basin States came together and began hashing out a plan that not only dealt with shortages, but also provided sweeping new changes to better manage the water of the Colorado River to meet each state's needs. The agreement was finalized in February 2006, and was referred to as a "preliminary proposal" although it was essentially complete. It was a historic event — not since the Colorado River Compact was signed in 1922 have the seven states agreed on conditions affecting the River as much as this proposal. Each state stands to benefit from some aspect of the agreement.

KEY REGIONAL AND STATE BENEFITS INCLUDE:

Upper Basin: While the shortage criteria focused on the Lower Basin, the Upper Basin benefits by the changes in operation of Lake Powell. Under the new agreement, Lake Powell will release less water during drought periods, resulting in higher storage levels. The higher storage levels reduce the likelihood that the Upper Basin will have to cut back its use to meet downstream requirements, and also protect power generation resources and recreation resources at Lake Powell.

Arizona: The agreement limits the size of the shortages to Arizona to no more than 500,000 acre-feet during all but the most severe drought conditions. Arizona has indicated that such a shortage is manageable within the state. It is actively storing water within its groundwater basins and can call on such water when needed to offset shortages. [see Davenport, TWR #17, Interstate Water Banking: Evolving Colorado River System Agreement].

Nevada: The agreement allows Nevada to develop new water supply programs to reliably augment its basic apportionment supplies. Programs identified in the agreement include: Nevada is allowed to fallow land that is tributary to the Colorado River upstream of Lake Mead, wheel the water through the Colorado River and then divert it near Las Vegas. Nevada is allowed to fund the construction of a regulating reservoir near the Mexican border to conserve Colorado River water and receive a share of the water that is saved. [see Water Briefs, TWR #35] The state is allowed to import water from Northern Nevada and receive a credit for any of that water that reaches the Colorado River, so that it can use the credit to increase Colorado River diversions. These programs will help the Southern Nevada Water Authority (SNWA) meet its growing water supply needs.

California: The agreement provides California protection of its senior water right position, as Arizona and Nevada have agreed to endure the first shortages on the Colorado River. It extends the conditions under which special surplus water is made available to Metropolitan by ten years. This ability to divert surplus water may or may not be of value, depending upon the hydrologic conditions of the next 20 years. Models indicate that, on average, special surplus water will be available in one out of every five years. The most important aspect of the Basin States Agreement, however, is the ability to store water in Lake Mead to provide dry year reliability to Southern California.

Under the operating rules which will remain until the new Basin States Agreement takes effect, users of Colorado River water must "use or lose" their allocated water supply. Any water not diverted becomes part of the system, encouraging users to divert as much water from the River as they can. At the same time, surface storage is becoming a premium in the West, and the development of new dams is all but forbidden due to environmental concerns. However, the current storage levels in Lake Mead are about one-half of capacity, and projections are that Lake Mead will likely drop further in the future. There are likely several

Colorado River

Lake Mead Storage

2008 Start-Up Scheduled

Projected Supplies

million acre-feet of storage space that will not be used for several years or even decades. The Basin States decided that if an agency could use the existing capacity in Lake Mead that all the states would benefit from the higher storage levels.

Under the terms of the Basin States Agreement, an agency can store water that is made available through conservation (such as land fallowing programs) in Lake Mead for later recovery. The conservation requirement was included to make sure that an agency would not store water that they would not otherwise have used. California was allocated a total storage space of 1.5 million acre-feet. Nevada and Arizona are each allocated 300,000 acre-feet of storage space. While all Lower Basin water users have the right to store water in Lake Mead, Metropolitan will likely be the agency storing water in the most significant amounts.

Agreement Provides Reliability for Southern California

On April 30, 2007, the Basin States reaffirmed their commitment to implement the Basin States Proposal by executing an agreement to formally work together to resolve any issues that may arise before pursuing any legal options. The Agreement still has to go through the National Environmental Policy Act (NEPA) process and be approved by the Secretary of the Interior. Implementation is scheduled to begin in 2008. While the Secretary could modify the proposal before it is implemented, it is believed that most of the components of the Basin States Agreement will be included in the final action.

The Basin States Agreement, along with its storage proposal, will once again allow Metropolitan's Colorado River Aqueduct to run full during dry years in California. Metropolitan began storing water in Lake Mead during 2006 and plans to store more water in 2007. By 2015, Metropolitan estimates that enough water will be stored in the reservoir to meet the needs of several dry years in California. It is notable that this feat will be accomplished without building expensive new reservoir projects, but rather by more sensible use of existing storage capacity. The chart below shows the projected supplies from the Colorado River Aqueduct for the next 20 years. The Aqueduct is filled by the agricultural transfer programs on the Colorado River Water Use Plan and by the storage capacity of Lake Mead.

Conclusion

The Basin States Agreement is a model of cooperation that will be needed as the states cope with ongoing drought conditions, climate change issues, and rapid growth. This agreement covers the next 20 years. Even more creative ideas will need to be implemented to meet the long-term water supply needs of the Colorado River Basin States.

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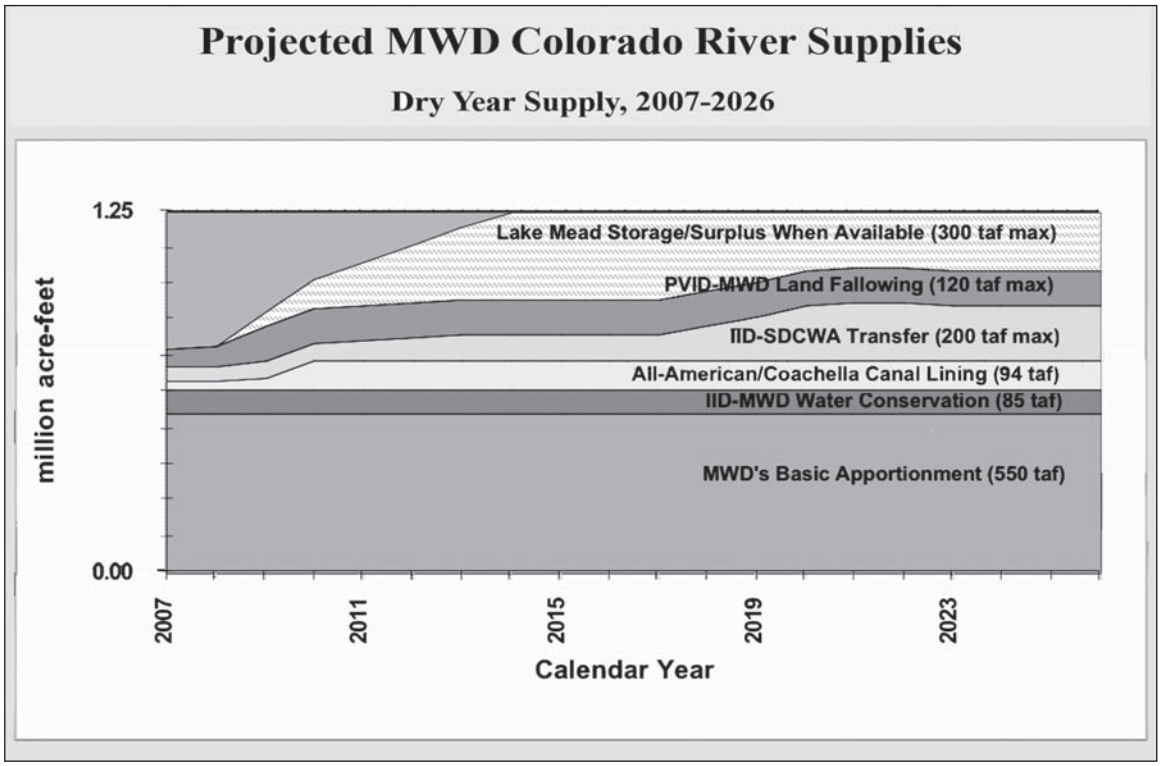


Bill Hasencamp is the Executive Program Manager at the Metropolitan Water District, where his principal role is to develop and manage water supply programs to augment Metropolitan's Colorado River Aqueduct supplies. He has been with Metropolitan for six years, recently representing Southern California in negotiations with other water agencies to develop a long-term interstate solution to deal with reduced Colorado River supplies. Prior to joining Metropolitan, Bill worked at Contra Costa Water District in Northern California, where he managed the District's energy portfolio and developed plans to fill and operate the new Los Vaqueros Reservoir. Before that he worked at the Los Angeles Department of Water and Power, developing environmental restoration plans for the Mono Basin and water supply forecasting techniques using snow survey data.

Colorado River

COLORADO RIVER BASIN WATER MANAGEMENT

Seven States Agreement Highlights

EDITOR'S ADDENDUM

Editor's Note: The "Basin States' Alternative" is one of five alternatives included in a US Bureau of Reclamation (Reclamation) draft environmental impact statement (DEIS) concerning *Coordinated Colorado River Basin Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead* (72 Fed. Reg. 9,026) released on February 28, 2007. The "Basin States' Proposal" is contained in a 68-page letter to the Secretary of the Interior from water officials representing the seven Colorado River Basin States, commenting on the DEIS and announcing their agreement that the Basin States' Alternative represents the best option. The letter is dated April 30, 2007.

Basin States' Proposal

Proposal Components

The Proposal put forth by the seven Colorado River Basin States, if accepted, would be in effect through December 31, 2025. The Basin States Proposal consists of: (1) Agreement Concerning Colorado River Management Operations (Attachment A; dated April 23, 2007); (2) Proposed Interim Guidelines for Colorado River Operations (Attachment B); (3) Lower Colorado River Basin Intentionally Created Surplus (ICS) Forbearance Agreement (Attachment C); (4) Arizona-Nevada Shortage Sharing Agreement (Attachment D; dated February 9, 2007); and (5) a Delivery Agreement (still under development) for ICS and Developed Shortage Supplies (Attachment B, Sections 5 and 6). The current expectation is that Reclamation will identify its preferred alternative in its Final Environmental Impact Statement (FEIS) and release its Record of Decision to implement the interim shortage criteria by the end of December 2007.

Supply Strategies

Water Supply Management Strategies

In Section 8 of the Agreement (Attachment A, page 9), the Basin States set out generally how they hope to deal with water supply issues in the future. "The Parties agree to diligently pursue interim water supplies, system augmentation, system efficiency and water enhancement projects within the Colorado River system. The term 'system augmentation' includes the quantifiable addition of new sources of supply to the Colorado River Basin, including importation from outside the Basin or desalination of ocean water or brackish water. The term 'system efficiency' includes efficiency projects in the Lower basin that will result in the more efficient use of existing supplies, such as in-system storage and enhanced management. The term 'water enhancement' includes projects that may increase available system water, including cloud seeding and non-native vegetation management."

Las Vegas Supply

Nevada Specific Issues

Also noteworthy in Section 8 is the statement that specifically addresses the Las Vegas situation, which shows how the various states are taking a regional approach to water supply. "Specifically, the Parties agree to cooperatively pursue an interim water supply of at least a cumulative amount of 280,000 acre-feet for the use in Nevada while long-term augmentation projects are being pursued. It is anticipated that this interim water supply will be made available in return for Nevada's funding of the Drop 2 reservoir mandated for construction by the Bureau of Reclamation by P.L. [Public Law] 109-432 § 396. Annual recovery of this interim water supply by Nevada will not exceed 40,000 acre-feet."

"Intentionally Created Surplus"

A press release from the Wyoming State Engineer's Office specifically discussed the use of Lake Mead as a storage vehicle. "An important element of the seven States' proposal…is developing 'Intentionally Created Surplus' (ICS) accounting. ICS water accounting provides a means for Lower Basin water contractors to add water to the system through conservation or importation and for the Secretary of the Interior to release water in the future to the Lower Division State

Colorado River

"ICS" Creation

(Arizona, California or Nevada) that added the water. Since in 'normal' water supply years, the Lower Division States are using their full entitlements of Colorado River water, it is necessary for one of the States to agree to use less water (or 'forbear') to allow another State to create ICS water that can be used in subsequent, water-short years." The Proposed Interim Guidelines explain that "ICS may be created through projects that create water system efficiency, extraordinary conservation, tributary conservation, and the importation of non-Colorado River System water into the Colorado River Mainstream." "Tributary conservation" may be created "by purchasing documented water rights on Colorado River System tributaries upstream of Hoover Dam within the Contractor's state if there is documentation that the water rights have been used for a significant period of Years and that the water rights were perfected prior to June 25, 1929." (See Attachment B, Section 5. D. 2)

Reservoir Operations

Lakes Mead and Powell: Coordinated Operation

One of the areas that the Basin States clearly spent a great deal of time developing is the proposal concerning changes in the operation of Lake Mead and Lake Powell to maximize those reservoirs' storage capacity. The "Coordinated Operation of Lakes Powell and Mead" in the Proposed Interim Guidelines (Attachment B) set out extremely detailed operational requirements and actions based on different reservoir levels that are achieved in Lake Mead and Lake Powell. Section 3 of those Guidelines says that the "objective of the operation of Lakes Powell and Mead as described herein is to avoid curtailment of uses in the Upper Basin, minimize shortages in the Lower Basin and not adversely affect the yield for development available in the Upper Basin."

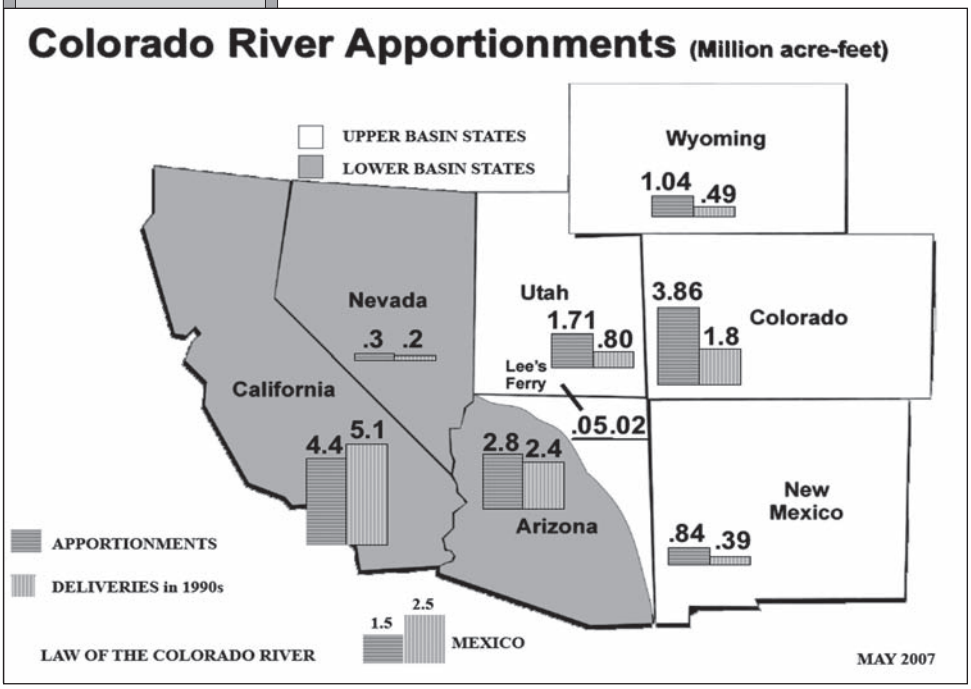
Mexico: Reductions Proposed

Issues with Mexico

Another interesting aspect of the Basin States' Agreement was the unresolved issue of water delivery to Mexico during shortages. The Basin States' Letter stressed that "no issue has surpassed the importance of how the United States exercises its authority to reduce the quantity of water allotted to Mexico under Article 10(a) of the Mexican Water Treaty of 1944." Under this Treaty, Mexico is entitled to 1.5 MAF annually. The Letter sets forth the Basin States' recommendations regarding the reduction of deliveries from Lake Mead as part of a shortage sharing agreement and then makes the following request: "The Basin States strongly urge the United States to exercise its authority to reduce the quantity of water allotted to Mexico in years in which the Secretary imposes shortages of water delivered from Lake Mead in the United States in a quantity consistent with the assumptions in the DEIS, and in other appropriate circumstances." The States' expressed support for "the concept [that] Mexico participate in the ICS program at some time in the future" provided that such participation is "part of a comprehensive arrangement between the two nations and incorporates, at a minimum, the material terms of the Basin States' Proposal."

Allocations Remain the Same

The Basin States' Proposal is concerned solely with coordinated water conservation, drought preparedness and other management options. The Agreement does nothing to alter the Basin States basic, previously established, water allocations.



Annual water allocations for the Basin States include:

- Arizona – 2.8 million acre-feet (MAF)
- California – 4.4 MAF
- Colorado – 3.9 MAF
- New Mexico – 838,000 acre-feet
- Nevada – 300,000 acre-feet
- Utah – 1.7 MAF
- Wyoming – 1.04 MAF

ADDITIONAL INFORMATION:
A complete copy of the April 30, 2007 letter to the Secretary of the Interior which includes the Basin States' Agreement can be accessed on the Web: www.cwcb.state.co.us (select: "CWCB News" >>> "Basin States Comments")

Mercury

PBT

Cycling and Deposition

Human Activities

From "*EPA's Roadmap for Mercury*" (7/06) **See website:** www.epa.gov/mercury/roadmap.htm

MERCURY REDUCTION PROGRAMS

OVERVIEW OF SEVERAL WESTERN STATES

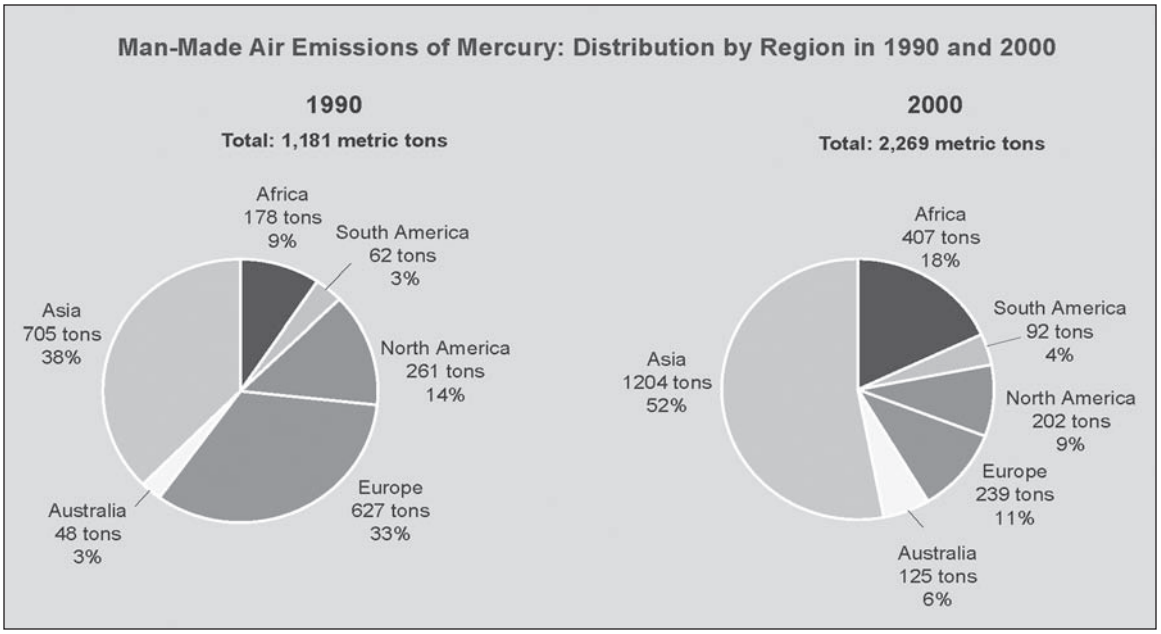
by Katherine Futornick, Exponent and Gary Bigham
(Exponent, Inc. — Lake Oswego, OR & Bellevue, WA Offices)

OVERVIEW

Public awareness of mercury in the food chain over the past several years has increased pressure on state agencies to take action to protect our land, waterways, and air from anthropogenic sources of mercury (see also, Futornic/Bigham/Henry, TWR #31). As a result, many states have pressed forward with actions to reduce sources of mercury. Some have developed comprehensive statewide strategies, while others have regulated mercury in products, developed regulations or voluntary programs to reduce discharges of mercury in waterways (including dental amalgams), and implemented regulations to reduce emissions from coal-fired power plants, waste-burning incinerators, etc. Regulatory solutions to reduce mercury in the environment are focused on point sources. However, mercury is also a naturally occurring contaminant found in many rivers, soils, and in the air. It is classified as a **p**ersistent **bi**oaccumulative **t**oxin (PBT) because it does not break down in the environment. It accumulates in increasingly toxic concentrations as it works its way up the food chain. Certain forms of mercury are also carried for thousands of miles in the atmosphere, deposited in the environment, and then re-emitted back into the atmosphere over many years.

The first part of this article describes the deposition and cycling of mercury in the environment and serves as a backdrop to the discussion on mercury reduction programs in certain western states. The discussion on mercury cycling and deposition is intended to illustrate three points: 1) mercury cycling is a very complex process involving natural and anthropogenic origination from old and new mercury sources; 2) methylmercury is the most toxic form of mercury; and 3) quantification or data collection regarding mercury in the environment and in fish tissue is essential for measuring the success of any program. It is clear that there will not be a simple solution to mercury reduction in the environment. However, states have taken some "first steps" and as progress is made new programs will replace and build on the current ones. The latter part of this article describes actions taken in several western states to reduce anthropogenic sources of mercury. Information on state programs that is included in this article is derived from literature and state agency websites.

Mercury has been cycling in the environment for a very long time, as a result of natural events such as volcanic eruptions and geothermal discharges. During the past 100 years, since the beginning of the industrial revolution, human activities have increased the amount of mercury released to the atmosphere. Deposition of mercury to the land, oceans, and freshwater systems has increased, and some scientists have concluded that the deposition of mercury can be as much as 3–5 times greater today than in pre-industrial times. The US Environmental Protection Agency (EPA) has estimated that one-third of reemitted mercury is from natural sources and two-thirds is from a combination of anthropogenic direct



Mercury

Water Quality

Global Sources

Deposition Data

Analysis Website

Methylmercury

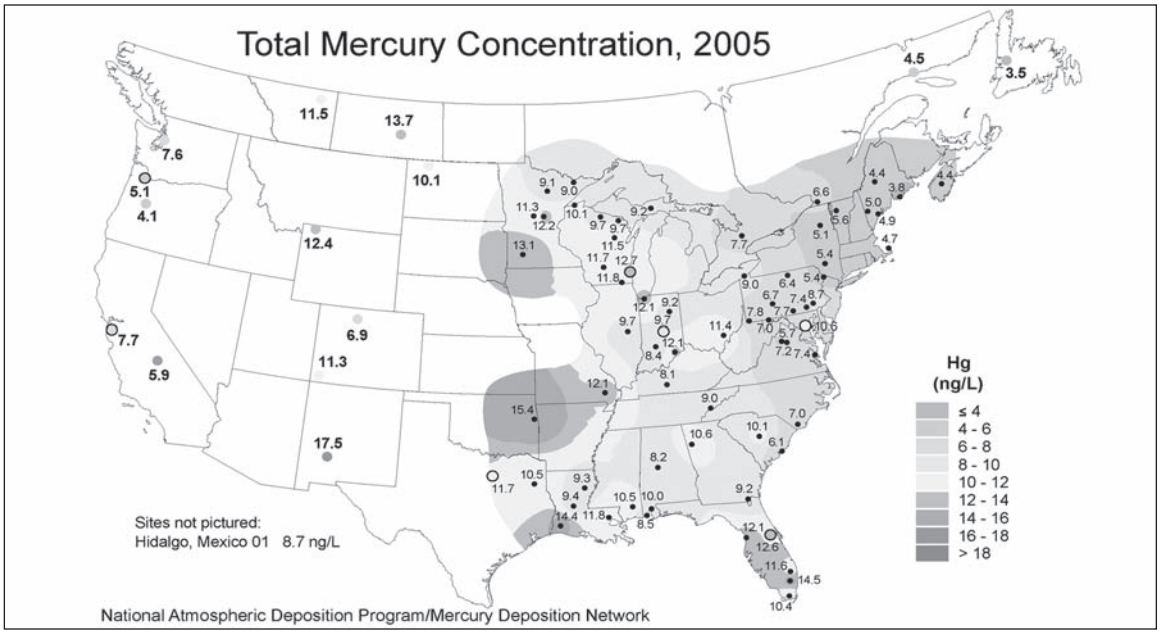
emissions and reemissions. Once mercury is deposited, a portion of the mercury re-emits or returns to the atmosphere. A major driver for mercury cycling in the environment is the increased amount of mercury from anthropogenic sources, resulting in increased food chain exposure and declining water quality in receiving streams. Increased awareness of the impacts of mercury to the human food chain has been evidenced through fish consumption advisories, resulting from elevated levels of mercury in fish tissue. This has translated into increased regulatory oversight, policies on mercury reductions in products and manufacturing processes, and extensive research studies on the most toxic form of mercury, i.e. methylmercury.

The reason an understanding of atmospheric deposition is of critical importance is that less than half of the total United States mercury emissions are deposited in the contiguous United States. There are regional differences as well. For example, according to EPA, an average of 89 percent of the mercury in west coast states, such as Oregon, comes from global sources, whereas United States mercury sources represent a greater part of the mercury deposition in the northeastern states, because of prevailing winds.

Mercury is a global pollutant that transcends political and geographic boundaries by traveling thousands of miles in the atmosphere before it is eventually deposited back to the earth in rainfall, snow, fog, or clouds (wet deposition), or in dry gaseous forms (dry deposition) by processes such as settling, adsorption, and impaction. Dry deposition is monitored through the Clean Air Status and Trends Network (CASTNet) and wet deposition is monitored through the National Atmospheric Deposition Program (NADP). Both CASTNet and NADP collect weekly precipitation samples. Data from these programs and others are used to inform lawmakers and policy makers as they try to understand the causes and consequences of mercury contamination and develop approaches to minimize and reduce adverse impacts from known sources. Mercury data used to inform legislation and regulation is of enormous geographic scope and scientific complexity. Effectively addressing this effort requires the integration of large amounts of data and expertise from many scientific disciplines. The Environmental Mercury Mapping, Modeling, and Analysis (EMMMA) website — a joint effort of the US Geological Survey (USGS) and the National Institute of Environmental Health Sciences (NIEHS) — is designed to support environmental and health researchers, as well as land and resource managers (USGS website: http://emma.usgs.gov).

Three principal forms of mercury are found in the atmosphere: 1) particulate mercury, associated with settling particles; 2) **r**eactive **g**aseous **m**ercury (RGM); and 3) gaseous elemental mercury. Inorganic mercury (the form emitted to the environment) is generally not a health concern as it is poorly absorbed by the digestive tract. The significant health issue is methylmercury—an organic form that is highly toxic to the nervous system. Processes that oxidize gaseous elemental mercury and convert it to reactive gaseous mercury can increase the deposition rate of this more reactive form of mercury. Methylmercury is produced from inorganic mercury by methylation — a microbial process controlled by certain bacteria and enhanced by chemical and environmental variables, such as the presence of organic matter, sulfur, and oxygen. More than 95 percent of all mercury in fish tissue is methylmercury, and this form of mercury biomagnifies to high concentrations at the top of food chains.

From NADP/MDN:
Mercury Deposition Network
See website:
http://nadp.sws.uiuc.edu/mdn/



Mercury

Re-emission Studies

With re-emission of mercury into the environment, studies have been undertaken to investigate whether there is any difference between "old" mercury and "new" mercury. Does mercury that has resided in sediments and soils for more than 100 years provide a pool of mercury that can last for a very long period of time? To answer this question, dosing studies have been undertaken from small scale projects to the scale of a large watershed. Using isotopic forms of mercury as tracers, researchers are able to track mercury introduced into the environment and distinguish it from mercury already existing in the environment. An organization called Mercury Experiment to Assess Atmospheric Loading in Canada and the US (METALLICUS) has studied an entire boreal forest ecosystem in Canada. The ecosystem is being loaded with isotopes of mercury that are being tracked in the water and atmosphere to better understand the conditions under which methylation of mercury occurs, and to evaluate the relationship between atmospheric loading rates and formation of methylmercury. A similar project is being conducted in the Florida Everglades.

Factual Questions

Contributions of old mercury, atmospheric deposition of mercury from external sources, and the formation of methylmercury are all relevant issues in the debate about how to regulate mercury. For policy makers to effect reductions in mercury and correlate reduced mercury to reduced uptake in fish tissue, there needs to be an understanding of the causes and effects of mercury speciation, mercury deposition, and methylmercury found in fish tissue. To draw reasonable conclusions, data would need to have been collected and studied over a long period of time. For most western states, that has not been the case.

EPA Approach

EPA is recommending the voluntary approach for states that have in place a comprehensive mercury reduction program with elements recommended by EPA. These states may separate their waters impaired by mercury primarily from atmospheric sources in a specific subcategory ("5m") of their Clean Water Act section 303(d) lists. States using this approach may also defer development of TMDLs for mercury-impaired waters as a result of having implemented mercury reduction programs. Rather than deferring action, the 5m approach recognizes states that are already taking action in advance of TMDLs to address their mercury sources and achieve environmental results earlier.

TMDLs Deferred

The remainder of this article highlights some of the key features of mercury reduction programs being implemented in several western states. All the states cited below have identified mercury as a constituent of concern in certain water bodies and several have developed mercury TMDLs (Oregon and California). Certain states have also developed more stringent requirements regulating the emission of mercury. However, all states have developed programs to reduce mercury in consumer products.

STATE MERCURY REDUCTION EFFORTS

Oregon

Oregon Actions

Oregon has undertaken three significant actions to reduce the presence of mercury in the environment: 1) reduction of mercury in the Willamette River Basin through establishment of a **t**otal **m**aximum **d**aily **l**oad (TMDL); 2) adoption of the Utility Mercury Rule; and 3) a reduction program focused on reducing or eliminating mercury in products such as thermometers and automobile switches.

Fish Consumption

The Oregon Department of Human Services has issued fish consumption advisories for the Willamette River, and the Cottage Grove and Dorena Reservoirs, based on high levels of mercury found in bass and northern pikeminnow. Impairments to these water bodies triggered the federal Clean Water Act requirement for a TMDL. The TMDL goal for the Willamette Basin is to reduce mercury levels in the basin, in order to reach safe consumption levels in fish tissue. In Oregon, that level is set at 0.35 parts per million. The Oregon Department of Environmental Quality's (ODEQ's) analysis of mercury sources in the basin determined that the majority of mercury was coming from nonpoint sources such as erosion of native soils containing mercury and from atmospheric deposition from sources outside of Oregon. EPA identified that approximately 89 percent of the mercury in Oregon as originating from global sources outside the state. Very little comes from industrial facilities. Nonetheless, ODEQ is requiring known sources of mercury to gradually reduce their mercury levels and meet allocated waste loads. In 2007, certain industrial and municipal facilities will increase monitoring and reporting of mercury and will develop mercury reduction plans. Best Management Practices (BMPs) will be encouraged to reduce soil erosion from farming and forestry practices. In 2011, DEQ expects to evaluate the data from increased monitoring and determine the effectiveness of its TMDL program.

Nonpoint Sources

Coal-Fired Power Plants

In 2006, the US Department of Energy identified plans for construction of 151 new coal-fired power plants in the United States. In Oregon, as many as five plants were considered, which prompted significant public opposition. In response to concerns about increased public exposure to mercury emissions, DEQ adopted regulations to reduce mercury emissions from coal-fired power plants. These new rules are more stringent than the federal Clean Air Mercury Rule (CAMR) adopted by EPA in 2005. The CAMR reduced mercury emissions through a national emissions cap-and-trade program for all coal-fired power

Mercury

Cap & Trade

plants, established new mercury standards for newly constructed facilities, and allocated emission credits to each state. In a separate but related action, EPA, also in 2005, issued the Clean Air Interstate Rule (CAIR) that is intended to reduce air pollution moving across state boundaries. The national program has a two-phase implementation strategy. The first phase (2010–2017) represents the benefits expected through implementation of CAIR, and after 2018, reasonable emission reductions need to be achieved through control technologies with verification through source monitoring. Concerns were raised that the national cap-and-trade program could delay installation of mercury controls if power plants chose to reduce emissions through purchase of credits from other states.

Utility Rule

The Oregon Utility Mercury Rule significantly limits emissions for new plants. Any new plant will be required to submit a Mercury Emission Reduction Plan, install continuous monitoring equipment, and between 2010 and 2017, receive 15 lb of mercury credits. Also, under Oregon's Utility Mercury Rule, interstate trading of mercury emissions will be allowed starting in 2010, limited after 2013, and eliminated by 2018. With respect to Oregon's only coal-fired power plant, located in Boardman, the rule requires that the Portland General Electric plant install mercury control technology to reduce mercury emissions from its current range of 137-to-281 pounds (lbs) per year to a range of 18–to-35 lbs per year. The plant will also install continuous monitoring equipment to determine the effectiveness of the control systems.

Emission Cap

EPA's allocated total mercury emission cap for Oregon is 152 lbs per year. In 2018, that will drop to 60 lbs per year and new plants will not be allowed to emit more than 25 lbs of mercury per year. With the Boardman plant capped at 35 lbs per year, it is conceivable that one new coal-fired power plant can be constructed, as long as the 60 lbs per year cap is not exceeded.

The widespread geographic and adverse impacts of methylmercury pollution have elicited strong responses from the public and regulatory authorities, and have been the subject of many scientific investigations. Although there are uncertainties with respect to specific processes that control region-specific influences for mercury pollution, there is general agreement that atmospheric mercury emissions and transport pathways are responsible for widespread mercury contamination, particularly for remote areas. There is also agreement on the conversion of inorganic mercury to methylmercury.

Washington

Washington Actions

Mercury is listed as a chemical of concern in the State of Washington. Statewide studies have identified mercury in fish tissue and sediments in lakes and rivers across Washington. Washington started implementing a mercury reduction chemical action plan in 2003. In 2003, the Washington State Legislature passed the Mercury Education and Reduction Act (MERA) that mandates proper disposal and recycling of many mercury-containing products. Washington State Department of Health is responsible for educating schools, businesses, local governments, and the public about how to reduce mercury contamination from products that contain mercury. MERA establishes dates by which certain mercury-containing items will be eliminated or banned from sale in Washington. By January 1, 2004, all mercury-containing lamps, including fluorescent lights and their packaging, manufactured after November 20, 2003, must have an "Hg" label. By January 1, 2005, all Washington State government agencies had to begin to purchase products containing little or no mercury.

Disposal and Recycling

As of January 1, 2006, the following restrictions took effect:

2006 Restrictions

- No sale of the following mercury-containing items:
  - Thermometers except for calibration
  - Manometers, pressure-measuring instruments such as blood pressure gauges
  - Commercial or residential thermostats unless the manufacturer participates in a recovery/recycling program
  - Novelties, toys, or jewelry containing mercury
  - Newly manufactured cars containing mercury switches
- Primary and secondary schools can no longer purchase elemental mercury or mercury compounds, and must remove and properly dispose of bulk elemental mercury
- Novelty manufacturers must notify retailers on the proper disposal of mercury-containing items

PBT Strategy

In 2005, the state adopted a Persistent Bioaccumulative Toxics (PBT) Strategy and mercury was the first PBT to be addressed. Washington's mercury reduction program has focused on strategies and programs to manage waste and recycle products containing mercury.

Key features of the State's Mercury Chemical Action Plan include:

Dental Amalgam

Dental Amalgam Reduction: By placing metals separators in dental offices, dental amalgam release to the environment is reduced or prevented. The Washington Dental Association and Washington State Department of Ecology (Ecology) agreed to a program that will require dental offices to install amalgam separators (August 2005). Dentists in King County were required to have amalgam separators beginning in July 2003.

Mercury

Recycling Programs

Safe Disposal of Products (used in households and small businesses): Products such as fluorescent lamps, button batteries, mercury fever thermometers, and mercury-containing wall thermostats all are potential sources of mercury contamination. Several counties sponsor thermometer exchanges or offer free mercury-recycling facilities for households. Businesses can contract for mercury recycling services or, in some cases, pay a fee to drop off materials at municipal hazardous waste facilities.

Medical Equipment Replacement and Improving Waste Separation in Hospitals: The Washington State Hospital Association and Ecology are working to reduce hospitals' reliance on equipment containing mercury by using safer alternatives.

State Grants: Grants are available to local governments and non-profit organizations to strengthen and better publicize hazardous-waste services and facilities.

Emission Credits

In March 2007, Washington proposed requirements in place of the federal rule and to opt out of mercury trading and establish emission standards through a phased approach. This state rulemaking will develop a methodology to distribute mercury emission credits in Washington, including evaluating the possibility of establishing an in-state trading program for those credits once the state is not participating in the federal program. This rule may also adopt (by reference) requirements for new coal-fired electrical generating units with adoption of more stringent requirements being evaluated. Establishing a stringent emission limit would be part of the mercury emissions distribution plan and will require TransAlta, currently the sole coal-fired power plant in Washington, to install controls to meet the limit.

Landfill Monitoring

Washington is also participating in a program to monitor mercury in landfills. Mercury in products, such as fluorescent lights, batteries, electrical switches and relays, barometers, and thermometers can end up in municipal landfills. The mercury contained in these products can evaporate into the air or leach into the groundwater from the landfills. Researchers are planning to quantify how much mercury is emitted to the atmosphere from landfills. Mercury leaching from landfills into groundwater has been studied more than air emissions. Available data show that mercury in groundwater can exceed drinking water standards from older, unlined landfills, but is less likely to leach into groundwater from landfills that are lined and use leachate collection systems. Depending on how the leachate is treated, however, mercury collected in leachate systems may re-enter the environment.

Groundwater

Alaska

Alaska Actions

The State of Alaska has focused on mercury monitoring, water and air regulations, and reduction of mercury in products. The Alaska Department of Environmental Conservation (ADEC), in response to concerns that **p**ersistent **o**rganic **p**ollutants (POPs) are able to travel across the globe and have been identified in Arctic climates, developed a Fish Monitoring and Assessment Program. ADEC's Fish Monitoring Program, initiated in 2001, is an ongoing collaborative effort to collect and test fish for certain environmental contaminants. Partners include the Alaska Department of Health and Social Services, the Alaska Department of Fish and Game, the National Oceanic and Atmospheric Administration, the International Pacific Halibut Commission, and Alaska subsistence users and commercial fishermen. The program involves a general survey and testing of certain marine and freshwater fish. More than 500 marine and freshwater fish were tested for mercury in up to 20 waterbodies across the state. The early findings show low levels of mercury in the following fish: ling cod, yellow eye rockfish, halibut over 50 pounds, spiny dogfish, and shark. With regard to all the species of fish mentioned above, it appears the larger and older fish carry more mercury than the younger and smaller fish. The source of the mercury is thought to be deposition of airborne mercury from distant sources (Governor Palin, Press Release, January 31, 2007).

Fish Monitoring

The Alaska Division of Public Health is also biomonitoring mercury accumulation in maternal hair and the Alaska Native Tribal Health Consortium monitors mercury in maternal infant cord blood.

TMDL Development

Alaska's 303(d) list identifies two water bodies with impairments, in part, resulting from mercury, Klag Bay and Skagway Harbor; their TMDLs are due to be completed in June 2008 and June 2007 respectively. Alaska's air quality regulations have adopted the federal standards by reference, and coal-fired power plants as well as waste incinerators are regulated to limit emissions from mercury.

California

California Regulation

California regulates mercury releases from hazardous waste facilities, cement kilns, and mercury-containing products. California wastes containing mercury are classified as hazardous waste if the total mercury concentration equals or exceeds 20 mg/kg. Disposal of hazardous wastes is made to a Class I landfill, which is regulated to monitor mercury in leachate.

Mining

Cinnabar deposits in California's coast range created mining opportunities that resulted in mine tailings containing residual mercury. The California Department of Toxics Substances Control maintains a

Mercury

Water Quality Standard (TMDLs)

database (CalSites) to evaluate and track activities including sites where mercury was identified. More than 80 sites have been identified requiring mercury corrective actions.

Since the 1980s, mercury has been a substance of interest under the California air toxics program. The California Air Resources Board maintains emissions inventory for mercury. Three programs, the Toxics Air Contaminant Program, the Air Toxics "Hot Spots" Program, and the Children's Environmental Health Protection Program, have identified mercury as a toxic air contaminant, and required facility operators to report emissions and meet emission levels. In order to protect the most vulnerable of the population, California is also monitoring mercury. Because mercury is a significant neurotoxin, and because California has low ambient levels of mercury, it has been placed in a second tier of concern.

In certain waterbodies, ambient concentrations of mercury exceed the water quality standard of 50 ng/L. Waterbodies which do not meet water quality standards for mercury have been required to develop TMDLs. Based on EPA's database on watershed assessment, there are seven waterbodies where TMDLs are required and the source of contamination appears to be primarily legacy mining waste. California has tested fish tissue for mercury in more than 300 waterbodies. CALFED has provided funds to study the sources, fate, and transformation of inorganic mercury to methylmercury in listed waterbodies in the Central Valley.

In 2001, California passed the Mercury Reduction Act which, after January 1, 2005, prohibited: schools from purchasing devices containing mercury; thermometers from containing mercury; the manufacture, sale, or distribution of mercury-containing novelty items; and the sale of mercury in vehicle light switches. Voluntary programs for collection of elemental mercury and mercury-containing products are in place, including elemental mercury from recreational mining. Mercury-containing thermostats and blood pressure gauges are regulated under both federal and state universal waste programs. More recently, manufacturers are required to provide a "clear and reasonable warning" for any listed chemical within a product.

CONCLUSION

The programs developed in each of the states mentioned above address mercury contamination in a variety of ways. Programs to reduce mercury began as early as the early 1980s and have seen significant increases in regulations and activities. One of the common features is the prohibition or restriction on mercury-containing products. Another common feature is the recent focus on emissions from coal-fired power plants and other point sources. Certain states are looking to develop a comprehensive strategy to address mercury reduction. Even so, many are beginning to recognize the challenges in trying to achieve localized reductions through regulation in the wake of global sources whose mercury emissions are transported and deposited thousands of miles away.

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Katherine Futornick is a managing scientist with Exponent and specializes in strategic planning and management of complex environmental projects. She completed her undergraduate degree at the Massachusetts Institute of Technology and graduate studies at the University of Oregon and Oregon State University where she conducted research into the environmental stressors on internal opiates in mammalian reproductive systems. During the past 10 years, she has managed projects investigating mercury contamination from legacy mining sites and managed several watershed assessment and stormwater projects. Katherine serves as Chair of the Oregon Chapter of the Air & Waste Management Association (A&WMA) and is on the board for the Pacific Northwest International Section of A&WMA.

Gary Bigham is a Principal with Exponent in Bellevue, WA and specializes in the evaluation of contaminant and sediment transport and fate in the environment. He received his BS is geology from Oregon State University and his MS in geophysical sciences from Georgia Tech University. Gary has undertaken numerous investigations of mercury in the environment and in indoor air over the past 15 years. The largest has been the comprehensive investigation of mercury cycling and bioaccumulation in a lake contaminated by two mercury-cell chlor- alkali plants, in Onondaga Lake, NY. He also recently participated in a natural resource damage assessment of the Guadalupe River, CA that drains the New Almaden Mining District, the largest mercury mining area in the US. Over the past 10 years, he has been involved with litigation regarding the influence of nutrients on mercury cycling and bioaccumulation in the Florida Everglades. Gary has participated in investigations at many other mercury-contaminated sites and published numerous papers and presentation abstracts. He also led an extensive evaluation of the behavior of mercury spilled from gas pressure regulators and mercury vapor in indoor air, and served as an expert witness in litigation involving mercury spilled in buildings and homes.

UPCOMING CONFERENCE: BELLEVUE, WA, JUNE 21st
Mercury Conference: Global Problem - Local Solutions

RE: Mercury in the West; Joint EPA Mercury Studies (Spencer Peterson, EPA); the Mercury Deposition Network (Eric Prestbo, Frontier Geosciences); Mercury Study in National Parks (Dr. Dan Jaffe). Sponsored by the Northwest Environmental Business Council and the Air & Waste Management Association (Puget Sound Chapter).

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Tribal Water

Change of Use Application

Flathead Reservation

Non-Indian Owners

Tribal Rights Unquantified

"Adversely Affect"

TRIBAL WATER RIGHTS DECISION

UNQUANTIFIED RESERVED RIGHTS & STATE SEGULATION

by David Moon, Editor

Introduction

On March 12th, the Montana Supreme Court (Court) issued an important decision involving a proposed change of use of water rights located on the Flathead Indian Reservation (Reservation). *Confederated Salish and Kootenai Tribes v. Bud Clinch and DNRC*, 2007 MT 63 (2007). The decision authored by Justice Jim Rice, if it stands, will undoubtedly exacerbate tribal fears regarding state water agencies and state courts. Overturning a lower court decision, the Court found in favor of Montana's Department of Natural Resources and Conservation (DNRC), thus allowing DNRC to continue processing the change application sought by non-Indian owners located on the Reservation. Several issues are involved in the decision that impacts tribal water rights, including the McCarran Amendment and state adjudications of water, sovereign authority, and regulation of water rights by a state agency. The Court's 92-page opinion includes 66 pages of dissent by Justice James C. Nelson. The Tribes filed a Petition for Rehearing with the Court that was still pending as this publication went to press.

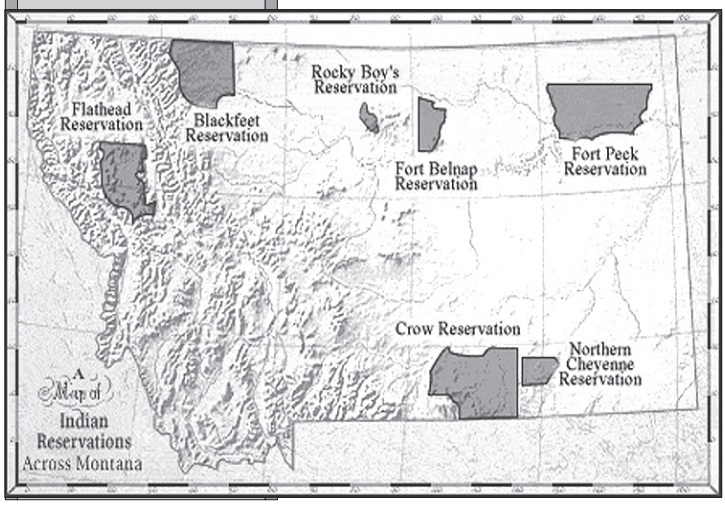
The Confederated Salish and Kootenai Tribes are comprised of the Bitterroot Salish, the Pend d'Oreille and the Kootenai tribes. The Flathead Reservation of 1.317 million acres is located in northwest Montana (see map). The Hellgate Treaty of 1855 is available from the Tribes website at: www.cskt.org/.

Confederated Salish and Kootenai Tribes v. Bud Clinch and DNRC

James and Katherine Axe, non-Indian owners of two appropriative water rights on the Reservation, applied to DNRC to change the use of their water rights from irrigation to recreation for a water-ski pond. The Tribes brought suit against DNRC to prevent processing of the change application, in light of the fact that the Tribes' reserved water rights have not been adjudicated and are therefore unquantified. Montana is in the process of a long-running, state-wide adjudication of water rights to determine the validity and extent of all pre-July 1, 1973 water rights. Nearly 220,000 claims are involved in the state-wide adjudication that began in 1979. Federal reserved water rights, including tribal water rights, are part of the adjudication but are currently being handled separately by the Reserved Water Rights Compact Commission (RWRCC; see Interview of Montana's Chief Water Judge Bruce Loble, TWR #2). Compacts have been approved by the Montana Legislature for five out of the seven Indian reservations in Montana, and a draft Compact for the Blackfeet Tribes has just been released for comment (see Water Briefs, this TWR). The Confederated Salish and Kootenai Tribes have not reached a compact agreement to date and so long as negotiations are continuing with the RWRCC, no proceeding to adjudicate those rights may occur (see § 85-2-217, MCA).

The Confederated Salish and Kootenai Tribes (Tribes) had convinced the District Court to issue a summary judgment and grant a permanent injunction stopping the change process. The Tribes' basic position was that DNRC could not determine whether the proposed change would "adversely affect" the use of their water rights in the absence of a quantification of the Tribes' reserved rights. The statutory standard in Montana for change applications is based on the basic "no injury rule," i.e. would the change proposed "adversely affect" another water user's rights ((*see* § 85-2-402(2)(a), MCA). It is important to remember that the "no injury rule" applies to both junior and senior water rights owners.

The Tribes also emphasized that if DNRC was permitted to conduct proceedings to change existing water uses on the Reservation, the Tribes "may be required to present extensive legal and factual cases literally thousands of times" in order to safeguard their unquantified reserved water rights against each proposed change. As noted in the dissenting opinion, the Court's majority did not find that argument "compelling," instead assuring the Tribes that they "need not participate in the DNRC process" and that they "are not bound by the DNRC's decisions." (Opinion, ¶38 and 40; Slip Op. at 28) The dissent, on the other hand, took exception with the Court's position. "This assurance, however, misses the point. By sanctioning a wholly inadequate method of evaluating change-of-use applications — the "no more water will be diverted than is currently" approach — the majority has, unfortunately, put the Tribes in the position of having to contest such applications as a matter of course and, thus, to defend their reserved water rights piecemeal." (Slip Op. at 28)



The Court also discussed the effect of the McCarran Amendment on this issue (43 U.S.C. § 666). Under the

Tribal Water

McCarran Amendment

McCarran Amendment, the federal government waives its sovereign immunity from lawsuits in order to be joined as a defendant when it is a necessary party and allow a state to proceed with a comprehensive adjudication of water rights by a state court. "The Tribes also argue that change of use proceedings are improper piecemeal adjudications prohibited by the McCarran Amendment, codified at 43 U.S.C. § 666, and that they should not have to intervene in multiple change of use proceedings — which are separate from and in addition to a comprehensive adjudication of rights — in order to ensure that their rights are not infringed." (Slip Op. at 5-6) Eventually, however, the Court majority concluded that, "[W]hether the change of use would adversely affect the Tribes and whether such assertion of regulatory authority by the State would have a direct effect on the Tribes are legal conclusions. However, these legal conclusions must emanate from a developed factual record, which is absent here." (Slip Op. at 19-20).

Change of Use Distinction

The Court explained its decision regarding the standard of "adverse affect" and how an application for a new water right —which would require waiting for the Tribes' rights to be quantified — can be treated differently than a change application. "On its face, an application for a new use of water on the Reservation means that, if approved, more water will be taken from the available supply. By contrast, a change in use, by definition, means that no more water will be diverted than is currently…However, we see no compelling reason to deprive a holder of a state water right — who is already using a given amount of water — of the opportunity to prove by a preponderance of the evidence that the proposed change will not adversely affect the use of other water rights, including the Tribes' reserved rights. It very well could be that a change in use would adversely affect the use of the Tribes' rights or that an applicant for a change of use cannot prove a lack of adverse effect on the use of the Tribes' unquantified rights. However, we are not prepared to hold that it is impossible, as a matter of law, for an applicant to meet that burden." (Slip Op. at 3)

Adverse Affect Intricacies

The dissent vehemently attacked the majority's reasoning, stating that the Court had misinterpreted Montana's no injury standard by adopting a simplistic view that failed to account for the intricacies of "adverse affect" on existing water rights. "First, I disagree with the majority's conclusion that the DNRC is able to determine, *before* the Tribes' reserved water rights have been quantified, whether a proposed change to an existing water use on the Reservation will 'adversely affect' those rights…The majority's contrary conclusion lacks any corresponding explanation or analysis of how one can determine whether a proposed change in use will affect — let alone, adversely affect — water rights whose scope is unknown but whose nature on the Reservation is ubiquitous. The majority merely posits that 'a change in use, by definition, means that no more water will be diverted than is currently.' Opinion, ¶ 38." (Slip Op. at 27)

Revision of Standard?

The dissent argues that by adopting this view of a "change in use" the court has effectively revised Montana's statute governing change applications. "Consequently, the majority's revision to § 85-2-402(2)(a), MCA, such that it now requires a determination only that 'no more water will be diverted than is currently,' emasculates the statute's 'adversely affect' prohibition and, in so doing, exposes the Tribes' reserved water rights to routine infringement by the DNRC with each change-of-use application that the DNRC approves on the Reservation pursuant to this standard. As a result, it can no longer be said that the Tribes' interests are being satisfactorily protected under Montana's Water Use Act." (Slip Op. at 28) Judge Nelson argues this point in detail later in the dissent. "However, the majority and the DNRC presume, mistakenly, that the effects a proposed change might, may, or could have on the Tribe's reserved water rights can actually be identified and measured *before* those rights have been quantified. Again, the testimony elicited at the hearing in the District Court establishes that this premise is incorrect. While an applicant might be able to prove that "no more water will be diverted than is currently," Opinion, ¶ 38, he or she cannot prove, until the scope of the Tribes' reserved water rights has been determined, that the proposed change will not adversely affect those rights in some other way (e.g., by increasing or decreasing the flow in a protected stretch of a stream, by raising or lowering a water table, artesian pressure, or water level in a protected area, or by impeding aboriginal practices). Thus, the majority has provided change-of-use applicants with the opportunity to prove something that, as a matter of law, cannot as yet be proven." (Slip Op. at 84)

Effects of Proposed Change

Sovereignty v. Property

The dissent also asserted that the Court "simply misconstrued the pertinent issue at hand" based on the belief that "the Tribes are claiming infringement of their *sovereignty* by the DNRC. *See* Opinion, ¶¶ 14, 18. But the Tribes have claimed no such thing. There is not a competition here to regulate water on the Reservation. Rather, the Tribes are claiming infringement of their *property*—namely, their reserved water rights. They seek to enjoin the DNRC from approving applications to change an existing water use on the Reservation because, according to the Tribes, any such change could impinge upon their unquantified reserved water rights." (Court emphasis; Slip Op. at 30-31)

The Court remanded the case back to the District Court with instructions regarding how to proceed. First, "the District Court must decide whether DNRC has the sovereign authority to conduct such proceedings [change of use applications]." The majority further explained what it viewed as the primary

Tribal Water

Regulatory Authority

Petition for Rehearing

Jurisdiction and Sovereignty

considerations in arriving at such a decision: "Central to the District Court's analysis will be a consideration of the off-Reservation effects involved in the State's assertion of regulatory authority or lack thereof and the impact the processing of the Axes' application may have on the Tribes' economic security, health, or welfare—including whether the change of use would adversely affect the Tribes' reserved water rights." If the District Court determines that DNRC does have "sovereign authority" to proceed with the change application, that court then "must permit the Axes to attempt to prove by a preponderance of the evidence that the 'proposed change in appropriation right will not adversely affect the use of the existing water rights of other persons,' § 85-2-402(2)(a), MCA, including the Tribes' reserved rights." (Slip Op. at 5)

The Tribes Petition for Rehearing, submitted March 26, naturally faces an uphill battle due to the narrow Montana Supreme Court rules for granting rehearings. The Petition asserts that the decision is in conflict with the express language of the McCarran Amendment, as well as controlling federal decisions which were not argued before the Court. The Tribes also point out that "the Court did not address the inseparable and preclusive nature of the Tribes' and the United States' status as necessary and indispensable parties to a *Bracker* litigation and the lack of waiver of sovereign immunity by either." ["*Bracker* litigation" refers to an "interest-balancing test" to analyze the assertion of state regulatory authority over tribal reservations and members — including authority over the conduct of non-Indians engaging in activity on the reservation. See *White Mountain Apache Tribe v. Bracker*, 448 U.S. 136, 100 S. Ct. 2578 (1980) and Slip Op. at 13-19].

At the end of its Introduction, the Petition includes what is perhaps the most succinct statement about this decision — "Rather than clarifying competing sovereign claims to jurisdiction over Reservation waters, this Opinion makes the situation more confusing." Petition at 1 and 2.

This lengthy opinion and dissent contain discussions regarding several issues not covered in this article, including the question of state regulatory authority over waters within the exterior boundaries of the Reservation. Anyone interested in tribal water rights should review the decision in detail.

For Additional Information: Complete case and briefs available at the Montana Supreme Court website: http://courts.mt.gov/supreme/default.asp. >>>Opinions>>>Case No. 04-04 (decided March 12, 2007)

WOOD WASTE & WATER

Washington States's new wood waste cleanup push

by Steven J. Thiele, Douglas J. Steding, and Christopher R. Hermann
(Stoel Rives LLP, Seattle, WA & Portland, OR, Offices)

Remediation of Sediments

Introduction

Over the last 150 years, hundreds of forest products facilities, from small sawmills to large pulp and paper facilities, have operated on the shores of the Northwest's rivers and harbors. At many of these facilities, log, product, and process-waste handling resulted in deposition of wood waste — ranging from sunken logs to coarse bark to fine sawdust to chips — in adjacent waterways. Until recently, environmental regulators focused on chemical contamination in sediments and largely ignored the presence of wood waste in the aquatic environment, reasoning that uncontaminated wood waste posed no real threat to the environment. Recently. the Washington State Department of Ecology (Ecology) has sharply changed direction and now is requiring remediation of wood debris impacted sediments. The State of Washington's "Puget Sound Initiative" — which includes a broad coalition of stakeholders assembled by the Governor to address Puget Sound environmental issues — is serving as the springboard for this significant change in direction. Ecology has now identified dozens of sites with wood debris impacted sediment in and around Puget Sound for extensive investigation and remediation. The process is underway with an initial set of five sites: Port Gamble; Fidalgo Bay; Port Angeles; Oakland Bay; and Port Gardner/Everett.

Site Cleanups

Past Focus on Chemical Contamination

Because of uplands contaminated by a variety of hazardous substances used in past operations, many forest products facilities in Washington have been the subject of regulatory actions under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the state's Model Toxics Control Act (MTCA) over the last 20 years. Site characterization activities associated with these cleanups often revealed accumulations of wood waste in the waters adjacent to the site. However, unless these accumulations of wood waste were also associated with more traditional hazardous substances, such as mercury or creosote, agencies largely ignored the wood waste. That approach is changing.

Wood Waste

New Scrutiny on Wood Waste

Responding to political pressure to do more to save endangered salmon and other species, environmental agencies have refocused their attention on uncontaminated wood waste in aquatic environments. The previous approach of allowing wood waste to degrade on-site over time has been replaced by a directive to exhaustively characterize the nature and extent of wood debris deposition and the physical effects of the wood on biota residing in the impacted sediment. In the course of investigating sites, Ecology is now requiring **p**otentially **l**iable **p**arties (PLPs) to quantify both the physical and chemical effects of wood waste on aquatic environments. For instance, as it degrades, wood waste can impact biota through releases of hazardous substances like sulfide and ammonia. Biota may be effected even just through physical contact with the wood debris. Degradation of wood waste can also produce bacterial mats, particularly in low-energy environments such as bays and estuaries. These bacterial mats can block valuable habitat and degrade the quality of overlying waters. Combined, these effects can have an adverse impact on smaller organisms that form the base of the food chain of an ecosystem. By extrapolating these effects over the whole ecosystem — essentially working from a "food chain" model — regulatory agencies may base their aquatic clean-up standards on the effects a substance has on these small organisms, likely resulting in significant remediation requirements.

Impact on Biota

Bacterial Mats

State and Federal Authorities

The cleanup of wood waste presents new legal challenges for state and federal agencies. Because no major state or federal legislation has specifically addressed this issue, agencies must rely on existing regulatory frameworks in requiring wood waste remediation. Both state and federal clean-up laws give environmental agencies broad authority to compel a party who is responsible for the release of a hazardous substance into the environment to clean up the resulting contamination. Because wood waste itself does not fall into the broad definition of a hazardous substance under either state or federal law, an agency seeking to compel cleanup must argue that the decomposition products of the wood waste are hazardous substances subject to regulation. Therefore, whether CERCLA or state clean-up authority can be applied depends on whether decomposition of wood waste at a particular site has been proven as a source of hazardous substances in the sediments or overlying water column. Alternatively, California, Oregon, Washington, and Alaska may attempt to rely on their state water quality laws to regulate wood waste. Under those laws, each state has broad power to regulate "pollution" to preserve water quality, and wood waste generally falls within the definitions of "pollution" set forth in the statutes. Although it has not generally been used to compel cleanup of wood waste, the use of water quality laws to compel cleanup of chemical contamination is well established. Ecology has already begun to focus on and refine its approach to wood-debris-only sites. In 2004 Ecology prepared draft guidance which identified wood waste sites as requiring investigation as well as outlining Ecology's approach to dealing with such sites. The draft guidance was not issued in final form, but it provides a preview of Ecology's approach to future regulatory action.

Decomposition Products

Authority Issue

Evolving Techniques for Characterization and Remediation

Quantifying the actual effects of wood waste on the environment poses unique problems because the physical effects of the wood often lead to failures in bioassay tests designed to evaluate the chemical toxicity of sediment. This may occur even though other techniques — such as sediment profile imaging — show biota thriving in the very same sediments. In short, traditional tests do not translate well to quantifying wood waste toxicity. Ecology is grappling with alternative in situ and laboratory methods to address this problem; however, these initial difficulties illustrate of the kind of issues that arise when regulators begin to tackle a new category of waste.

Test Failures

Agencies are also beginning to recognize the unique nature of wood waste when making clean-up decisions. For contaminated sediment sites, agencies have traditionally had a strong bias toward dredging and upland disposal as the appropriate remedial action. Over the last few years, this bias has begun to soften, and capping or sand cover type remedies are becoming increasingly acceptable to regulators for impacted sediment sites. Although there has been less work to evaluate the capping of wood waste, the technique appears promising, and may represent an appropriate alternative to more expensive dredging and upland disposal.

Capping Remedy

New Department of Ecology Initiative

Ecology has long been on the forefront of issues concerning contaminated sediments, so it is not surprising that the agency is now turning its attention to wood waste. Under the auspices of Governor Christine Gregoire's Puget Sound Initiative, Ecology is directing significant new enforcement resources toward the cleanup of wood waste sediment sites, with a special emphasis on wood waste located on state-owned aquatic lands. Ecology has made a wood waste site located at Port Gamble its highest clean-up priority under the Puget Sound Initiative, using its authority under MTCA as the primary tool for its enforcement efforts. Because wood waste is not a listed hazardous substance, significant questions exist

MTCA Authority

Wood Waste

Regulatory Scrutiny

regarding Ecology's ability to use MTCA to regulate wood waste directly. MTCA's language is, however, very broad and many PLPs may opt to cooperate with Ecology in studying and potentially addressing the physical effects of wood debris in Puget Sound sediments.

Conclusion

As demonstrated by Ecology's recent efforts, current and former forest products facilities on the shores of Puget Sound and state waterways should expect to receive regulatory scrutiny in the near future. This may include agencies revisiting sites that were the subject of cleanups under state and federal law in the past, and may involve significant additional clean-up efforts. It is not unreasonable to assume that this increased focus on the effects of wood waste on the aquatic environment will have impacts throughout the pulp and paper industry. The scope and approach of these new efforts is likely to be defined by the precedent established in Washington. Preliminary wood waste clean-up efforts in Washington have already resulted in an increased understanding of the effects wood waste has on the environment. As these studies lead to actual clean-up actions, the nature and scope of these actions will likely set the standard for cleanup in other jurisdictions. Combined, these efforts by Ecology will result in new guidance and approaches for remediation of wood waste sites, with the lessons learned then applied to other sites throughout the Northwest.

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Douglas J. Steding is an associate in the Resources, Development and the Environment practice group at Stoel Rives LLP's Seattle office. He focuses on environmental compliance, including issues related to contaminated sediments and aquatic cleanup, with a particular emphasis on Washington State's Model Toxics Control Act, and the federal Comprehensive Environmental Response, Compensation and Liability Act. In addition to his law degree, Doug holds a Ph.D. in geochemistry. Prior to law school, Doug's scientific career included research on fate and transport of metals in aquatic systems, and the atmospheric chemistry and transport of mercury.

Christopher R. Hermann practices with the Resources, Development and Environment practice group at Stoel Rives LLP's Portland, OR and Seattle, WA, offices. He regularly advises clients on liability issues and obligations in connection with hazardous substances contamination including environmental liability insurance coverage claims. He assists with complex regulatory compliance issues and permitting and represents industrial entities in enforcement actions. Chris is an Adjunct Professor of Law at Lewis & Clark Law School and a frequent author and speaker on environmental cleanup and compliance issues, as well as environmental liability and insurance issues.

CERCLA LIABILITY

United States v. Burlington

ninth circuit accepts "divisible harm" as a defense

by Brien J. Flanagan and Carson Bowler, Schwabe, Williamson & Wyatt, PC (Portland, OR)

"Divisibility of Harm" Defense

In *United States v. Burlington Northern & Santa Fe Railway Co*., No. 03-17125, 2007 US App. LEXIS 6083, 2007 WL 777875 (9th Cir. Mar. 16, 2007) (*Burlington Northern*), the US Ninth Circuit conclusively stated that Potentially Responsible Parties (PRPs) may use "divisibility of harm" as a defense in cost recovery actions under Section 107 of the federal Comprehensive Environmental Response Compensation, and Liability Act (CERCLA or "Superfund" (42 U.S.C. § 9607)). The defense places the burden on a defendant/PRP to demonstrate that a reasonable basis exists for finding that its contamination is distinct ("divisible") from the rest of the contamination at a particular site, and that the divisible portion is traceable to only that PRP.

Cost Recovery Actions

Cost recovery actions under CERCLA have historically consisted of two separate (but sometimes interrelated) inquiries. First, which parties are liable? CERCLA was designed to cast a wide net over a range of PRPs who, because of their status or conduct (as owners, operators, or arrangers), were presumed liable to pay for all of the cost to clean up a contaminated property. At least in theory, all these PRPs were jointly and severally liable for the whole, thus providing the greatest number of possible contributors to pay for the efforts to clean up the site.

Allocation of Damages

Arguments about relative culpability were reserved for the second inquiry, which determined how to allocate percentages of or damages to those parties deemed liable. The court would employ equitable factors to figure out what percentage each party should contribute to the total cost. The risk of joint and several liability, regardless of the percentage allocated to any particular party, included the potential of

CERCLA

Severable Liability

having to cover the costs of any party that — for one reason or another — was unable to pay for some or all of its allocated share.

After *Burlington Northern*, however, a defendant PRP now may argue at the first phase (liability phase) that it should only be liable for a severable portion of the overall contamination. Particularly with small or minor contributors to a site, the possibility of severable liability significantly decreases a party's exposure to pay for cleaning up contamination to which it is a stranger.

Background

In *Burlington Northern*, a now-defunct agricultural products company owned and operated the contaminated site for many years for purposes of storage and shipping large quantities of toxic chemicals. Predecessors to the Burlington Northern & Santa Fe Railway Company and the Union Pacific Transportation Company (the "Railroads") owned a small portion of the land where the same storage and shipping occurred, but were not directly involved in the operations. Shell Oil supplied and delivered some of the chemicals used by an agricultural products company at the site. During the agricultural company's operations, large quantities of toxic substances were released into the environment at the site.

After more than twenty years of leakage from storage tanks and other releases, the US Environmental Protection Agency (EPA) and State of California's Department of Toxic Substances Control investigated and began to remediate the contamination. The government spent substantial amounts of money to clean up the site. The two agencies then brought suit to recover response costs under CERCLA.

Liability Decisions

The federal district court found the Railroads liable as owners and Shell liable as an "arranger" under CERCLA, § 9607(a)(3) — i.e. a person who arranged for the disposal of hazardous substances. Shell and the Railroads had argued that they had no liability and, therefore, provided no argument for apportionment at the liability phase. The district court nevertheless concluded that the site was capable of apportionment and proceeded to apportion it.

Proportional Liability

The court apportioned liability based on a number of factors, including assumptions about the contamination and (apparently) equitable considerations. The court ultimately found that the Railroads' proportional liability was 9%, and found that Shell was liable for 6% of the Railroads' 9%. Because no collection could be obtained from the agricultural company, the State and Federal environmental agencies were stuck with the balance of the costs not apportioned to the Railroads and Shell. The government agencies appealed, seeking to hold the Railroads and Shell jointly and severally liable for the entire judgment. Shell appealed the finding that it was liable as an arranger.

The Ninth Circuit Decision: Apportionment at the Liability Stage

Liability Apportionment

The Ninth Circuit affirmed Shell's liability as an arranger, but reversed the district court's ruling that the liability could be apportioned in this case and remanded for further proceedings. Although reversing the portion of the district court judgment that declined to impose joint and several liability, the Ninth Circuit made clear that a court — under the right circumstances — may apportion the liability among PRPs in cost recovery actions.

Availability of apportionment under CERCLA

CERCLA Unclear

The Ninth Circuit first addressed whether liability could be apportioned at all in a CERCLA case. It noted that "CERCLA is a 'super-strict' liability statute" that "shifts the costs of cleaning up environmental harm from the taxpayer to the parties who benefited from the disposal of the wastes that caused the harm" (Slip Op. at 3223 and 3222 respectively), but does not require a showing that a PRP caused all the contamination at a site in order to be found liable. The Ninth Circuit, however, also noted that CERCLA does not specifically address the question whether "liability is joint and several — meaning that each PRP responsible for all cleanup costs at a facility is liable for such costs — or severable — meaning that cleanup costs at a single facility can be apportioned among PRPs on some basis." (Slip Op. at 3224)

Joint and Several Liability

The court reiterated that a defendant may be held fully liable for all cleanup costs despite being responsible for only a fraction of the contamination, noting "[i]n this circuit, liability is joint and several when the harm is indivisible." (Slip Op. at 3225) After examining the statutory language and cases from other circuits, however, the court determined that apportionment at the liability phase was consistent with the statutory scheme of CERCLA. The court made clear, however, that "apportionment is the exception, available only in those circumstances in which adequate records were kept and the harm is meaningfully divisible." (Slip Op. at 3244) Thus, the Court acknowledged that the burden to establish divisible harm is on the defendant PRP's, which can be problematic in cases like those involving old sites with poor (or unavailable) records and documentation.

"Meaningfully Divisible"

Standards for apportionment under CERCLA

Common Law

The Ninth Circuit was careful to craft a standard for apportionment that corresponds with CERCLA's strict liability, "polluter pays" framework. The Ninth Circuit, like other circuits that have addressed the issue, relied on common law principles — particularly Section 433A of the Restatement of Torts — which

CERCLA

require a "reasonable basis" for apportioning liability among joint "tortfeasors" (i.e. those determined to have induced the damage). Finding, however, that the Restatement's formulation deviates from CERCLA's strict status liability scheme, the court modified two important features in crafting its apportionment standard. The first deals with causation. Instead of adopting the Restatement's traditional principles of causation, the court substituted a "nexus" concept that accounts for the particular PRP provision applicable (i.e., is the party an owner, operator or arranger?). (Slip Op. at 3228-39) Under the Ninth Circuit test, there must be a nexus (or lack thereof) between the contamination at the site and the PRP's conduct or status giving rise to its potential liability. The second modification addresses "harm." Divisibility under the Restatement is partially based on the proportional "harm" caused by each tortfeasor. Because CERCLA damages are couched in terms of "costs of removal or remedial action" and "necessary costs of response," the "harm" for purposes of apportionment in CERCLA cases turns on whether the "contamination [is] traceable to each defendant." (Slip Op. at 3233)

"Nexus" Concept

"Harm" Traceability

Moreover, the Ninth Circuit announced that an examining court may *not* consider equitable factors in determining whether liability is to be joint and several or apportioned:

> At the liability stage, CERCLA simply assigns liability to statutorily responsible parties so as to assure that, as between those with *some* connection to the contamination — and who have, it may be assumed, benefitted from the contamination-causing process — and those with *none*, such as the taxpayers. Any court-created structure that would allow PRPs to whittle their share to little or nothing and leave the taxpayers holding the bag may seem more equitable to some PRPs but would violate the basic structure of the CERCLA statutory scheme. Because of such concerns, courts have generally refrained from using an equity-based allocation analysis, so as not to weaken further the strict liability principle basic to CERCLA. (Slip Op. at 3236)

No Equitable Factors

Thus, in order to support a claim that liability should be apportioned, a defendant must show that there is a reasonable basis to support a nexus between the defendant's PRP status (e.g., owner, operator, or arranger) and that the contamination is traceable to that defendant, independent of any equitable arguments.

Defendant Burden

In this case, the court found that the Railroads failed to demonstrate that "their" contaminants were divisible for purposes of apportionment. The court further found that Shell had not submitted adequate evidence to define its portion of liability with any certainty.

Implications

Although the rule in *Burlington Northern* applies only to Section 107 cost recovery actions, it imposes additional pressure and risk exposures to those who either own or undertake cleanups on contaminated properties. PRPs now have another argument to limit their contributions to paying for cleanups. Divisibility has been argued successfully in other circuit courts based on the nature of the contaminant of concern, on the location of contamination, and the degree to which certain parties have contributed to the contamination at issue. Complex widespread (or "areawide") sites being addressed by governmental agencies might have numerous PRPs with divisibility arguments. If successful, the divisibility defense could transfer some of the (unrecovered) clean up costs to the government (and taxpayers). Defendants, however, may be faced with tough strategic decisions in deciding whether to argue (like the defendants in *Burlington Northern*) that they have no liability or to concede some "divisible" liability. *Burlington Northern* will, in effect, require plaintiffs in some cost recovery actions to not only prove liability, but to disprove that a particular defendant's contamination is legally detachable from the overall problem.

Divisibility Defense

Plaintiff's Burden

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Case available at: www.ca9.uscourts.gov/>>(Case NO. 03-17125; March 16, 2007)

Carson Bowler is a shareholder with Schwabe, Williamson & Wyatt's Portland office. Mr. Bowler's practice focuses on environmental, real estate, insurance and administrative law issues. He has litigated and negotiated settlements for numerous hazardous substance liability and contribution cases in state and federal courts, and recently assisted in having an $8 million cost-recovery claim dismissed against a client. He provides expertise and advice regarding real property due diligence, risk allocation, risk management and other environmental aspects of real property transactions. Since starting at Schwabe, Williamson & Wyatt in 1997, he has been involved with insurance coverage matters, including coverage for environmental contamination. Carson has extensive experience with state and federal agencies in licensing, permitting and civil enforcement actions, including the Oregon Department of Environmental Quality, the US Army Corps, the Division of State Lands, and the Department of Forestry. He has also successfully defended a number of citizen suits under the Clean Water Act.

Brien Flanagan is an associate in Schwabe's Portland office. Mr. Flanagan focuses his practice on environmental and natural resources law as well as commercial litigation. He has litigated cases involving the Clean Water Act, CERCLA, Oregon Superfund, Washington's Model Toxics Control Act and Washington's State Environmental Policy Act. Recently, Mr. Flanagan won a multimillion dollar summary judgment award for insurance coverage of environmental liabilities. He regularly consults on environmental risk and liability issues for mergers and acquisitions, real estate, energy, and natural resources transactions. His efforts include conducting due diligence investigations and risk analysis for industrial property purchases, leases and natural resources development projects, as well as analyzing workplace environmental safety and liability issues and assisting with permitting issues. Mr. Flanagan lends a significant portion of his time and efforts to pro bono legal work through Schwabe's legal clinic, a low-income legal clinic which serves the Hispanic population in east Multnomah County.

WATER BRIEFS

KLAMATH BASIN OR/CA

"TAKINGS" DECISION • MINIMUM FLOWS DECISION • USGS GROUNDWATER REPORT

The Klamath Basin continues to be a source of conflict on water issues. Two court decisions have been reached and a groundwater study has recently been released dealing with various water questions in the Basin.

On March 16, the US Court of Federal Claims rejected breach of contract claims that were part of a "takings" lawsuit filed by irrigators (*Klamath Irrigation Dist. v. United States*, 2007 WL 853018 (March 16, 2007). The plaintiffs sought compensation for the loss of irrigation water that was required for listed fish species under the federal Endangered Species Act (ESA) on the Klamath River. The Bureau of Reclamation (Reclamation), based on Biological Opinions issued by the US Fish & Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), withheld irrigation water in 2001 to satisfy listed species' needs. The irrigators filed a "takings" lawsuit with the Court of Federal Claims, based on the Fifth Amendment and an alleged breach of contract between the irrigators and Reclamation to supply the water. In an earlier decision, this court found that the plaintiffs' (irrigators') "interests in the use of Klamath Basin water did not constitute cognizable property interests for purposes of the Takings Clause, and, therefore, that plaintiffs were not entitled to compensation under the Fifth Amendment. *Klamath Irr. Dist. v. United States*, 67 Fed. Cl. 504, 531-535, 539-40 (2005)." (Slip Op. at 2). That decision, however, left open the possibility that the irrigators could be compensated for their breach of contract claims (67 Fed. Cl. at 535-37).

The latest Court of Federal Claims decision rejected the breach of contract claims. The court stated that the controlling issue was "whether the contracts [between the irrigators and Reclamation] must be read to imply that the United States reserved its ability to exercise its sovereign powers without the threat of liability for failing to deliver water." (Slip Op. at 7). The "sovereign acts doctrine," as explained by the court, "recognizes that 'the Government-as-sovereign must remain free to exercise its powers'…and shields the United States from contract liability based upon its 'public and general acts as a sovereign'..." *Id.*[67 Fed. Cl. at 536] (quoting *Yankee Atomic Elec.Co. v. United States*, 112 F.3d 1569, 1575 (Fed. Cir. 1997), *cert. denied*, 524 U.S. 591 (1998) and *Horowitz v. United States*, 267 U.S. 458, 461 (1925)). According to the court, the only related doctrine that could have saved the plaintiffs' claims was the "unmistakability doctrine." The court noted, however, in this case the "plaintiffs readily admit, there are no unmistakable terms in any of the contracts precluding the government from exercising its sovereign powers — indeed, the water shortage clauses in most of the contracts reflect the opposite intent." The court then quoted from *United States v. Winstar Corp*., 518 U.S. 839, 872 (1996): "Sovereign power governs all contracts subject to the sovereign's jurisdiction, and will remain intact unless ***surrendered*** in unmistakable terms." (court emphasis; Slip Op. at 25). Judge Allegra concluded that the "sovereign acts doctrine" provides a complete defense to the breach of contract claims and precludes plaintiffs from recovering damages.

The 9th Circuit also recently affirmed the District Court's order dealing with minimum flows in the Klamath River needed for listed species under ESA (*PCFFA v. U.S. Bureau of Reclamation*, No. 16-16296, 2007 WL 901580 (9th Cir. March 26, 2007)). The lower court's order granted injunctive relief to environmental and fisheries groups requiring Reclamation to limit deliveries of water to irrigators in the Klamath Project. The deliveries are limited if they would cause flow levels in the Klamath River to fall below 100% of the levels specifically identified by NMFS as necessary to prevent jeopardy. The order also required this limitation to remain in place until a new Biological Opinion was prepared by the agencies and reviewed by the court. The government agencies had sought to phase-in the flow levels over ten years, rather than immediately requiring 100% of the flows to be met.

After the 9th Circuit found that plan invalid in *PCFFA v. United States Bureau of Reclamation*, 426 F.3d 1082 (9th Cir. 2005) (*PCFFA III)* and remanded the case to the district court, NMFS released a "supplement" to the invalidated plan in hopes of avoiding a permanent injunction. The 9th Circuit, however, found that "the supplement made no changes to the flow plan for the 2002-2012 period (which we held invalid in *PCFFA III*), and, most importantly, the NMFS and the BOR did *not* reinitiate the ESA-mandated consultation process in producing the supplement." (court emphasis; Memorandum at 3) The 9th Circuit was clearly not impressed with these actions. "It is well settled that a previous agency determination in a Biological Opinion cannot be amended or supplemented with post-determination analysis or evidence without reinitiating the consultation process. *See, e.g.*, *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1076-77 (9th Cir. 2004); *Ariz. Cattle Growers' Assoc. v. U.S. Fish & Wildlife Serv.*, 273 F.3d 1229, 1245 (9th Cir. 2001). Indeed, it is clear that 'post-hoc rationalizations' of agency decisions are not permitted as they provide an inadequate basis for judicial review. *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168-69 (1962). The NMFS supplement is nothing more than the product of post-hoc rationalization." (Memorandum at 3-4).

The court also held that the agencies' inquiry to determine "what percentage of flow is required to avoid jeopardizing coho salmon" is "forward-looking." The court reiterated that "as we already explained in *PCFFA III"* the "proper baseline analysis is not the proportional share of responsibility the federal agency bears for the decline in the species [(i.e, fifty-seven percent)], but what jeopardy might result from the agency's proposed actions in the present and future human and natural contexts." 426 F.3d at 1093." (Memorandum at 4-5)

Finally, in support of the lower court's injunction, the Memorandum stated that "[E]njoining diversions of water to ensure that the flow limits specified by NMFS are met is an equitable remedy reasonably calculated to prevent BOR from jeopardizing coho salmon in its Klamath Project operations. Accordingly, the injunction was a valid exercise of the court's equitable powers." Memorandum at 6. Note that the 9th Circuit's decision was issued through an unpublished "Memorandum" that, therefore, limits its precedential value.

(continued)

WATER BRIEFS

(continued from previous page)

"*Ground-Water Hydrology of the Upper Klamath Basin, Oregon and California*" has been published as US Geological Survey Science Investigations Report 2007-5050. While it has long been recognized that groundwater discharging to streams through springs and seeps is a major source of streamflow in the upper Klamath Basin, helping to sustain flow during the dry months of late summer and fall, the new USGS report is the first to provide quantitative estimates of groundwater discharge to streams over the entire upper basin.

The sources of groundwater in the basin are rain and snowmelt that infiltrate through the soil into the aquifer system at an estimated rate of about two million acre-feet per year. Most of this recharge occurs in the Cascade Range and uplands in the interior and eastern parts of the basin. Groundwater generally flows toward the interior basins and stream valleys, and most eventually discharges to streams.

Ken Lite, a coauthor of the report from the Oregon Water Resources Department, observed that "groundwater levels historically have been stable in the upper Klamath Basin, moving up and down mostly in response to drought cycles. Pumping has caused some declines in the past, but these generally have been modest and restricted to relatively small areas." Lite added, however, that increases in pumping in recent years have caused water level declines of as much as 10-to-15 feet in some deep wells in the Klamath Valley and northern Tule Lake sub-basin. It is not known how long it will take the water table to recover once wet climate conditions return and pumping is reduced.

For info: "Takings" case is available on the 9th Circuit website: www.uscfc.uscourts.gov/2007.htm#mar07.>>>March 16th decision; Minimum flows decision is available at: www.ca9.uscourts.gov/ >>>Memorandum>>>March 26, 2007>>>Case No. 06-1696; Groundwater report can be viewed on the Web at http://pubs.usgs.gov/sir/2007/5050/

GROUNDWATER CLEANUP NM

PCE PLUME: BIOREMEDIATION PILOT

The New Mexico Environment Department (NMED) recently completed construction of the groundwater remediation system for the North Railroad Avenue Plume Superfund Site in Española. The remediation system is designed to treat groundwater over a **p**er**c**hloro**e**thylene (PCE) contaminated plume, which is three quarters of a mile long and 260-feet deep. The plume stretches from Norge Town Cleaners on North Railroad Avenue south to the Rio Grande. Contamination at the site — discovered in 1989 — affected at least 280 million gallons of water, forced the closure of two city supply wells and threatened to spread into the river.

Ron Curry, NMED's Secretary, noted that the "Environment Department took the lead on this project but we are thankful for cooperation with the USEPA, the City of Espanola and Santa Clara Pueblo. It is teamwork like this that makes such important projects achievable." NMED is beginning a pilot test phase in the source area to reduce the concentration of contaminants in the aquifer.

The $4 million construction project, which included 90 percent federal and 10 percent state matching grants, consists of two bioremediation systems that will use in-situ bioremediation to destroy PCE contaminants in the high concentration source area and deep zone aquifer. A third in-situ bioremediation system was installed in the area downgradient of the plume to prevent the continued migration of PCE plume and prevent contamination from impacting the Rio Grande. The pilot project is designed to test three bioremediation amendment solutions in order to determine the most viable alternative for full scale implementation.

The biodegradable amendment solutions include vegetable oil, whey protein and ethyl lactate, which will be recirculated within the PCE plume. The amendments will add necessary electron donor required for biodegradation of the PCE to nontoxic end products. The pilot test is expected to take nine months to complete with full system operations scheduled to begin in March.

For info: Marissa Stone, NMED Communications Director, 505/ 827-0314 or Superfund Oversight Section's website: www.nmenv.state.nm.us/gwb/New_Pages/SOS.htm

GROUNDWATER RIGHTS NV

STATE ENGINEER APPROVAL

On April 16, the Nevada State Engineer approved a portion of the groundwater rights applications the Southern Nevada Water Authority (SNWA) submitted to obtain water from the Spring Valley Hydrographic Basin in White Pine County, enabling SNWA to develop a maximum of 60,000 **a**cre-**f**eet (AF) annually from the basin to use for municipal and domestic purposes in Las Vegas. The decision allows SNWA to pump 40,000 AF annually from the basin for 10 years. At that point, the SNWA will be allowed an additional 20,000 AF annually from the basin based on the results of monitoring and impact analysis. The State Engineer's approval also requires the protection of existing groundwater rights in the basin, the ability for future groundwater growth and development in Spring Valley and a comprehensive monitoring, management and environmental mitigation plan. The first water deliveries from Spring Valley to Southern Nevada are not expected until 2015 at the earliest.

SNWA's predecessor filed multiple applications for six cubic feet per second (cfs) of underground water in 1989. Protests were filed by numerous parties and a plethora of issues were involved, including groundwater availability and "mining," municipal needs for future growth, the "public interest," and the interbasin transfer of water.

Ultimately, the State Engineer approved the use of 60,000 AF annually (amount "available for appropriation"). That figure was based on findings of a perennial yield of 80,000 AF, committed consumptive use of groundwater rights

WATER BRIEFS

of 11,128 AF, potential future domestic use of 1,265 AF, and a set-aside of 10% of the perennial yield (8,000 AF) for future use in the basin of origin. The amount approved is, however, subject to future adjustments due to the "great uncertainty" concerning "unreasonable impacts" from the pumping. The Ruling requires that "the development of water will occur in stages in conjunction with a significant monitoring and mitigation plan. If unreasonable impacts from the pumping are seen or are likely, curtailment of pumping will be ordered unless the impacts can be reasonably and timely mitigated." (Ruling at 53).
For info: State Engineer's website (Ruling #5726): http://water.nv.gov/scans/rulings/5726r.pdf; SNWA website: www.snwa.com/

WATER CONTAMINANTS US

SAFE DRINKING WATER LIST

A preliminary determination has been made by EPA not to regulate 11 contaminants on the second drinking water **c**ontaminant **c**andidate **l**ist (CCL). Based on an extensive review of health effects and occurrence data, EPA concluded that the specific contaminants do not occur at levels of public health concern in public water systems.

The 11 contaminants include naturally occurring substances, pesticides, herbicides and chemicals used (or once used) in manufacturing. The 11 contaminants are: Boron (naturally occurring metal-like element used in industrial production); Dacthal mono- and Di-acid degradates (herbicides that should not be directly applied or discharged to surface waters); 1,1-dichloro-2,2-bis(p-chlorophenyl) ethylene (DDE: degradate of the pesticide DDT, which was banned in 1973); 1,3-dichloropropene (Telone: soil fumigant used to control nematodes which has labeling requirements to protect sources of drinking water); 2,4-dinitrotoluene, and 2,6-dinitrotoluene (chemicals found in ammunition, explosives, dyes, polyurethane foams and automobile air bags); s-ethyl propyl thiocarbamate (EPTC: herbicide used on various food crops); Fonofos (soil insecticide which was discontinued by the manufacturer in 1999); Terbacil (herbicide used to control broadleaf weeds); and 1,1,2,2-tetrachloroethane (volatile organic chemical once used for a variety of industrial uses). While none of the contaminants were found nationally at levels of public health concern, EPA is recommending that health advisories for seven of the contaminants be updated to provide local officials with current health information for situations where the contaminants may occur.

Two other contaminants — perchlorate and MTBE — require additional investigation to ascertain total human exposure and health risks. For those contaminants, EPA is providing a summary of current health, occurrence, and exposure information. The agency is seeking comment and additional information to help EPA's evaluations.

A regulatory determination is a formal decision on whether EPA should develop a national primary drinking water regulation for a specific contaminant. The Safe Drinking Water Act requires that EPA issue a CCL every five years for at least five contaminants from the most recent CCL. In 2005, the agency published the second CCL of 51 contaminants.
For info: Eric Burneson, EPA, 202/564-5250 or email: burneson.eric@epa.gov; Contaminant candidate list website: www.epa.gov/safewater/ccl/reg_determine2.html

DAM REMOVAL WA

ELWHA RIVER: CWA PERMIT ISSUED

EPA has issued a key Clean Water Act permit which will aid in the restoration of the Elwha River on the Northern Olympic Peninsula. The permit will ensure a clean water supply for domestic and industrial uses from the Elwha during future dam removal efforts and while the river is recovering. The National Pollutant Discharge Elimination System (NPDES) permit will allow the Elwha Water Treatment Plant (EWTP) to treat the water and discharge removed sediment to the river. Construction of the EWTP is scheduled to begin later this year.

The EWTP and the NPDES permit are important parts of a major habitat restoration project that has been years in the making to restore the Elwha River to its natural state. The restoration project involves the removal of the Elwha and Glines Canyon Dams, which will occur after the water treatment plant is completed. According to Mike Gearheard, EPA's Director of the Office of Water & Watersheds in Seattle, the Elwha dam removal project will free the river and allow salmon to return to the entire pristine watershed. During the dam removal process (expected to last five years), an estimated 18 million cubic yards of sediment currently trapped behind the two dams will be released into the water column.

EPA issued the NPDES permit with the cooperation of the Washington State Department of Ecology, the US Bureau of Reclamation, the National Park Service, and many other partners working together to help restore salmon habitat in the Elwha River.
For info: Brian Nickel, EPA, 206/ 553-6251 or email: nickel.brian@epa.gov; Elwha River Ecosystem and Fisheries Restoration Act websites: www.fws.gov/laws/laws_digest/ELWHA.HTML and www.nps.gov/archive/olym/elwha/docs/restoreact.htm; NPDES permits – EPA website: http://epa.gov/r10earth/waterpermits.htm

WATERSHED PLANNING US

EPA WEB-BASED TOOL

EPA has released the Watershed Plan Builder, an interactive, web-based tool to improve efforts by states and local communities in protecting and restoring local water resources. The tool was developed to help local watershed organizations develop integrated watershed plans to meet state and EPA requirements and promote water quality improvements. During the next six months, the Watershed Plan Builder is available to watershed organizations, federal and state agencies, tribes, universities and local governments to beta test the application and provide feedback. A team of experts from

WATER BRIEFS

EPA's water programs developed the tool, with input from state, tribal and local agency experts and other local watershed practitioners.

Practitioners can use the Watershed Plan Builder to address polluted runoff, the largest contributor to water quality problems nationwide according to EPA. Once data is entered, the tool produces an outline of a comprehensive watershed plan tailored to a specific watershed. It features links to EPA, other federal agencies and state water programs. The Watershed Plan Builder walks the practitioner through various watershed planning steps, including watershed monitoring and assessment, community outreach, selection and application of available models, best management practices, implementation and feedback.

For info: Stuart Lehman, EPA, 202/566-1205 or email: lehman.stuart@epa.gov**;** Watershed Plan Builder: www.epa.gov/owow/watershedplanning/

BLACKFEET COMPACT MT

COMPACT COMMISSION PROPOSAL

The Blackfeet Tribe (Tribe), the State of Montana and the United States have been in negotiations for over 20 years to settle the federal reserved water rights claims of the Tribe, its members and allottees. A draft compact was recently approved by the Montana Reserved Water Rights Compact Commission, the Blackfeet Tribe and the US for release to the public for review and comment. The Compact reflects the current efforts of the parties to the negotiations to reach a workable solution to the difficult issues involved. The document is not final and is subject to further revisions based on the Parties' continued negotiations and on comments from the public. Some portions of the text are set off by brackets, reflecting areas that the Parties recognize need particular additional discussion.

In general, the proposed Compact provides water from surface flow, groundwater and storage for the Blackfeet Tribe for existing and future tribal water needs, as well as providing protections for all current water users for non-irrigation rights in all affected water basins from the Tribe's future exercise of its water right. The draft includes provisions for an administrative structure where the Tribe will administer the Tribal Water Right, the State will administer rights arising under state law, and the "Blackfeet-Montana Compact Board" will be established to referee disputes between the two systems. The Compact also would close basins to new water appropriations under state law, while allowing changes and transfers of water rights to continue. [see Moon, this TWR, regarding a recent Montana Supreme Court decision on change applications.] Another provision allocates water stored in Tiber Reservoir for the Tribe to use or market.

For info: For a complete copy of the Draft Compact and related documents, Montana DNRC website: http://dnrc.mt.gov/rwrcc/Compacts/blackfeet/default.asp

NONPOINT SOURCE NM

2006 MANAGEMENT REPORT

The Surface Water Quality Bureau of the New Mexico Environment Department (NMED) recently released its 2006 Report on its Nonpoint Source Management Program. The purpose of the annual report is to provide an overview of nonpoint source management related activities conducted around New Mexico between January and December, 2006. The report identifies programs and actions which address specific nonpoint source pollution problems and help address the goals and objectives outlined in the NMED Surface Water Quality Bureau's Nonpoint Source Management Program Plan. The majority of funding for projects is provided by Clean Water Act section 319(h) grants awarded to NMED by EPA; non-319 funded activities are also included in this report. Projects include implementation of best management practices (BMPs) and 401/404 permits.

For info: NMED website: www.nmenv.state.nm.us/SWQB/

WASTEWATER FUNDING US TRIBAL ASSISTANCE

A new program brochure will help tribal officials and tribal assistance providers gain a better understanding of EPA's Clean Water Indian Set-Aside Grant Program. EPA manages the grant program for the construction of wastewater treatment facilities for Indian tribes, Alaska Native Villages, and tribes on former reservations in Oklahoma. The brochure provides easy to find information about project eligibility, program administration and regional program contacts.

For info: EPA website: http://www.epa.gov/owm/mab/indian/cwisa.htm

WQ MODELING TOOL US

EPA NEW VERSION

EPA has released a new version of its acclaimed watershed management program making it easier to use and more readily available. "Better Assessment Science Integrating Point and Nonpoint Sources" (BASINS) is a multipurpose system that integrates environmental data, analytical tools, and modeling programs. BASINS will enable users to develop cost-effective approaches to watershed management and environmental protection. BASINS 4.0 is a valuable tool for watershed and water quality-based analyses, including developing total maximum daily load (TMDL) allocations.

Unlike earlier releases, BASINS 4.0 runs on non-proprietary, open source, free geographic information system (GIS) software, making the tool universally available to anyone interested in the system. Prior versions required users to purchase costly GIS software to run the BASINS system. Once installed on a personal computer, BASINS 4.0 gives users access to detailed point and non-point source data, which they can use to assess or predict flow and water quality for selected streams or entire watersheds.

CALENDAR

May 15-16 WA
Washington Brownfields: Community Development Opportunities, Conference, Spokane, Davenport Hotel. For info: Mike Bellamente, National Association of Development Organizations, 202/ 624-7809 or email: mbellamente@nado.org; Robin Toth at 509-742-9388 or rtoth@spokaneedc.org

May 15-16 OR
Oregon Watershed Enhancement Board (OWEB) Meeting, Salem. For info: Monte Turner, OWEB Communications Coordinator, 503/ 986-0195 or website: www.oregon.gov/OWEB

May 16 OR
Small Hydro Projects Seminar, Bend, McMennamins. Sponsored by Northwest Hydroelectric Association. For info: NWHA, 541/ 610-3311 or website: www.nwhydro.org

May 16-18 CA
Climate Change Workshop, Irvine, Hilton Irvine/Orange County Hotel, 18800 MacArthur Blvd. Sponsored by the Western States Water Council. For info: WSWC, 801/ 561-5300 or email: credding@wswc.state.ut.us

May 18 CA
Northern California Hydro Compliance Workshop, Sacramento. Sponsored by Northwest Hydroelectric Association. For info: NWHA, 541/ 610-3311 or website: www.nwhydro.org

May 18-22 WA
River Network's National River Rally 2007, Conference, Stevenson. RE: Citizen Involvement, Watershed Protection & Restoration. For info: River Network website: www.rivernetwork.org/rally/

May 23 VA
2007 NOAA Stakeholder Forum, Arlington, Hyatt Regency Crystal City. RE: Input on NOAA's Prioritites and Strategic Direction & Environmental Trends. For info: NOAA email: strategic.planning@noaa.gov or website: http://noaaregistration.fedworx.org/noaa/stakeholderreg.nsf/Person?OpenForm

May 20-24 NV
Native American Fish & Wildlife Society 25th Annual Conference, Reno, Silver Legacy Hotel. Sponsored by Southwest Region Native American Fish & Wildlife Society. For info: EPA website: http://epa.gov/osp/tribes/announce/event.htm

May 22-23 CO
Sustainable Water Resources Roundtable Meeting, Boulder, National Wind Technology Center. RE: Water Sustainability Related to Energy-Water Nexus, Western Water Issues, Agriculture Water Issues & Climate Change. For info: Nick Bardis, Water Environment Federation, email: Nbardis@wef.org, or website: http://acwi.gov/swrr/

May 22-24 CO
32nd Colorado Water Workshop, Gunnison, Western State College. RE: Watershed Look at Colorado River Controversies. For info: Peter Lavigne, 970/943-3162, email: plavigne@western.edu, or website: www.western.edu/water/datechange.html

May 23 WA
Model Toxics Control Act Conference, Seattle. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

May 23-25 Greece
River Basin Management 2007 Conference, Kos. RE: Development & Application of Hydroinformatics Software Tools, Predicting Flow, Water Quality, Sediment Transport & Ecological Processes in Riverine Systems. For info: Zoey Bluff, Wessux Institute of Technology, +44 (0) 238 029 3223, fax: +44 (0) 238 029 2853, email: zbluff@wessex.ac.uk, or website: www.wessex.ac.uk/conferences/20070rm07/index.html

May 24 OR
Constructing with GCLs and PVC Geomemberanes, NW Environmental Business Council (NEBC) Technical Workshop. Portland. RE: Construction, Operation and Closure of Landfills, Lagoons, Ponds, etc. Corrective Action Activities at Closed Sites. Latest Info on GCLs. For info: Cheryl, NEBC, 503/ 222-1963 x100, email: cherylb@oeconline.org, or website: www.nebc.org

May 24 OR
Southern Willamette Valley Groundwater Management Area Committee Meeting, Harrisburg, City Hall, 8am-10am. For info: Audrey Eldridge, DEQ, 541/ 776-6010 x223

May 24-25 ID
Water Law Conference, Boise. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

May 24-25 WA
Brownfields Conference, Seattle. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net/

May 30-31 CO
"Managing for Excellence," Bureau of Reclamation Public Workshop, Denver, Airport Marriott. RE: Reclamation's Core Capabilities & Ability to Respond to Future Needs. For info: www.usbr.gov/excellence/publicmtgs.html

May 30-June 1 CO
Practical Resource Economics for the Roaring Fork Valley Course, Aspen, 100 E. Francis Street. Sponsored by Aspen Global Change Institute. For info: AGCI, 970/ 925-7376, email: marta@agci.org, or website: www.agci.org

May 31 OR
Hydropower Relicensing Conference, Portland. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net/

May 31-June 1 OR
Hydro Technical & Maintenance Workshop, The Dalles. Sponsored by Northwest Hydroelectric Association. For info: NWHA, 541/ 610-3311 or website: www.nwhydro.org

May 31- June 1 OR
Oregon Water Resources Commission Meeting, Salem. For info: Cindy Smith, OWRD, 503/ 986-0876, or website: www.wrd.state.or.us/OWRD/COMMIS/calendar.shtml

June 1 OR
Willamette River Conference, Portland. For info: Holly Duncan, Environmental Law Education Center, 503/ 282-5220, email: hduncan@elecenter.com or website: www.elecenter.com/

June 1 CA
Groundwater Resources Association Annual Groundwater Law Conference, San Francisco, Hotel Nikko in San Francisco. RE: California's Foremost Industry Experts on Timely and Important Groundwater Topics. For info: Mary Megarry, Nossaman Gunther, 916/ 446-3626 or email: mmegarry@nossaman.com

June 2 WEB
Environmental Forensics Conference, WEB. Sponsored by American Bar Association Environmental Sciences. RE: Natural Resource Damage, Toxic Tort & Insurance Claims, Analytical Fingerprinting of Chemical Constituents, Remote Sensing & GIS. For info: ABA website: www.abanet.org/environ/programs/environsci07/

June 3-6 UT
Western State Workshop: Strengthening the Roles of Land Trusts and Local Governments in Protecting and Restoring Wetlands and Riparian Areas, Park City, Treasure Mt. Inn. RE: "How To" Information on Protection & Restoration of Wetlands & Riparian Areas. For info: Association of State Wetland Managers website: www.aswm.org/calendar/lt&lg/lt&lg2.htm

June 4-5 WA
Water Law Conference, Seattle. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

June 4-6 UT
Strengthening the Roles of Land Trusts & Local Governments in Protecting & Restoring Wetlands/Riparian Areas, Conference, Park City, Treasure Mt. Inn. Sponsored by the Association of State Wetland Managers. For info: Jon Kusler, ASWM, 518/ 872-1804, email: aswm@aswm.org, or website: www.aswm.org/calendar/lt&lg/lt&lg2.htm

June 4-6 WY
2007 AFS Fish Health Section Annual Meeting, Grand Teton National Park, Jackson Lake Lodge. For info: A. Goodwin, University of Arizona Extension, email: agoodwin@uaex.edu

June 4-6 MD
Federal Environmental Symposium (6th Annual), Bethesda, National Institutes of Health's Natcher Conference Center. RE: Executive Order 13423 - Strengthening Federal Environmental, Energy, and Transportation Management. For info: OFEE website: www.fedcenter.gov/symposium2007/

June 5 AZ
Water Resources Research Center 2007 Water Conference: *The 20th Anniversary of the Environmental Quality Act and ADEQ: Assessing and Protecting Arizona's Water Quality,* Phoenix, Hyatt Regency at Civic Plaza. RE: Genesis and History of the Environmental Quality Act and ADEQ; the Water Quality Assurance Revolving Fund (WQARF); Emerged and Emerging Contaminants; Emerging Policy Challenges; and the Future of ADEQ. Presentation on the State of ADEQ by Director Steve Owens. Governor Napolitano invited to Keynote. For info: Cas Sprout Water Resources Research Center, 520/ 792-9591 x55 or email: csprout@cals.arizona.edu

June 5-7 FL
Ninth Water Information Summit, West Palm Beach. Sponsored by South Florida Water Management District, Inter-American Water Resources Network (IWRN), UNESCO, and UNEP. RE: "Information in an Age of Water Insecurity: the Roles of Networking, Education, and Technology." For info: WaterWeb Consortium website: www.waterweb.org/wis9/

June 6 WA
Columbia River Policy Advisory Group Meeting, Yakima, Depart. of Ecology Bdlg. For info: www.ecy.wa.gov/programs/wr/cwp/crwmp__info.html

June 6 NY
Profiting in the Water Industry Conference, New York City, The Havard Club. RE: "Tapping a Reservoir of Wealth" — Water Infrastructure Investment Opportunities; Deal Making; Financing; Gaining Governmental Approvals for Projects; Regulatory Landscape; More. For info: Neomi Barazani, Conf Organizer, 609/ 919-1895 x100, or email: neomi@incrementaladvantage.com

June 6-7 MA
Climate Change Strategies and Environmental Communication, Boston, RE: Manage Risks, Develop New Products, and Get Message to Customers. For info: Ekaterina Kvasova, Conf Director, 800-814-3459 or email: ekaterina.kvasova@ethicalcorp.com

June 6-8 CO
The Future of Natural Resources Law and Policy Conference, Boulder, University of Colorado School of Law. For info: Heidi Horton, Natural Resources Law Center, 303/ 492-3720, or website: www.colorado.edu/law/centers/nrlc/

CALENDAR

(continued from previous page)

June 7-8 **NM**
Fourth Annual Water Policy CLE, Albuquerque, New Mexico State Bar Bldg. RE: Utton Center Model Interstate Water Compact: Advanced Management Principles for Interstate Rivers For info: Utton Transboundary Resource Center website: http://uttoncenter.unm.edu/water_policy_conf.html

June 7-8 **OR**
Global Warming Conference, Portland. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net/

June 10-12 **SD**
2007 Western Governor's Association Annual Meeting, Deadwood. For info: WGA, 303/ 623-9378 or website: www.westgov.org/

June 10-13 **AK**
National Congress of American Indians Mid-Year Conference & Tradeshow, Anchorage. For info: NCAI, 202/ 466-7767, email: mcai@ncai.org, or website: www.ncai.org

June 10-15 **CA**
2007 Society of Wetland Scientists International Conference: Water, Wetlands & Wildlife - Resolving Conflicts & Restoring Habitat, Sacramento. For info: SWS website: www.sws.org/sacramento2007/index.html

June 11 **WA**
Model Toxics Control Act Conference, Seattle. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

June 12-16 **NM**
National Tribal Caucus Meeting, Albuquerque, Sheraton Uptown Hotel. For info: Dianne Briggs, 202/ 564-0279

June 12 **TX**
Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) Workshop, Dallas, RE: Clean Water Act; Scope of the NPDES Program; Types of Permits; Permits for Industrial Dischargers; Basis for Effluent Limits Developing Reasonable Permit Limits; Draft Permit Negotiation; Monitoring and Reporting; Storm Water Permits and Pollution Prevention Plans; Other water regulations (e.g., SPCC, Wetlands); Case Studies and More. For Info: Trinity Consultants website: www.trinityconsultants.com

June 15 **WA**
Washington Dredging & Sediment Conference, Seattle. For info: For info: Holly Duncan, Environmental Law Education Center, 503/ 282-5220, email: hduncan@elecenter.com or website: www.elecenter.com/

June 18-19 **ID**
IWUA Summer Water Law Seminar & Workshop, Sun Valley. Sponsored by the Idaho Water Users Association. For info: IWUA, 208/ 344-6690 or website: www.iwua.org/

June 19-20 **CA**
Analysis and Design of Isotopic and Hydrogeological Characterization of Fractured Rock Settings, Conference, San Francisco. For info: National Ground Water Association, 800/ 551-7379, email: customerservice@ngwa.org, or website: www.ngwa.org

June 21-22 **OR**
Oregon Environmental Quality Commission Meeting, Portland. For info: Helen Lottridge, ODEQ, 503/ 229-6725, or website: www.deq.state.or.us/about/eqc/EQCagendas.htm

June 21-22 **CA**
Increasing Groundwater Storage to Meet California's Future Demand, Conference, Long Beach, Westin Long Beach. For info: Groundwater Resources Association of California, 916/ 446-3626 or website: www.grac.org/gwstorage.asp

June 22 **CA**
Los Angeles Area Groundwater Recharge Field Trip, Long Beach, Westin Long Beach. For info: Groundwater Resources Association of California, 916/ 446-3626 or website: www.grac.org/gwstorage.asp

June 24-27 **WA**
TMDL 2007 Conference, Bellevue, Meydenbauer Convention Center. Sponsored by the Water Environment Federation. For info: WEF, 703/ 684-2400, email: tmdl07@wef.org, or website: www.wef.org/ConferencesTraining/Conferences/SpecialtyConference

June 25-27 **ID**
The Energy-Water Nexus: Meeting the Energy and Water Needs of the Snake/Columbia River Basin in the 21st Century (Science and Technology Summit), Boise, Red Lion Inn. For info: Gary Johnson, Idaho Water Resources Research Institute, 208/ 282-7985, email: Johnson@if.uidaho.edu, or website: www.iwrri.uidaho.edu/default.aspx?pid=99479

June 25-27 **CO**
Emerging Contaminants of Concern in the Environment: Issues, Investigations, and Solutions Conference, Vail. Sponsored by the American Water Resources Association. For info: AWRA website: www.awra.org/meetings/Vail2007/index.html

June 26-27 **NJ**
Environmental Forensics: Methods and Applications Conference, Fair Lawn. For info: National Ground Water Association, 800/ 551-7379, email: customerservice@ngwa.org, or website: www.ngwa.org

June 26-27 **WA**
Brownfields 2007: Towards Sustainable Redevelopment in the Puget Sound (Conference), Seattle. RE: Redevelopment Trends, Regulatory System, Sustainable Development Practices & More. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

July 11-12 **NM**
NPDES Overview Course for Permittees, Albuquerque. RE: Basic Requirements & Methods for NPDES Permits, Permit Development & Implementation. For info: Water Environment Federation website: www.wef.org/ConferencesTraining/TrainingProfessionalDevelopment/Workshops/NPDESPermitProgramOverview.htm

July 12 **DC**
NRC Colloquium on Water Implications of Biofuels, Washington, D.C., The National Academy of Sciences Building. RE: Water Quality, Water Quantity & Related Land Resource Implications of Biofuel Production. For info: Water Science and Technology Board, 202/ 334-3422 or website: http://dels.nas.edu/wstb/biofuels.shtml

July 12-13 **WA**
3rd Annual Emerging Northwest Tribal Economies Conference, Seattle. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

Please Note: Bruce Darling's follow-up article on **Marketing Water Rights in Texas** has had to be postponed. We now expect to publish that article in **July**.

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