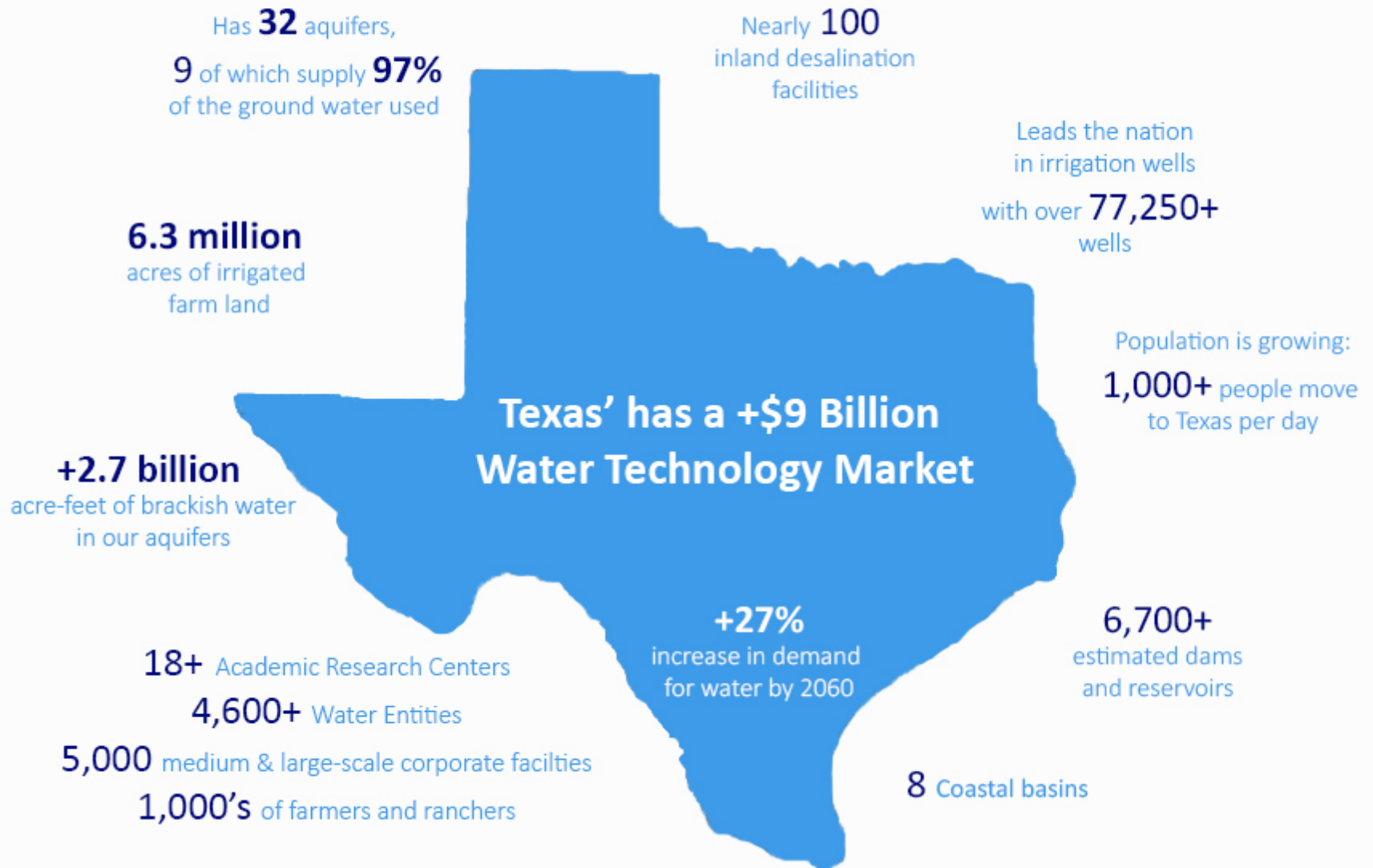


Making Texas A Global Hub of Water Technology, Innovation, & Economic Competitiveness





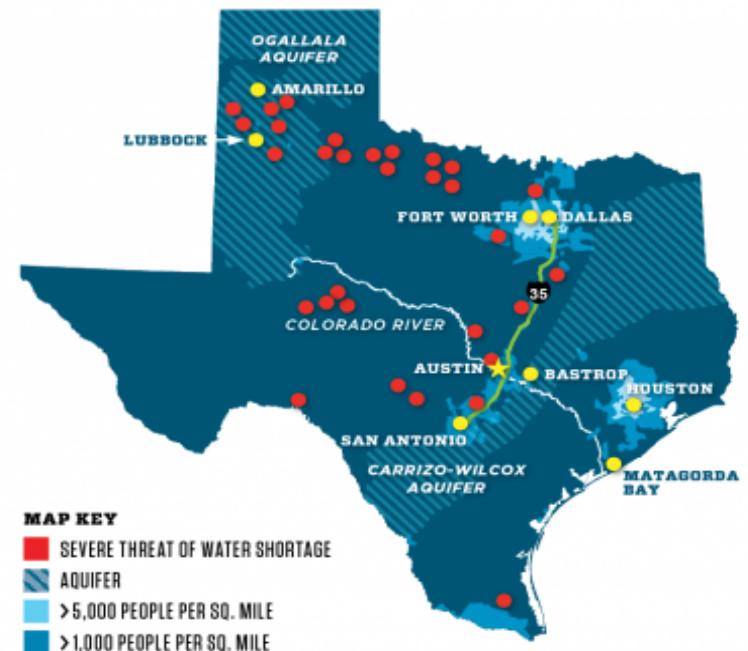
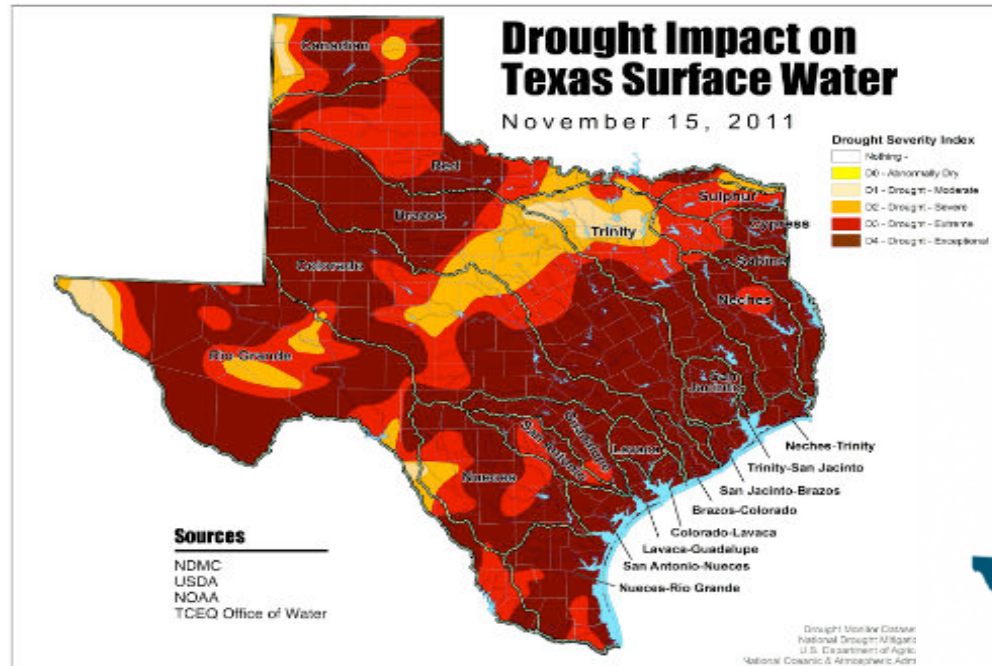
Our Objectives

We all know that water is an ongoing challenge for Texas

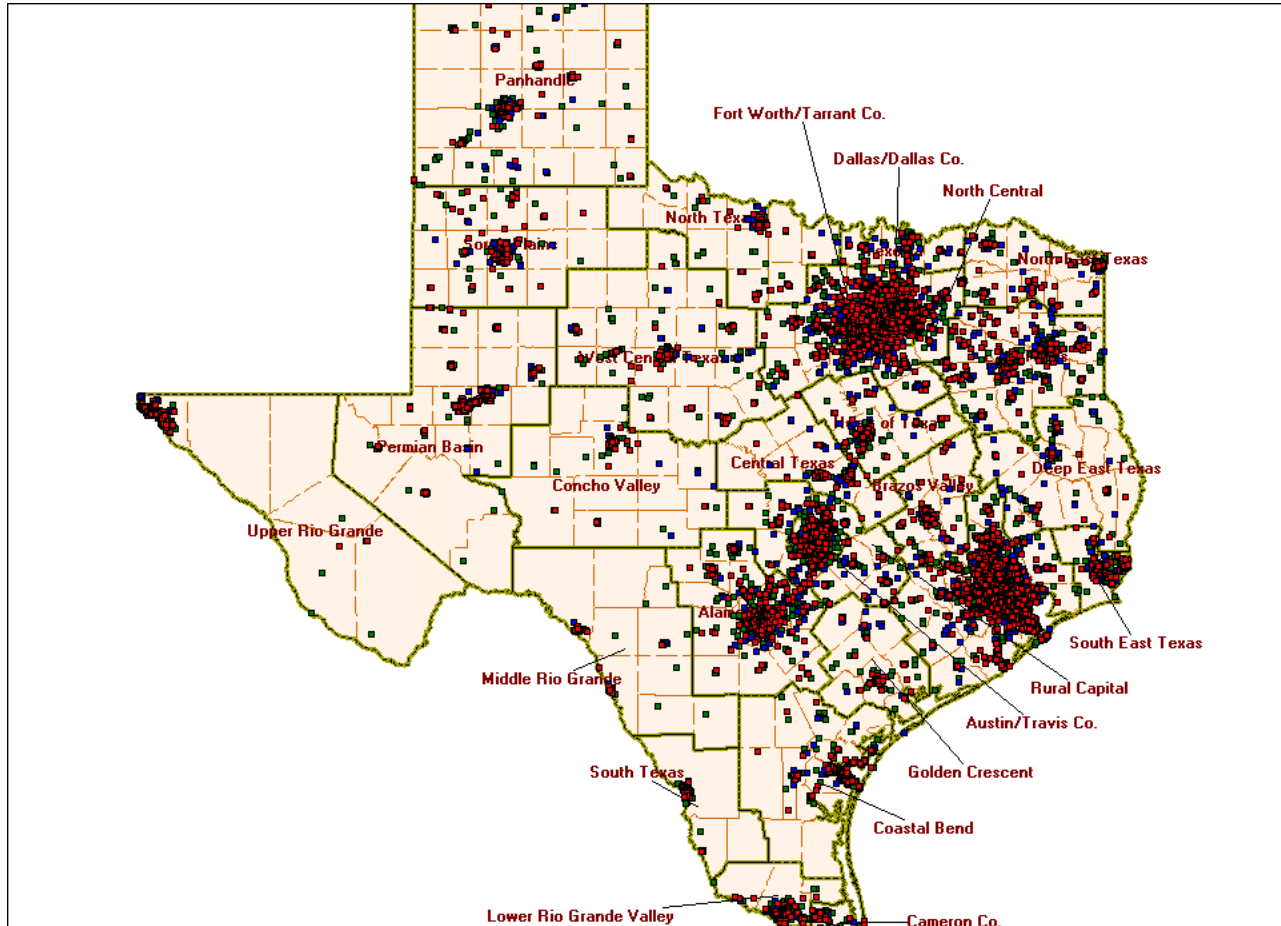
One way to meet that challenge is use the world's best technologies to make all sources of water go farther. However there are barriers and limitations that keep that from happening.

We formed the Texas Water Technology Accelerator – “AccelerateH2O” – to break through these barriers and put those technologies to work!

The Realities of Droughts – Then, Now, Tomorrow

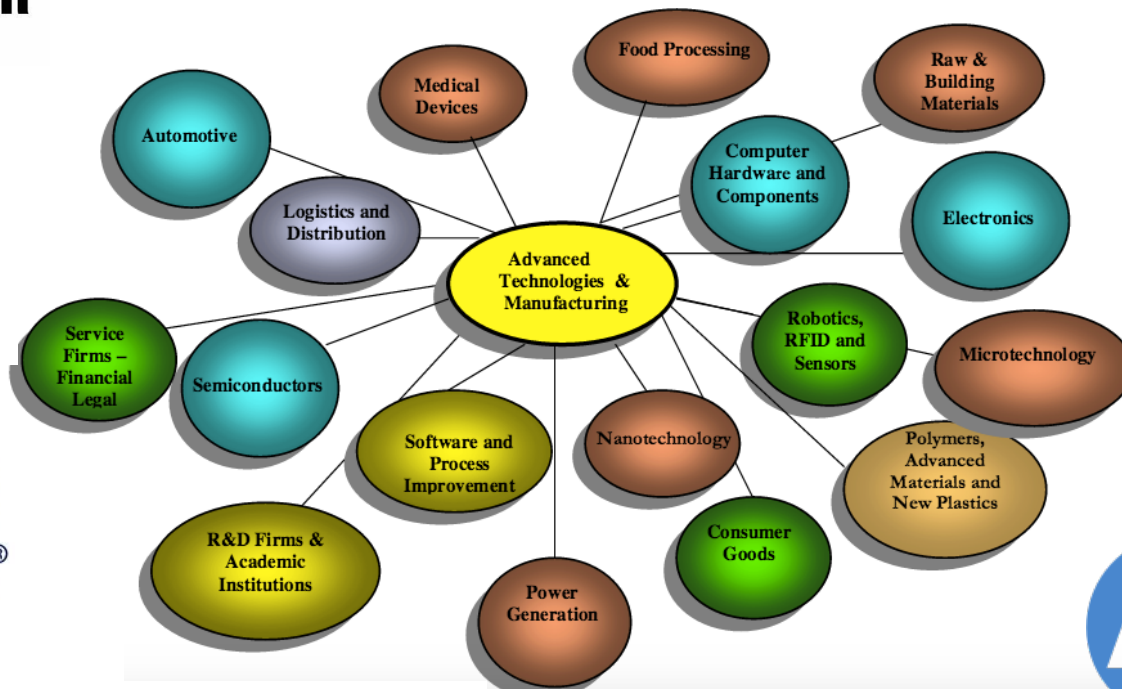
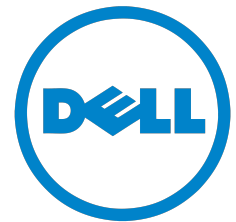


Texas IS A Whole Other Country of Opportunity



Leveraging and responding to the needs of 5000+ corporate plants, campuses, facilities requiring water for production and manufacturing

Global Brands for Sustainability of Water & Innovation



Our Mission Statement:

“...AccelerateH2O is a driver of Texas’ \$9 billion water technology market by organizing assets, expertise, knowledge, and resources to more efficiently and effectively respond to our current crisis and position us as the leading Global Water Technology Hub...”

Barriers and Limitations: Innovating Water in Texas

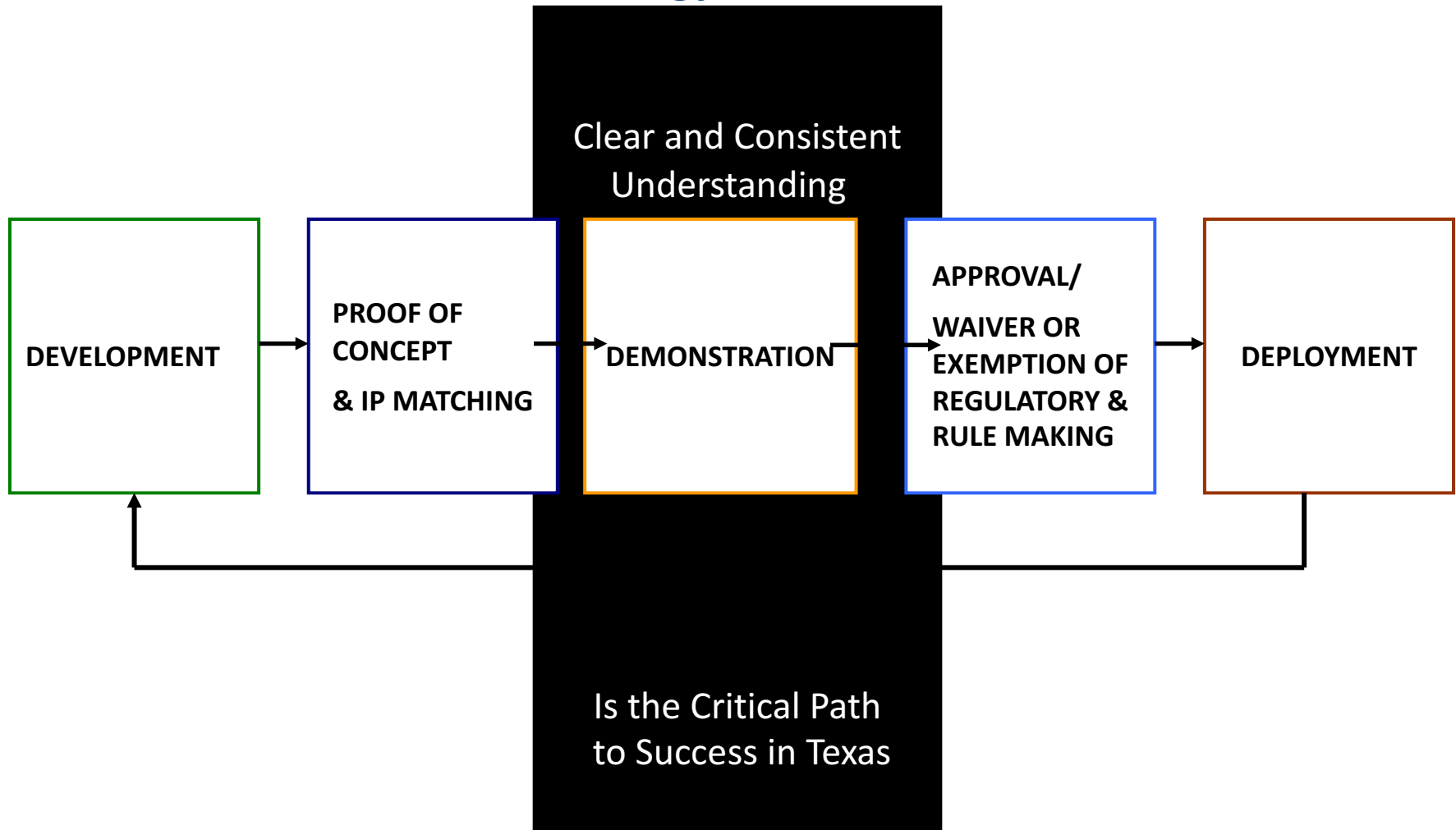
AccelerateH2O has identified several barriers and limitations requiring immediate attention to assure Texas is truly innovating water. We have also identified best practices, approaches, and opportunities to address these limitations – as noted in our agenda and activities.

- Regulatory and Rule-Making
- Economic and Business Models
- Adoption of New Solutions
- Integration into Existing Operations and Use
- Perceptions and Culture of Risk Adversity
- Proving Effectiveness and Efficiency of Products, Services
- Regional and State Water Planning Processes
- National, State and Local Rule Conflicts
- Traditional versus Innovative Engineering Practices
- Alternative Investment and Financing Tools

Proposed Grand Challenge Topics: WaterQuest Competitions

- **Brine, Concentrate Management from Desalination**
- **Produced Water & Waste from Energy Processes**
- **Arsenic and Radon in Small Water Systems**
- **Reduction of Energy Demand in Desalination**
- **Storm-Water, Run-Off Impact Reductions**
- **Leak Detection and Advanced Sensors, Monitoring**
- **Integrated Data, Modeling, Instrumentation**
- **Location, Mapping Desal of Brackish Waters & Aquifer Recharge**
- **Advanced “Smart” Irrigation Systems**

Our Scope of Work: Streamlining a More Efficient and Effective Water Technology Value Chain



Strategic High Impact Projects: Water Technology Innovation & Demonstration Nodes

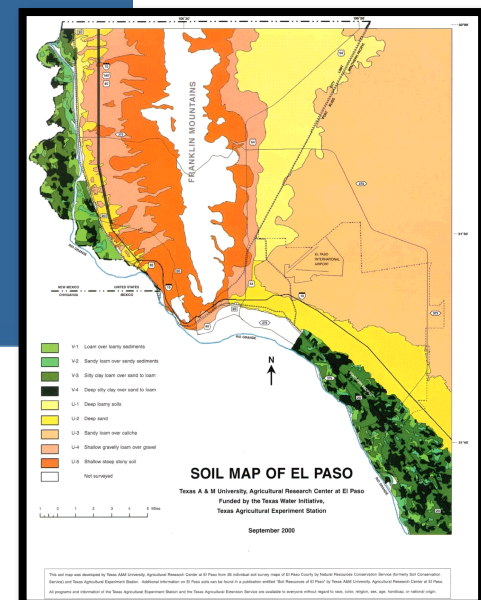


Objectives of Innovative Demonstration Hubs

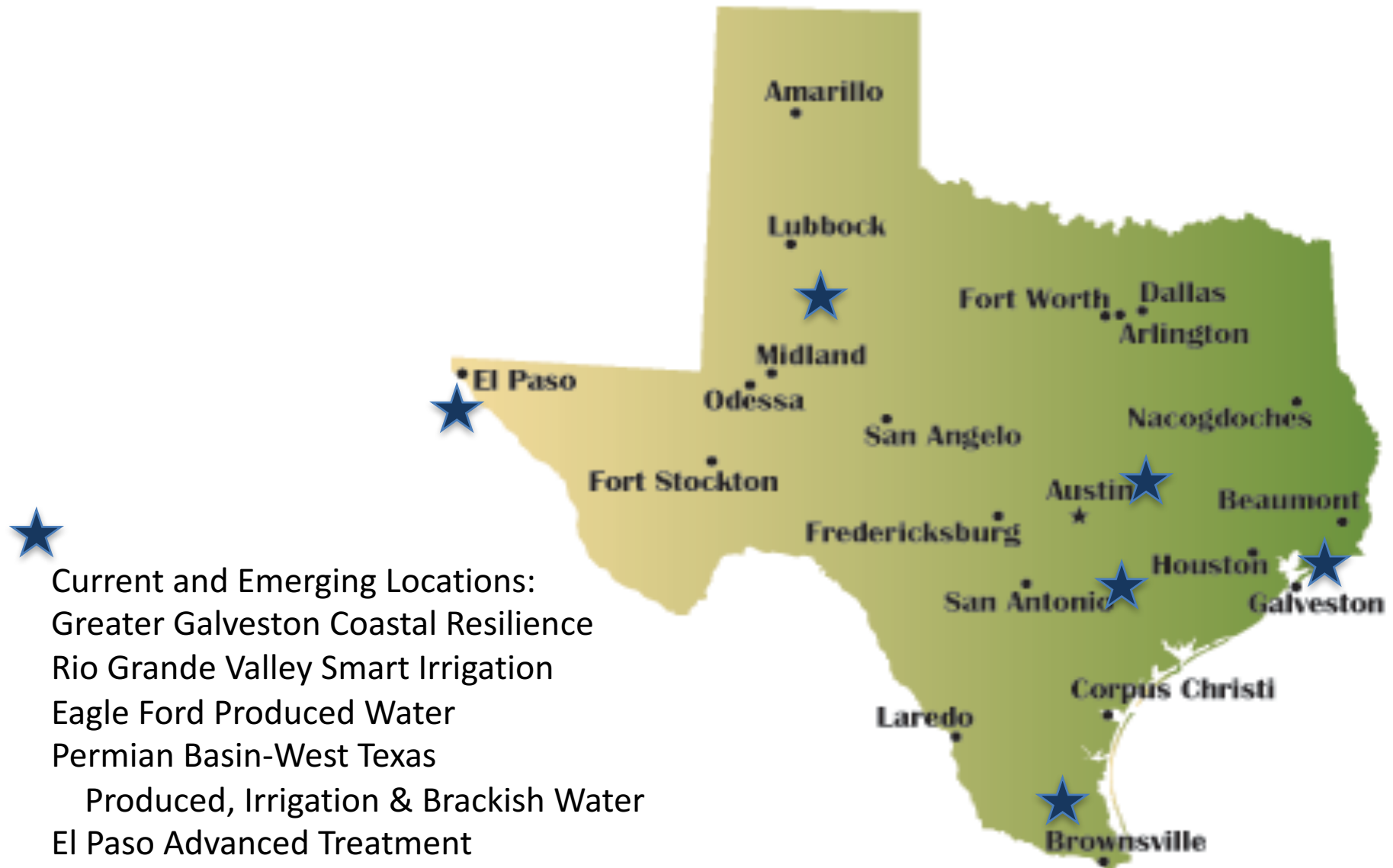
- Professionally organized, managed, delivered testing, evaluation, demonstration of existing and emerging technologies to solve specific use-cases and demands
- Establish baselines for scientific, engineered, and technical determinations, approvals, efficacy
- Integrate solutions with current operations, future expectations
- Economically prove and deploy solutions, practices, and technologies that position Texas as a global source of innovation

The map illustrates the water infrastructure in El Paso, Texas, and its proximity to Ciudad Juárez, Mexico. Key features include:

- Geography:** The Franklin Mountains are shown in brown, and the Rio Grande forms the border with Mexico.
- Surface Water Plants (Yellow Cylinders):**
 - Upper Valley Water Treatment Plant (located near the Rio Grande in the north).
 - Kay Bailey Hutchison Desalination Plant (located in the east).
- Groundwater Plants (Green Cylinders):**
 - Robertson & Umbenhauer Water Treatment Plant (located near the border).
 - Jonathan Rogers Water Treatment Plant (located further south).
- Infrastructure:**
 - Water distribution lines (solid white lines) and wastewater collection lines (dashed yellow lines) are shown.
 - Other landmarks include Fort Bliss, the Airport, and the Military Reservation.
- Legend:** A blue box in the bottom left corner identifies the yellow cylinders as "Surface Water Plants" and the green cylinders as "Groundwater Plants".



Innovative Water Demonstration Hubs



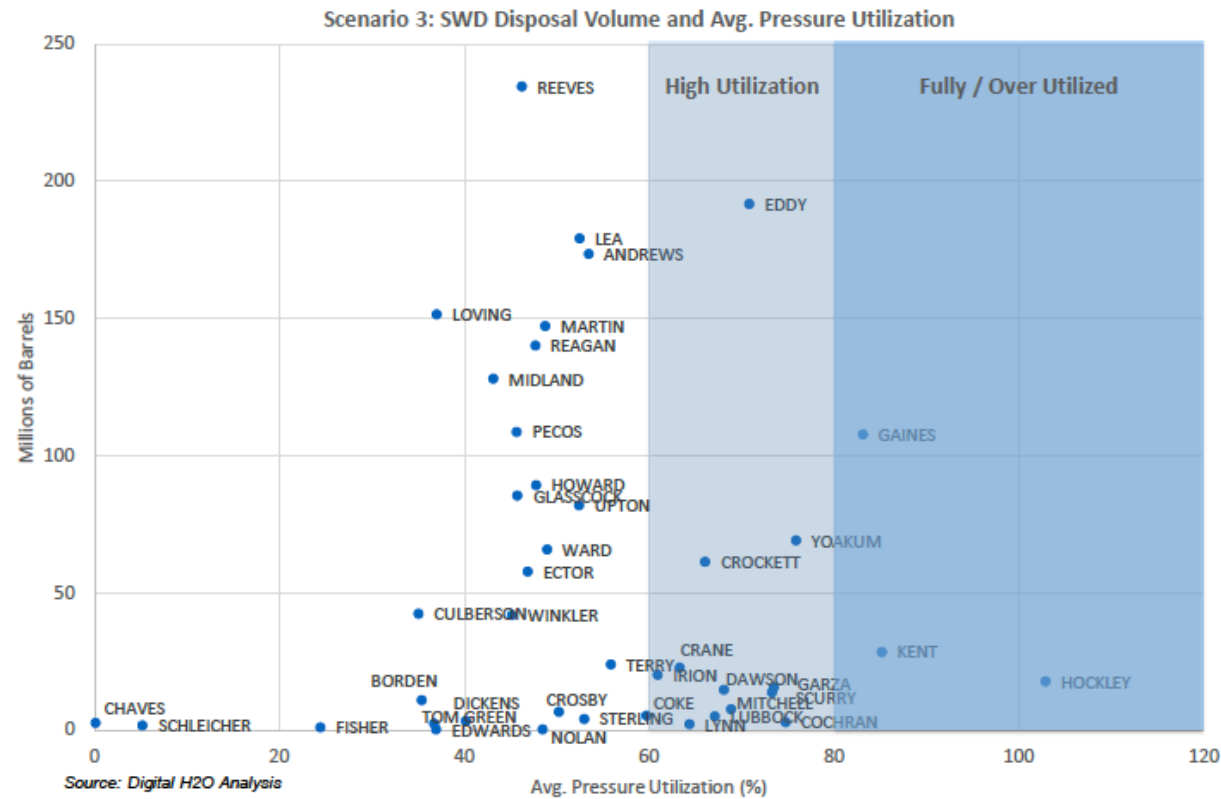
Demonstration Hub Framework

- Responding to Growth and Mature Stage Technologies
Required Field-Test and Evaluation for Permitting, Investing,
Procuring Decision-Makers
- “Concierge” Type of Service Model to Identify, Secure,
Organize, and Deliver Professional Demonstrations On or
Adjacent to Specific Water Quality, Geology, Industry, End-
User Base
- Streamline the Process for Scientific, Engineered Evaluation
and Approval
- Connect Real-Time Knowledge Sharing, Learning, Application
of Results and Findings

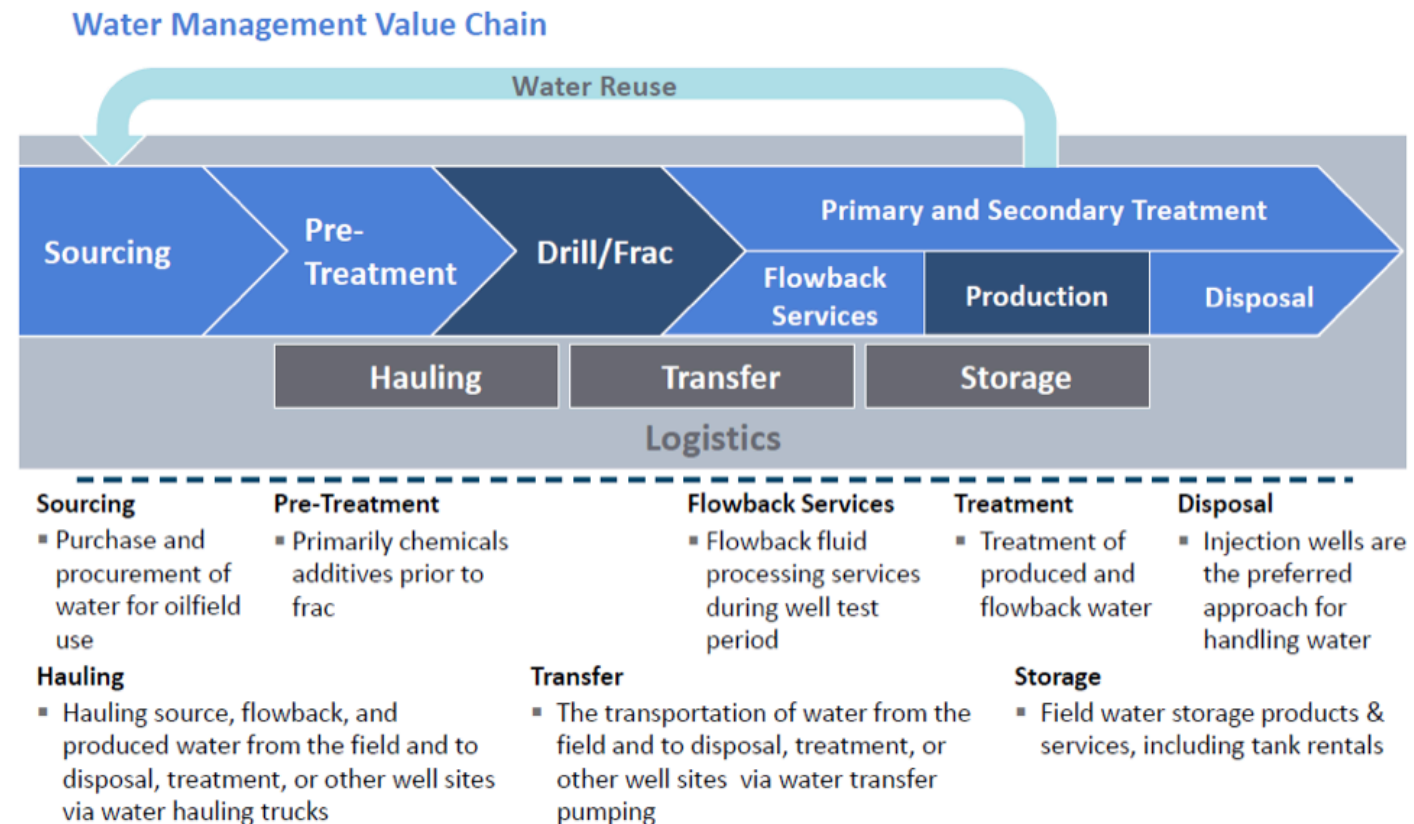
SWD & DISCHARGE DEMAND NO.3

Disposal Capacity Constraints Become Acute With \$70 Oil

3



Integrating along value chains



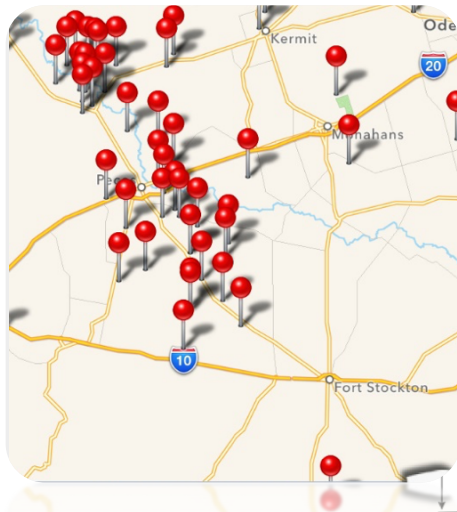
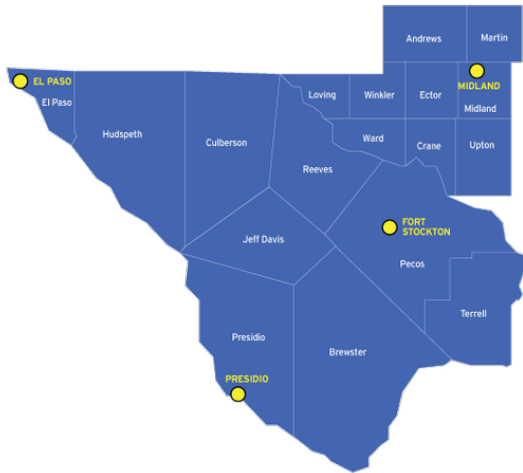
Example: Produced Water from Conventional and Unconventional Energy Activities

Partnership with Leading SWD and Energy-Water Nexus Management Consulting Team

- 150'x150' site pad with access to truck, tank, and discharge well waters, related facilities and testing equipment;
- Site licensed, existing and required permits for handling water and waste;
- Safety and health program, site operations, and workforce/visitor agreements
- Source water baseline, discharge of waste and/or off-site discharge partnership with River/Municipal

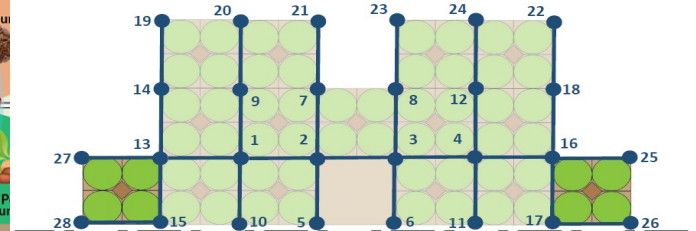
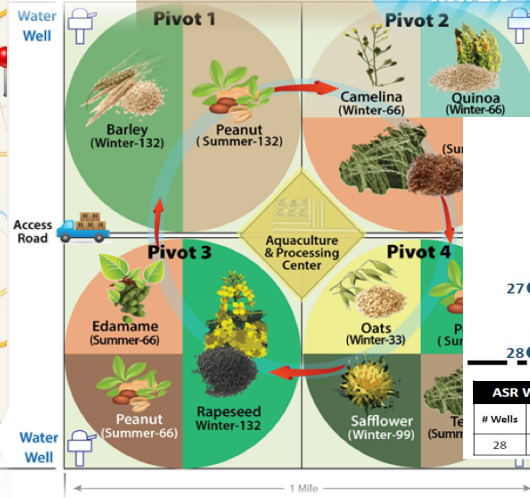
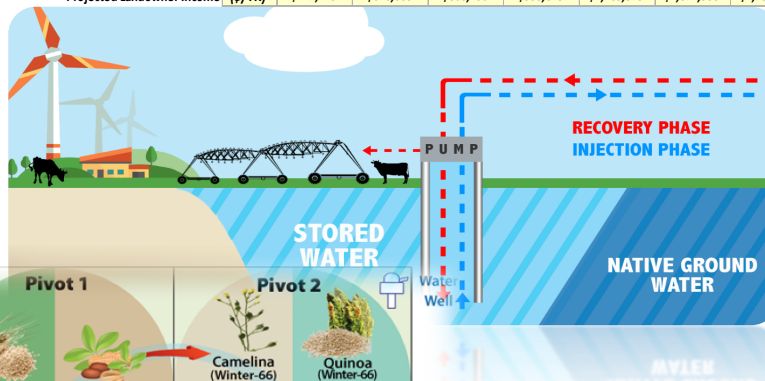


West Texas: Targets of Opportunity



Agriculture 10 - Year Phased Implementation Plan										
AF/Y	5663	8494	11325	14156	16988	19819	25481	31144	36806	42469
AF/D	15.5	23.3	31.0	38.8	46.5	54.3	69.8	85.3	100.8	116.4
MGD	5.1	7.6	10.1	12.6	15.2	17.7	22.7	27.8	32.8	37.9
GPM	3509	5264	7019	8773	10528	12282	15792	19301	22810	26319
ACRES	1920	2560	3200	3840	4480	5120	6400	7680	8960	10240

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Water Right(s) Lease (\$/AF):	\$283,125	\$424,688	\$566,250	\$707,813	\$849,375	\$990,937.50	\$1,274,063	\$1,557,188	\$1,840,313	\$2,123,438
Land Right(s) Lease (\$/ACRE):	\$144,000	\$192,000	\$240,000	\$288,000	\$336,000	\$384,000	\$480,000	\$576,000	\$672,000	\$768,000
Projected Landowner Income (\$/YR)	\$427,125	\$616,688	\$806,250	\$995,813	\$1,185,375	\$1,374,938	\$1,754,063	\$2,133,188	\$2,512,313	\$2,891,438



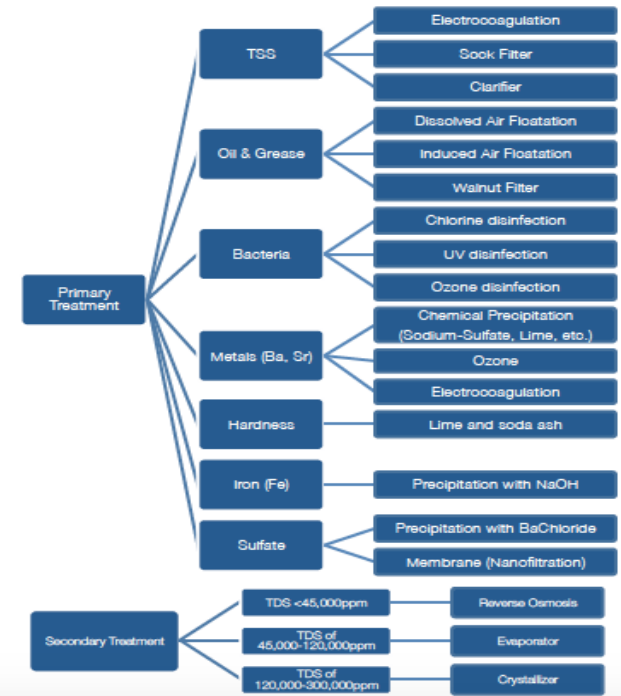
ASR Wellfield Inventory		
# Wells	Capacity (GPM)	Capacity (AF)
28	21,000	33,810

Land Inventory	
Land Lease (Acres)	Irrigation (Acres)
10,240	7,920

Our Partners for Implementing Goals



USA Shale Gas Produced water Treatment Insight Report



Market Opportunities for Desalination in Texas

					Capital Costs (When the facility was built)	Plant Design Capacity (including blending) MGD	Membrane Recovery
Facility Name	City	Startup Year	Source Water	Process			
Big Bend Motor Inn (Hargesheimer Treatment Plant)	Terlingua	1989	GW	RO	26,000	0.057	0.75
	Tuscola	2003	SW	RO	NA	7.95	0.65 to 0.78
City of Bardwell	Bardwell	1990	GW	RO	100,000	0.252	0.6
City of Bayside	Bayside	1990	GW	RO	NA	0.045	NA
City of Beckville	Beckville	2004	GW	RO	400,000	0.216	0
City of Brady	Brady	2005	SW	RO	9,000,000	3	0.75
City of Clarksville City	White Oak	2006	GW	RO	1,539,000,000	0.288	0.75
City of Evant	Evant	2010	GW	RO	250,000	0.1	0.8
City of Fort Stockton		1996	GW	RO	6,000,000	6.5	0.8
Original EDR Plant was built in 1984; in 2007 RO Plant							
City of Granbury	Granbury	2002	GW	RO	600,000		
City of Hubbard	Hubbard	1995	GW	RO	NA		
City of Kenedy	Kenedy	1995	GW	RO	NA		
City of Laredo	Laredo	1996	GW	RO	NA		
City of Los Ybanez	Los Ybanez	1991	GW	RO	300,000		
City of Robinson	Waco	1994	SW	RO	6,000,000		
City of Seadrift	Seadrift	1998	GW	RO	1,200,000		
City of Seymour	Seymour	2000	GW	RO	4,500,000		
City of Sherman	Sherman	1993	SW	EDR	NA		
City of Tatum	Tatum	1999	GW	RO	NA		
Cypress Water Treatment	Wichita Falls	2008	SW	RO	NA		
Dell City	Dell City	1997	GW	EDR	NA		
DS Waters of America, LP	Katy	1997	GW	RO	NA		
Esperanza Fresh Water Supply	Pecos	1990	GW	RO	NA		
Holiday Beach WSC	Fulton	2002	GW	RO	450,000		
Horizon Regional MUD	El Paso	2001	GW	RO	6,800,000		
Kay Bailey Hutchison Desalination Plant	El Paso	2007	GW	RO	87,000,000		
Lake Granbury Surface Water Advanced Treatment System	Granbury	2003	SW	RO	36,600,000		
Longhorn Ranch Motel	Alpine	1990	GW	RO	34,149		
Midland Country Club - fairways & greens	Midland	2004	GW	RO	90,000		
North Alamo Water Supply Corporation (Lasara)	Raymondville	2005	GW	RO	2,000,000		
North Alamo Water Supply Corporation (Owassa)	San Juan	2008	GW	RO	8,000,000		
North Alamo (Doolittle)	Edinburg	2008	GW	RO	NA		
North Cameron Regional	Harlingen	2006	GW	RO	1,783,651		
Oak Trail Shores	Granbury	EDR was installed in 1998; RO replaced EDR in	SW	RO	NA		
Possum Kingdom Water Supply Corporation	Graford	2003	SW	RO	NA		
River Oaks Ranch	Pflugerville	1987	GW	RO	NA		
Southmost Regional Water Authority	Brownsville	2004	GW	RO	13,090,000		
Sportsmans World MUD	Strawn	1984	SW	RO	3,500,000		
Study Butte Terlingua Water System	Terlingua	2000	GW	RO	1,348,000		
The Cliffs (Double Diamond Utilities)	Graford	1991	SW	RO	NA		
Valley MUD #2	Olmito	2000	GW	RO	800,000		
Veolia Water Treatment Plant	Port Arthur	1992	SW	RO	NA		
Water Runner, Inc.	Midland	2001	GW	RO	NA		
Windermere Water System	Austin	2003	GW	RO	A,500,000		

Market Opportunities

Desalination in Texas

This table contains prioritizations of Recommended Water Management Strategy Projects in the 2016 Regional Water Plans specific to brackish desalination and aquifer recharge, as of December 1, 2015. Please note that each WMS prioritization score is based on a maximum of 1,000 possible points.

Unique ID #	Sponsor	Recommended Water Management Strategy (WMS) Name	Capital Cost (\$)	Final Prioritization Score (max = 1,000)
34	COUNTY-OTHER, HUDSPETH	Hudspeth County Other (Dell City) - Brackish groundwater desalination facility	1,299,000\$	710
40	EL PASO	EPWU - Brackish groundwater at the Jonathan Rogers WWTP	65,865,000\$	668.17
11		DESALINATION OF BRACKISH SURFACE WATER (CRMWD DIVERTED WATER SYSTEM) - CRMWD	34,819,000\$	542.12
144	COLORADO RIVER MUD	CONROE BRACKISH GROUNDWATER DESALINATION	40,691,342\$	688.77
335	CONROE	BWA BRACKISH GROUNDWATER DEVELOPMENT	34,016,950\$	522.26
559	BRAZOS RIVER AUTHORITY	Brackish Wilcox Groundwater for SAWS	53,162,000\$	713.83
35	SAN ANTONIO WATER SYSTEM	Expanded Brackish Wilcox Project - SAWS	723,175,000\$	615.67
39	SCHERTZ-SEGUN LOCAL GOVERNMENT CORPORATION	Brackish Wilcox Groundwater for CRWA	62,787,000\$	590.75
46	SAN ANTONIO WATER SYSTEM	Brackish Wilcox Groundwater for SS WSC	16,864,000\$	414.33
48	CANYON REGIONAL WATER AUTHORITY	Brackish Groundwater Development - Alice	15,051,000\$	651.67
56	S S WSC	Sherman - Desalination Water Treatment Plant Expansion 1 Q-13	17,328,500\$	802.18
15	ALICE	Sherman - New 10 MGD Desalination Plant Q-12	34,657,000\$	574.18
131	SHERMAN	Sherman - Desalination Water Treatment Plant Expansion 2 Q-13	29,478,000\$	400.38
512	SHERMAN	Horizon Regional MUD - Additional wells and expansion of desal plant	56,443,000\$	996
557	SHERMAN	EPWU - Expansion of the Kay Bailey Hutchinson Desal Plant	37,200,000\$	797.67
1	HORIZON REGIONAL MUD	Hudspeth County Other (Dell City) - Brackish groundwater desalination facility	1,299,000\$	710
14	EL PASO	DESALINATION OF OTHER AQUIFER SUPPLIES IN TOM GREEN COUNTY - CONCHO RURAL WSC	5,131,000\$	554
34	COUNTY-OTHER, HUDSPETH	DESALINATION OF OTHER AQUIFER SUPPLIES IN TOM GREEN COUNTY - SAN ANGELO	57,967,000\$	403.05
143	CONCHO RURAL WATER CORPORATION	FREEPORT SEAWATER DESALINATION	132,937,747\$	378.05
145	SAN ANGELO	CCP / UGRA - Desalination plant	14,539,000\$	842.33
600	BRAZOS RIVER AUTHORITY	Seawater Desalination - SAWS	1,590,590,000\$	573.42
17	COUNTY-OTHER, KERR	Brownsville Seawater Desalination Demonstration	56,756,000\$	735
50	SAN ANTONIO WATER SYSTEM	Brownsville Seawater Desalination Implementation	319,115,000\$	490.33
66	BROWNSVILLE	Seawater Desalination	248,000,000\$	716.5
122	BROWNSVILLE	Hale County - Abernathy Groundwater Desalination	10,100,000\$	818.33
10	CORPUS CHRISTI	Gaines County - Seminole Groundwater Desalination	31,572,000\$	694.91
15	ABERNATHY	LNRA Desalination	31,393,000\$	574
34	SEMINOLE	EPWU - Recharge of Hueco Aquifer groundwater with treated surface water	1,806,000\$	784.17
5	LAVACA NAVIDAD RIVER AUTHORITY			
17	EL PASO			

Top (“IOHO”) Lessons Learned

- The global expertise, know-how, and reputation exist in Texas for more project implementation and P3s in our own backyard – how do we unleash the best of the private sector to solve Texas’ water challenges?
- It is not the technology nor the capital, it’s the economics of the water
- Quantity of water, quality of the water, AND the cost or price of the water are the three pillars for commercial success
- 50 mgd Seawater versus distributed .5 mgd co-gen Brackish? Seems more opportunities right now for brackish solutions
- Hyper-local markets are better than a few large-scale offtakes several years away
- De-Risk the business, technical model for attracting partners, investors
- Local politics plus concerns about debt-rate structures are THE hurdles
- Mandating a legislative solution for local activities will NOT work
- Offtake, offtake, offtake – like real-estate’s location, location, location
- A portfolio approach to technologies, generating water will be viewed more often than a single solution including “only desalination”
- New partnerships need to address the above lessons by adapting, adopting strategies to address these gaps, barriers
- A New Partnership Model? Reverse the RFP Process: Texas Desal Open-Source Innovation X Prize

Questions and Next Steps

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www.accelerateH2O.org