Lessons from California's Journey in Water Markets

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Chairman Larsen and members of the House Committee on Natural Resources. Thank you for the opportunity to share my experiences developing water markets in California and throughout the west. Over thirty years in the evolution of California water markets provides insights that may prove useful for Texas as it considers the potential benefits and challenges to expanded water markets in Texas.

My name is Rodney T. Smith, President of Stratecon Inc. a strategic planning and economic consulting firm specializing in water resources. As an advisor to the Imperial Irrigation District during the negotiation of the multi-billion-dollar, long-term lease of up to 200,000 acre-feet per year of conserved water to the San Diego County Water Authority, I learned first-hand how to juggle the many facets of a successful transaction: economics, finance, science, engineering, law, policy and politics. I am routinely involved in due diligence and negotiations of water resource acquisitions and project development. My career started at the RAND Corporation, a Santa Monica, CA based think tank specializing in rigorous analysis of public policy issues.

What has this water warrior learned? I start with specific lessons and wrap up with strategic implications for Texas. As publisher of the Journal of Water (www.journalofwater.com) and a blog (www.hydrowonk.com) I'm in print on these matters. I provide links to materials that explore issues in greater detail.

Lesson 1: Recognize private property rights in water and keep to it.

In 1991, California faced a severe drought with dramatic reductions in available surface water. The federal Central Valley Project and the State Water Project lacked any significant water supplies. More senior surface water right owners controlled the available water.

Then Governor Wilson faced a policy choice. Some suggested the use of emergency powers to reallocate available water supplies by regulatory fiat. Others counseled that a drought water bank be created based on voluntary transactions where owners of high priority surface water rights (who faced no supply cutbacks) make water available to water users with low priority surface water rights (who faced severe supply cutbacks) at negotiated prices.

After inevitable policy debate, Governor Wilson favored voluntary transactions. The bank acquired more than 800,000 acre-feet of water in a few months. The voluntary reallocation of water cut the economic losses from the drought by hundreds of millions of dollars.

The following year California's Department of Water Resources commissioned a study of outside experts to provide a "Retrospective" on the 1991 Drought Water Bank. As a team member,

we conducted extensive interviews with various stakeholders. Among the dozens of findings and recommendations was that the policy debate over whether to use emergency powers to reallocate water placed a significant damper on the willingness of senior water right owners to engage in voluntary transactions.[1] The specter of regulatory takings diminished the effectiveness of addressing water supply challenges during the drought and thereafter. California could have done better by exclusive reliance on voluntary transactions.

Any river adjudications in Texas require fine-tuning?

Lesson 2: Landmark transactions (i) arise from solving real problems and (ii) require political entrepreneurship

Later in the 1990s, California was facing a severe challenge on the Colorado River. To facilitate passage of the Boulder Canyon Project Act (that resulted in the construction of Lake Mead), California passed legislation in 1927 to limit its use of Colorado River water to 4.4 million acre-feet per year. With Arizona and Nevada not fully utilizing their Colorado River entitlements, California was using 5.2 million acre-feet per year of Colorado River for decades. The southern California regional wholesale agency, the Metropolitan Water District, planned to rely on the continued availability of excess Colorado River water. However, Arizona development of groundwater storage programs for water available under their Colorado River entitlement (as a precaution against future water shortages) and growth in Nevada by the mid-1990s made continued reliance on excess Colorado River water for California a fool's errand.

San Diego's business community refused to bet their region's economic base on Metropolitan's planning assumptions. They provided the political support for the San Diego County Water Authority, the regional water supplier in San Diego, to seek their own water supplies independent of Metropolitan. San Diego's General Manager Maureen Stapleton became a political entrepreneur.

At the same time, the largest user of Colorado River water in the entire Colorado River Basin, the Imperial Irrigation District anticipated attempted regulatory takings by junior water right owners. Junior water right owners believed that a State Water Resources Control Board action regarding Salton Sea flooding provided a "key to the kingdom" for making water available for free. With a county population of 140,000 versus 16 million residents in urban Southern California, Imperial sought a strategic political partner. This formed the basis of the long-term lease of conserved water to San Diego. Imperial's board members supported by landowners (but not all) became political entrepreneurs.

Imperial and San Diego needed a road map to navigate the shoals of federal and state politics. Then Secretary of the Interior Bruce Babbitt was the lead federal political entrepreneur. A former Arizona Governor who established marketable groundwater rights through the state's 1980s Groundwater Management Act, Secretary Babbitt laid out that acceptable transactions based on water conservation should be based on measured reductions in water use from a defined

[1] See "Retrospective on California's 1991 Emergency Drought Water Bank", Nancy Moore (RAND Corporation), Richard Howitt (UC Davis) and Rodney T. Smith (Stratecon Inc., https://searchworks.stanford.edu/view/2178497.

baseline. This provided the impetus for Imperial's unprecedented and unanticipated offer to quantity its senior Priority 3 water right to Colorado River water at 3.1 million acre-feet per year as part of implementation of the San Diego agreement.

Being California, there were also environmental challenges, most significantly the impact of water conservation on the Salton Sea, California's largest lake. Reduced inflows into the Salton Sea were anticipated to lower sea elevations, expose playa with toxic residues generating public health risks and accelerating salinity leading to ecosystem collapse. Governor Davis placed the highest priority on finding solutions. On Governor's Davis behalf, former Assembly Speaker Robert Hertzberg and later former legislator and member of the State Water Resources Control Board, Richard Katz, lead multi-party negotiations involving water districts, landowners, environmentalists, Indian Tribes, state legislators and state and federal agencies. The result was a grand bargain providing a 15-year window of stabilized sea conditions, so the state could address Salton Sea problems in exchange for indemnification of local interests for responsibility to address the Salton Sea.

Significant water challenges involve statewide interests. Leadership at the local level and from the executive branches of government proved essential. Major change will not occur without political entrepreneurs. A key question for the private sector is "where are the political entrepreneurs in Texas"?

Lesson 3: Market Transactions Range from Project Development to Trading of Water Rights

The Imperial-San Diego agreement is best viewed as a negotiated project based on defined measures of water conservation (land fallowing, efficiency conservation, and system infrastructure improvements). The Drought Water Bank was a centralized market for acquisition of available surface water from water rights and from storage.

In groundwater, California has used groundwater adjudications (negotiated settlements) to create defined pumping rights to address groundwater overdrafts. These adjudications are examples of local interests addressing local water challenges. These rights can be leased or sold within an adjudicated basin. If a water user pumps more groundwater than they have rights, they must acquire rights from other water users or pay a financial assessment to the basin's "watermaster" to fund the acquisition of supplemental water for the basin. Lease prices are driven by (i) the financial assessment incurred when pumping exceeds rights, and (ii) the extent to which actual pumping of groundwater in the basin approaches the total groundwater rights in the basin. Lease prices drive the market price of groundwater rights.[2]

In 2014, the California Legislature enacted the *Sustainable Groundwater Management Act ("SMGA")*, requiring local interests to address widespread groundwater overdrafts throughout the Golden State. While we are at the beginning, many believe that local institutions will follow the

[2] For discussion of an adjudicated basin and price formation, see "Economics of Water Prices in the Mojave River Basin Adjudication: Alto Subbasin", *Journal of Water*, February 16, 2015, https://journalofwater.com/jow/economics-of-water-prices-in-mojave-river-basin-adjudication-alto-subarea/.

experiences of adjudicated groundwater basins, including the trading of groundwater rights established pursuant to SGMA.

Is this a model for Groundwater Conservation Districts in Texas groundwater pumping approaches the sustainable yield of basins?

Lesson 4: Transportation Arrangements are Critical

California is blessed with regional pipelines (California Aqueduct, Central Valley Project and Colorado River Aqueduct). Transportation arrangements are critical for successful water deals. In the 1980s, then Assemblyman Richard Katz carried legislation ("the Katz wheeling bill") that defined the terms and conditions under which a water deal can gain access to facilities owned by a third party. The two major conditions are (i) unused capacity and (ii) payment of reasonable compensation.

The Metropolitan Water District attempted to use their ownership of the Colorado River Aqueduct to fight the Imperial-San Diego deal. David Kennedy, Executive Director of California's Department of Water Resources was directed by Governor Davis to "drill down on the facts". His concluded that reasonable compensation was close to the Imperial-San Diego position. To provide a benefit for Metropolitan, he recommended that the state fund the Lining of the All American and Coachella Canals that, provided under federal law, Metropolitan about 80,000 acre-feet per year of conserved water. This provided the impetus for the California Legislature to pass a bill recognizing a water exchange agreement between Metropolitan and San Diego incorporating Director Kennedy's recommendations.

Things sometime change in water world. In 2003, as definitive negotiations among the various parties was reaching a conclusion on the Imperial-San Diego and related agreements, Metropolitan conveyed to San Diego their "call rights" to conserved water from the state-funded lining of the All American and Coachella Canals. In return, San Diego agreed to terminate the legislatively-approved exchange agreement and pay transportation charges consistent with Metropolitan's interpretation of the Katz wheeling bill for five years. Metropolitan and San Diego then litigated for years with San Diego winning superior court decisions and Metropolitan prevailing at the appellate court. When the California Supreme Court decided not to hear San Diego's appeal, the legal controversy is settled. Unless the Legislature intervenes, the appellate court decision will tilt future transactions in favor of Southern California acquiring water from Northern California.[3]

[3] For discussion how the appellate court decision tilted the economics of water transactions in California, see "Appellate Court Wheeling Decision Puts More Pressure on Northern California Water Supplies, *Hydrowonk Blog,* August 29, 2017, https://hydrowonk.com/blog/2017/08/29/appellate-court-wheeling-decision-puts-more-pressure-on-northern-california-water-supplies/.

Lesson 5: Science Matters

Successful water management and transactions require a firm understanding of the consequences of the amount, location and use of water resources on other water right owners and ecosystems. To this end, California has invested resources into understanding the variability in the yield of the State Water Project in the face of hydrologic risk and regulatory restrictions. It has invested in the science of the state's Bay Delta resources. To assist its efforts at Salton Sea restoration, the state has invested in models of the Salton Sea's ecosystem.

The federal government has also invested in the development of an extensive model of the Colorado River system. This tool has been used to develop objective criteria for decision-making by the Bureau of Reclamation concerning declaration of shortages or surpluses on the Colorado River. Current decisions on "drought contingency planning and agreements" could not have proceeded without science.

Poaching on the next panel's topic, California's experience suggests that Texas should consider developing a policy towards science. While I have many thoughts about science, what I want to focus on here is that science should not become a "black box" for policy-makers, water users and the private sector. Instead, science must be developed with transparency. Models must be tested regularly, and predictions verified through ground-truthing. Otherwise, water resource management can run afoul of reality.

Two examples from California illustrate my point. Every two years, California's Department of Water Resources publishes a study on the variability in the yield of the State Water Project. In the last study issued before the serve drought beginning in 2014, DWR concluded that the minimum yield of the State Water Project was 8%. DWR subsequently declared a SWP yield of zero.[4] Interestingly, the $18 billion California WaterFix project is justified by the same computer modeling. What could possibly go wrong?

The second example involves the Salton Sea. Buttressed by computer models developed by the Bureau of Reclamation, the "Hertzberg" discussions developed a water conservation and mitigation plan that was to maintain the elevation of the Salton Sea through 2017. In fact, the elevation of the Salton Sea had peaked in the late 1990s and started a declining trend in elevation that accelerated in 2006. A definitive explanation (or diagnosis) has yet to be found. Nonetheless, California has initiated a $400 million 10-year plan to address the environmental and public health risk at the Salton Sea. Action ahead of understanding may fail due to "the law of unintended consequences.[5]

[4] For discussion of the implications of a zero allocation for rethinking the State Water Project, see "Rethinking California's Water Industry: Part 1—A Zero State Water Project Allocation World,", *Hydrowonk Blog*, February 26, 2014 https://hydrowonk.com/blog/2014/02/26/rethinking-californias-water-industry-part-1-a-zero-state-water-project-allocation-world/.

[5] For discussion of the inadequate scientific understanding of the Salton Sea, see "Why Is the Salton Sea Over There?", *Hydrowonk Blog,* March 30, 2017, https://hydrowonk.com/blog/2017/03/30/why-is-the-salton-sea-over-there/.

The Texas Commission on Environmental Quality in surface water and the Texas Water Development Board for groundwater have critical roles to play going forward.

Strategic Implications for Texas

The take-aways from my experience and expertise are that political entrepreneurs are essential for success in the water sector. Real problems of regional or if not, statewide significance may command the interest of political entrepreneurs. Theoretical ideas and hypotheticals are on the "cutting room floor." Invest in the science of water resource management issues so that there can be structure to the inevitable debates surrounding the impacts of water projects and transactions. Science should be asked to develop monitoring and mitigation plans to confront the accuracy or inaccuracy of predictions and how best to adapt to changing circumstances.

From my perspective, Texas has pressing water problems in the Permian and Corpus Christi. It is time for Lone Star political entrepreneurs to get to work. The Permian must address the transitions from trucking to pipelines and the proper regulatory framework for developing brackish groundwater for the Oil & Gas industry.[6] Corpus Christi's economic development potential can be realized with a regional water supply strategy based on desalination of brackish groundwater and seawater. In both instances, the economic stakes for success are substantial. There will come a time when the economic consequences of further delay are unsustainable.[7]

Thank you all for your attention. I stand ready to address any questions you may have. Also, feel free to reach out if you have any follow-up questions or inquiries after today.

[6] For discussion of the key challenges, see "Looking Forward: Importing Institutional Concepts from the Water World, Rodney T. Smith, speech before the inaugural Permian Basin Water in Energy Conference, ttps://www.stratwater.com/looking-forward-importing-institutional-concepts-from-the-water-world/.

[7] For discussion of the key drivers of institutional change, see "When Will Gridlock in Water Work Stop", Journal of Water, December 3, 2013 https://journalofwater.com/jow/when-will-gridlock-in-water-world-stop/. The tipping point for institutional change where a critical threshold is reached where seemingly small changes yield fundamental and permanent changes.