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TRIBAL RIGHTS TO GROUNDWATER

ANALYSIS OF THE AGUA CALIENTE'S WATER CASE

by Catherine F. Munson and Mark Reeves, Kilpatrick Townsend LLP (Washington, D.C.)

INTRODUCTION

In May of 2013, the Agua Caliente Band of Cahuilla Indians (Agua Caliente) filed suit against the Coachella Valley Water District (CVWD) and Desert Water Agency (DWA) (collectively, the water districts) asking the United States District Court for the Central District of California to declare, among other things, that the Tribe has a federal reserved right to groundwater underlying its Reservation, that its reserved right includes both a certain quantity and quality of water, and to determine the amount and quality of groundwater that the United States reserved for the Tribe. In addition, Agua Caliente asked the court to enjoin the water districts from conduct that would interfere with the Tribe's use and enjoyment of its rights.

This was not a step that Agua Caliente took lightly. The Tribe had watched in dismay for years as the longstanding overdraft of the Coachella Valley aquifer continued. It had seen the water districts undertake a program to recharge the aquifer with imported Colorado River water, a practice that reduced — but did not solve — the problem of overdraft and created a problem of decreasing groundwater quality. Perhaps most frustratingly for Agua Caliente, it had spent years consistently voicing its concerns about declining groundwater quantity and quality without any concrete, substantive response from the water districts. When the water districts responded to a final overture from Agua Caliente in 2013 with a letter declaring that there was "little to discuss," the Tribe concluded that litigation was its only option.

PROCEDURAL HISTORY OF THE LITIGATION

Early on in the litigation, Agua Caliente and the water districts agreed that the most sensible, efficient way to approach the case would be to have the courts decide the threshold legal questions before proceeding to develop and litigate the fact-intensive issues surrounding quantification of the Tribe's water right. The water districts believed that a decision in their favor on the threshold legal questions could end the litigation without having to spend the resources necessary for the quantification claim. For its part, Agua Caliente hoped that a relatively quick declaration of its legal rights — rights that the water districts had previously refused to acknowledge — could lead to good faith discussions of a settlement that could benefit all parties that rely on the Coachella Valley aquifer.

While their motivations differed, the Tribe and the water districts were able to come to agreement on a somewhat unusual plan to "trifurcate" the case (divide it into three phases). Phase 1 would focus on the most fundamental legal question at the heart of the case — i.e., whether Agua Caliente had any right to groundwater beyond the overlying rights ostensibly available to all California landowners. Phase 2 of the case would focus on a second set of legal issues — namely: (1) whether the Tribe's right to groundwater encompassed a right to a certain quality of water; (2) whether Agua Caliente owns subterranean "pore space"

Tribal Groundwater

"Unclean Hands"
The unclean hands doctrine provides that a party cannot seek equitable relief if that party has itself acted inequitably.

"Balancing of the Equities"
Balancing of the equities is a process in which a court considers the competing or offsetting equitable interests and risks of harm faced by the parties.

"Laches"
Laches is an equitable doctrine that can allow a court to deny relief to a party that has unreasonably delayed asserting a claim, provided that the delay has served to prejudice the opposing party.

See:
Black's Law Dictionary (10th ed. 2014).

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underlying its reservation; (3) whether the water districts' affirmative equitable defenses of unclean hands, balancing of the equities, and laches could apply to Agua Caliente's claims for declaratory relief as a matter of law; and (4) the standard for quantifying the Tribe's groundwater right. Finally, Phase 3 would involve the complex, fact-intensive work of quantifying Agua Caliente's water rights, determining the contours of any water quality component of that right, and fashioning any injunctive relief that the Court deemed appropriate. The parties jointly filed a stipulation to trifurcate the case in this fashion on December 2, 2013, and they have since litigated pursuant to this framework.

The United States moved to intervene in the case as a co-plaintiff in support of Agua Caliente's federal reserved right to groundwater on May 14, 2014.

THE *WINTERS* DOCTRINE

To understand Agua Caliente's claims in its water rights litigation, it is first necessary to have a working knowledge of the legal concepts that underpin them. The most important of these concepts is that a federal reservation of land includes an implied reservation of available water rights necessary to accomplish the reservation's purposes. This principle, commonly referred to as the *Winters* doctrine, was first established in the foundational case of *Winters v. United States*, 207 U.S. 564 (1908). Courts have consistently applied and reaffirmed the doctrine for more than a century. *See, e.g., Cappaert v. United States*, 426 U.S. 128, 138-143 (1976); *Arizona v. California*, 373 U.S. 546, 598-600 (1963); *Colville Confederated Tribes v. Walton*, 752 F.2d 397 (9th Cir. 1985) (*Walton II*); *Colville Confederated Tribes v. Walton*, 647 F.2d 42 (9th Cir. 1981) (*Walton I*); *United States v. Cappaert*, 508 F.2d 313 (9th Cir. 1974), aff'd by 426 U.S. 128 (1976); *Confederated Salish & Kootenai Tribes of the Flathead Reservation v. Stults*, 59 P.3d 1093 (Mont. 2002); *In re Gen. Adjudication of All Rights to Use Water in the Gila River Sys. & Source*, 989 P.2d 739 (Ariz. 1999) (en banc).

The United States Supreme Court (Supreme Court) decisions, *Winters* and *Arizona v. California,* set the foundation of the *Winters* doctrine. *Winters* involved the water rights of the Fort Belknap Indian Reservation, which was established by the US in 1888 as "a permanent home and abiding place" for certain Indians in Montana. *Winters*, 207 U.S. at 565. Portions of the Fort Belknap Reservation — those lying near the Milk River, which served as the Reservation's northern boundary — were suitable for pasturing stock and were used for that purpose from the time of the Reservation's establishment. *Id*. at 566. Other parts of the Reservation were potentially suitable for agriculture, but those lands were "of dry and arid character, and, in order to make them productive, require[d] large quantities of water for the purpose of irrigating them." *Id*. In 1898, well after the reservation's establishment, Indians living on the Fort Belknap Reservation began to divert water from the Milk River to irrigate roughly 30,000 acres of that "dry and arid" land. *Id*.

While the Indians of the Fort Belknap Reservation were not diverting the entire flow of the Milk River, both they and the US contended that "all of the waters of the river [we]re necessary for…the purposes for which the reservation was created." *Id*. at 567. Accordingly, when third parties began diverting the water reserved for the reservation, the US filed suit asking the court to enjoin all upstream diversions. *Id*. In response, the defendants argued that: (1) they had acquired valid, state law riparian rights to the waters of the Milk River after the creation of the Fort Belknap Reservation by diverting water from the river before the Indians began doing so; (2) their rights were thus senior and superior to any rights held by the Indians; (3) other springs and streams were available within the Reservation to supply the Indians' needs; and (4) a ruling in favor of the United States would render the defendants' lands valueless and destroy communities of "thousands of people," thereby defeating the government's purpose in opening the lands upstream of the Reservation for public settlement. *Id*. at 568-570.

The *Winters* Court rejected all of the defendants' arguments. It observed that the Reservation was but a small part of a much larger area previously occupied by the "nomadic and uncivilized" Indians, and that "it was the policy of the government…to change those habits and [for the Indians] to become a pastoral and civilized people." *Id*. at 576. The Court further recognized that, in order to become a "pastoral…people" on a small fraction of their traditional lands, the Indians would need to take up agriculture on lands that "were arid, and, without irrigation, were practically valueless." *Id*. Finally, with respect to the defendants' argument that the Indians had lost any rights to Milk River water through nonuse and should have to rely on other springs and streams within their Reservation for water, the Supreme Court squarely rejected the notion that the defendants' state law riparian rights could ever trump the federal reservation of rights. *Id*. at 577. ("The power of the government to reserve the waters and exempt them from appropriation under the state laws is not denied, and could not be." (citations omitted). Based on these determinations, the Supreme Court held that the Indians of the Fort Belknap Reservation retained rights to the Milk River water necessary to irrigate their reservation and that those rights were reserved and held by the US as of the date of the Reservation's establishment "for a use which would be necessarily continued through years." *Id*. at 576-577.

Tribal Groundwater

Creation of Reservations

Present & Future Needs

"Practicably Irrigable Acreage"

Reserved Right

Reservation Purposes

State Law Deferences

Permanent Rights Vested

The Supreme Court reaffirmed the *Winters* doctrine in the landmark case of *Arizona v. California* (*Arizona*). There, the Supreme Court considered various parties' rights to the water of the Colorado River, including the United States' assertion of *Winters* rights on behalf of five executive order Indian reservations in Arizona, California, and Nevada. *Arizona* established that the *Winters* doctrine applies to Indian reservations created by executive orders in the same manner that it applies to statutory or treaty reservations. *See* 373 U.S. at 597-599 (explicitly rejecting the argument that executive order reservations do not enjoy *Winters* rights). *Arizona*, 373 U.S. at 595-596. Over numerous objections by the State of Arizona, the Supreme Court affirmed a Special Master's determination "as a matter of fact and law that when the United States created these reservations or added to them, it reserved not only land but also the use of enough water from the Colorado to irrigate the irrigable portions of the reserved lands." *Id*. at 596.

The *Arizona* Court found it "impossible to believe" that the President would have created Indian reservations "unaware that most of the lands were of the desert kind — hot, scorching sands — and that water from the river would be essential to the life of the Indian people…and the crops they raised." *Id*. at 599. Accordingly, the Supreme Court held that "the United States did reserve the water rights for the Indians effective as of the time the Indian Reservations were created" and that "the water was intended to satisfy the future as well as the present needs of the Indian Reservations." *Id*. at 600. Emphasizing that the reserved rights must take into account both the contemporaneous and future needs of the reservations, the Supreme Court finally concluded that water was reserved in an amount sufficient "to irrigate all of the practicably irrigable acreage on the reservations." *Id*. *Arizona* thus clarified and reinforced both the applicability and the application of the federal reserved rights doctrine as a means of ensuring that Indian reservations include a permanent right to adequate water supplies for all of their present and future needs. These principles — that a federal reservation of lands impliedly includes the immediate and permanent reservation of water rights in an amount necessary to accomplish the reservation's purpose — collectively make up the *Winters* doctrine, and that doctrine serves as the basis for the Agua Caliente Tribe's claim to federally reserved water rights.

THE PARTIES' ARGUMENTS

The parties filed cross-motions for summary judgment on the Phase 1 issues in October of 2014. In support of their argument for the existence of a federal reserved right to groundwater, Agua Caliente and the US contended that *Winters* and subsequent court opinions established a number of basic concepts that, when taken together, inexorably lead to the conclusion that the US impliedly reserved available water — including groundwater — when in first established the Agua Caliente Reservation in the 1870s.

The Tribe's Arguments

Agua Caliente cited *Winters* and *Arizona* for the fundamental proposition that the federal reservation of land impliedly includes the immediate and permanent reservation of water rights in an amount necessary to accomplish the purposes of the reservation. *See Winters*, 207 U.S. at 576-77; *Arizona v. California*, 373 U.S. 546 (1963). Building on that foundation, Agua Caliente cited subsequent case law from the Supreme Court, the Ninth Circuit Court of Appeals, and various state and lower federal courts to establish additional characteristics of federal reserved water rights.

Not Dependent on State Law

First, the Tribe argued that federal reserved water rights are not dependent on or subject to state law. This principle arises, among other things, from the Supreme Court's decision in *United States v. New Mexico*, 438 U.S. 696, (1978), which held that "the 'reserved rights doctrine' is…an exception to Congress' explicit deference to state law in other areas." *Id*. at 715; *see also Colville Confederated Tribes v. Walton*, 752 F.2d 397, 400 (9th Cir. 1985) ("Reserved rights are 'federal water rights' and 'are not dependent upon state law or state procedures.'" (quoting *Cappaert v. United States*, 426 U.S. 128, 145 (1976))); *United States v. Adair*, 723 F.2d 1394, 1410 (9th Cir. 1984); *Soboba Band of Mission Indians v. United States*, 37 Ind. Cl. Comm. 326, 487 (1976) ("The *Winters* Doctrine…is paramount to the California law, including the California doctrines of riparian rights, appropriation, and percolating ground waters… ."). Based on this principle, Agua Caliente argued that any state law rights that it might have, such as ostensible overlying landowner rights or state-decreed surface water rights, could not replace or diminish its federal reserved rights.

Fully Vested from Reservation's Establishment

Second, Agua Caliente argued that federal reserved rights are permanent rights that are fully vested from the moment of a reservation's establishment. This principle is derived from the Supreme Court's decision in the *Cappaert* case, which declared that the United States "acquires a reserved right in unappropriated water which vests on the date of the reservation" and numerous other sources. 426 U.S. at 138; *see also*, e.g., *Colville Confederated Tribes v. Walton*, 647 F.2d 42, 48 (9th Cir. 1981) ("[T]he Tribe has a vested property right in reserved water… ."). From this principle, Agua Caliente argued that while its need for and use of water might change over time, its federal reserved water right is static and unchanging.

Tribal Groundwater

No Use Exception

Need Not Be Exercised Immediately and Cannot Be Lost Through Nonuse

Third, the Tribe argued that *Winters* rights necessarily contemplate changing and expanded water use by the right holder over time. Accordingly, they are not limited to the source or amount of water in use at the time of a reservation's establishment and cannot be lost through nonuse. This concept flows naturally from *Winters* and *Arizona*, both of which affirmed the existence of water rights that were not being fully used by tribes at the time of their reservations' establishment, and it was explicitly set forth in later cases in the Ninth Circuit and elsewhere. *See*, *e.g., Walton*, 752 F.2d at 404 (holding that federal reserved water rights cannot be lost through nonuse); *United States v. Adair*, 723 F.2d 1394, 1416 (9th Cir. 1984) ("[T]he full measure of this [federal reserved] right need not be exercised immediately …[W]ater may be used by Indian allottees for present and future irrigation needs."). This principle combines with the previous one to make a nuanced, but important point: while tribal use of water may wax, wane, or change over time, its vested property right in a set quantum of reserved water does not.

Homeland

Reservation's Purpose: Permanent Homeland

Combining these foundational concepts, Agua Caliente and the US argued that when the United States established the Agua Caliente Reservation in the 1870s, it impliedly and immediately reserved appurtenant, unappropriated water — including groundwater — in the amount necessary to accomplish the Reservation's purpose of serving as a permanent homeland for the Agua Caliente people. While acknowledging a paucity of federal appellate law explicitly applying the *Winters* doctrine to groundwater, Agua Caliente and the US relied on a number of state and lower federal court decisions and the purpose of the doctrine to argue that: (1) the critical consideration was whether a reservation required water, not whether that water flowed above the ground or percolated beneath it; and (2) the Agua Caliente Reservation required water to accomplish its purpose.

Water Required

Water Districts' Arguments

***Winters* Doctrine Doesn't Apply**

Groundwater Application

The water districts largely and expectedly argued the opposite of the positions advocated by Agua Caliente and the US. Their first, most basic argument, was that the *Winters* doctrine simply does not apply to groundwater. They argued out that the Supreme Court had never applied the doctrine in that way, and they contended that it had gone out of its way to avoid doing so in the *Cappaert* case, where it held that an underground pool at Devil's Hole National Monument was actually subterranean surface water rather than groundwater. *See Cappaert*, 426 U.S. at 142-43. The Supreme Court would not have done this, the water districts contended, unless the law of federal reserved water rights applied differently to surface water and groundwater. And they further argued that such disparate treatment was fully consistent with the laws of California and many other states, which draw substantial distinctions between surface water and groundwater.

Doctrine's Application to Groundwater

The water districts also contended that even if the *Winters* doctrine could apply to groundwater as a matter of law, the Agua Caliente Reservation did not have a reserved right to groundwater. For this argument, they relied heavily on the Supreme Court's decision in the *New Mexico* case, which they contended substantially narrowed and restricted the application of the *Winters* doctrine.

***Winters* Limitation**

Under the water districts' interpretation, *New Mexico* reflected a strong sensitivity to traditional notions of federal deference to state water law. Based on this sensitivity, the water districts argued, the *New Mexico* Court restricted the applicability of the *Winters* doctrine — including the very existence of *Winters* rights — to instances in which the "specific purposes…of the reservation would be entirely defeated" if a *Winters* right did not exist. *New Mexico*, 438 U.S. at 700. Under the water districts' reading of the law, the operative question in determining whether the United States reserved water for a reservation, was not whether the water was necessary to achieve the reservation's purposes, but rather whether a federal reserved right to water was necessary.

Purpose "Defeated"

Necessary for Purposes of the Reservation

With this framework in mind, the water districts offered several reasons why they did not believe that a federal reserved water right was necessary to accomplish the purposes of the Agua Caliente Reservation. First, they argued that California state law gives all overlying landowners, including Agua Caliente, a correlative right to reasonably and beneficially use the groundwater underlying their land. Because Agua Caliente had the same rights to access and use groundwater as other landowners under state law, the water districts claimed, a federal reserved right to groundwater was not necessary to prevent the purposes of the Agua Caliente Reservation from being "wholly defeated." It naturally followed that a federal reserved right to groundwater did not exist under the water districts' reading of *New Mexico*.

Other Rights Impact

The water districts made a similar argument based on the fact that Agua Caliente has a state decreed right to use a certain amount of surface water from Andreas and Tahquitz Creeks. The water districts argued that this right, which was decreed for the Tribe as the result of the US filing a "Suggestion" that such a right be included in the state law adjudication of rights in the Whitewater River and its tributaries, provided the water that the US had felt was necessary to accomplish the purposes of the Agua Caliente Reservation — so the recognition of any additional, federal water right would be unfounded.

Tribal Groundwater

Alternative Sources

California Management

Groundwater Reserved

Quantity Issue Deferred

Ninth Circuit Appeal

Needs Met Without Groundwater

To complement their arguments that a federal reserved water right was not necessary to prevent the purposes of the Agua Caliente Reservation from being entirely defeated, the water districts argued that Agua Caliente was not using groundwater at the time of the Reservation's establishment and to this day does not produce its own groundwater, instead acquiring water from the districts. If the Tribe can meet all of its water needs without producing its own groundwater, the water districts claimed, a federal reserved right to groundwater necessarily is not required to accomplish the purposes of the reservation.

Policy Arguments: Adverse Effects for Other Users

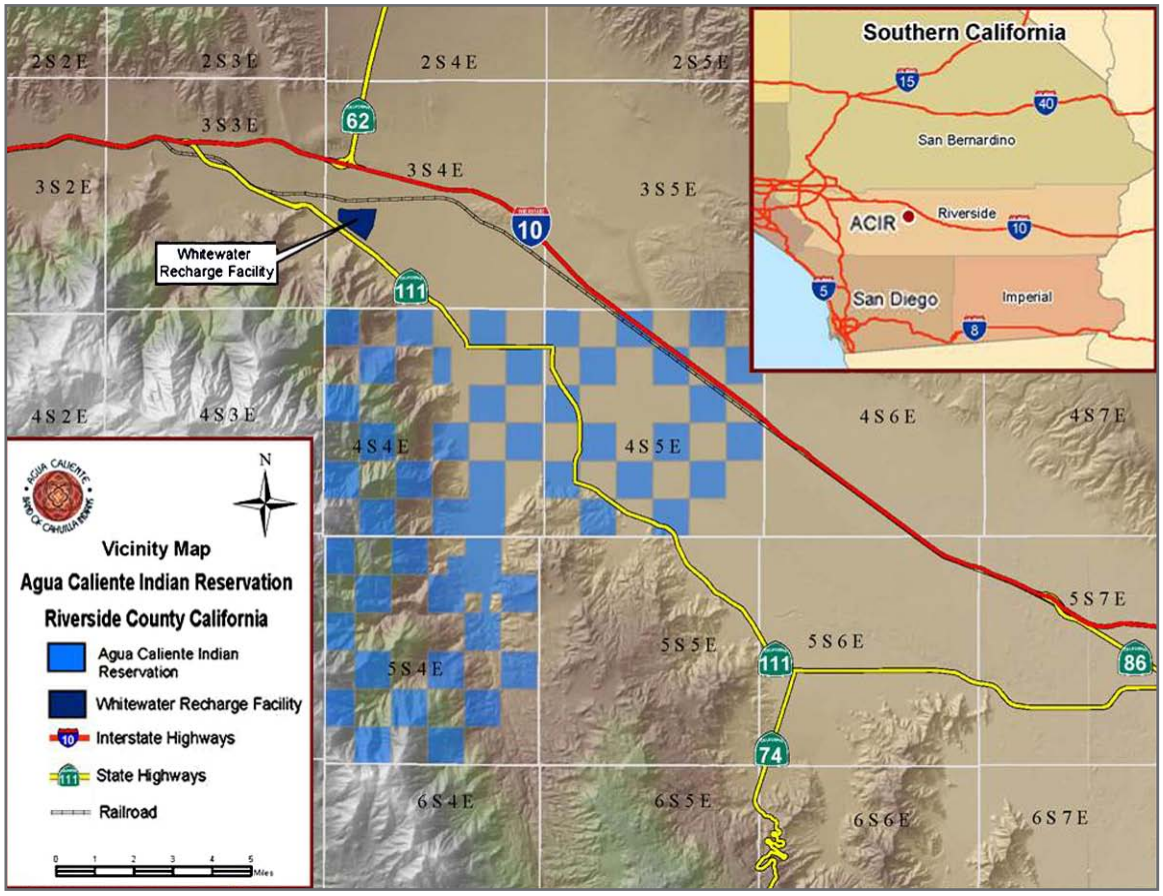
In addition to these legal arguments, the water districts presented a number of policy-based arguments regarding the adverse effects that they believed recognition of a federal reserved right to groundwater under the Agua Caliente Reservation could have for surrounding landowners, other water users, and the State of California's ability to effectively manage its groundwater resources.

THE DISTRICT COURT'S PHASE 1 DECISION

On March 20, 2015, after hearing oral argument from all parties, the district court granted Agua Caliente's motion for summary judgment on the question of whether the Agua Caliente Reservation has a federal reserved right to groundwater. It held that: (1) the *Winters* doctrine applies to groundwater; (2) the purpose of the Agua Caliente Reservation was "to provide the Agua Caliente with a permanent homeland"; and (3) the United States reserved water, including groundwater, for Agua Caliente in an amount to be determined in Phase 3 of the litigation.

Per the parties' stipulation, the court deferred until Phase 3 any ruling addressing the amount of water reserved for Agua Caliente. It noted that no such ruling was necessary to answer the Phase 1 question of whether the United States reserved any groundwater for the Agua Caliente Reservation. "The Court can safely state that the reservation implied at least some water use; but exactly how much is not a question presented by Phase I of this case." *Agua Caliente Band of Cahuilla Indians v. Coachella Valley Water Dist.*, No. EDCV 13-883-JGB, 2015 WL 1600065, at *6 (March 20, 2015). Consistent with its other rulings and the parties' stipulation, the district court held that several of the water districts' arguments, many of which they advanced later in the appeal, went to the quantification of Agua Caliente's reserved water right rather than the right's existence and that those arguments would be addressed in Phase 3.

The district court certified its order for interlocutory appeal pursuant to 28 U.S.C. § 1292(b), and the Ninth Circuit Court of Appeals granted the water districts' petition for permission to appeal.



Tribal Groundwater

Note: ***The Ninth Circuit Opinion has been appealed to the US Supreme Court*** **(see Briefs, page 20)**

Primary Purpose

Impliedly Reserved

"Appurtenant" Groundwater

Other Water Sources

State Rights Preempted

Quantity Impact

THE NINTH CIRCUIT OPINION

On March 7, 2017, nearly two years after the district court entered its order, the Ninth Circuit agreed that the US reserved groundwater for Agua Caliente when it established the Tribe's Reservation in 1876 and 1877. *See Agua Caliente Band of Cahuilla Indians v. Coachella Valley Water Dist*., 849 F.3d 1262 (9th Cir. 2017). The Court answered this question through a three step analysis: (1) whether the US intended to reserve water when it created Agua Caliente's reservation; (2) whether the reserved rights doctrine encompasses groundwater; and (3) whether the Tribe's state law water rights or the Tribe's historic lack of drilling of groundwater on the Reservation impacts the answers to the first two questions.

With respect to the first question, the defendant water districts argued, based on their interpretation of the Supreme Court's *New Mexico* decision, that where other sources of water are available under state law and the lack of a federal right would not entirely defeat the purpose of the reservation, then Congress intended to defer to state law and the US must obtain water like any other user. The Ninth Circuit rejected this narrow reading of *New Mexico* in favor of the Tribe's argument that the existence of a federal reserved water right hinges not on the present availability of water under state law, but rather on whether the primary purpose of the Reservation contemplates water use.

To determine the primary purpose of the Agua Caliente Reservation, the Ninth Circuit considered the documents surrounding its establishment. It reviewed the Executive Orders establishing the Reservation for "the permanent use and occupancy of the Mission Indians" and for "Indian purposes," as well as earlier reports from the federal Indian Agents urging the US to secure for the Tribe "permanent homes, with land and water enough." Based on this documentation and Supreme Court precedent holding that the US was aware "that water…would be essential for the life of Indian people," the Court determined that the primary purpose of Agua Caliente's Reservation was to create a home for the Agua Caliente people. Because that purpose necessarily contemplated the use of water, the Ninth Circuit held that the United States impliedly reserved water for that purpose.

On the second question of whether the *Winters* doctrine extends to groundwater, the Ninth Circuit again adopted the Tribe's position. It noted that for water to be reserved it must be "appurtenant" (attached to the Reservation). The Court found that appurtenance of groundwater to the Reservation was not and could not be disputed. It also explained that there is no reason to limit the *Winters* doctrine to surface water, and it therefore concluded that the groundwater underlying Agua Caliente's Reservation was reserved. In further explanation of its holding, the Ninth Circuit observed that many tribes throughout the western US, including Agua Caliente, rely on groundwater as their only consistently available water source, and it would make no sense to assume that the US did not intend to reserve the water needed for those tribes' reservations.

Lastly, the Ninth Circuit considered the water districts' arguments that Agua Caliente does not have a federal reserved right to groundwater because: (1) it has a correlative right to groundwater under California state law; (2) the Tribe has not drilled for and does not produce groundwater on its Reservation; and (3) the Tribe has a right to surface water under the Whitewater decree. The Ninth Circuit summarily rejected each of the arguments. It first held that state rights are preempted by federal reserved rights, and therefore a federal reserved water right cannot be supplanted or obviated by the existence of a state law water right. Second, the Court reaffirmed the well-settled proposition that *Winters* rights cannot be lost simply because they are not fully used by a tribe. Finally, it rejected the water districts' claim that Agua Caliente did not need groundwater because it has a decreed right to a limited amount of surface water. The Court explained that in *New Mexico*, the Supreme Court focused only on whether water is needed to accomplish the *purpose* of the Reservation, not whether a federal reserved water right is currently needed to sustain the Reservation. This critically important distinction effectively amounted to a rejection of the water districts' theory of the case.

In the concluding paragraphs of its opinion, the Ninth Circuit preempted anticipated arguments by the water districts that state law and surface water rights will diminish the quantity of water the Tribe should receive in the quantification stage of the case. The Court's conclusion that state rights cannot preempt federal rights and rejection of the water districts' anticipated arguments should discourage the water districts from again raising these arguments in the later phase of the case or at least guide the district court when considering such arguments.

The Ninth Circuit produced a clear and well-written opinion that should prove persuasive if and when other tribes assert their own federal rights to groundwater. It is in all respects a resounding victory for tribal interests, reaffirming the core principles underlying the *Winters* doctrine for the benefit of Agua Caliente and the rest of Indian Country. For additional information regarding the decision, *see* Moon, *TWR* #158.

Tribal Groundwater

Groundwater Reservation

***Winters* Applicability**

Need for Water

Disclaimer:
The authors of this article are lead counsel for Agua Caliente in the litigation discussed. The views and opinions presented in the article are the authors' own and do not represent the position of Agua Caliente.

CONCLUSIONS: WHAT IT ALL MEANS

The Ninth Circuit's decision has garnered a great deal of attention in Indian Country and beyond because it is the first federal appellate decision to address the scope of *Winters* rights in over two decades and because it states that it is the first federal appellate decision to hold that *Winters* rights encompass groundwater. This latter statement is technically incorrect, because the Ninth Circuit was confronted with this same question more than forty years ago in *United States v. Cappaert*, 508 F.2d 313 (9th Cir. 1974), and it reached the same conclusion there: "In our view the United States may reserve not only surface water, but also underground water." *Id*. at 317. However, as the Ninth Circuit noted in footnote 8 of the *Agua Caliente* opinion and as explained above, the Supreme Court ultimately held that the water at issue in the *Cappaert* case was surface water, and its decision to not squarely address the *Winters* doctrine's applicability to groundwater cast some question on the precedential value of the Ninth Circuit's holding. *See Cappaert*, 426 U.S. at 142.

Regardless of how one views the Ninth Circuit's *Cappaert* decision, its more recent decision in *Agua Caliente* should provide a final clarification to any lingering questions about the *Winters* doctrine's applicability to groundwater. The Ninth Circuit, twice, two state Supreme Courts and multiple lower federal courts have all held that the US can reserve groundwater just as effectively as it reserves surface water when establishing a federal reservation. *See, e.g., Gila River*, 989 P.2d 739 (Ariz. 1999) (en banc); *Confederated Salish & Kootenai Tribes*, 59 P.3d 1093 (Mont. 2002); *United States v. Washington*, No. 2:01-cv-00047 at *16 (W.D. Wash. Feb. 24, 2003); *Tweedy v. Tex. Co*., 286 F. Supp. 383, 385 (D. Mont. 1968); *Soboba Band of Mission Indians*, 37 Ind. Cl. Comm. at 487.

Congress too has weighed in, approving numerous Indian water rights settlements that recognize and confirm tribes' rights to groundwater. *See*, *e.g., Ak-Chin Indian Community Water Rights Settlement Act*, Act of July 28, 1978, Pub. L. No. 95-328, 92 Stat. 409 (1978), as amended, Pub. L. No. 98-530, 98 Stat. 2698 (1984). The lone dissenting voice is the Wyoming Supreme Court, which issued a decision declining to apply the *Winters* doctrine to groundwater before the current weight of authority had fully developed. Even there, however, the court recognized that "[t]he logic which supports a reservation of surface water to fulfill the purpose of the reservation also supports a reservation of groundwater." *In re Big Horn River Sys*., 753 P.2d 76 (Wyo. 1988).

Ultimately then, the *Agua Caliente* decision simply confirms what most in Indian Country have understood the law to be all along. The United States' reservation of appurtenant, available water in connection with the establishment of a reservation hinges *not* on whether the water flows above or percolates beneath the ground, but rather on the reservation's need for water. In the context of Indian reservations, which are intended to provide a permanent home and abiding place for Indian people, the need for water is obvious.

While the application of the Winters doctrine to groundwater may create a certain amount of short-term uncertainty and perhaps unease in the West, what the Ninth Circuit wrote over three decades ago rings true today: "[r]esolution of the problem is found in quantifying reserved water rights, not in limiting" them. *Walton v. United States*, 647 F.2d 42, 48 (9th Circuit 1981). The *Agua Caliente* decision should serve as a capstone to the weight of authority holding that the federal reserved rights doctrine applies to groundwater. The decision should also facilitate future settlements and quantifications of tribal water rights that put an end to uncertainty — where tribes and other stakeholders work together willingly and in good faith, benefitting all parties.

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Mark Reeves is a partner in Kilpatrick Townsend's Augusta, Georgia office. He has represented and advised federally recognized Indian tribes in a broad range of litigation in federal, state, and tribal courts and at both the trial and appellate levels. Mr. Reeves has significant experience litigating issues relating to tribal sovereignty and immunity, the acquisition, development, and protection of tribal land and water rights, the taxation of Indian lands and property, litigation over easements and rights-of-way on Indian lands, and the application of federal and state laws to Indian tribes and tribal enterprises. Mr. Reeves has also assisted and advised tribes in numerous non-litigation contexts. He has been recognized as a "Rising Star" for Native American law in Georgia from 2015-2017. After graduating from Vanderbilt Law School (2004), Mr. Reeves served as a law clerk to the Hon. R. Lanier Anderson, III, United States Court of Appeals for the 11th Circuit.

Reuse

"One Water" Approach

Alternative Sources

Non-Potable Needs

Toilets

ONSITE TREATMENT & REUSE

OVERCOMING THE BARRIERS

by Paula Kehoe, Director of Water Resources, San Francisco Public Utilities Commission

INTRODUCTION

Whether challenged by multi-year drought, extreme flooding, impacts due to a changing climate, or increased demand on water supplies due to population growth, water utilities across the nation are taking on new approaches to manage local water supplies and increase resilience. For example, utilities are producing non-potable and potable water supplies by treating wastewater for reuse, pumping groundwater to supplement surface water supplies, and implementing conservation and demand management programs to extend drinking water supplies. Through a "one water" approach, all water — drinking water, wastewater, stormwater, graywater, and more — is managed as a single resource that should be utilized and valued across all stages of the water cycle.

As utility leaders, city officials, and the general public embrace innovative, integrated, and inclusive approaches to water use, the opportunity to utilize alternate water sources (e.g. roof runoff, stormwater, foundation water, blackwater, and graywater) for non-potable uses is great. Water that we normally let run down our drains or through our streets into receiving waters has untapped potential to meet non-potable needs such as cooling buildings, irrigating landscapes, flushing toilets, and offsetting valuable potable water supplies. The key is applying the right water to the right use.

ONSITE NON-POTABLE WATER SYSTEMS

Onsite non-potable water systems are changing the way we think about matching water supplies with the right use. Onsite non-potable water systems collect wastewater, stormwater, rainwater, and more, and treat it so that it can be reused in a building or at the local scale for non-potable needs (Figure 1). These systems are usually integrated into the city's larger water and wastewater systems, by connecting to potable water systems for back-up or make-up water and sewer systems for discharge, while providing more sustainable management of water.

Generally, the major non-potable indoor water demand in any building is toilet flushing — ranging from approximately 25% for residential and up to 75% for commercial occupancies. This demand can be substantially or fully met through the capture, treatment, and reuse of on-site alternate water sources. Other major applications for non-potable water within a building or district include irrigation, cooling/heating applications, and process water, which can bring the amount of water reuse to 50% for residential buildings applications and up to 95% in commercial building applications.

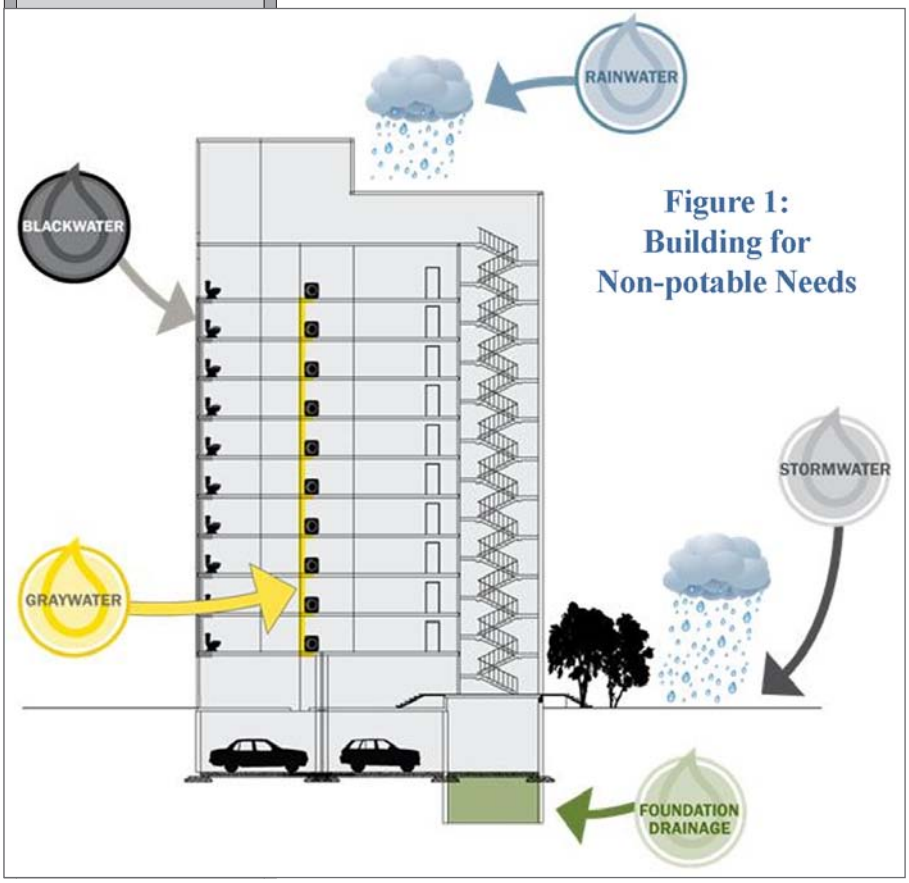

Figure 1: Building for Non-potable Needs

What originally began as a response to drought-driven conservation needs in urban cities, onsite non-potable water systems have increasingly gained interest as an element of long-term, resilient, and sustainable water supply planning. Other benefits can include: stormwater pollution reduction; extending the capacity of existing infrastructure; potential reduction in energy consumption and greenhouse gas emissions from collecting and treating water at the source; and environmental stewardship.

If proven technology is available and the benefits are evident, why then, haven't we seen more wide-spread implementation of these systems?

Reuse

Guidance Lacking

Post-Construction Protection

Ordinance Structure

District-Scale Systems

Mandated Installation

Urban Water Systems

Blueprint Developed

CHALLENGES: POLICY BARRIERS

First, communities are challenged by the lack of guidance on how to develop permitting processes, management and oversight programs for these systems. In the United States, there are no overarching national standards for managing onsite systems or water quality and wastewater treatment for onsite non-potable water systems collecting and treating alternate water sources. There are guidelines such as the EPA's Guidelines for Water Reuse and ANSI/NSF 350 and 350-1 Standard for the onsite reuse of graywater and blackwater. In addition, there are two model plumbing codes that include regulations on onsite water reuse: the International Plumbing Code (IPC) and the Uniform Plumbing Code (UPC). However, each state establishes their own interpretation of the laws, guidelines, and codes to develop state regulations, which can then be further refined when setting water quality numerical limits in individual project permits.

In California, the plumbing code uses the UPC as the model for the California Plumbing Code (CPC). The CPC includes regulations for graywater and rainwater for multiple end-use applications in both residential and commercial occupancies. However, a gap in regulation still exists: namely, the ongoing operation, maintenance, and permitting of alternate water source systems to ensure the protection of public health post-construction. Building codes, including the plumbing code, are generally enforced at the time of construction and are not intended to mandate ongoing operation and maintenance.

Program Creation by SFPUC: Non-potable Water Ordinance

The San Francisco Public Utilities Commission (SFPUC) spearheaded an effort to create a local program for regulating onsite water use. In September 2012, Article 12C was added to the San Francisco Health Code, establishing the *Onsite Water Reuse for Commercial, Multi-Family and Mixed-Use Developments Ordinance*, also known as the Non-potable Water Ordinance. The ordinance allows the collection, treatment, and use of alternate water sources for non-potable applications and established a regulatory structure for the administration and approval process. It also outlined roles and responsibilities for three City agencies (SFPUC, Department of Building Inspection, and Department of Health).

In October 2013, the ordinance was amended to allow district-scale non-potable water systems in San Francisco, where a district is defined as two or more buildings sharing non-potable water. The establishment of district-scale water systems added a fourth agency, the San Francisco Department of Public Works (SFDPW), to the City's collaborative implementation process. SFDPW works with district-scale projects to obtain encroachment permits to install pipes in the public streets or sidewalks.

The SFPUC recognizes that while water reuse is often considered at the building level, district-scale non-potable water systems offer significant benefits in comparison to individual building systems. For example, district-scale projects can provide economic benefits by offering a centralized solution to the district's treatment system, rather than implementing several single-building treatment systems.

The Non-potable Water Ordinance was further amended in July 2015 to mandate the installation of non-potable water systems in new developments meeting specified criteria. The latest amendments to the ordinance require all new development projects of 250,000 square feet or more of gross floor area, located within the boundaries of San Francisco's designated recycled water use area, to install and operate non-potable water systems for toilet and urinal flushing and irrigation. This mandated requirement expanded to any new development project in San Francisco on November 1, 2016.

Since establishing the Non-potable Water Program in 2012, the SFPUC has been receiving calls from other municipalities grappling with the same issues around permitting and oversight of on-site non-potable systems in their jurisdiction. In May 2014, the SFPUC convened the Innovation in Urban Water Systems meeting with support from the Water Research Foundation (WRF) and the Water Environment Research Foundation to:

- Share knowledge and best practices
- Discuss barriers in implementing onsite non-potable water systems, and
- Identify model programs to facilitate learning

The meeting was the first of its kind, bringing together a range of water and wastewater utilities, public health agencies, and research institutions from across North America to develop recommendations for mangement and permitting strategies and to help communities overcome policy barriers to implementation.

The meeting led to the development of the *Blueprint for Onsite Water Systems: A Step-by-Step Guide for Developing a Local Program to Manage Onsite Water Systems.*

The blueprint covers 10 basic steps to help establish and implement a local program:

1. Convene a working group to guide the development of the local program
2. Select the specific types of alternate water sources covered in the program
3. Identify the specific non-potable end uses allowed
4. Establish water quality standards for each alternate water source and/or end use
5. Identify and supplement local building practices by integrating the program into the building permit process

Reuse

6. Establish monitoring and reporting requirements for ongoing operations
7. Prepare an Operating Permit process for initial and ongoing operations
8. Implement guidelines and the program to provide clear direction for project sponsors and developers
9. Evaluate the program to promote best practices
10. Grow the program by expanding and encouraging onsite water systems

Public Health Standards

The Innovation in Urban Water Systems meeting also uncovered that the most critical issue communities face — with implementing and scaling onsite non-potable water systems — is the lack of guidance on developing water quality standards and monitoring strategies to adequately protect public health. Currently, there are no national standards or guidelines for onsite non-potable water systems in the United States. While some states may have limited standards in place today, there is wide variation in existing water quality criteria.

TREATMENT REQUIREMENTS AND MANAGEMENT FRAMEWORK

Risk-Based Approach

To further chip away at this barrier, SFPUC partnered with the National Water Research Institute (NWRI) to develop recommendations and guidance for decentralized non-potable water systems. NWRI convened an Independent Advisory Panel to establish recommended strategies and standards for management, monitoring, permitting, and reporting by using a risk-based approach that is protective of public health. The research was published by WRF and the Water Environment & Reuse Foundation (WE&RF) as Risk-Based Framework for the Development of Public Health Guidance for Decentralized Non-potable Water Systems (WE&RF Project No. SWIM10C15, Sharvelle et al. 2017). Available at: www.werf.org/a/ka/Search/ResearchProfile.aspx?ReportId=SIWM10C15; create free WE&RF Login: www.werf.org/_ad/Create_Account_no_Sign_In.aspx

Pathogen Reduction

The research effort focused on two key goals: (1) the development of recommendations and guidance for treatment requirements that ensure public health protection; and 2) the development of a management framework for the appropriate use of onsite treated water for non-potable applications. The Independent Panel used Quantitative Microbial Risk Assessments (QMRAs) to derive the pathogen reduction targets because this approach is considered the most advanced and protective of public health. These goals are specified in terms of "log reduction targets," or LRTs. While this risk-based approach is new for onsite non-potable water systems, the approach is based on widely accepted practices for both drinking water and potable reuse.

System-Based

The report provides information and guidance through a risk-based framework to help state and local health departments develop onsite non-potable water systems that are adequately protective of public health. This framework also fits the Water Safety Plan approach promoted by the World Health Organization (Figure 2). Unlike current limited standards for onsite non-potable water systems that often rely on end-point assessment of water quality, the risk-based framework focuses on a systems-based approach to setting water quality targets that will help reduce the public's exposure to pathogens.

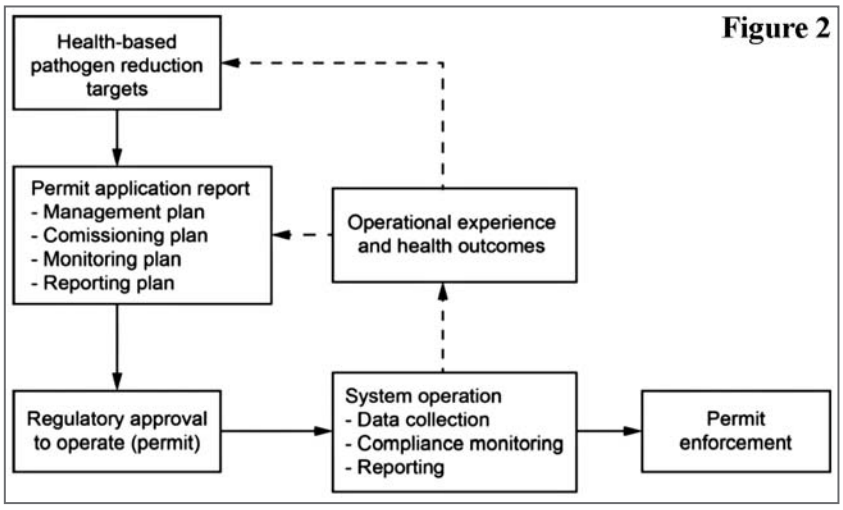

Figure 2: Framework for Decentralized Non-Potable Water (DNW) Systems that fits the Water Safety Plan approach promoted by the World Health Organization (dashed lines indicate where experiences from DNW Systems are used to improve the process). Source: Adapted from Sharvelle et al., 2017

POLICY GUIDANCE AND FRAMEWORK FOR IMPLEMENTATION

Support Implementation

With this research as an essential tool, our attention is now on translating these risk-based standards into policy guidance and frameworks that support local implementation of this sustainable water strategy. To do this, the SFPUC partnered with the US Water Alliance, along with WRF and WE&RF, to convene the National Blue Ribbon Commission for Onsite Non-potable Water Systems from 2016 to 2018. The National Blue Ribbon Commission (Commission) is comprised of over 32 representatives from public

Reuse

Water Quality Criteria

Model State Guidance

Draft Regulation

Interest & Demand

Sustainability

Control & Revenue Concerns

Research Agenda

Clarity Essential

health agencies, water and wastewater utilities, and municipalities from ten states and the District of Columbia. (*See*: http://uswateralliance.org/initiatives/commission/)

In addition to serving as a forum for collaboration and knowledge exchange, the Commission is also charged with crafting a state guidance and policy framework that recommends mandatory water quality criteria for non-potable water systems that can be transferable from state-to-state. The standard for the treatment of alternate water sources is to meet or exceed the specified log reduction targets (LRTs) for the removal of pathogens as recommended in the recent research. Using the risk-based public health research as a guide, the model state guidance will focus on creating consistency in the elements of an oversight and management program including water quality performance, monitoring, and reporting requirements, as well as present various implementation pathways to establish a successful local program. Additional items that will be included in the model state guidance are templates for an engineering report and operations and maintenance manual and other requirements for design, construction, and operation. With this document, states will be able to customize a guiding policy that is consistent with public health standards across other states, but that honors local context and meets local needs. The Commission's goal is to work with our respective state, and others, to adopt similar guiding policies in order to address these barriers and advance local implementation of these systems. SFPUC, along with the Alliance for Water Efficiency, won the inaugural Imagine H2O California Water Policy Challenge in early 2016. The prize will enable stakeholders to review the model draft regulation in three workshops throughout California in Fall 2017.

Generating Interest and Demand: Developers and City Officials

In addition to policy barriers, however, other challenges that have inhibited the development of onsite non-potable water programs persist — one of which is generating interest and demand in onsite non-potable water systems by developers and city officials. City officials need to better understand how onsite non-potable water systems can be a tool of flexibility within smart growth and retrofitting plans and policies. As new facilities are being constructed, city agencies can promote incorporation of onsite non-potable water systems and can set policies that incentivize, or even require, their integration. At the same time, developers need to better understand the connection between sustainable water management and business productivity and stability. By incorporating these systems, building owners can reduce water-related hard costs, as well as meet sustainability targets and minimize indirect risk exposures. Developers need more data that demystifies the risks and demonstrates the return on investment. As more data that quantifies the benefits of these systems becomes available, the more it will shape market-driven and policy-driven demand.

EVOLVING WATER UTILITY INDUSTRY

Finally, as water challenges and our strategies for addressing them evolve, so should the water utility industry. Fundamentally, the utility business is changing as we introduce new types of infrastructure and new innovations to centralized water and wastewater systems. Despite growing interest in this innovation, it has not been without concern for loss of revenue or loss of control as more commercial and industrial customers deploy these systems. How can utilities quantify the benefits beyond water saved? How can utilities continue to recover costs, reduce risk, and maintain system control? A report being developed by the Commission will help answer these questions by demonstrating the potential business opportunities for public utilities and municipalities in the implementation of onsite non-potable systems. The Commission is focused on helping utilities confront these concerns in order to focus on the ways in which utility business can benefit from integrating onsite non-potable water systems with centralized infrastructure. See weblink above to check for updates from the Commission.

NEW SCIENCE AND APPROACHES: RESEARCH NEEDS

As the field of onsite non-potable systems evolves, the Commission is committed to staying abreast of new science and approaches that support onsite non-potable water systems, as well as identify additional research needs in the field. The Commission will prioritize research needs and will prepare a research agenda that will further advance the field, that will be developed in late 2017/early 2018 and posted on the US Water Alliance website.

NEW TECHNOLOGY: REGULATORY NEEDS

As witnessed in the energy sector, a clear and supportive regulatory environment can lead to an explosion of innovation and efficiency gains. We can see a similar result in water. Absent clarity about existing water quality standards, companies and entrepreneurs are not incentivized to bring their talents, ideas, and resources to bear on the challenge and are reluctant to invest in developing technologies. Standards such as those developed through the Commission signal consistency and can spur growth with improved technologies.

Reuse

Paula Kehoe is the Director of Water Resources with the San Francisco Public Utilities Commission (SFPUC). She is responsible for diversifying San Francisco's local water supply portfolio through the development and implementation of conservation, groundwater, and recycled water programs. Paula spearheaded the landmark legislation allowing for the collection, treatment, and use of alternate water sources for non-potable end uses in buildings and districts within San Francisco.

CONCLUSION

As with any emerging innovation, the best way to evoke change is to model it. That's what the SFPUC and our two-dozen public utility and public health agency partners are trying to emulate. We hope that through our efforts on the Commission, we can break down policy barriers, demystify the unknown, and pave the way for future research. We've been able to forge great progress together and with expanded partnership from other agencies, water industry organizations, and various stakeholders, we can continue to advance the field toward a more sustainable water future.

For Additional Information:

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San Francisco's Non-potable Water Program website: http://sfwater.org/index.aspx?page=686
National Blue Ribbon Commission website: http://uswateralliance.org/initiatives/commission/
Link to NWRI report:
Risk-Based Framework for Development of Public Health Guidance for Decentralized Non-Potable Water Systems (SIWM10C15)
Report Link: https://www.werf.org/a/ka/Search/ResearchProfile.aspx?ReportId=SIWM10C15
Create Free WE&RF Login: https://www.werf.org/_ad/Create_Account_no_Sign_In.aspx

Figure 3: Living Machine

SFPUC Headquarters & The Living Machine

In June 2012, the San Francisco Public Utilities Commission (SFPUC) moved into its new, LEED Platinum, headquarters in San Francisco's Civic Center District. The 277,500 square foot building houses over 900 employees, and is equipped with cutting-edge green technologies including solar panels to create renewable energy. The building also employs several water conservation features including ultra-low flow toilets and urinals, a 25,000 gallon rainwater harvesting cistern, and a Living Machine®.

The Living Machine® utilizes constructed wetlands installed along the sidewalk and within the building lobby that mimic tidal wetlands by alternately flooding and draining the concrete cells fill with engineered shale, microorganisms, and grasses and plants. A disinfection system with both ultraviolet light and chlorination is housed in the building's basement. This onsite water system treats all of the building's wastewater and then distributes it to be reused for toilet flushing. The system reduces the building's total potable water use by about 60%. The system is a blend of function and aesthetics, and a demonstration of the new water paradigm of reusing water onsite. (Figure 3)

Cleanup

KIRTLAND AIR FORCE BASE CLEANUP

BULK FUEL LEAKS REMEDIATION

A COLLABORATIVE APPROACH TO A COMPLEX SITE REMEDIATION

by Kathyrn Lynnes and Dr. Adria Bodour, US Air Force (Albuquerque, NM)

INTRODUCTION

Cleanup Changes

The pace and lack of transparency of initial site remediation efforts at Kirtland Air Force Base — located in the southeast part of Albuquerque, New Mexico — resulted in public outcry and distrust. Changes within the last three years to the cleanup efforts have led to great strides forward on both fronts. This article outlines the advantages of implementing a program that coordinates regulatory strategies, technical expertise, and stakeholder engagement at a complex cleanup site.

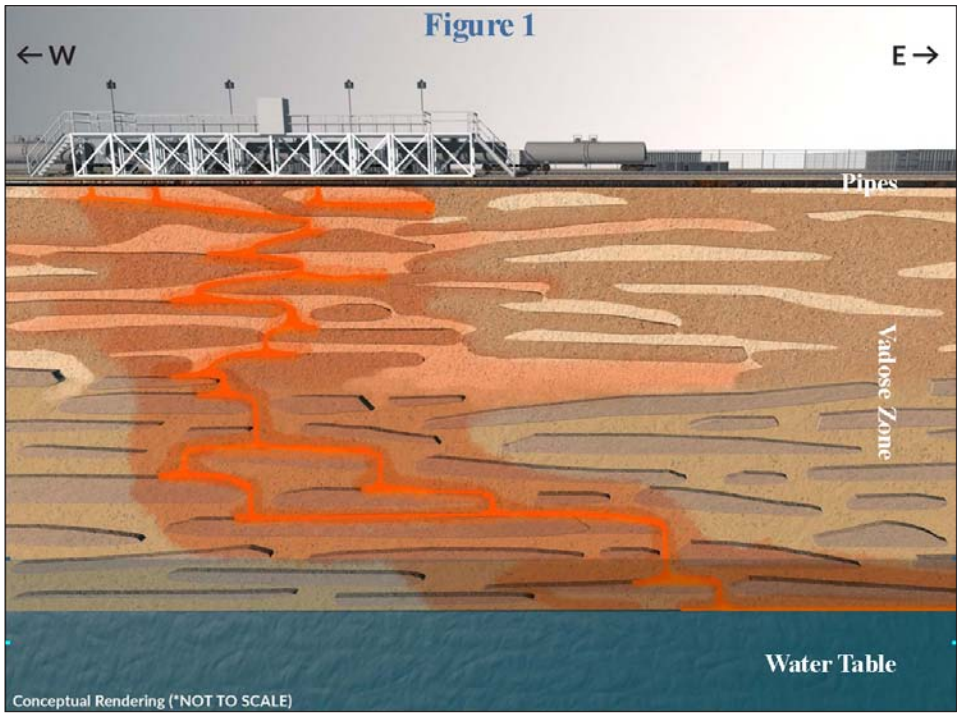
BACKGROUND

Bulk Fuel Facility

Kirtland Air Force Base, home to the 377th Air Base Wing, occupies approximately 52,000 acres. Kirtland is comprised of an extensive list of mission partner units that contribute to the nation's defense via research and development, test and evaluation, special operations and combat rescue training, and support of the nuclear enterprise. As the "installation" commander, the 377th is a mission enabler for those mission partners. Kirtland AFB celebrated its 75th anniversary last year.

As the base grew during and after World War II a new bulk fueling facility was needed to support the mission. This Bulk Fuels Facility (BFF), which began operating in 1953, was used for the storage and distribution of aviation gasoline, jet propellant 4, and jet propellant 8. The fuel was offloaded first from railcars and later from tanker trucks, pumped through underground pipelines to the pump house under a vacuum, and then to large, above-ground fuel storage tanks at the BFF. Leaks were discovered in November 1999 when BFF workers performed pressure testing of the two underground pipelines between the fuel unloading rack and pump house. Both pipelines failed pressure testing (Figure 1).

Figure 1

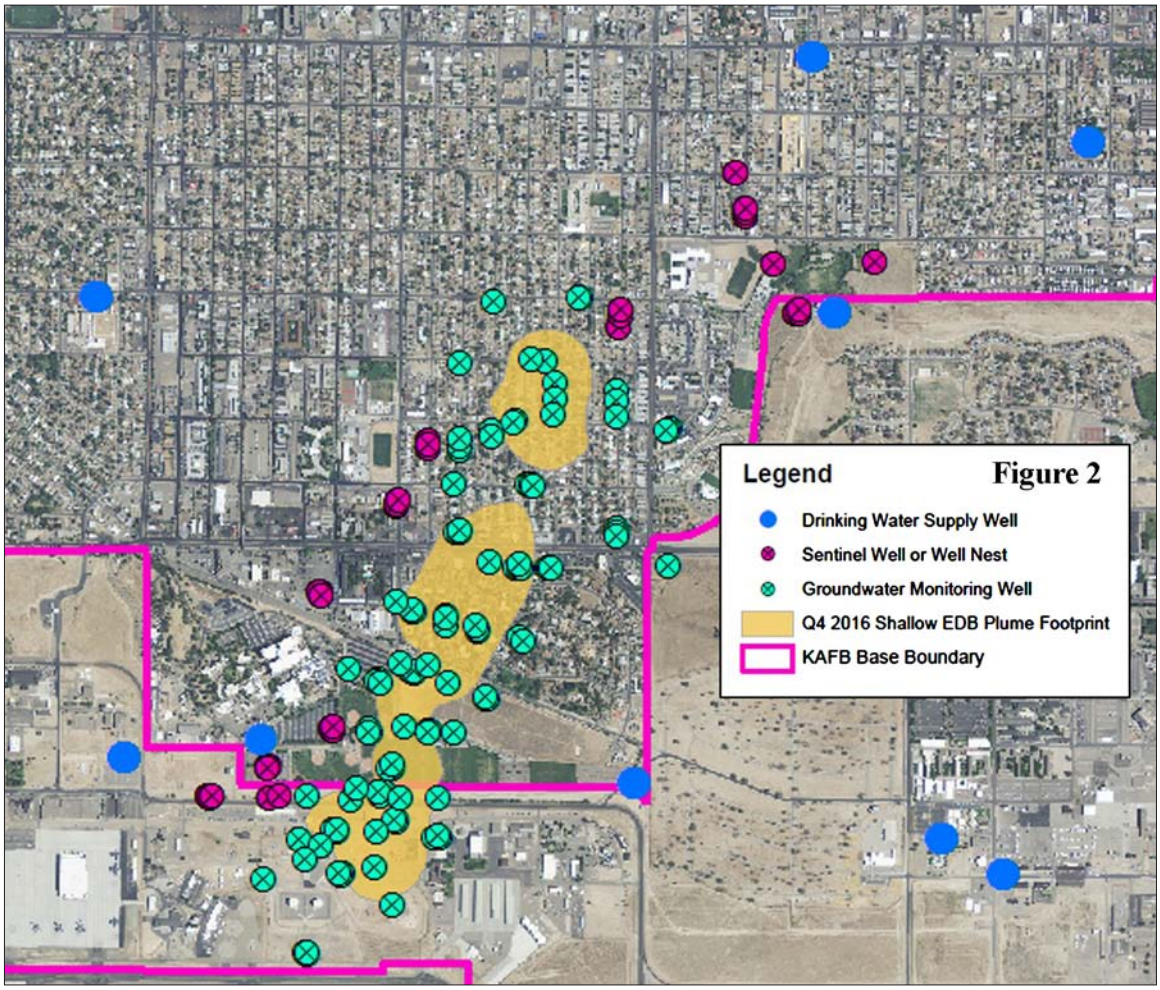


Contamination Plume

Soil vapor and groundwater monitoring wells were then installed to define the extent of the contamination in the subsurface environment. Groundwater monitoring wells identified a plume containing **e**thylene **di**bromide (EDB) at concentrations above the federal and state drinking water standard. This plume, which has moved approximately 6,800 feet off the Base, is located beneath a densely developed residential area in Albuquerque and is in the same regional aquifer as drinking water supply wells operated by the Albuquerque Bernalillo County Water Utility Authority (Water Authority - Figure 2, next page).

Cleanup

Plume Footprint



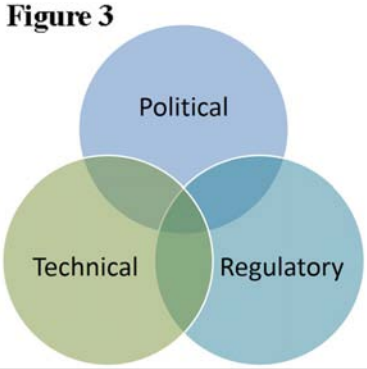
Slow Pace

Although a significant amount of characterization and remediation activities took place in the first 14 years of the fuel leak investigation, the community had a negative perception of the Air Force's response to the leak. The slow pace of the investigation, the failure to immediately begin cleaning up the EDB plume and the Air Force's perceived lack of transparency led to growing frustration among the local community, the Water Authority, the City of Albuquerque, the New Mexico Environment Department (NMED), and state and federal elected officials. By mid-2014 this combined frustration had reached a crescendo and in September 2014, Air Force Deputy Secretary Mark Correll presented an action plan to stakeholders in Albuquerque to gain concurrence on a more effective path forward to clean up the EDB plume.

Project Changes

Within three years, the Kirtland AFB fuel leak cleanup project has made a 180-degree turn. The Air Force has stepped up its technical approach by initiating a **g**round**w**ater **t**reatment **s**ystem (GWTS) **i**nterim **m**easure (IM); creating focused technical working groups and monthly stakeholder meetings; assigning an experienced technical project manager from the Air Force Civil Engineer Center (AFCEC); and hiring a highly qualified expert to serve as the senior advisor for the cleanup. The nature and extent of contamination has been almost completely defined and the Resource Conservation Recovery Act (RCRA) Facility Investigation Report and Risk Assessment were submitted to NMED in 2017. The Air Force and NMED have also significantly expanded their approach to stakeholder engagement by co-hosting eight public meetings, three field trips, two technical deep-dives, and two workshops along with presenting updated, background information to any public event they were asked to attend (i.e., neighborhood association meeting, community events, and Water Authority boards).

Figure 3



What lessons can be learned from the fuel leak cleanup at Kirtland AFB? Large, complex environmental remediation projects require the long-term dedication of technical and regulatory resources plus the active participation of stakeholders using data-driven decision-making to achieve an effective cleanup. While thinking of these three resources as a Venn diagram with a "sweet spot" in the middle is simplistic (Figure 3), it does illustrate the importance of balancing the technical, regulatory and stakeholder engagement aspects of a complex site cleanup. This article describes how the cleanup of the fuel leak at Kirtland AFB has achieved this balance.

Cleanup

RCRA Permit

Interim Measures

Migration Control

Groundwater Treatment

Treated Effluent Disposition

REGULATORY LAYERS OF CLEANUP

Groundwater Treatment System

The Kirtland AFB fuel leak cleanup is a regulatory torte of many layers. The regulatory effort that supported the **g**round**w**ater **t**reatment **s**ystem **i**nterim **m**easure (GWTS IM) for the EDB plume is an example of the innovative and collaborative approach employed throughout this project.

The characterization and remediation of the site fuel leak is being implemented under the corrective action provisions of Kirtland AFB's Hazardous Waste Treatment Facility Operating Permit (Permit No. NM9570024423 – "RCRA Permit"). New Mexico is authorized by the US Environmental Protection Agency (EPA) to be the lead regulator for RCRA Hazardous and Solid and Waste Amendment corrective action.

The RCRA Permit provides for the implementation of **i**nterim **m**easures (IMs) if the New Mexico Environment Department determines that "such measures are necessary to reduce or prevent migration of hazardous wastes or hazardous constituents that have, or may result in, an unacceptable human or environmental receptor exposure to hazardous waste or hazardous constituents while long-term corrective action remedies are being evaluated and implemented." NMED's position is consistent with EPA's corrective action policy. EPA stated in the 1999 "RCRA Corrective Action Workshop on Results-Based Project Management" that "[T]aking interim and/or final actions to control unacceptable exposures to humans and further migration of contaminated groundwater represents the highest priority for the RCRA Corrective Action Program."

IMs are important tools for protecting human health and the environment because the Facility Investigation Report, **c**orrective **m**easures **e**valuation (CME: this process is equivalent to EPA's **c**orrective **m**easures **s**tudy or CMS) and **c**orrective **m**easure **i**mplementation (CMI) processes are often lengthy. The selected IM for the EDB plume was a GWTS (groundwater treatment system), which was determined by the technical project team to be the only feasible remedial action considering the depth and the migration path of EDB plume, its location under a residential community, and other factors.

Treated Effluent Options

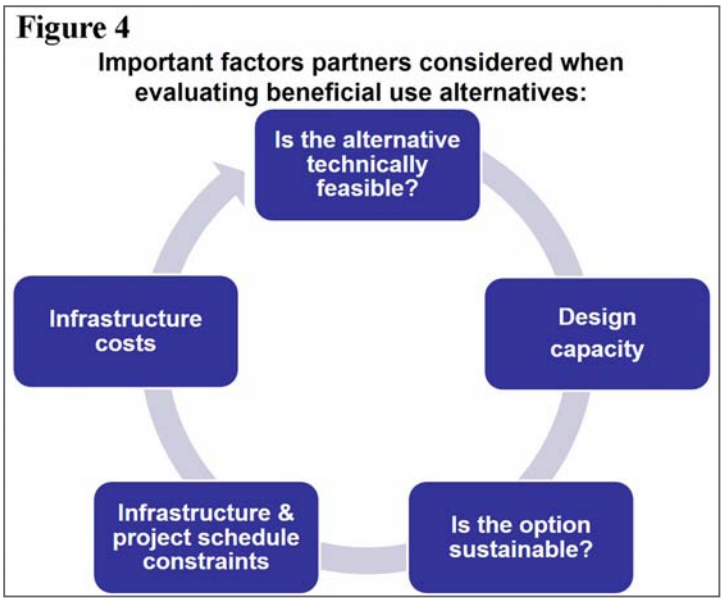
Once GWTS IM was selected, the technical team had to identify one or more options to manage the large volume of treated effluent that would be generated by the GWTS. As of June 19, 2017, the GWTS has generated 206 million gallons of treated effluent. This IM will likely operate for at least a decade based upon modeling.

A number of options were considered for the disposition of the treated effluent including:

- irrigation of the on-base golf course;
- irrigation of nearby off-base city parks or golf course;
- off-base point source discharge to the Water Authority's reuse distribution system;
- on-base infiltration galleries;
- on-base injection into the regional aquifer;
- on-base point source discharge into an arroyo; or
- use as a drinking water source for the base's community water supply system.

The technical team's identified possible beneficial uses of the treated effluent are shown in Figure 4.

Figure 4



Cleanup

Technical Feasibility

Design Capacity

Sustainability

Underground Injection

Infrastructure Constraints

Cost Criteria

Discharge Permit Oversight

Well Moratorium

Remediation

The first criteria is a determination of technical feasibility. Options that do not meet this criteria are dropped from further evaluation. For example, soil testing demonstrated that infiltration galleries were not technically feasible due to soil lithology (i.e., layering of clay/silt soil that is less permeable to water moving through it).

The second criteria is an evaluation of the design capacity. That is, will the option support the volume of treated effluent that will be generated until the completion of the corrective action? The initial option selected for the disposition of treated effluent was to use it for irrigating the on-base golf course. This option has worked well in the summer months but required a second option for the colder months due to the lack of irrigation. This seasonal constraint also affected the option of placing the treated water in the Water Authority's reuse distribution system.

The third criteria relates to environmental sustainability. The beneficial use of this large volume of treated effluent is of critical concern to the local community because Albuquerque is located in the arid Southwest where groundwater is a valuable resource. The use of a surface-point source discharge to an arroyo would not enhance the regional aquifer because most, if not all, of the water would evaporate and never reach the regional aquifer. Sustainability was a key factor in the selection of underground injection and use as a drinking water source as water disposition options over a point source discharge. Injection essentially returns all of the treated effluent to the regional aquifer and beneficial use as drinking water would reduce pumping otherwise necessary from other base production wells.

The fourth criteria involves an evaluation of infrastructure and project schedule constraints. The accelerated schedule for the construction of the GWTS also accelerated the schedule for developing the infrastructure for the disposition of the treated effluent. Significant infrastructure was already in place on-base for the use of the treated effluent for irrigation and a former drinking water well was available to retrofit as an injection well. Other options — like use of the treated effluent for irrigating a city park and/or golf course, or a point source discharge in Water Authority's reuse system — would require new infrastructure. In addition, under the federal Clean Water Act, a National Pollutant Discharge Elimination System (NPDES) permit would be required for the point source discharge and this would entail significant lead time to implement (i.e. two years or more).

The last criteria is cost. As a federal agency, the Air Force needs to be a good steward of the taxpayers' dollars. The use of existing infrastructure not only accelerated the schedule but also kept project costs down while achieving the goals.

Based on these criteria, the Air Force selected and implemented the on-base irrigation and injection options for the disposition for the treated effluent. NMED's Ground Water Quality Bureau (GWQB) determined that a discharge permit was not required for the irrigation of the on-base golf course. However, a Class V **u**nderground **i**njection **c**ontrol (UIC) permit was required and was issued by the GWQB on April 28, 2017. This Discharge Permit (DP-1839) is unique because both the Hazardous Waste Bureau (HWB) and GWQB provide regulatory oversight for the EDB plume groundwater treatment system IM. The HWB regulates the evaluation and remediation of the EDB plume and the associated GWTS. The GWQB regulates the procedures that ensure treated effluent discharged from the GWTS to UIC well(s) meets Discharge Permit requirements. The introduction in the DP-1839 public notice recognized the need for coordination between the two Bureaus in the following statement:

> This Discharge Permit is not intended to conflict or supersede the remedial actions selected for the BFF under the Resource Conservation and Recovery Act (RCRA), any implementing agreements, or the corrective action provisions of the RCRA Permit.

Intra-Department coordination in DP-1839 addresses sampling, reporting, release notifications, and well abandonment requirements.

To ensure that no new potable or irrigation wells will be installed in or adjacent to the EDB plume until the groundwater cleanup is completed, NMED submitted a request to the New Mexico Office of the State Engineer on December 13, 2016, for a well drilling moratorium associated with Bulk Fuels Facility corrective action activities. This request was granted by the State Engineer on February 9, 2017, to protect human health and prevent interference with ongoing corrective action activities. It restricts the drilling of new water supply wells and the transfer of water rights within the boundaries specified by NMED.

TECHNICAL

A significant amount of characterization and remediation had been performed in the first 14 years after the leak was discovered, including:

- The installation of 116 monitoring and 285 soil vapor wells that were sampled quarterly
- The removal and replacement of the failed fueling infrastructure
- The excavation of 4,822 tons of contaminated soil from the source area

Cleanup

Soil Vapor Extraction

Plume Migration

Site Complexities

Action Alternatives

Complex Site Initiative

- The installation and operation of a **s**oil **v**apor **e**xtraction (SVE) systems, bioslurping, and biodegradation induced by the extraction system, which removed approximately 780,000 gallons of fuel over a 12 year period (Bioslurping technology includes a drop pipe that is extended from the ground surface to the top of the floating fuel. A vacuum system is attached to the pipe and pulls fuel vapor off the water table and treats them at the surface.)
- The installation and short-term operation of a skimmer system, which was replaced by a more effective modified bioslurping technology

Despite all of this effort, problems remained. The nature and extent of the toe of the off-base EDB plume had not been defined, the simplified conceptual site model did not adequately represent site conditions, and no interim measure (IM) was in place to control the migration of the EDB plume. By early 2014, it had become obvious the site was more complex than originally assumed and that a different approach was necessary to expedite the investigation and cleanup actions.

Site complexities include:

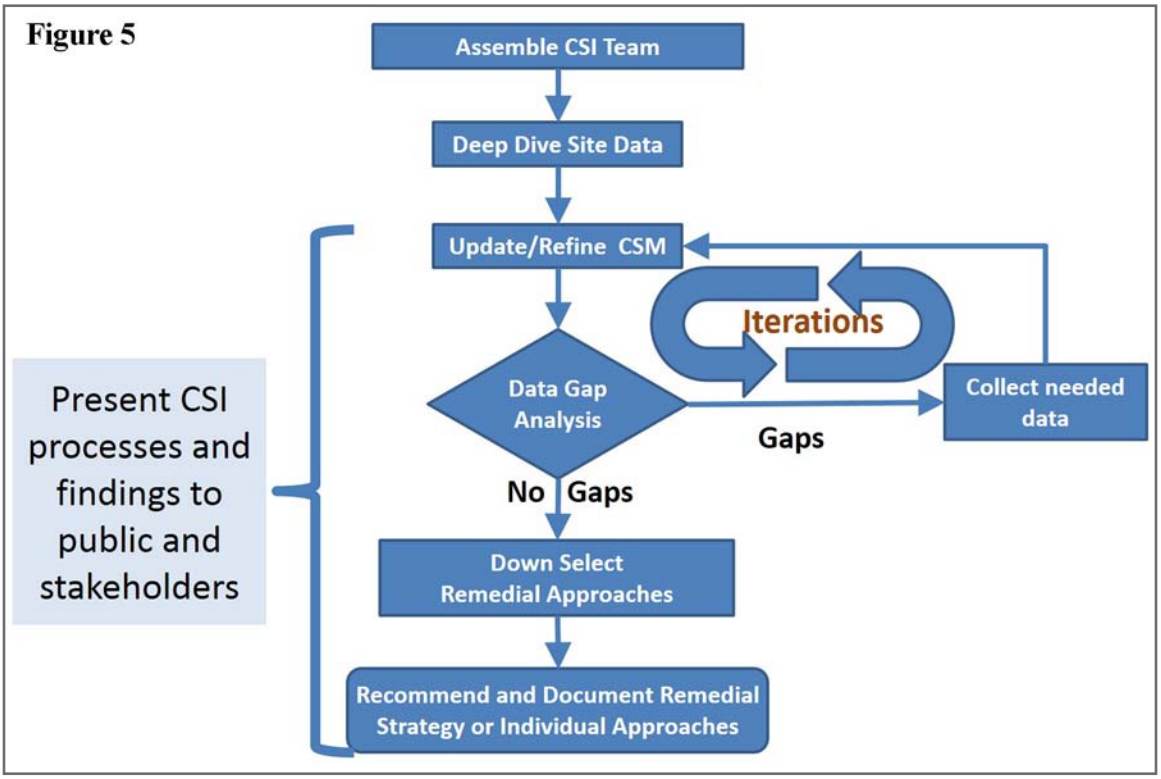
- A deep water table (the unsaturated soil between the ground surface and the groundwater table — also called the "vadose zone" — is approximately 500 feet thick)
- Complex soil stratigraphy that includes east-west oriented alluvial fan deposits (approximately 100-150 feet thick) derived of sediments eroded from the Sandia and Manzanita mountains, which overlays north-south oriented Ancestral Rio Grande Sediment deposits
- The location of the EDB plume under a densely developed residential area
- A fluctuating water table with changing gradients and artificial flow fields from Water Authority drinking water supply wells

Data-Driven Approach

The technical project team agreed to employ a results-based, data-driven approach focused on the data collected that are necessary and sufficient to support decisions on corrective action activities. This approach allowed the technical team to focus on: obtaining data necessary to complete the characterization phase; facilitate the development of a functional conceptual site model; develop an effective soil and groundwater monitoring program; evaluate potential IMs for both the vadose and groundwater zones; and complete the Facility Investigation Report and the Risk Assessment.

To implement the data-driven approach, the Air Force Civil Engineer Center (AFCEC) used its complex site initiative (CSI) to facilitate the collaborative technical teams in July 2014 (Figure 5).

Figure 5



Cleanup

Initiative Tools

Two initial technical working groups (i.e. Hydrogeology and Vadose Zone) were convened and had team members consisting of representatives from AFCEC, Air Force contractors, US Army Corps of Engineers, EPA Region 6, United States Geological Survey (USGS), NMED, City of Albuquerque, and the Water Authority. The technical working groups used AFCEC's complex site initiative tools which includes:

- Geographical information system platform to maintain, analyze and communicate about site data
- Geostatistical Temporal/Spatial optimization software to evaluate sampling frequency, analytes, and optimize the size and configuration of the monitoring program
- Environmental sequenced stratigraphy to create a best-fit interpretation of the complex sedimentary deposits that underlie the Site
- Analytic element and finite difference groundwater modeling

Within three years, this collaborative approach has paid significant dividends. The conceptual site model has been updated based on the complexity of the site. AFCEC began remediating the dissolved phase EDB plume in the northern portion in June 2015. The nature and extent of the contamination has been defined. A risk assessment has been performed. The soil and groundwater monitoring programs have been optimized and three source area pilot tests are planned in 2017.

Groundwater Treatment System

The best evidence of this transparent and collaborative approach is the speed that the GWTS IM came online. The groundwater treatment system began with one extraction well with a temporary GWTS that started pumping and treating EDB contaminated groundwater on June 30, 2015. Less than six months later, two more extraction wells were installed and a full-scale GWTS was designed, constructed, and in operation. The GWTS uses **g**ranular **a**ctivated **c**arbon (GAC) to remove EDB and other fuel-related contaminants to non-detectable levels. The capacity of the GWTS doubled to a total of 800 gallons per minute in March 2017. The GWTS consists of two treatment trains. Each treatment train is comprised of: an influent tank; pre-filter bags; lead-lag GAC vessels (each vessel contains 20,000 pounds of GAC); post-filter bags; and an effluent tank. Sand filters will be added to both treatment trains along with a fourth extraction well to begin extraction in 2017.

Extraction Progress

GWTS IM has extracted 206 million gallons and removed 63 grams of EDB. The interim measure (IM) has significantly mitigated the forward movement of the toe of the EDB plume. The most recent quarterly sampling data have shown that the plume is starting to "break" around the extraction wells. That is, the concentration of EDB in an area of groundwater between the extraction wells is below the Maximum Contaminant Level. The Maximum Contaminant Level (MCL) is the legal threshold concentration of a chemical that is allowed in public water systems under the federal Safe Drinking Water Act. This positive trend is expected to continue as two additional extraction wells are added to the system.

Residual Fuel

Additional IM's have been and will continue to be implemented in the leak source area. Three source area pilot tests are planned in 2017. These pilot tests will evaluate treatment technologies for the remediation of the residual fuel in vadose zone, and smeared fuel below the water table. The IMs will be documented in a Facility Investigation Report Addendum and will be evaluated when developing the proposed final corrective action technologies in the CME (corrective measures evaluation).

STAKEHOLDER ENGAGEMENT: COMMUNITY FEAR

Communication Breakdown

Although the Air Force had made substantial technical progress in the first 14 years, they did not communicate their accomplishments well and did not comprehend the level of frustration and fear in the community about the leaks. As a result, key stakeholders took direct action. The Water Authority hired an outside consultant, began monthly samples and analyzed nearby drinking water supply wells for EDB and other jet fuel constituents, contracted for the installation of a deep sentinel well nest between the EDB plume boundary and the Ridgecrest Well Field, and passed a resolution to remove any drinking water supply well that may be contaminated with EDB out of service. Local activist groups sent a request to the EPA to add the Kirtland AFB Bulk Fuels Facility (BFF) to the National Priority List (Superfund). Additionally, a State Senate Memorial was introduced that requested the New Mexico Congressional delegation to fund and assemble an independent panel of experts to oversee the cleanup. The New Mexico Congressional delegation and the Mayor of Albuquerque held frequent meetings with the Secretary of the Air Force. Negative media coverage expanded beyond local media to a feature on the PBS News Hour.

Community Trust Needed

The new project team brought in to the cleanup project in 2014 immediately recognized that technical progress could not be made without earning the trust of the community and its stakeholders. The Air Force and NMED began working closely together on a comprehensive engagement strategy that includes:

- Co-hosting and presenting public meetings as required under the RCRA Permit and adding poster sessions to give the public more of an opportunity to engage directly with the technical project team
- Co-hosting field trips on- and off-base to provide the public first-hand knowledge of site geology and the IMs, such as **s**oil **v**apor **e**xtraction (SVE) systems and **g**roundwater **t**reatment **s**ystems (GWTS)

Cleanup

Cleanup Websites

- Co-hosting technical "deep-dives" presentations to provide an in-depth look at specific topics related to the BFF characterization, IMs, and risk assessment
- Making joint presentations, as requested, to neighborhood associations, universities, city and county governmental agencies, legislative committees, and to other interested organizations

Both Air Force and NMED maintain fuel leak cleanup websites (http://afcec.publicadmin-record.us.af.mil/ and www.env.nm.gov/kafbfuelplume/) to make correspondence and technical information readily available to the public. The Air Force also maintains a public document repository at a local college. Both parties maintain list serves to send out periodic messages to inform community and our stakeholders about upcoming public meetings and other opportunities for involvement.

The Air Force has developed targeted handout materials to help keep the public informed about the project including a 101 factsheet (to provide basic information about the project), project update factsheet, and a gardening factsheet. In recognition of the diverse community neighborhoods affected by the EDB plume off-base, AFCEC has translated some of these materials into Spanish and Vietnamese.

Strategic Plan (Annual)

In 2015, NMED began publishing an annual Strategic Plan to provide a clear vision on how to continue to advance the fuel cleanup during the upcoming calendar year (www.env.nm.gov/kafbfuelplume/kafb-fuel-plume-documents). The primary goals of this reference and planning document are to increase transparency and public involvement.

Engagement Results

The Air Force and NMED co-host quarterly governmental stakeholder meetings to present project updates, and provide access to technical members to answer questions. These stakeholders include representatives from AFCEC, Air Force contractors, US Army Corps, EPA Region 6, USGS, NMED, the City of Albuquerque, and the Water Authority. There is substantial evidence that the expanded approach to community and stakeholder involvement is working. Media coverage is now focused on project updates; questions at public meetings have dramatically changed from confrontational accusations to requests for clarifications; and meetings end with applause instead of cursing. Every meeting begins with a partnership slide that shows how broad and diverse the project's community and stakeholders are — including, but not limited to, neighborhood associations, universities, federal and state agencies, an activist group, and the church where the first extraction well is located.

Water Supply

CONCLUSION

Has the Bulk Fuels Facility cleanup hit the "sweet spot" that balances the technical, regulatory, and stakeholder engagement aspects of this complex site? Trust is a fragile commodity and must continue to be earned. Although significant progress has been made on all three fronts — regulatory, technical, and stakeholder engagement — everyone on the project team is constantly looking for ways to build on the success of the last three years until the cleanup is complete. The Air Force and NMED are embarking on a new regulatory path that will allow Kirtland AFB to use the treated effluent in its on-base water supply system. The data from the three source area pilot tests will be used to help inform the recommended remedy. The community will continue to watch this project closely and will hold Air Force and NMED to our commitments to protect Albuquerque's drinking water.

For Additional Information:
Kathryn Lynnes, 505-846-8703 or kathryn.lynnes@us.af.mil
NMED cleanup website: www.env.nm.gov/kafbfuelplume/
Kirtland Air Force Base website: www.kirtlandjetfuelremediation.com

Kathryn (Kate) Lynnes, who has degrees in civil engineering and law, brings 34 years of experience in environmental permitting and corrective action to her current position as the Senior Advisor for the Bulk Fuels Facility Remediation at Kirtland Air Force Base. Kate has spent over 20 years in consulting assisting industrial and municipal clients on a broad range of environmental issues including permitting, corrective action, brownfield redevelopment, waste management, and real estate transactions. She was also a permit writer for a state regulator and a Chief Environmental Engineer for a mining company.

Dr. Adria Bodour is the environmental remediation expert, providing technical and programmatic support for the Air Force Civil Engineer Center (AFCEC) Environmental Restoration Program Management Office, Joint Base San Antonio-Lackland, Texas. Dr. Bodour has over 20 years of experience in environmental research, restoration, and remediation technologies to clean up contaminated sites. She is the technical lead for the Kirtland Air Force Base, New Mexico, Bulk Fuels Facility leak remediation effort and is spearheading robust interim measures to advance the cleanup of ethylene dibromide associated with the leak. Dr. Bodour is the program manager for the AFCEC Broad Agency Announcement Program that demonstrates and validates novel technologies to improve upon restoration and remediation processes and decrease Air Force liabilities. Her doctorate was obtained from the University of Arizona as a Superfund fellow to advanced bioremediation technologies.

WATER BRIEFS

Errata

We regret to say that we mistakenly used outdated information concerning author Todd Votteler in our June 2017 issue (see Texas Surface Water and Whooping Crane Dispute, TWR #160). The correct information is as follows: Todd H. Votteler, Ph.D. is the Executive Manager of Resource Policy & Stewardship for the Guadalupe – Blanco River Authority. In addition, Votteler is the Editor in Chief of the Texas Water Journal. He is also President of Collaborative Water Resolution, LLC (www. waterdisputes.org). Votteler served as the Federal Special Master for the Endangered Species Act litigation, *Sierra Club v. San Antonio*. Previously, Votteler was the Federal Court Monitor's assistant during *Sierra Club v. Babbitt*. Votteler has a B.S. in Natural Resources from The University of the South, a M.S. in Natural Resources from the University of Michigan, and a Ph.D. in Environmental Geography from Texas State University.

SUPREME COURT APPEAL US

***AQUA CALIENTE* APPEALED**

On July 5, Desert Water Agency (DWA) and Coachella Valley Water District (CVWD) each filed a Writ of Certiorari with the US Supreme Court to appeal the Ninth Circuit Court of Appeals' decision in the *Aqua Caliente* case. *Agua Caliente Band of Cahuilla Indians v. Coachella Valley Water Dist*., 849 F.3d 1262 (9th Cir. 2017) (*Agua Caliente*). "This case presents the distinct question whether *Winters* extends to groundwater, and, if so, the circumstances under which *Winters* rights preempt state groundwater regulation." CVWD Writ at 2. This issue of *The Water Report* includes a lead article discussing the Ninth Circuit's March 7, 2017 decision.

The Supreme Court (Court) will first decide if it will review the case. If the Court reviews the case and rules in favor of the water districts by reversing the Ninth Circuit ruling, that decision would end the litigation. On the other hand, the Court could decide not to review the case or review and uphold the Ninth Circuit decision. Should either of those options occur, the case would continue to determine if the Agua Caliente has a right to water quality and water storage, as well as the quantity that Agua Caliente is entitled to as a reserved water right.

The importance of this case for tribal water rights and the impact on other water users practically compels the Court to grant review. The Ninth Circuit's decision that the federal reserved rights doctrine applies to appurtenant groundwater — under the *Winters* doctrine — is a decision that the Court will in all likelihood rule on to eliminate any uncertainty at this point.
For info: Writs are available with additional information at DWA's website: https://dwa.org/waterrights and CVWD's website: www.cvwd.org/331/Information-regarding-Agua-Caliente-Laws

CLIMATE, ESA, TRIBES NW

BASELINE DATA IMPORTANCE

From: *2017 Tribal Environmental Leaders Summit – Report for EPA Region 10*

Baseline data is an essential tool for understanding the progression of climate change indicators and impacts. It can also be a requirement to compete for grant funding. In one facilitated discussion that took place during the Technical Track, a participant shared that his tribe was denied funding because they did not have baseline data.

The Nooksack Tribe shared a presentation on the approach they used to establish baseline conditions to assess climate change impacts for the Nooksack River Basin. They worked collaboratively with EPA to assess climate change impact on stream flow. This process included a vulnerability assessment to understand the impact on species. It also allowed them to make recommendations that included reconnecting the river to the flood plain and continuing instream rehabilitation and restoration. The report from this process was recently released by EPA and could be a model for other tribes to adapt. It is called *Qualitative Assessment: Evaluating the Impacts of Climate Change on Endangered Species Act Recovery Actions for the South Fork Nooksack River, WA* (*Qualitative Assessment)*. This report is available at https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryID=320470.

The Tribe is also in the process of developing a watershed conservation plan. The presenter urged participants to get started on gathering baseline data right away — before demand for water becomes more difficult to resolve.
For info: Report available at: http://region10rtoc.net/tribal-leaders-summit/

CLIMATE, ESA ACTIONS US

ESA-CLIMATE RESPONSE

Being touted as a model for watershed planning responses to anticipated climate change impacts, the website for the *Qualitative Assessment* referenced in the previous brief provides the following Description:

The South Fork Nooksack River (South Fork) is located in northwest Washington State and is home to nine species of Pacific salmon, including Nooksack early Chinook (aka, spring Chinook salmon), an iconic species for the Nooksack Indian Tribe. The quantity of salmon in the South Fork, especially spring Chinook salmon, has dramatically declined from historic levels, due primarily to habitat degradation from the legacy impacts of various land uses such as commercial forestry, agriculture, flood control, and transportation infrastructure.

Segments of the South Fork and some of its tributaries exceed temperature criteria established for the protection of cold-water salmonid populations, and were listed on Washington State's Clean Water Act (CWA) 303(d) list of impaired waterbodies. High water temperatures in the South Fork are detrimental to fish and other native species that depend on cool, clean, well-oxygenated water. Of the nine salmon species, three have been listed as threatened under the federal Endangered Species Act (ESA) and are of high priority to restoration efforts in the South Fork — spring Chinook salmon, summer steelhead trout, and bull trout. Growing evidence shows that climate change will exacerbate legacy impacts.

This *Qualitative Assessment* is a comprehensive analysis of climate change impacts on freshwater habitat and Pacific salmon in the South Fork. It also evaluates the effectiveness of restoration tools that address Pacific salmon recovery. The objective of the assessment is to identify and prioritize climate change adaptation strategies or recovery actions for the South Fork that explicitly include climate change as a risk.

…EPA found that the most important actions to implement to ameliorate the impacts of climate change in the South Fork watershed are riparian restoration, floodplain reconnection, wetland restoration, and placement of log jams. Most of these actions are already being implemented

WATER BRIEFS

to varying degrees, but the pace and scale of implementation will need to be increased by explicitly addressing barriers to implementation. This will require substantial planning including a watershed conservation plan, project feasibility assessments, agency consultation, landowner cooperation, stakeholder involvement, and funding. The qualitative assessment's findings will inform development of the CWA South Fork temperature TMDL Implementation Plan, updates to the ESA Water Resource Inventory Area 1 (WRIA1) Salmonid Recovery Plan, and other land use and restoration planning efforts.
For info: EPA website: https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryID=320470

RANCH WATER RIGHTS NM

NATIONAL FOREST LICENSES

On June 9, the New Mexico State Engineer issued an order to protect ranchers' water rights in Lincoln National Forest. The Office of the State Engineer (OSE) has begun issuing licenses pursuant to his Order that confirm the ranchers' longstanding beneficial use of water to sustain their livestock. Last year, certain watering areas were closed off in Lincoln National Forest after a potentially endangered mouse was discovered.

Over the last several years, the State Engineer has worked to protect the rights of farmers and ranchers. OSE has issued permits for off-channel watering of cattle, which allowed for cattle to access water from previously closed off areas in the Lincoln National Forest. OSE also ordered an investigation into complaints about watering sources being unlawfully blocked by the Lincoln National Forest.

The Order issued on June 9 applies to water right owners who have maintained continuous use of surface water since before 1907 for livestock watering within Lincoln National Forest. Licenses issued under the Order will clarify that ranchers' water rights give them the ability to use all sources of surface water on their grazing allotment — including streams and springs — for livestock watering.

OSE's Order notes that, "…these claims for Pre-1907 stockwatering water rights, although existing at the time of the adjudication suit, were not considered in and were omitted from the May 8, 1933 Final Decree entered in the suit to adjudicate water rights in the Pecos River stream system…" known as the "Hope Decree." The Order states that the Licenses will be issued pursuant to NMSA 1978, Section 72-5-13 (1907).

Ranchers must prove beneficial use with documentation of their historical practices, "supported by documentation of the maximum number of animal units historically grazed on the given allotment… ." According to OSE, the Licenses issued under this order will confirm longstanding beneficial uses of water and provide greater certainty to water right owners in the face of recent actions by the Lincoln National Forest to limit ranchers' access to water for livestock. The Order also notes that licenses issued pursuant to the Order "shall recognize a surface water right for livestock to consume water from impoundments or other surface water points of diversion or directly from a surface water source located within the external boundaries of a Lincoln National Forest grazing allotment… ."

In accordance with the Order, "OSE will inspect the place of use and evaluate the claimed beneficial use and pre-1907 priority date… ." Once a stockwater right has been licensed, the rights "must remain *in situ*, with no change in purpose of use and no change in place of use to a location outside of the external boundaries of the grazing allotment, ensuring that their continuing exercise will not result in impairment to valid and existing water rights… ." Any point of diversion "may be changed by State Engineer permit but may not be changed to a location outside the external boundaries of the grazing allotment."
For info: Melissa Dosher-Smith, OSE, 505/ 469-5698 or melissa.dosher@state.nm.us; Order available at: www.ose.state.nm.us/

GREEN INFRASTRUCTURE US

PARK LAND APPLICATIONS

On June 9, EPA released *Green Infrastructure in Parks: A Guide to Collaboration, Funding, and Community Engagement*. The EPA guide was produced to encourage partnerships between park agencies and stormwater agencies to promote the use of green infrastructure on park lands. By building strong partnerships, agencies can improve park lands and access to parks, better manage stormwater, increase community resiliency to shifting weather patterns, and provide funding to implement and maintain park enhancements. Case studies are included to illustrate the approaches presented in the guide.
For info: www.epa.gov/nps/green-infrastructure-parks?utm_medium=email&utm_source=govdelivery

INFRASTRUCTURE WEST

COLORADO RIVER REPORT

In June, the Walton Family Foundation released *Colorado River Critical Infrastructure Needs* white paper by Anne Castle, a Senior Fellow with the Getches Wilkinson Center for Natural Resources, Energy, and the Environment. The approach of the white paper is set out on page 2: "Each of the projects highlighted in the white paper can create jobs and enhance local communities, prevent hazardous situations from developing as a result of aging infrastructure, and underscore the importance of using water efficiently for the benefit of multiple purposes." The white paper summarizes 15 projects within the basin states of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming that represent a variety of water use sectors. They range from a groundwater replenishment project in Arizona to a project that would increase stability and storage capacity at a reservoir in (the headwaters within) Wyoming. The paper is divided into lower basin projects, upper basin projects, basin-wide projects and options for funding water infrastructure under existing programs. The white paper points out that by 2030, 53% more people will be living in Colorado River Basin states and those people will necessarily "depend on a healthy and secure water supply from the Colorado River." *Id*.
For info: Report available at: www.colorado.edu/law/research/gwc

ALGAL INDICATORS US

WATER QUALITY TOOL

On June 27, EPA published "*Algal Indicators in Streams: A Review of Their Application in Water Quality Management of Nutrient Pollution*" — a paper which summarizes the application of algae as indicators of nutrient pollution in water quality management. It describes the use of algal indicators to develop water quality diagnostics for nutrient pollution in the US and then reviews scientific developments in the use and application of algal indicators

WATER BRIEFS

across the world. The paper is a technical resource for the water quality manager/practitioner seeking to utilize algae to detect the presence of nutrient pollution and to estimate the risks of nutrient pollution in adversely affecting the condition of stream ecosystems.
For Info: www.epa.gov/sites/production/files/2017-06/documents/algal-indicators-whitepaper.pdf

STREAMFLOW IMPACTS KS

USGS REPORT RELEASED

Human activity — such as groundwater pumping, land management, reservoir operations, and urbanization — has a measurable effect on streamflows in Kansas locally, regionally, and statewide, according to a new report by the US Geological Survey (USGS) issued June 26, in cooperation with the US Fish and Wildlife Service and the Kansas Department of Wildlife, Parks and Tourism.

Streamflow alteration can adversely affect the availability and quality of habitat needed by fish and wildlife. Findings show that certain human activities throughout Kansas cause decreased streamflow or declining groundwater levels. Researchers assessed streamflow alteration as it relates to habitat management by analyzing data from 129 USGS streamgages across the state from 1980 through 2015. "The most likely explanations for altered streamflows are changes in precipitation and human activity," said Kyle Juracek, a USGS scientist and the lead author of the study.

Agricultural practices have one of the greatest effects on streamflow. Ongoing pumping of groundwater from the High Plains aquifer, mostly for irrigation, has resulted in an ongoing drop in groundwater levels in parts of western Kansas. In some areas, levels have declined 50 to 100 feet or more. Studies have shown there is a connection between groundwater and surface water, meaning that a reduction in groundwater levels can cause streamflow in the affected areas to also decline.

Statewide, agricultural land-management practices implemented to reduce runoff and soil erosion may have been responsible, in part, for decreased duration and magnitude of high flows. Also, the implemented practices may have been partly responsible for increasing low flows at several sites in central and eastern Kansas. In urban areas, the increase in impervious surfaces, such as roads and sidewalks, has resulted in "flashier" streamflows with more frequent and larger peak flows. Downstream effects of eight large reservoirs in western Kansas typically included decreased peak flows and average monthly flows. Decreased streamflow is a concern because it may adversely affect the availability and quality of habitat needed by fish and wildlife. In southwest Kansas, declining streamflow likely has adversely affected habitat for the Arkansas darter, a state threatened fish species.
For info: USGS Report at: https://pubs.er.usgs.gov/publication/sir20175046

MERCURY RULE US

DENTAL PRACTICES

EPA is promulgating technology-based pretreatment standards under the federal Clean Water Act to reduce discharges of mercury from dental offices into municipal sewage treatment plants known as **p**ublicly **o**wned **t**reatment **w**orks (POTWs). This final rule requires dental offices to use amalgam separators and two best management practices recommended by the American Dental Association (ADA). This final rule includes a provision to significantly reduce and streamline the oversight and reporting requirements in EPA's General Pretreatment Regulations that would otherwise apply as a result of this rulemaking. EPA expects compliance with this final rule will annually reduce the discharge of mercury by 5.1 tons as well as 5.3 tons of other metals found in waste dental amalgam to POTWs. A sewage industry group has estimated that dentists are the source of half of the mercury at municipal treatment plants.

The final rule is effective on July 14, 2017. The compliance date — meaning the date that existing sources subject to the rule must comply with the rule — is July 14, 2020.
For Info: Karen Milam, EPA, 202/ 566-1915 or milam.karen@epa.gov; EPA website: www.epa.gov/eg/dental-effluent-guidelines

CLEAN WATER RULE US

MOVE TO RESCIND

EPA issued a press release on June 27th explaining the Trump Administration's move to rescind the 2015 "Waters of the U.S." definition, also known as the Clean Water Rule. EPA, Department of Army, and the Army Corps of Engineers (the agencies) are proposing a rule to rescind the Clean Water Rule and re-codify the regulatory text that existed prior to 2015 defining "**w**aters **o**f the **U**nited **S**tates" or WOTUS. The agencies maintain that this action would, when finalized, provide certainty in the interim, pending a second rulemaking in which the agencies will engage in a substantive re-evaluation of the definition of WOTUS. For additional information on the Clean Water Rule, *see* Kolanz, *TWR* #160.
For info: Pre-publication Federal Register Notice and additional information at: www.epa.gov/wotus-rule

RATE STRUCTURE BATTLE CA

COURT OF APPEAL RULING

The Court of Appeal for the State of California (Court of Appeal) issued a ruling on June 21 on the litigation between the San Diego County Water Authority (Water Authority) and Metropolitan Water District of Southern California (Metro or MWD) over the allegations that Metro has been overcharging the Water Authority for water deliveries. Both sides issued press releases claiming victory in the case. Metro claimed the decision was a "major legal and financial victory not only for Metropolitan, but for the district's cooperative of member public agencies as well as the millions of consumers they serve." SDCWA maintained, meanwhile, that the court "ruled in favor of the Water Authority, the San Diego region, and its ratepayers on several significant elements of the Water Authority's lawsuits to secure legal rates at the Los Angeles-based Metropolitan Water District of Southern California." For background information on the lower court's (Superior Court's) decision of July 15, 2015, *see* Water Briefs, *TWR* #138.

This appellate decision doesn't appear to be the end of the litigation despite both parties' claims of victory. In fact, the Water Authority press release specifically stated that, "[W]ith so much at stake, both the Water Authority and MWD are likely to seek review from the California Supreme Court of various aspects of the June 21 decision."
For info: Metro's website at: http://mwdh2o.com/WhoWeAre/Pages/facts.aspx; Water Authority's website: http://sdcwa.org/mwdrate-challenge; Both websites have a link to the Appellate Order and other information.

CALENDAR

The Water Report **Editor David Moon** will provide the opening presentation: "The Big Picture on Water Resource Policies Around the Region"

July 17 NM
Using Hydrology as Proof in Water Cases Seminar, Santa Fe. La Fonda Santa Fe Hotel. For info: Law Seminars Int'l, 206/ 567-4490 or www.lawseminars.com

July 18-19 NM
Natural Resource Damages Conference, Santa Fe. La Fonda Santa Fe Hotel. For info: Law Seminars Int'l, 206/ 567-4490 or www.lawseminars.com

July 18-20 England
IWA's Efficient 2017 Conference, Somerset. University of Bath's Chancellor's Hall. Presented by the International Water Assoc. For info: http://efficient2017.com/registration/

July 20 HI
Hawaii's Shoreline Seminar: Legal & Regulatory Issues, Sea Level Rise & Adaptation, Honolulu. Hilton Waikiki Beach. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

July 20-22 NM
Rocky Mt. Mineral Law Foundation 63rd Annual Institute, Santa Fe. Eldorado Hotel & Spa. For info: www.rmmlf.org

July 25-26 WA
Water Law in Washington Seminar, Seattle. Washington State Convention Ctr. For info: Law Seminars Int'l, 206/ 567-4490 or www.lawseminars.com

July 27 WA
2nd Annual Pacific Northwest Environmental Industry Summit, Seattle. Washington Athletic Club. Environmental Business International and Northwest Environmental Business Council Event. For info: www.environmentalbusiness.org/pacific-northwest-summit

August 8-10 NM
Western Water Seminar, Santa Fe. El Dorado Hotel & Spa. Presented by National Water Resources Assoc. For info: www.nwra.org/upcoming-conferences-workshops.html

August 8-10 MT
Symposium on the Settlement of Indian Reserved Water Rights Claims: Completed & Ongoing Negotiated Settlements, Great Falls. Best Western Plus Heritage Inn. Presented by the Western States Water Council and the Native American Rights Fund. For info: www.westernstateswater.org

August 9-10 TX
Biosolids and Odor and Corrosion Conference & Expo, San Marcos. Embassy Suites. Water Environment Assn. of Texas (WEAT) Event. For info: www.weat.org

August 13-23 ME
Taxonomic Identification of Harmful Algae in US Marine Waters Training Course, East Boothbay. Bigelow Laboratory for Ocean Sciences Research and Education campus. Provasoli-Guillard National Center for Marine Algae and Microbiota (NCMA), with support from NOAA, is offering the second annual US training course. For info: https://ncma.bigelow.org/merhab-course

August 14-15 TX
Wastewater Capacity, Management, Operation & Maintenance (CMOM) 2017 Conference, Austin. Austin Convention Center. EPA, WEAT, TCEQ, City of Austin Event. Dynamic System Operation Framework. For info: www.weat.org

August 15-19 WA
The Council of State Governments West Annual Meeting: Innovation is Our Nature, Tacoma. Hotel Murano, 1320 Broadway. For info: http://www.csgwest.org/annualmeeting/default.aspx

August 24-25 AZ
Arizona Water Law Conference: Balancing the Rights & Interests of All Arizonians, Scottsdale. Hilton Scottsdale. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

September 10-11 Israel
Cutting-Edge Solutions to Wicked Water Problems Conference, Tel Aviv. Tel Aviv University. Sponsored by American Water Resources Assoc. & Water Research Center at Tel Aviv University. For info: http://www.awra.org/meetings/Israel2017/

September 11-12 NM
25th Anniversary SuperConference - New Mexico Water Law: The History & Future of Our Water Resources, Santa Fe. La Fonda Hotel. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

September 11-12 CA
Climate Change and Energy in California, San Francisco. Marriott Marquis Hotel. For info: Law Seminars Int'l, 206/ 567-4490 or www.lawseminars.com

September 11-13 WY
The Environmental Council of States Fall Meeting, Jackson. Snow King Resort. For info: www.ecos.org/event/2017-ecos-fall-meeting/

September 13 WA
Emerging Issues in Water Quality Regulations Seminar, Seattle. Hilton Garden Inn Downtown. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

September 15 CA
California Environmental Quality Act (CEQA) Seminar, Santa Monica. DoubleTree Guest Suites Santa Monica Hotel. For info: Law Seminars Int'l, 206/ 567-4490 or www.lawseminars.com

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CALENDAR

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September 17 WA
Washington Environmental Cleanup: CERCLA & MTCA, Seattle. Washington State Convention Ctr. For info: Environmental Law Education Center, www.elecenter.com/

September 17-21 TX
EPA Region 6 Stormwater Conference and LID Competition, San Antonio. Hilton Palacio. Organized by EPA Region 6, in partnership with San Antonio, Texas, Texas A&M University Kingsville, Municipal Separate Storm Sewer Systems (MS4s), and States in Region 6.. For info: Nelly Smith, EPA, smith.nelly@epa.gov

September 18-19 CA
California Coastal Law Conference: Legal, Policy & Commission Updates, Los Angeles. Los Angeles Athletic Club. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

September 18-20 AUST
10th International Riversymposium and Environmental Flows Conference: Sustainable River Basin Management, Brisbane, Australia. Presented by International River Foundation. For info: http://riversymposium.com/

September 18-20 NV
WaterPro Conference - Annual Conference of the National Rural Water Assoc., Reno. Grand Sierra Resort. For info: http://waterproconference.org/

September 20 TX
Pollution Prevention Waste Management Workshop, Austin. J.J. Pickle Research Campus, University of Texas at Austin. Presented by Texas Commission on Environmental Quality. For info: www.tceq.texas.gov/p2/events

September 25-26 CA
Endangered Species Act Conference, San Francisco. BASF Conference Center. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

September 25-27 CA
CASQA in the Capital: Building Bridges for Water: California Stormwater Quality Association (CASQA) Annual Conference, Sacramento. Sacramento Convention Center. For info: www.casqa.org/events/annual-conference/hotel-and-travel

September 26-27 CO
Indian Law & Natural Resources: The Basics & Beyond Institute, Westminster. Marriott Hotel. For info: Rocky Mt. Mineral Law Foundation, 303/ 321-8100, info@rmmlf.org or www.rmmlf.org

September 28-29 MT
Montana Water Law - 17th Annual Seminar, Helena. Great Northern Hotel. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

September 30-Oct. 4 IL
WEFTEC 2017: The Water Quality Event & Exhibition, Chicago. McCormick Place North & South. Presented by Water Education Foundation. For info: www.weftec.org/future-weftec-schedule/

October 3 WA
2017 AWRA Washington State Conference: "The 100 Year Anniversary of the Washington Water Code: Where We Came From & Where We're Going", Seattle. Mountaineers Seattle Program Center, 7700 Sand Point Way NE. Presented by Washington Section of the American Water Resources Assoc. For info: http://waawra.org/event-2504575