

Appendix I. Oil and Gas Industry Water Use Tables

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Table 1-1a. Hydraulic fracturing (HF) water use volumes, produced water volumes, injection volumes, and oil and gas wells completed in 2019 by county.

<i>County</i>	<i>Play Name</i>	<i>2019 Wells Completed</i>	<i>2019 HF Water Use (acre-ft)</i>	<i>2019 Produced Water (acre-ft)</i>	<i>2019 SWD (acre-ft)</i>	<i>2019 EOR (acre-ft)</i>	<i>2019 Injection (acre-ft)</i>
Anderson	Misc	7	-	3,238	1,223	473	1,696
Andrews	Permian	233	4,209	50,496	14,216	36,610	50,826
Angelina	Haynesville	16	388	401	40	-	40
Aransas	None	4	-	46	17	3	20
Archer	Barnett	61	1	2,322	394	1,162	1,555
Armstrong	Anadarko	-	-	-	-	-	-
Atascosa	Eagle Ford	118	4,083	3,000	2,976	189	3,166
Austin	Eagle Ford	22	-	579	424	2	426
Bailey	Permian	-	-	-	-	-	-
Bandera	None	-	-	0	-	-	-
Bastrop	Eagle Ford	-	-	107	1	59	59
Baylor	Misc	4	0	180	115	81	196
Bee	Eagle Ford	13	0	222	132	7	139
Bell	None	-	-	-	-	-	-
Bexar	Misc	-	-	3	0	1	1
Blanco	None	-	-	-	-	-	-
Borden	Permian	47	1,713	4,074	1,931	1,960	3,891
Bosque	Barnett	-	-	-	-	-	-
Bowie	None	-	-	32	40	-	40
Brazoria	Misc	38	-	5,600	8,439	3,523	11,962
Brazos	Eagle Ford	75	2,459	1,008	1,190	-	1,190
Brewster	Permian	-	-	-	-	-	-
Briscoe	Anadarko	-	-	-	-	-	-
Brooks	Misc	19	1	202	66	8	74
Brown	None	2	0	78	35	49	84
Burleson	Eagle Ford	96	4,286	1,950	1,701	-	1,701
Burnet	None	-	-	-	-	-	-
Caldwell	Misc	8	-	13,372	22,313	29	22,342
Calhoun	None	2	0	249	604	-	604
Callahan	Misc	16	0	175	101	199	299
Cameron	None	-	-	-	-	-	-
Camp	None	-	-	432	215	142	357
Carson	Anadarko	6	1	38	57	0	57
Cass	Misc	11	7	151	41	160	201
Castro	Anadarko	-	-	-	-	-	-
Chambers	None	28	-	2,274	8,686	211	8,897
Cherokee	Bossier	5	28	1,515	2,263	-	2,263
Childress	Anadarko	-	-	0	8	-	8
Clay	Barnett	22	0	296	176	426	603
Cochran	Permian	17	130	3,232	1,116	3,814	4,929
Coke	Permian	4	0	983	585	1,864	2,448
Coleman	Misc	12	0	262	50	370	420
Collin	None	-	-	-	-	-	-
Collingsworth	Anadarko	2	-	8	3	2	5
Colorado	Eagle Ford	12	0	145	358	-	358
Comal	None	-	-	-	-	-	-
Comanche	Barnett	1	0	8	0	0	0
Concho	Permian	7	0	428	27	421	448
Cooke	Barnett	35	64	3,460	1,212	2,908	4,120
Coryell	Barnett	-	-	-	-	-	-
Cottle	Permian	2	-	26	32	33	64

<i>County</i>	<i>Play Name</i>	<i>2019 Wells Completed</i>	<i>2019 HF Water Use (acre-ft)</i>	<i>2019 Produced Water (acre-ft)</i>	<i>2019 SWD (acre-ft)</i>	<i>2019 EOR (acre-ft)</i>	<i>2019 Injection (acre-ft)</i>
Crane	Permian	118	106	13,666	2,654	17,804	20,458
Crockett	Permian	18	0	6,386	4,736	1,810	6,546
Crosby	Permian	21	1	2,172	387	3,310	3,698
Culberson	Permian-Far West	167	8,276	24,301	18,344	83	18,427
Dallam	Anadarko	-	-	-	-	-	-
Dallas	Barnett	-	-	90	-	-	-
Dawson	Permian	27	214	4,344	1,946	4,597	6,543
Deaf Smith	Anadarko	-	-	-	-	-	-
Delta	None	-	-	-	-	-	-
Denton	Barnett	17	258	1,188	360	7	367
DeWitt	Eagle Ford	-	6,834	3,180	2,729	-	2,729
Dickens	Permian	9	0	311	251	253	504
Dimmit	Eagle Ford	247	7,488	6,799	5,456	117	5,573
Donley	Anadarko	-	-	-	-	-	-
Duval	Eagle Ford	26	0	3,685	2,490	1,274	3,764
Eastland	Barnett	5	0	480	184	490	674
Ector	Permian	175	1,407	48,241	5,131	45,991	51,122
Edwards	Permian	5	-	3	18	1	19
El Paso	Permian	-	-	-	-	-	-
Ellis	Barnett	-	-	13	-	-	-
Erath	Barnett	-	-	131	1	-	1
Falls	None	1	-	1	0	-	0
Fannin	None	-	-	-	-	-	-
Fayette	Eagle Ford	43	645	1,215	838	-	838
Fisher	Permian	43	106	2,966	718	2,392	3,110
Floyd	Permian	-	-	-	-	-	-
Foard	None	2	-	97	14	84	98
Fort Bend	Misc	26	0	2,857	2,391	652	3,044
Franklin	Bossier	2	-	3,161	3,227	16	3,243
Freestone	Haynesville	4	33	1,178	1,441	35	1,477
Frio	Eagle Ford	56	2,678	718	1,597	27	1,624
Gaines	Permian	143	56	38,179	11,312	33,370	44,682
Galveston	None	5	-	815	354	4	358
Garza	Permian	31	3	6,838	1,562	4,571	6,133
Gillespie	None	-	-	-	-	-	-
Glasscock	Permian	239	10,463	21,889	13,951	9,824	23,775
Goliad	Eagle Ford	3	-	334	274	14	288
Gonzales	Eagle Ford	177	5,944	3,748	3,261	-	3,261
Gray	Anadarko	5	0	405	402	588	990
Grayson	Misc	13	20	1,050	547	239	786
Gregg	Haynesville	12	0	12,503	14,377	384	14,761
Grimes	Eagle Ford	7	43	214	335	-	335
Guadalupe	Misc	9	0	24,569	28,083	1,112	29,195
Hale	Permian	5	0	2,565	64	2,168	2,233
Hall	Anadarko	-	-	-	-	-	-
Hamilton	Barnett	-	-	0	-	0	0
Hansford	Anadarko	22	18	142	263	208	471
Hardeman	Barnett	18	4	297	360	102	462
Hardin	Misc	29	13	1,153	1,797	13	1,809
Harris	Misc	6	-	4,585	4,336	798	5,134
Harrison	Haynesville	72	2,556	8,790	1,452	119	1,571
Hartley	Anadarko	6	0	402	185	286	471
Haskell	Misc	28	0	577	255	974	1,229
Hays	None	-	-	1	-	-	-

County	Play Name	2019 Wells Completed	2019 HF Water Use (acre-ft)	2019 Produced Water (acre-ft)	2019 SWD (acre-ft)	2019 EOR (acre-ft)	2019 Injection (acre-ft)
Hemphill	Anadarko	20	465	4,169	2,698	-	2,698
Henderson	Misc	5	0	201	360	-	360
Hidalgo	Misc	32	17	1,503	738	87	825
Hill	Barnett	-	-	122	103	-	103
Hockley	Permian	90	8	23,122	1,575	20,242	21,817
Hood	Barnett	-	-	1,539	1,040	-	1,040
Hopkins	None	-	-	614	360	266	625
Houston	Bossier	7	0	2,379	1,703	262	1,965
Howard	Permian	541	21,032	38,813	28,960	15,763	44,723
Hudspeth	Permian	2	6	-	-	-	-
Hunt	None	-	-	4	-	3	3
Hutchinson	Anadarko	2	0	671	618	24	642
Irion	Permian	117	6,162	3,701	1,976	1,012	2,987
Jack	Barnett	47	8	1,148	1,464	152	1,616
Jackson	Misc	97	-	6,172	2,793	5,728	8,520
Jasper	Eagle Ford	8	1	296	286	-	286
Jeff Davis	Permian	1	28	-	-	-	-
Jefferson	Misc	22	-	1,430	3,912	-	3,912
Jim Hogg	Eagle Ford	3	-	106	55	11	67
Jim Wells	None	11	-	23	92	65	157
Johnson	Barnett	5	16	4,704	4,315	-	4,315
Jones	Misc	30	0	413	340	336	676
Karnes	Eagle Ford	490	14,286	6,865	10,125	81	10,206
Kaufman	None	1	-	299	298	-	298
Kendall	None	-	-	-	-	-	-
Kenedy	Misc	21	2	259	206	11	217
Kent	Permian	42	5	11,092	1,718	12,053	13,771
Kerr	None	-	-	-	-	-	-
Kimble	Permian	-	-	-	-	-	-
King	Permian	17	0	1,880	437	1,932	2,369
Kinney	None	-	-	-	-	-	-
Kleberg	Misc	8	0	123	134	1	135
Knox	Misc	7	-	363	88	181	269
La Salle	Eagle Ford	334	13,267	7,519	7,868	26	7,894
Lamar	None	-	-	-	-	-	-
Lamb	Permian	9	0	849	17	363	381
Lampasas	None	-	-	-	-	-	-
Lavaca	Eagle Ford	53	2,270	992	848	0	848
Lee	Eagle Ford	16	442	375	632	0	632
Leon	Eagle Ford	6	82	511	203	144	347
Liberty	Misc	13	-	926	1,032	48	1,080
Limestone	Haynesville	8	45	574	346	36	382
Lipscomb	Anadarko	17	106	901	393	39	432
Live Oak	Eagle Ford	95	2,956	1,382	614	26	639
Llano	None	-	-	-	-	-	-
Loving	Permian-Far West	463	15,155	52,688	60,215	1,541	61,755
Lubbock	Permian	6	0	2,024	170	2,223	2,394
Lynn	Permian	1	-	572	211	470	681
Madison	Eagle Ford	9	318	485	929	29	958
Marion	Bossier	6	1	169	397	29	426
Martin	Permian	676	28,000	33,819	32,305	371	32,676
Mason	None	-	-	-	-	-	-
Matagorda	Misc	21	-	379	486	-	486
Maverick	Eagle Ford	14	61	754	3	66	69

<i>County</i>	<i>Play Name</i>	<i>2019 Wells Completed</i>	<i>2019 HF Water Use (acre-ft)</i>	<i>2019 Produced Water (acre-ft)</i>	<i>2019 SWD (acre-ft)</i>	<i>2019 EOR (acre-ft)</i>	<i>2019 Injection (acre-ft)</i>
McCulloch	Permian	-	0	70	-	88	88
McLennan	None	-	-	-	-	-	-
McMullen	Eagle Ford	-	5,611	2,849	3,366	69	3,436
Medina	Olmos	11	1	4	0	5	6
Menard	Permian	3	0	77	32	80	112
Midland	Permian	767	35,407	41,827	32,821	934	33,755
Milam	Eagle Ford	60	736	935	783	37	820
Mills	None	1	-	-	-	-	-
Mitchell	Permian	13	0	3,852	241	5,240	5,482
Montague	Barnett	14	0	5,658	1,617	2,724	4,341
Montgomery	Misc	18	0	9,070	7,525	1,102	8,627
Moore	Anadarko	40	10	122	174	28	202
Morris	None	-	-	1	-	-	-
Motley	Permian	3	0	114	124	-	124
Nacogdoches	Haynesville	20	751	1,104	882	-	882
Navarro	Haynesville	2	-	677	652	134	786
Newton	Misc	5	-	458	655	-	655
Nolan	Permian	42	19	1,828	755	1,202	1,957
Nueces	Misc	10	-	366	560	13	572
Ochiltree	Anadarko	21	281	1,637	837	551	1,388
Oldham	Anadarko	2	0	100	320	98	418
Orange	Misc	9	-	350	465	-	465
Palo Pinto	Barnett	14	1	703	488	127	615
Panola	Haynesville	108	3,755	22,180	6,740	107	6,847
Parker	Barnett	2	7	1,609	1,447	-	1,447
Parmer	Anadarko	-	-	-	-	-	-
Pecos	Permian-Far West	341	8,778	26,745	20,962	15,063	36,025
Polk	Misc	21	5	714	829	-	829
Potter	Anadarko	23	87	150	83	13	96
Presidio	Permian	1	-	-	-	-	-
Rains	None	-	-	-	-	-	-
Randall	Anadarko	-	-	-	-	-	-
Reagan	Permian	282	16,786	18,889	20,054	308	20,361
Real	Permian	-	-	0	-	-	-
Red River	None	1	-	140	8	115	122
Reeves	Permian-Far West	988	38,683	126,408	108,596	1,437	110,033
Refugio	None	58	-	8,370	5,724	2,823	8,547
Roberts	Anadarko	8	76	311	176	15	192
Robertson	Eagle Ford	22	529	567	302	-	302
Rockwall	None	-	-	-	-	-	-
Runnels	Permian	27	0	388	451	32	483
Rusk	Haynesville	40	168	24,900	8,873	2,801	11,673
Sabine	Haynesville	-	-	1	7	-	7
San Augustine	Haynesville	24	1,210	900	578	-	578
San Jacinto	Misc	5	-	70	119	-	119
San Patricio	Misc	16	0	1,863	2,945	3	2,947
San Saba	Misc	-	-	-	-	-	-
Schleicher	Permian	9	0	194	59	167	225
Scurry	Permian	150	191	32,120	2,954	38,125	41,079
Shackelford	Barnett	39	0	578	122	636	758
Shelby	Haynesville	20	561	1,849	4,252	-	4,252
Sherman	Anadarko	12	3	157	107	61	168
Smith	Haynesville	27	127	2,003	2,489	1,040	3,529
Somervell	Barnett	-	-	253	169	-	169

County	Play Name	2019 Wells Completed	2019 HF Water Use (acre-ft)	2019 Produced Water (acre-ft)	2019 SWD (acre-ft)	2019 EOR (acre-ft)	2019 Injection (acre-ft)
Starr	Misc	39	2	807	651	60	711
Stephens	Barnett	21	11	33,751	2,295	25,883	28,178
Sterling	Permian	6	7	682	233	394	627
Stonewall	Permian	39	4	3,469	296	3,375	3,671
Sutton	Permian	4	0	29	173	-	173
Swisher	Anadarko	-	-	-	-	-	-
Tarrant	Barnett	16	119	10,707	2,605	-	2,605
Taylor	Misc	13	0	179	160	161	321
Terrell	Permian-Far West	2	-	36	31	-	31
Terry	Permian	6	0	7,054	1,846	4,480	6,326
Throckmorton	Misc	31	27	609	644	455	1,100
Titus	None	1	-	4,266	3,169	386	3,556
Tom Green	Permian	5	20.41	743	417	408	825
Travis	None	-	-	0	0	0	0
Trinity	None	4	-	89	73	-	73
Tyler	Misc	7	6	683	411	-	411
Upshur	Haynesville	5	139	674	9,932	442	10,374
Upton	Permian	263	12,738	25,292	15,788	11,278	27,065
Uvalde	None	-	-	-	-	-	-
Val Verde	Permian	2	-	12	-	0	0
Van Zandt	Bossier	3	-	2,716	2,346	141	2,487
Victoria	None	26	-	3,966	5,015	874	5,889
Walker	Eagle Ford	5	0	18	0	-	0
Waller	Misc	5	-	1,358	1,234	380	1,614
Ward	Permian	319	8,441	30,448	24,921	5,926	30,847
Washington	Eagle Ford	32	735	1,837	40	-	40
Webb	Eagle Ford	227	8,803	10,013	974	85	1,059
Wharton	Misc	29	-	3,864	2,882	1,043	3,926
Wheeler	Anadarko	5	40	2,718	1,794	21	1,815
Wichita	Misc	90	2	9,613	926	7,367	8,293
Wilbarger	Misc	39	0	1,743	483	1,226	1,709
Willacy	Olmos	1	0	465	304	-	304
Williamson	None	-	-	0	-	-	-
Wilson	Eagle Ford	18	439	965	273	76	349
Winkler	Permian	227	3,323	16,490	12,896	5,643	18,539
Wise	Barnett	29	623	3,257	1,942	39	1,981
Wood	Bossier	31	259	3,017	3,356	743	4,100
Yoakum	Permian	168	431	30,117	11,044	28,420	39,464
Young	Barnett	48	1	1,610	687	1,303	1,990
Zapata	Misc	24	3	2,657	359	1	360
Zavala	Eagle Ford	38	646	320	31	31	62
Total		11,267	319,880	1,133,190	732,515	427,860	1,160,374

Table 1-1b. Hydraulic fracturing (HF) water use volumes, produced water volumes, injection volumes, and oil and gas wells completed in 2019 by play.

<i>Play Name</i>	<i>2019 Wells Completed</i>	<i>Number of Counties</i>	<i>2019 HF TWDB FracFocus (acre-ft)</i>	<i>2019 HF Water Use (acre-ft)</i>	<i>2019 Produced Water (acre-ft)</i>	<i>2019 SWD Injection (acre-ft)</i>	<i>2019 EOR Injection (acre-ft)</i>	<i>2019 Total Injection (acre-ft)</i>
Anadarko	191	26	971	1,088	11,930	8,119	1,935	10,054
Barnett	394	26	777	1,113	73,924	20,981	35,958	56,939
Bossier	54	6	315	288	12,955	13,293	1,190	14,484
Eagle Ford	2,325	33	90,732	85,641	63,692	51,097	2,370	53,467
Haynesville	358	14	11,209	9,733	77,735	52,062	5,098	57,160
Misc	843	42	91	104	104,143	100,695	26,832	127,527
Olmos	12	2	0	1	469	304	5	309
Permian	4,982	56	142,728	151,019	536,364	253,112	331,321	584,433
Permian-Far West	1,961	5	71,062	70,893	230,178	208,148	18,124	226,272
None	147	44	-	0	21,799	24,704	5,026	29,729
Total	11,267	254	317,885	319,880	1,133,190	732,515	427,860	1,160,374

Table 1-1c. Hydraulic fracturing (HF) water use splits by county

<i>County</i>	<i>Play Name</i>	<i>2019 HF Water Use (acre-feet)</i>	<i>GW (acre-feet)</i>	<i>SW (acre-feet)</i>	<i>Reuse (acre-feet)</i>
Anderson	Misc	-	-	-	-
Andrews	Permian	4,209	3,577	-	631
Angelina	Haynesville	388	271	116	-
Aransas	None	-	-	-	-
Archer	Barnett	1	1	-	-
Armstrong	Anadarko	-	-	-	-
Atascosa	Eagle Ford	4,083	4,083	-	-
Austin	Eagle Ford	-	-	-	-
Bailey	Permian	-	-	-	-
Bandera	None	-	-	-	-
Bastrop	Eagle Ford	-	-	-	-
Baylor	Misc	0	0	-	-
Bee	Eagle Ford	0	0	-	-
Bell	None	-	-	-	-
Bexar	Misc	-	-	-	-
Blanco	None	-	-	-	-
Borden	Permian	1,713	1,456	-	257
Bosque	Barnett	-	-	-	-
Bowie	None	-	-	-	-
Brazoria	Misc	-	-	-	-
Brazos	Eagle Ford	2,459	2,459	-	-
Brewster	Permian	-	-	-	-
Briscoe	Anadarko	-	-	-	-
Brooks	Misc	1	1	-	-
Brown	None	0	0	-	-
Burleson	Eagle Ford	4,286	4,286	-	-
Burnet	None	-	-	-	-
Caldwell	Misc	-	-	-	-
Calhoun	None	0	0	-	-
Callahan	Misc	0	0	-	-
Cameron	None	-	-	-	-
Camp	None	-	-	-	-
Carson	Anadarko	1	1	-	-
Cass	Misc	7	7	-	-
Castro	Anadarko	-	-	-	-
Chambers	None	-	-	-	-
Cherokee	Bossier	28	20	8	-
Childress	Anadarko	-	-	-	-
Clay	Barnett	0	0	-	-
Cochran	Permian	130	111	-	20
Coke	Permian	0	0	-	0
Coleman	Misc	0	0	-	-
Collin	None	-	-	-	-
Collingsworth	Anadarko	-	-	-	-
Colorado	Eagle Ford	0	0	-	-
Comal	None	-	-	-	-
Comanche	Barnett	0	0	-	-
Concho	Permian	0	0	-	0
Cooke	Barnett	64	64	-	-

Coryell	Barnett	-	-	-	-
Cottle	Permian	-	-	-	-
Crane	Permian	106	90	-	16
Crockett	Permian	0	0	-	0
Crosby	Permian	1	1	-	0
Culberson	Permian-Far West	8,276	7,035	-	1,241
Dallam	Anadarko	-	-	-	-
Dallas	Barnett	-	-	-	-
Dawson	Permian	214	182	-	32
Deaf Smith	Anadarko	-	-	-	-
Delta	None	-	-	-	-
Denton	Barnett	258	258	-	-
DeWitt	Eagle Ford	6,834	6,834	-	-
Dickens	Permian	0	0	-	0
Dimmit	Eagle Ford	7,488	7,488	-	-
Donley	Anadarko	-	-	-	-
Duval	Eagle Ford	0	0	-	-
Eastland	Barnett	0	0	-	-
Ector	Permian	1,407	1,196	-	211
Edwards	Permian	-	-	-	-
El Paso	Permian	-	-	-	-
Ellis	Barnett	-	-	-	-
Erath	Barnett	-	-	-	-
Falls	None	-	-	-	-
Fannin	None	-	-	-	-
Fayette	Eagle Ford	645	645	-	-
Fisher	Permian	106	90	-	16
Floyd	Permian	-	-	-	-
Foard	None	-	-	-	-
Fort Bend	Misc	0	0	-	-
Franklin	Bossier	-	-	-	-
Freestone	Haynesville	33	23	10	-
Frio	Eagle Ford	2,678	2,678	-	-
Gaines	Permian	56	47	-	8
Galveston	None	-	-	-	-
Garza	Permian	3	3	-	0
Gillespie	None	-	-	-	-
Glasscock	Permian	10,463	8,894	-	1,569
Goliad	Eagle Ford	-	-	-	-
Gonzales	Eagle Ford	5,944	5,944	-	-
Gray	Anadarko	0	0	-	-
Grayson	Misc	20	20	-	-
Gregg	Haynesville	0	0	0	-
Grimes	Eagle Ford	43	43	-	-
Guadalupe	Misc	0	0	-	-
Hale	Permian	0	0	-	0
Hall	Anadarko	-	-	-	-
Hamilton	Barnett	-	-	-	-
Hansford	Anadarko	18	18	-	-
Hardeman	Barnett	4	4	-	-
Hardin	Misc	13	13	-	-
Harris	Misc	-	-	-	-
Harrison	Haynesville	2,556	1,789	767	-
Hartley	Anadarko	0	0	-	-

Haskell	Misc	0	0	-	-
Hays	None	-	-	-	-
Hemphill	Anadarko	465	465	-	-
Henderson	Misc	0	0	-	-
Hidalgo	Misc	17	17	-	-
Hill	Barnett	-	-	-	-
Hockley	Permian	8	7	-	1
Hood	Barnett	-	-	-	-
Hopkins	None	-	-	-	-
Houston	Bossier	0	0	0	-
Howard	Permian	21,032	17,877	-	3,155
Hudspeth	Permian	6	5	-	1
Hunt	None	-	-	-	-
Hutchinson	Anadarko	0	0	-	-
Irion	Permian	6,162	5,237	-	924
Jack	Barnett	8	8	-	-
Jackson	Misc	-	-	-	-
Jasper	Eagle Ford	1	1	-	-
Jeff Davis	Permian	28	24	-	4
Jefferson	Misc	-	-	-	-
Jim Hogg	Eagle Ford	-	-	-	-
Jim Wells	None	-	-	-	-
Johnson	Barnett	16	16	-	-
Jones	Misc	0	0	-	-
Karnes	Eagle Ford	14,286	14,286	-	-
Kaufman	None	-	-	-	-
Kendall	None	-	-	-	-
Kenedy	Misc	2	2	-	-
Kent	Permian	5	4	-	1
Kerr	None	-	-	-	-
Kimble	Permian	-	-	-	-
King	Permian	0	0	-	0
Kinney	None	-	-	-	-
Kleberg	Misc	0	0	-	-
Knox	Misc	-	-	-	-
La Salle	Eagle Ford	13,267	13,267	-	-
Lamar	None	-	-	-	-
Lamb	Permian	0	0	-	0
Lampasas	None	-	-	-	-
Lavaca	Eagle Ford	2,270	2,270	-	-
Lee	Eagle Ford	442	442	-	-
Leon	Eagle Ford	82	82	-	-
Liberty	Misc	-	-	-	-
Limestone	Haynesville	45	31	13	-
Lipscomb	Anadarko	106	106	-	-
Live Oak	Eagle Ford	2,956	2,956	-	-
Llano	None	-	-	-	-
Loving	Permian-Far West	15,155	12,882	-	2,273
Lubbock	Permian	0	0	-	0
Lynn	Permian	-	-	-	-
Madison	Eagle Ford	318	318	-	-
Marion	Bossier	1	1	0	-
Martin	Permian	28,000	23,800	-	4,200
Mason	None	-	-	-	-

Matagorda	Misc	-	-	-	-
Maverick	Eagle Ford	61	61	-	-
McCulloch	Permian	0	0	-	0
McLennan	None	-	-	-	-
McMullen	Eagle Ford	5,611	5,611	-	-
Medina	Olmos	1	1	-	-
Menard	Permian	0	0	-	0
Midland	Permian	35,407	30,096	-	5,311
Milam	Eagle Ford	736	736	-	-
Mills	None	-	-	-	-
Mitchell	Permian	0	0	-	0
Montague	Barnett	0	0	-	-
Montgomery	Misc	0	0	-	-
Moore	Anadarko	10	10	-	-
Morris	None	-	-	-	-
Motley	Permian	0	0	-	0
Nacogdoches	Haynesville	751	525	225	-
Navarro	Haynesville	-	-	-	-
Newton	Misc	-	-	-	-
Nolan	Permian	19	17	-	3
Nueces	Misc	-	-	-	-
Ochiltree	Anadarko	281	281	-	-
Oldham	Anadarko	0	0	-	-
Orange	Misc	-	-	-	-
Palo Pinto	Barnett	1	1	-	-
Panola	Haynesville	3,755	2,629	1,127	-
Parker	Barnett	7	7	-	-
Parmer	Anadarko	-	-	-	-
Pecos	Permian-Far West	8,778	7,462	-	1,317
Polk	Misc	5	5	-	-
Potter	Anadarko	87	87	-	-
Presidio	Permian	-	-	-	-
Rains	None	-	-	-	-
Randall	Anadarko	-	-	-	-
Reagan	Permian	16,786	14,268	-	2,518
Real	Permian	-	-	-	-
Red River	None	-	-	-	-
Reeves	Permian-Far West	38,683	32,881	-	5,803
Refugio	None	-	-	-	-
Roberts	Anadarko	76	76	-	-
Robertson	Eagle Ford	529	529	-	-
Rockwall	None	-	-	-	-
Runnels	Permian	0	0	-	0
Rusk	Haynesville	168	118	50	-
Sabine	Haynesville	-	-	-	-
San Augustine	Haynesville	1,210	847	363	-
San Jacinto	Misc	-	-	-	-
San Patricio	Misc	0	0	-	-
San Saba	Misc	-	-	-	-
Schleicher	Permian	0	0	-	0
Scurry	Permian	191	162	-	29
Shackelford	Barnett	0	0	-	-
Shelby	Haynesville	561	393	168	-
Sherman	Anadarko	3	3	-	-

Smith	Haynesville	127	89	38	-
Somervell	Barnett	-	-	-	-
Starr	Misc	2	2	-	-
Stephens	Barnett	11	11	-	-
Sterling	Permian	7	6	-	1
Stonewall	Permian	4	3	-	1
Sutton	Permian	0	0	-	0
Swisher	Anadarko	-	-	-	-
Tarrant	Barnett	119	119	-	-
Taylor	Misc	0	0	-	-
Terrell	Permian-Far West	-	-	-	-
Terry	Permian	0	0	-	0
Throckmorton	Misc	27	27	-	-
Titus	None	-	-	-	-
Tom Green	Permian	20.41	17	-	3
Travis	None	-	-	-	-
Trinity	None	-	-	-	-
Tyler	Misc	6	6	-	-
Upshur	Haynesville	139	97	42	-
Upton	Permian	12,738	10,827	-	1,911
Uvalde	None	-	-	-	-
Val Verde	Permian	-	-	-	-
Van Zandt	Bossier	-	-	-	-
Victoria	None	-	-	-	-
Walker	Eagle Ford	0	0	-	-
Waller	Misc	-	-	-	-
Ward	Permian	8,441	7,175	-	1,266
Washington	Eagle Ford	735	735	-	-
Webb	Eagle Ford	8,803	8,803	-	-
Wharton	Misc	-	-	-	-
Wheeler	Anadarko	40	40	-	-
Wichita	Misc	2	2	-	-
Wilbarger	Misc	0	0	-	-
Willacy	Olmos	0	0	-	-
Williamson	None	-	-	-	-
Wilson	Eagle Ford	439	439	-	-
Winkler	Permian	3,323	2,825	-	499
Wise	Barnett	623	623	-	-
Wood	Bossier	259	181	78	-
Yoakum	Permian	431	366	-	65
Young	Barnett	1	1	-	-
Zapata	Misc	3	3	-	-
Zavala	Eagle Ford	646	646	-	-
Total		319,880	283,587	3,006	33,287

Table 1-1d. Hydraulic fracturing (HF) water use splits by play.

<i>Play Name</i>	<i>GW Split (%)</i>	<i>SW Split (%)</i>	<i>Reuse Split (%)</i>	<i>2019 HF Water Use (acre-ft)</i>	<i>GW (acre-feet)</i>	<i>SW (acre-feet)</i>	<i>Reuse (acre-feet)</i>
Anadarko	100	0	0	1,088	1,088	-	-
Barnett	100	0	0	1,113	1,113	-	-
Bossier	70	30	0	288	202	86	-
Eagle Ford	100	0	0	85,641	85,641	-	-
Haynesville	70	30	0	9,733	6,813	2,920	-
Misc	100	0	0	104	104	-	-
Olmos	100	0	0	1	1	-	-
Permian	85	0	15	151,019	128,366	-	22,653
Permian-Far West	85	0	15	70,893	60,259	-	10,634
None	100	0	0	0	0	-	-
Statewide Totals (acre-feet)				319,880	283,587	3,006	33,287
Statewide Totals (%)				100.0	88.7	0.9	10.4

Table 1- 2a. Time series of annual hydraulic fracturing water use volumes by county

County	TWDB Play Name	Oil and Gas Industry Water Use (acre-ft)									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Anderson	Misc	-	-	-	-	34	-	-	-	-	-
Andrews	Permian	607	1,095	1,313	1,589	2,115	1,911	1,887	2,735	4,387	4,209
Angelina	Haynesville	13	-	-	17	-	33	1	56	651	388
Aransas	None	-	-	-	1	-	-	0	-	-	-
Archer	Barnett	-	8	3	5	1	-	-	-	-	1
Armstrong	Anadarko	-	-	-	-	-	-	-	-	-	-
Atascosa	Eagle Ford	21	712	1,781	2,670	5,757	4,041	1,969	2,536	3,767	4,083
Austin	Eagle Ford	-	-	8	-	-	-	-	-	-	-
Bailey	Permian	-	-	-	-	-	-	-	-	-	-
Bandera	None	-	-	-	-	-	-	-	-	-	-
Bastrop	Eagle Ford	-	-	-	-	15	-	-	-	-	-
Baylor	Misc	-	-	2	-	4	4	-	-	-	0
Bee	Eagle Ford	14	51	127	28	46	24	-	-	-	0
Bell	None	-	-	-	-	-	-	-	-	-	-
Bexar	Misc	-	-	-	-	-	-	-	-	-	-
Blanco	None	-	-	-	-	-	-	-	-	-	-
Borden	Permian	9	7	61	131	144	4	100	697	1,821	1,713
Bosque	Barnett	-	-	-	4	-	-	-	-	-	-
Bowie	None	-	-	-	-	-	-	-	-	-	-
Brazoria	Misc	3	-	1	-	-	-	-	-	-	-
Brazos	Eagle Ford	95	42	121	1,144	2,058	1,837	478	495	1,778	2,459
Brewster	Permian	-	-	-	-	-	-	-	-	2	-
Briscoe	Anadarko	-	-	-	-	-	-	-	-	-	-
Brooks	Misc	1	2	3	6	16	-	1	1	2	1
Brown	None	-	-	-	-	-	-	-	-	-	0
Burleson	Eagle Ford	95	68	43	130	1,580	2,426	1,184	4,791	6,086	4,286
Burnet	None	-	-	-	-	-	-	-	-	-	-
Caldwell	Misc	2	-	-	-	-	-	-	-	-	-
Calhoun	None	-	-	-	-	-	-	-	0	-	0
Callahan	Misc	-	-	-	-	-	-	-	-	-	0
Cameron	None	-	-	-	-	-	-	-	-	-	-
Camp	None	-	-	-	-	-	-	-	-	-	-
Carson	Anadarko	-	-	-	-	2	-	-	1	-	1
Cass	Misc	-	-	-	12	19	-	35	-	3	7
Castro	Anadarko	-	-	-	-	-	-	-	-	-	-
Chambers	None	-	-	-	-	-	-	-	-	-	-
Cherokee	Bossier	24	10	13	36	130	43	167	214	176	28
Childress	Anadarko	-	-	-	-	-	-	-	-	-	-
Clay	Barnett	-	-	79	7	83	12	15	-	-	0
Cochran	Permian	2	12	6	4	55	17	-	204	80	130
Coke	Permian	0	-	-	47	11	-	-	-	-	0
Coleman	Misc	-	-	-	-	-	-	-	-	-	0
Collin	None	-	-	-	-	-	-	-	-	-	-
Collingsworth	Anadarko	-	-	-	-	-	-	-	-	-	-
Colorado	Eagle Ford	-	-	-	2	-	-	-	12	49	0
Comal	None	-	-	-	-	-	-	-	-	-	-
Comanche	Barnett	-	-	-	-	-	-	-	-	-	0
Concho	Permian	-	-	-	-	-	-	-	-	-	0
Cooke	Barnett	693	1,686	747	883	194	82	-	-	-	64
Coryell	Barnett	-	-	-	-	-	-	-	-	-	-
Cottle	Permian	-	-	2	2	7	3	2	-	-	-
Crane	Permian	48	129	414	515	240	127	13	27	23	106

County	TWDB Play Name	Oil and Gas Industry Water Use (acre-ft)									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Crockett	Permian	12	400	1,745	3,456	4,362	2,488	1,315	2,549	1,094	0
Crosby	Permian	-	-	-	-	-	-	1	-	-	1
Culberson	PermianFW	24	192	301	455	1,202	2,114	1,442	3,602	6,108	8,276
Dallam	Anadarko	-	-	-	-	-	-	-	-	-	-
Dallas	Barnett	148	79	38	15	100	-	-	34	122	-
Dawson	Permian	29	96	150	186	330	263	82	307	0	214
Dewitt	Eagle Ford	183	1,163	1,892	2,995	6,828	6,137	3,116	4,069	5,373	6,834
Deaf Smith	Anadarko	-	-	-	-	-	-	-	-	-	-
Delta	None	-	-	-	-	-	-	-	-	-	-
Denton	Barnett	2,008	3,493	1,528	1,249	1,554	774	422	279	459	258
Dickens	Permian	-	-	-	-	-	-	-	-	-	0
Dimmit	Eagle Ford	1,086	3,222	6,530	11,508	11,203	10,753	6,302	7,677	13,962	7,488
Donley	Anadarko	-	-	-	-	-	-	-	-	-	-
Duval	Eagle Ford	-	-	-	-	-	-	-	-	-	0
Eastland	Barnett	-	-	-	-	-	-	-	-	-	0
Ector	Permian	542	659	1,267	1,400	1,574	512	263	625	867	1,407
Edwards	Permian	-	-	0	-	-	-	-	-	-	-
El Paso	Permian	-	-	-	-	-	-	-	-	-	-
Ellis	Barnett	146	38	44	27	-	-	-	-	-	-
Erath	Barnett	17	6	45	-	-	24	-	-	-	-
Falls	None	-	-	-	-	-	-	-	-	-	-
Fannin	None	-	-	-	-	-	-	-	-	-	-
Fayette	Eagle Ford	-	38	67	369	451	316	-	221	306	645
Fisher	Permian	-	-	10	88	25	-	-	-	-	106
Floyd	Permian	-	-	-	-	-	-	-	-	-	-
Foard	None	-	-	-	-	-	-	-	-	-	-
Fort Bend	Misc	-	-	-	-	-	-	-	-	-	0
Franklin	Bossier	-	-	-	-	-	-	-	-	-	-
Freestone	Haynesville	99	100	196	78	118	11	19	6	26	33
Frio	Eagle Ford	23	392	630	633	1,278	959	873	1,902	1,025	2,678
Gaines	Permian	15	63	57	81	91	97	86	507	220	56
Galveston	None	-	-	-	-	-	-	-	-	-	-
Garza	Permian	2	-	5	18	13	-	-	-	9	3
Gillespie	None	-	-	-	-	-	-	-	-	-	-
Glasscock	Permian	435	1,718	2,696	3,511	5,124	4,688	3,330	8,181	13,439	10,463
Goliad	Eagle Ford	1	-	-	-	-	-	-	1	9	-
Gonzales	Eagle Ford	46	1,419	2,590	5,185	4,958	3,995	3,309	2,916	5,804	5,944
Gray	Anadarko	-	-	-	-	-	-	-	-	-	0
Grayson	Misc	13	15	118	74	289	139	-	-	14	20
Gregg	Haynesville	39	25	46	26	-	-	51	85	426	0
Grimes	Eagle Ford	-	12	90	110	228	17	49	21	7	43
Guadalupe	Misc	-	-	-	-	-	-	-	-	-	0
Hale	Permian	-	-	-	-	-	-	-	-	-	0
Hall	Anadarko	-	-	-	-	-	-	-	-	-	-
Hamilton	Barnett	-	-	-	-	-	-	-	-	-	-
Hansford	Anadarko	10	3	21	7	45	8	10	54	91	18
Hardeman	Barnett	-	7	17	9	4	-	-	8	15	4
Hardin	Misc	-	-	-	-	-	-	-	7	-	13
Harris	Misc	1	-	-	-	-	-	-	-	-	-
Harrison	Haynesville	1,113	437	740	711	830	263	236	330	746	2,556
Hartley	Anadarko	-	-	-	12	84	1	-	-	47	0
Haskell	Misc	-	-	-	3	-	-	-	-	-	0
Hays	None	-	-	-	-	-	-	-	-	-	-
Hemphill	Anadarko	576	1,388	1,298	1,314	1,135	1,024	364	517	1,035	465

County	TWDB Play Name	Oil and Gas Industry Water Use (acre-ft)									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Henderson	Misc	4	7	-	-	-	-	43	-	-	0
Hidalgo	Misc	72	20	31	41	57	5	1	19	2	17
Hill	Barnett	311	108	-	-	-	-	-	-	-	-
Hockley	Permian	-	-	-	28	64	42	-	-	-	8
Hood	Barnett	475	655	579	319	110	-	47	-	-	-
Hopkins	None	-	-	-	-	-	1	-	-	-	-
Houston	Bossier	44	194	154	142	296	302	20	1	32	0
Howard	Permian	134	445	850	1,366	2,068	2,657	3,938	13,457	17,557	21,032
Hudspeth	Permian	-	-	-	-	-	-	-	-	6	6
Hunt	None	-	-	-	-	-	-	-	-	-	-
Hutchinson	Anadarko	3	3	-	17	-	-	7	63	15	0
Irion	Permian	63	705	2,123	4,568	5,976	3,403	1,374	2,504	3,815	6,162
Jack	Barnett	23	17	149	197	486	176	45	1	83	8
Jackson	Misc	-	-	-	1	-	-	-	-	-	-
Jasper	Eagle Ford	4	-	-	-	8	26	-	-	1	1
Jeff Davis	Permian	-	-	-	-	4	-	-	2	26	28
Jefferson	Misc	-	-	-	-	-	-	-	-	-	-
Jim Hogg	Eagle Ford	-	-	-	4	1	9	1	-	-	-
Jim Wells	None	-	-	-	-	-	-	-	-	-	-
Johnson	Barnett	4,996	4,161	2,504	541	176	56	26	86	45	16
Jones	Misc	-	-	-	-	-	8	-	-	-	0
Karnes	Eagle Ford	303	2,556	5,430	6,370	10,779	9,842	6,791	13,217	14,368	14,286
Kaufman	None	-	-	-	-	-	-	-	-	-	-
Kendall	None	-	-	-	-	-	-	-	-	-	-
Kenedy	Misc	3	2	1	2	-	-	-	1	1	2
Kent	Permian	-	-	-	8	-	-	-	15	-	5
Kerr	None	-	-	-	-	-	-	-	-	-	-
Kimble	Permian	-	-	-	-	-	-	-	-	-	-
King	Permian	-	-	-	-	-	-	-	-	-	0
Kinney	None	-	-	-	-	-	-	-	-	-	-
Kleberg	Misc	-	7	7	2	1	-	-	-	-	0
Knox	Misc	-	-	-	-	-	-	-	-	-	-
La Salle	Eagle Ford	627	2,318	5,876	8,702	12,938	12,307	5,244	10,931	14,757	13,267
Lamar	None	-	-	-	-	-	-	-	-	-	-
Lamb	Permian	-	-	-	-	-	-	-	-	-	0
Lampasas	None	-	-	-	3	-	-	-	-	-	-
Lavaca	Eagle Ford	0	23	341	766	1,942	1,270	339	918	1,624	2,270
Lee	Eagle Ford	7	10	58	108	514	338	20	101	1,165	442
Leon	Eagle Ford	36	117	332	238	307	85	8	-	41	82
Liberty	Misc	-	-	-	-	-	-	-	-	-	-
Limestone	Haynesville	68	86	72	7	27	1	-	106	-	45
Lipscomb	Anadarko	111	343	628	465	997	519	166	295	333	106
Live Oak	Eagle Ford	111	728	1,099	1,694	2,232	1,380	746	904	1,006	2,956
Llano	None	-	-	-	-	-	-	-	-	-	-
Loving	PermianFW	41	161	748	1,005	2,401	4,154	5,866	11,271	15,041	15,155
Lubbock	Permian	-	-	17	6	-	1	-	-	-	0
Lynn	Permian	-	-	6	15	-	-	-	-	-	-
Madison	Eagle Ford	5	125	359	620	1,021	678	335	89	109	318
Marion	Bossier	16	-	17	-	5	-	1	30	10	1
Martin	Permian	1,146	2,083	2,633	3,055	5,253	6,190	6,527	12,188	23,773	28,000
Mason	None	-	-	-	-	-	-	-	-	-	-
Matagorda	Misc	-	-	-	1	-	-	-	1	-	-
Maverick	Eagle Ford	83	144	205	63	135	29	13	52	117	61
Mcculloch	Permian	-	-	-	-	-	-	-	-	-	0

County	TWDB Play Name	Oil and Gas Industry Water Use (acre-ft)									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Mclennan	None	-	-	-	-	-	-	-	-	-	-
Mcmullen	Eagle Ford	373	1,350	3,692	6,565	8,500	6,011	3,965	3,728	5,337	5,611
Medina	Olmos	-	-	-	-	-	-	-	-	-	1
Menard	Permian	-	-	-	-	-	-	-	-	-	0
Midland	Permian	859	1,840	2,327	2,624	5,633	9,059	17,966	25,272	35,506	35,407
Milam	Eagle Ford	3	14	31	20	35	-	-	130	137	736
Mills	None	-	-	-	-	-	-	-	-	-	-
Mitchell	Permian	12	3	30	236	66	7	2	-	-	0
Montague	Barnett	2,158	3,678	2,277	3,746	2,305	622	30	-	-	0
Montgomery	Misc	6	-	11	-	-	-	-	-	-	0
Moore	Anadarko	-	-	-	4	-	1	2	4	-	10
Morris	None	-	-	-	-	-	-	-	-	-	-
Motley	Permian	-	-	-	-	-	-	-	-	-	0
Nacogdoches	Haynesville	188	855	1,041	2	76	96	119	333	367	751
Navarro	Haynesville	-	-	29	-	23	-	-	-	-	-
Newton	Misc	-	1	1	1	-	-	-	-	-	-
Nolan	Permian	4	-	24	65	64	2	-	-	-	19
Nueces	Misc	1	9	-	-	-	-	-	-	-	-
Ochiltree	Anadarko	256	251	416	750	751	397	226	280	412	281
Oldham	Anadarko	-	1	5	1	20	50	-	-	33	0
Orange	Misc	0	6	-	-	2	1	-	-	-	-
Palo Pinto	Barnett	51	42	72	92	83	36	17	1	4	1
Panola	Haynesville	280	657	1,719	2,223	3,149	2,213	808	1,021	3,601	3,755
Parker	Barnett	1,030	780	1,564	856	199	61	5	-	-	7
Parmer	Anadarko	-	-	-	-	-	-	-	-	-	-
Pecos	PermianFW	84	42	75	209	619	1,073	2,421	3,735	7,390	8,778
Polk	Misc	-	-	-	1	5	8	22	-	5	5
Potter	Anadarko	-	-	-	3	48	180	12	219	210	87
Presidio	Permian	-	-	-	-	-	-	-	-	-	-
Rains	None	-	-	-	-	-	-	-	-	-	-
Randall	Anadarko	-	-	-	-	-	-	-	-	-	-
Reagan	Permian	239	747	2,223	4,370	8,296	7,893	6,908	12,405	15,483	16,786
Real	Permian	-	-	-	-	-	-	-	-	-	-
Red River	None	-	-	1	-	-	-	-	-	-	-
Reeves	PermianFW	93	499	1,304	1,973	5,392	7,117	7,944	24,009	40,389	38,683
Refugio	None	-	-	-	-	-	-	-	-	-	-
Roberts	Anadarko	81	288	338	389	680	309	102	95	206	76
Robertson	Eagle Ford	26	80	352	379	247	122	107	93	600	529
Rockwall	None	-	-	-	-	-	-	-	-	-	-
Runnels	Permian	-	-	-	-	-	-	-	-	-	0
Rusk	Haynesville	147	126	398	469	433	554	17	521	662	168
Sabine	Haynesville	-	163	53	-	-	-	-	-	-	-
San Augustine	Haynesville	479	911	567	416	803	385	1,077	1,212	1,842	1,210
San Jacinto	Misc	-	-	-	11	55	-	-	-	-	-
San Patricio	Misc	-	-	8	-	-	2	-	-	1	0
San Saba	Misc	-	-	-	-	-	-	-	-	-	-
Schleicher	Permian	9	83	113	214	187	65	37	-	-	0
Scurry	Permian	7	2	4	46	59	54	74	131	178	191
Shackelford	Barnett	11	2	1	-	1	-	-	-	-	0
Shelby	Haynesville	392	609	543	351	625	226	373	29	344	561
Sherman	Anadarko	-	-	-	3	3	1	-	-	-	3
Smith	Haynesville	-	-	-	-	35	144	100	37	229	127
Somervell	Barnett	243	291	29	-	-	-	-	-	-	-
Starr	Misc	10	15	116	8	4	4	1	-	20	2

County	TWDB Play Name	Oil and Gas Industry Water Use (acre-ft)									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Stephens	Barnett	-	-	14	-	-	-	-	-	15	11
Sterling	Permian	36	53	219	412	402	29	5	52	5	7
Stonewall	Permian	-	-	-	-	14	-	-	-	-	4
Sutton	Permian	4	9	7	11	-	1	-	-	3	0
Swisher	Anadarko	-	-	-	-	-	-	-	-	-	-
Tarrant	Barnett	7,280	8,927	5,293	2,856	2,038	1,391	671	381	659	119
Taylor	Misc	-	-	-	-	-	-	-	-	-	0
Terrell	PermianFW	4	-	-	-	15	12	-	1	-	-
Terry	Permian	-	16	93	30	18	3	3	2	2	0
Throckmorton	Misc	-	-	-	112	87	45	32	58	17	27
Titus	None	-	-	-	-	-	-	-	-	-	-
Tom Green	Permian	-	-	-	-	-	25	11	22	95	20
Travis	None	-	-	-	-	-	-	-	-	-	-
Trinity	None	-	-	-	-	17	-	-	-	-	-
Tyler	Misc	-	-	1	-	-	-	7	42	-	6
Upshur	Haynesville	14	1	11	-	17	56	21	-	37	139
Upton	Permian	1,189	2,019	2,621	3,363	6,052	6,848	7,616	10,727	12,917	12,738
Uvalde	None	-	-	-	-	-	-	-	-	-	-
Val Verde	Permian	-	-	-	-	-	-	-	-	-	-
Van Zandt	Bossier	-	-	-	-	-	-	-	-	6	-
Victoria	None	-	-	-	-	-	-	-	-	-	-
Walker	Eagle Ford	-	-	10	54	73	41	-	-	2	0
Waller	Misc	-	-	-	-	-	-	-	-	-	-
Ward	Permian	75	352	657	819	1,437	724	1,007	3,997	8,847	8,441
Washington	Eagle Ford	6	13	21	98	58	8	32	267	728	735
Webb	Eagle Ford	2,161	4,255	5,052	5,281	8,034	5,651	5,022	9,292	6,904	8,803
Wharton	Misc	-	-	-	-	1	-	1	0	-	-
Wheeler	Anadarko	1,362	4,161	3,447	3,619	1,706	306	168	401	385	40
Wichita	Misc	-	-	-	2	-	-	-	-	-	2
Wilbarger	Misc	-	3	7	20	25	14	-	-	-	0
Willacy	Olmos	1	-	0	-	0	-	-	-	-	0
Williamson	None	-	-	-	-	-	-	-	-	-	-
Wilson	Eagle Ford	10	322	437	539	644	-	-	45	110	439
Winkler	Permian	32	47	78	133	299	330	896	1,857	5,221	3,323
Wise	Barnett	2,835	2,414	2,334	2,645	1,844	1,027	63	411	911	623
Wood	Bossier	-	-	-	-	1	10	41	-	41	259
Yoakum	Permian	6	8	5	41	65	228	305	525	738	431
Young	Barnett	-	8	5	-	4	-	-	1	-	1
Zapata	Misc	4	4	-	-	-	-	3	1	2	3
Zavala	Eagle Ford	25	179	771	710	1,212	883	302	364	679	646
Total		38,963	69,941	91,514	117,878	164,590	142,951	117,221	213,617	315,234	319,880

Table 1- 2b. Time series of annual hydraulic fracturing water use volumes by play

<i>Play Name</i>	<i>HF (acre-ft)</i>									
	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>
Anadarko	2,398	6,437	6,152	6,584	5,470	2,797	1,057	1,930	2,767	1,088
Barnett	22,426	26,400	17,323	13,451	9,182	4,263	1,341	1,203	2,312	1,113
Bossier	84	204	184	177	432	354	229	245	265	288
Eagle Ford	5,342	19,352	37,944	56,985	83,080	69,185	40,205	64,771	85,851	85,641
Haynesville	2,831	3,971	5,417	4,301	6,136	3,982	2,821	3,736	8,932	9,733
Misc	121	91	306	296	598	230	146	129	66	104
None	-	-	1	4	17	1	0	0	-	0
Olmos	1	-	0	-	0	-	-	-	-	1
Permian	5,515	12,591	21,757	32,438	50,046	47,668	53,748	98,986	146,114	151,019
Permian-Far West	246	894	2,429	3,643	9,628	14,470	17,673	42,618	68,928	70,893
Statewide Total	38,963	69,941	91,514	117,878	164,590	142,951	117,221	213,617	315,234	319,880

Table 1- 3a. Annual produced water volumes by county

County	Play Name	Produced Water (acre-ft)									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Anderson	Misc	4,106	4,306	3,842	4,230	4,343	3,725	3,784	3,560	3,400	3,238
Andrews	Permian	37,321	38,252	42,164	44,596	46,523	46,851	48,453	49,361	50,824	50,496
Angelina	Haynesville	99	129	153	141	112	124	124	72	168	401
Aransas	None	235	69	70	63	89	101	93	51	61	46
Archer	Barnett	1,827	2,141	2,353	2,535	2,756	2,459	2,267	2,151	2,300	2,322
Armstrong	Anadarko	-	-	-	-	-	-	-	-	-	-
Atascosa	Eagle Ford	1,688	1,564	1,824	2,829	5,076	3,958	2,748	2,631	2,476	3,000
Austin	Eagle Ford	547	578	595	619	532	482	614	744	690	579
Bailey	Permian	-	-	-	-	-	-	-	-	-	-
Bandera	None	0	0	0	0	0	0	0	0	0	0
Bastrop	Eagle Ford	51	60	49	66	95	105	85	76	112	107
Baylor	Misc	275	258	268	232	275	264	212	181	189	180
Bee	Eagle Ford	567	570	544	440	431	487	320	222	267	222
Bell	None	-	-	-	-	-	-	-	-	-	-
Bexar	Misc	7	3	5	4	4	3	3	3	3	3
Blanco	None	-	-	-	-	-	-	-	-	-	-
Borden	Permian	2,181	2,752	2,367	2,414	3,028	2,202	2,257	2,498	3,306	4,074
Bosque	Barnett	8	4	0	-	-	-	-	-	-	-
Bowie	None	28	29	35	31	39	29	37	34	31	32
Brazoria	Misc	10,222	7,478	14,042	11,031	10,291	8,570	7,142	6,523	5,773	5,600
Brazos	Eagle Ford	399	338	385	696	1,549	1,352	827	566	721	1,008
Brewster	Permian	-	-	-	-	-	-	-	-	-	-
Briscoe	Anadarko	-	-	-	-	-	-	-	-	-	-
Brooks	Misc	270	286	316	270	297	238	227	270	236	202
Brown	None	117	110	110	100	101	98	84	91	86	78
Burleson	Eagle Ford	496	487	415	351	718	1,065	863	1,090	1,715	1,950
Burnet	None	-	-	-	-	-	-	-	-	-	-
Caldwell	Misc	8,077	8,977	10,508	10,789	11,413	11,283	11,647	10,490	11,688	13,372
Calhoun	None	378	401	323	365	341	239	190	117	231	249
Callahan	Misc	330	318	270	265	337	237	198	198	187	175
Cameron	None	-	1	2	28	4	-	-	-	-	-
Camp	None	643	662	577	560	635	559	288	400	422	432
Carson	Anadarko	126	108	140	116	98	79	62	53	46	38
Cass	Misc	87	96	93	99	133	283	265	207	187	151
Castro	Anadarko	-	-	-	-	-	-	-	-	-	-
Chambers	None	2,527	2,441	6,425	3,071	3,313	3,192	2,739	2,731	2,539	2,274
Cherokee	Bossier	1,773	1,596	1,558	1,665	2,018	1,853	2,026	1,860	1,619	1,515
Childress	Anadarko	6	6	6	5	9	9	5	4	1	0
Clay	Barnett	453	456	454	444	439	399	374	325	314	296
Cochran	Permian	3,409	3,510	3,774	3,887	3,815	3,396	3,168	3,177	3,547	3,232
Coke	Permian	4,148	3,173	3,393	3,598	4,123	5,274	3,952	2,897	2,788	983
Coleman	Misc	332	330	359	427	397	323	282	332	304	262
Collin	None	-	-	-	-	-	-	-	-	-	-
Collingsworth	Anadarko	7	8	8	7	7	7	5	4	6	8
Colorado	Eagle Ford	313	275	248	309	299	304	215	118	125	145
Comal	None	-	-	-	-	-	-	-	-	-	-
Comanche	Barnett	11	12	7	12	9	10	6	7	7	8
Concho	Permian	453	460	433	488	450	356	339	425	446	428
Cooke	Barnett	3,629	4,647	6,377	6,944	6,580	4,806	3,849	3,778	3,615	3,460
Coryell	Barnett	-	-	-	-	-	-	-	-	-	-
Cottle	Permian	43	35	43	27	44	34	32	40	33	26
Crane	Permian	13,368	12,769	13,198	14,048	15,541	14,268	14,398	14,335	13,857	13,666
Crockett	Permian	7,573	7,794	7,843	7,230	8,396	7,906	5,454	5,255	5,760	6,386
Crosby	Permian	1,344	1,748	2,134	2,466	3,325	3,626	2,934	2,482	2,005	2,172
Culberson	PermianFW	298	356	684	1,141	2,638	5,129	7,142	16,885	19,406	24,301
Dallam	Anadarko	-	-	-	-	-	-	-	-	-	-

County	Play Name	Produced Water (acre-ft)									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Dallas	Barnett	164	205	64	33	158	159	40	61	124	90
Dawson	Permian	3,888	3,733	3,562	4,541	4,634	4,291	4,384	4,439	4,319	4,344
Dewitt	Eagle Ford	575	773	1,179	1,207	2,045	2,373	2,134	1,985	2,703	3,180
Deaf Smith	Anadarko	-	-	-	-	-	-	-	-	-	-
Delta	None	-	-	-	-	-	-	-	-	-	-
Denton	Barnett	2,411	3,963	3,237	3,045	3,525	2,179	1,657	1,354	1,261	1,188
Dickens	Permian	598	330	345	348	368	320	305	324	310	311
Dimmit	Eagle Ford	989	1,880	2,890	6,654	12,535	9,580	4,784	5,338	7,331	6,799
Donley	Anadarko	-	-	-	-	-	-	-	-	-	-
Duval	Eagle Ford	3,617	3,468	3,438	3,328	3,210	3,166	3,232	3,102	3,427	3,685
Eastland	Barnett	1,037	1,073	1,028	913	908	814	625	547	557	480
Ector	Permian	44,971	47,341	51,311	56,073	53,557	50,961	51,193	49,398	48,539	48,241
Edwards	Permian	19	33	65	55	25	14	11	14	7	3
El Paso	Permian	-	-	-	-	-	-	-	-	-	-
Ellis	Barnett	392	243	100	56	47	26	25	18	16	13
Erath	Barnett	355	331	366	1,224	226	117	107	89	87	131
Falls	None	2	3	3	3	2	1	1	1	1	1
Fannin	None	-	-	0	-	-	-	-	-	-	-
Fayette	Eagle Ford	897	850	990	1,052	1,122	1,007	748	818	801	1,215
Fisher	Permian	2,514	2,644	3,201	3,441	3,589	2,237	2,610	2,966	2,888	2,966
Floyd	Permian	0	0	0	0	0	0	0	-	-	-
Foard	None	457	521	564	698	738	511	220	228	187	97
Fort Bend	Misc	3,149	2,940	2,088	2,774	3,559	4,036	2,248	2,533	2,793	2,857
Franklin	Bossier	2,033	1,069	1,086	1,859	2,589	3,689	3,974	3,648	3,174	3,161
Freestone	Haynesville	3,176	3,390	6,392	4,169	1,925	1,702	1,198	1,024	902	1,178
Frio	Eagle Ford	331	475	694	733	984	1,199	918	1,110	867	718
Gaines	Permian	37,621	37,563	39,344	40,458	41,238	40,551	37,738	38,401	39,096	38,179
Galveston	None	889	1,031	731	640	567	516	581	438	725	815
Garza	Permian	5,836	5,758	6,073	6,627	7,305	7,077	6,950	6,812	6,706	6,838
Gillespie	None	-	-	-	-	-	-	-	-	-	-
Glasscock	Permian	4,764	7,271	14,170	14,584	15,662	15,878	14,143	15,634	20,821	21,889
Goliad	Eagle Ford	531	561	430	378	341	319	330	333	361	334
Gonzales	Eagle Ford	157	600	1,554	3,408	4,313	3,371	2,548	2,226	2,713	3,748
Gray	Anadarko	817	785	787	755	1,581	672	678	630	522	405
Grayson	Misc	866	1,064	1,141	1,054	1,505	1,314	1,197	1,298	1,133	1,050
Gregg	Haynesville	16,620	16,672	18,265	14,212	14,440	13,680	13,421	15,679	14,270	12,503
Grimes	Eagle Ford	948	212	296	339	350	498	231	156	149	214
Guadalupe	Misc	16,692	16,345	16,755	17,084	18,170	17,790	16,836	17,195	22,101	24,569
Hale	Permian	1,951	2,035	2,138	2,720	2,454	2,120	2,176	2,752	2,545	2,565
Hall	Anadarko	-	-	-	-	-	-	-	-	-	-
Hamilton	Barnett	2	2	5	6	2	1	0	1	0	0
Hansford	Anadarko	189	173	154	134	158	134	89	106	181	142
Hardeman	Barnett	206	196	290	302	276	231	238	263	308	297
Hardin	Misc	1,867	2,001	1,949	1,887	1,758	1,511	1,524	1,306	1,160	1,153
Harris	Misc	4,263	4,555	4,629	4,845	5,037	4,505	4,477	4,637	4,424	4,585
Harrison	Haynesville	3,130	6,734	5,008	3,857	2,912	2,863	1,976	1,683	1,736	8,790
Hartley	Anadarko	142	185	253	372	416	481	393	346	445	402
Haskell	Misc	348	355	560	537	800	1,428	1,034	695	696	577
Hays	None	3	2	1	2	2	2	2	2	1	1
Hemphill	Anadarko	2,889	3,405	3,522	3,457	3,593	3,982	3,122	2,909	3,639	4,169
Henderson	Misc	631	436	352	336	337	316	328	339	247	201
Hidalgo	Misc	2,386	1,888	2,202	1,873	1,907	4,301	9,393	2,676	1,682	1,503
Hill	Barnett	2,379	3,729	483	301	316	311	169	140	127	122
Hockley	Permian	26,872	26,383	27,874	29,816	26,707	24,067	23,628	23,944	23,597	23,122
Hood	Barnett	2,336	1,562	1,218	1,200	1,530	895	1,582	2,151	1,656	1,539
Hopkins	None	486	497	623	674	672	584	625	618	614	614
Houston	Bossier	2,246	2,624	2,954	2,818	2,744	3,464	3,005	2,421	2,240	2,379
Howard	Permian	16,841	16,638	16,444	21,048	24,034	25,342	24,148	28,948	35,041	38,813

County	Play Name	Produced Water (acre-ft)									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Hudspeth	Permian	-	-	-	-	-	-	-	-	-	-
Hunt	None	-	-	-	1	1	1	3	8	6	4
Hutchinson	Anadarko	1,555	1,374	1,382	1,229	1,106	908	705	662	867	671
Irion	Permian	1,115	1,138	1,837	2,834	3,651	3,147	2,550	3,218	2,992	3,701
Jack	Barnett	855	1,178	2,155	2,210	2,765	2,676	1,777	1,276	1,089	1,148
Jackson	Misc	3,931	3,487	3,053	3,623	3,740	3,257	2,443	2,567	4,072	6,172
Jasper	Eagle Ford	686	670	547	452	505	357	232	219	225	296
Jeff Davis	Permian	-	-	-	-	-	-	-	-	-	-
Jefferson	Misc	2,959	2,755	3,748	3,749	3,481	2,918	2,751	2,319	1,544	1,430
Jim Hogg	Eagle Ford	138	135	180	167	136	127	111	122	103	106
Jim Wells	None	146	147	178	126	111	87	69	49	34	23
Johnson	Barnett	11,558	10,553	8,950	6,677	7,402	7,250	5,015	5,209	6,782	4,704
Jones	Misc	724	765	853	824	738	696	585	561	509	413
Karnes	Eagle Ford	822	1,258	2,273	3,006	4,735	5,623	5,329	6,215	7,369	6,865
Kaufman	None	475	463	485	480	494	475	279	236	310	299
Kendall	None	-	-	-	-	-	-	-	-	-	-
Kenedy	Misc	455	305	275	255	238	188	162	193	304	259
Kent	Permian	15,222	15,615	15,089	17,732	17,094	14,702	12,932	12,282	12,840	11,092
Kerr	None	-	-	-	-	-	0	-	-	-	-
Kimble	Permian	0	0	0	0	0	-	0	0	0	-
King	Permian	2,761	2,058	2,005	1,768	2,229	2,313	2,394	2,327	2,162	1,880
Kinney	None	-	-	-	-	-	-	-	-	-	-
Kleberg	Misc	149	203	257	321	348	333	308	255	200	123
Knox	Misc	253	259	316	278	284	297	272	292	380	363
La Salle	Eagle Ford	518	1,035	3,086	4,861	6,404	5,774	3,564	4,555	5,929	7,519
Lamar	None	-	-	-	-	-	-	-	-	-	-
Lamb	Permian	879	867	861	1,147	980	775	856	841	853	849
Lampasas	None	-	-	-	-	-	-	-	-	-	-
Lavaca	Eagle Ford	420	369	433	487	878	964	566	522	706	992
Lee	Eagle Ford	182	178	256	285	398	341	189	154	348	375
Leon	Eagle Ford	1,013	1,200	1,465	1,362	1,066	937	636	520	503	511
Liberty	Misc	1,766	1,699	1,766	1,860	1,825	1,701	1,290	1,247	1,075	926
Limestone	Haynesville	2,112	2,001	1,829	1,342	920	1,120	694	699	713	574
Lipscomb	Anadarko	301	381	609	688	1,200	1,321	866	751	809	901
Live Oak	Eagle Ford	1,175	1,209	1,434	1,509	1,450	1,406	1,233	851	966	1,382
Llano	None	-	-	-	-	-	-	-	-	-	-
Loving	PermianFW	2,349	2,521	3,785	5,293	7,564	11,035	15,870	23,714	41,963	52,688
Lubbock	Permian	2,108	2,460	2,807	2,446	2,354	2,192	2,184	2,103	2,000	2,024
Lynn	Permian	536	487	527	657	636	574	540	492	567	572
Madison	Eagle Ford	289	316	602	902	1,541	1,683	1,003	743	611	485
Marion	Bossier	203	182	179	191	182	214	277	236	197	169
Martin	Permian	6,040	8,067	10,386	11,025	12,063	13,000	12,856	15,381	24,456	33,819
Mason	None	-	-	-	-	-	-	-	-	-	-
Matagorda	Misc	1,319	1,158	945	1,110	776	597	547	504	442	379
Maverick	Eagle Ford	821	853	864	865	991	904	841	682	658	754
Mcculloch	Permian	111	100	127	129	108	80	74	80	67	70
Mclennan	None	-	0	0	-	-	-	-	-	-	-
Mcmullen	Eagle Ford	1,054	1,391	2,257	3,354	4,243	3,730	2,951	2,263	3,140	2,849
Medina	Olmos	5	6	7	8	7	6	5	4	4	4
Menard	Permian	100	94	96	89	124	99	61	77	82	77
Midland	Permian	6,542	7,636	8,705	9,376	11,496	12,258	15,331	24,481	33,970	41,827
Milam	Eagle Ford	372	372	387	441	535	446	377	451	511	935
Mills	None	-	-	-	-	-	-	-	-	-	-
Mitchell	Permian	4,673	4,628	4,581	4,569	4,628	4,545	4,322	4,131	4,057	3,852
Montague	Barnett	10,274	19,256	22,508	22,106	18,657	9,909	7,328	6,450	5,858	5,658
Montgomery	Misc	4,843	9,996	10,335	10,371	10,910	11,502	9,849	11,229	10,690	9,070
Moore	Anadarko	337	313	354	311	261	198	200	148	137	122
Morris	None	0	0	0	0	0	0	0	0	1	1

County	Play Name	Produced Water (acre-ft)									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Motley	Permian	313	281	280	160	141	142	112	131	125	114
Nacogdoches	Haynesville	1,928	1,784	1,864	1,234	1,049	893	687	760	757	1,104
Navarro	Haynesville	1,808	869	1,055	1,029	1,177	1,045	831	768	806	677
Newton	Misc	743	1,605	1,153	1,040	1,091	956	755	677	551	458
Nolan	Permian	1,516	1,523	1,751	1,951	2,189	2,114	1,773	1,902	1,838	1,828
Nueces	Misc	746	789	658	703	607	538	500	471	440	366
Ochiltree	Anadarko	594	907	1,037	1,248	2,157	1,880	1,391	1,261	1,521	1,637
Oldham	Anadarko	323	236	296	322	361	321	280	230	142	100
Orange	Misc	957	999	890	707	699	561	487	448	458	350
Palo Pinto	Barnett	2,993	2,561	2,186	2,129	1,870	1,382	873	803	845	703
Panola	Haynesville	5,344	5,107	5,814	5,726	7,252	8,672	7,970	8,188	14,739	22,180
Parker	Barnett	2,675	2,967	4,298	4,329	3,258	2,719	2,133	2,069	1,750	1,609
Parmer	Anadarko	-	-	-	-	-	-	-	-	-	-
Pecos	PermianFW	29,693	26,143	20,511	18,564	17,343	15,996	16,223	16,484	20,614	26,745
Polk	Misc	910	743	608	684	878	888	771	762	721	714
Potter	Anadarko	104	123	137	112	147	336	170	227	281	150
Presidio	Permian	-	-	-	-	-	-	-	-	-	-
Rains	None	1	1	1,216	199	170	128	46	-	-	-
Randall	Anadarko	-	-	-	-	-	-	-	-	-	-
Reagan	Permian	7,460	7,879	8,467	8,526	9,572	8,724	10,344	13,963	16,912	18,889
Real	Permian	0	0	0	0	0	0	0	0	0	0
Red River	None	5	39	60	93	117	132	111	113	143	140
Reeves	PermianFW	2,191	3,124	5,236	7,395	15,047	21,844	24,979	42,385	82,647	126,408
Refugio	None	10,495	9,739	8,776	8,941	9,792	8,661	8,387	7,746	7,876	8,370
Roberts	Anadarko	439	521	554	621	922	793	504	429	348	311
Robertson	Eagle Ford	914	1,129	1,273	1,402	820	679	531	502	559	567
Rockwall	None	-	-	-	-	-	-	-	-	-	-
Runnels	Permian	699	674	783	736	851	673	504	429	401	388
Rusk	Haynesville	12,039	9,282	10,170	9,378	9,179	9,309	8,014	8,854	25,447	24,900
Sabine	Haynesville	5	22	31	16	6	5	2	6	3	1
San Augustine	Haynesville	597	857	653	544	321	316	352	362	629	900
San Jacinto	Misc	374	400	303	327	217	369	189	281	122	70
San Patricio	Misc	1,653	1,741	2,165	1,985	2,147	2,241	1,941	1,357	1,237	1,863
San Saba	Misc	-	-	-	-	-	-	-	-	-	-
Schleicher	Permian	285	231	297	334	328	255	265	232	175	194
Scurry	Permian	27,053	28,324	36,284	39,136	35,539	33,485	31,063	33,015	34,790	32,120
Shackelford	Barnett	914	934	865	790	830	755	680	670	652	578
Shelby	Haynesville	1,390	1,805	1,576	1,162	780	592	565	410	543	1,849
Sherman	Anadarko	126	85	86	135	142	131	139	126	139	157
Smith	Haynesville	1,646	5,147	3,810	1,834	1,943	1,990	2,049	2,049	1,826	2,003
Somervell	Barnett	728	492	208	152	140	83	374	450	291	253
Starr	Misc	1,230	1,156	1,420	1,234	1,174	1,021	1,062	828	776	807
Stephens	Barnett	26,944	27,124	28,622	29,170	31,241	30,695	32,019	34,627	33,845	33,751
Sterling	Permian	1,194	1,291	1,382	1,510	1,648	1,089	931	772	783	682
Stonewall	Permian	1,929	2,015	2,721	2,329	2,972	3,993	3,966	3,459	3,487	3,469
Sutton	Permian	81	90	81	72	60	52	45	64	36	29
Swisher	Anadarko	-	-	-	-	-	-	-	-	-	-
Tarrant	Barnett	10,283	10,851	11,244	8,051	8,324	12,443	10,298	12,622	13,546	10,707
Taylor	Misc	266	287	282	251	275	237	224	264	199	179
Terrell	PermianFW	62	73	112	54	54	61	60	43	40	36
Terry	Permian	7,756	7,691	7,739	7,892	7,869	7,348	7,447	7,074	6,960	7,054
Throckmorton	Misc	584	611	692	886	1,345	914	629	625	841	609
Titus	None	3,617	3,414	2,961	3,205	3,192	4,050	4,036	4,199	4,148	4,266
Tom Green	Permian	997	973	949	981	1,032	1,212	1,007	973	912	743
Travis	None	0	0	0	0	0	0	0	0	0	0
Trinity	None	78	86	75	59	72	83	88	71	92	89
Tyler	Misc	713	714	708	1,009	637	638	558	605	563	683
Upshur	Haynesville	677	925	809	565	570	724	515	549	801	674

County	Play Name	Produced Water (acre-ft)									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Upton	Permian	7,271	8,062	9,677	11,437	15,883	17,247	17,479	19,882	21,818	25,292
Uvalde	None	0	0	0	-	-	-	-	-	-	-
Val Verde	Permian	40	24	16	14	14	6	5	4	11	12
Van Zandt	Bossier	1,313	1,204	3,536	3,579	3,496	2,954	2,974	2,440	2,855	2,716
Victoria	None	1,986	1,893	1,950	1,888	2,213	2,651	2,965	2,867	2,804	3,966
Walker	Eagle Ford	9	8	17	37	99	155	34	35	21	18
Waller	Misc	1,286	1,270	2,308	1,674	2,014	1,837	1,711	1,599	1,474	1,358
Ward	Permian	10,070	11,307	14,099	16,380	18,182	17,365	16,590	17,743	22,423	30,448
Washington	Eagle Ford	164	194	165	185	201	144	121	136	377	1,837
Webb	Eagle Ford	2,147	3,071	4,858	5,685	6,616	6,376	5,350	8,190	6,893	10,013
Wharton	Misc	3,935	3,871	3,792	3,881	4,221	4,427	4,161	3,817	3,738	3,864
Wheeler	Anadarko	5,746	8,292	9,599	20,496	8,610	5,722	3,882	3,409	3,285	2,718
Wichita	Misc	10,572	10,889	10,688	11,319	10,675	10,737	10,511	9,896	9,364	9,613
Wilbarger	Misc	1,678	1,666	1,874	2,352	2,091	1,931	1,921	1,800	1,713	1,743
Willacy	Olmos	794	763	763	725	679	623	562	482	433	465
Williamson	None	0	0	0	0	0	0	0	0	0	0
Wilson	Eagle Ford	572	686	895	1,065	1,337	893	753	705	707	965
Winkler	Permian	10,318	8,897	8,920	9,548	9,561	12,690	8,466	9,958	13,851	16,490
Wise	Barnett	3,229	4,294	4,004	5,161	5,900	4,728	4,029	3,895	3,609	3,257
Wood	Bossier	6,797	6,648	7,036	7,106	6,536	5,890	4,948	3,156	3,175	3,017
Yoakum	Permian	26,303	26,211	28,119	28,766	27,323	29,100	29,859	30,621	32,047	30,117
Young	Barnett	1,560	1,597	1,676	1,715	1,878	1,625	1,508	1,504	1,566	1,610
Zapata	Misc	752	626	656	578	639	1,245	3,020	3,723	2,960	2,657
Zavala	Eagle Ford	126	137	314	306	296	357	247	327	277	320
Total		703,144	735,238	806,096	843,906	876,761	857,807	815,093	872,815	1,016,576	1,133,190

Table 1- 3b. Time series of annual produced water volumes by play

<i>Play Name</i>	<i>Produced Water (acre-ft)</i>									
	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>
Anadarko	13,699	16,903	18,923	30,010	20,769	16,974	12,490	11,294	12,369	11,930
Barnett	87,225	100,371	102,701	99,505	99,036	86,671	76,973	80,459	80,208	73,924
Bossier	14,364	13,324	16,349	17,219	17,566	18,064	17,203	13,761	13,260	12,955
Eagle Ford	23,528	26,904	36,836	48,785	65,851	60,160	44,669	47,705	54,363	63,692
Haynesville	50,572	54,724	57,430	45,208	42,585	43,034	38,398	41,102	63,339	77,735
Misc	96,705	99,629	109,130	108,761	111,615	110,157	107,444	98,761	100,573	104,143
None	22,569	21,551	25,168	21,226	22,666	22,101	20,845	19,999	20,310	21,799
Olmos	800	769	770	733	686	629	567	486	437	469
Permian	359,087	368,845	408,462	440,010	453,344	445,951	432,229	459,738	507,047	536,364
Permian-Far West	34,593	32,217	30,327	32,447	42,645	54,065	64,275	99,511	164,669	230,178
Total	703,144	735,238	806,096	843,906	876,761	857,807	815,093	872,815	1,016,576	1,133,190

Table 1- 4a. Comparison of annual mining water use by county for 2015 as published by the United States Geological Survey (USGS), the Texas Water Development Board (TWDB) and the Texas Bureau of Economic Geology (This study) by county.

County	Play Name	All values in acre-ft																
		USGS 2015 Mining Groundwater			USGS 2015 Mining Surface Water			USGS 2015 Mining Total			TWDB 2015 Mining Water Use				2015 This Study			
		Fresh	Saline	Total	Fresh	Saline	Total	Fresh	Saline	Total	GW	SW	R/U	Total	HF	Injection	EOR	SWD
Anderson	Misc	-	1,983	1,983	-	-	-	-	1,983	1,983	1	-	-	1	-	1,980	487	1,494
Andrews	Permian	1,411	60,656	62,067	-	-	-	1,411	60,656	62,067	1,272	-	34	1,306	1,911	59,894	43,708	16,186
Angelina	Haynesville	22	134	157	11	-	11	34	134	168	19	8	1	28	33	129	-	129
Aransas	None	-	67	67	-	-	-	-	67	67	-	-	-	-	-	69	-	69
Archer	Barnett	-	2,464	2,464	-	-	-	-	2,464	2,464	-	-	-	-	-	2,469	1,946	522
Armstrong	Anadarko	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Atascosa	Eagle Ford	2,621	3,181	5,802	280	-	280	2,901	3,181	6,082	2,507	279	-	2,786	4,041	3,185	256	2,929
Austin	Eagle Ford	-	605	605	224	-	224	224	605	829	-	45	-	45	-	600	14	585
Bailey	Permian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bandera	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bastrop	Eagle Ford	45	67	112	-	-	-	45	67	112	44	-	-	44	-	65	59	6
Baylor	Misc	-	280	280	-	-	-	-	280	280	-	-	-	-	4	285	154	131
Bee	Eagle Ford	22	403	426	-	-	-	22	403	426	20	2	-	22	24	406	13	393
Bell	None	11	-	11	-	-	-	11	-	11	10	-	-	10	-	-	-	-
Bexar	Misc	6,620	-	6,620	-	-	-	6,620	-	6,620	6,731	-	-	6,731	-	2	2	0
Blanco	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borden	Permian	78	5,354	5,433	-	-	-	78	5,354	5,433	84	-	-	84	4	5,382	3,572	1,809
Bosque	Barnett	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bowie	None	-	45	45	-	-	-	-	45	45	-	-	-	-	-	41	-	41
Brazoria	Misc	-	14,472	14,472	112	-	112	112	14,472	14,584	-	-	-	-	-	14,609	6,409	8,200
Brazos	Eagle Ford	1,098	795	1,893	123	-	123	1,221	795	2,016	1,096	122	-	1,218	1,837	798	-	798
Brewster	Permian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Briscoe	Anadarko	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brooks	Misc	-	280	280	-	-	-	-	280	280	-	-	-	-	-	278	19	259
Brown	None	-	134	134	-	-	-	-	134	134	-	-	-	-	-	135	72	63
Burleson	Eagle Ford	2,016	1,165	3,181	224	-	224	2,240	1,165	3,405	2,018	224	-	2,242	2,426	1,164	-	1,164
Burnet	None	45	-	45	-	-	-	45	-	45	44	1	6	51	-	-	-	-
Caldwell	Misc	-	27,063	27,063	-	-	-	-	27,063	27,063	-	-	-	-	-	27,065	36	27,028
Calhoun	None	-	381	381	-	-	-	-	381	381	-	-	-	-	-	376	-	376
Callahan	Misc	-	392	392	-	-	-	-	392	392	-	-	-	-	-	389	210	179
Cameron	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Camp	None	-	627	627	-	-	-	-	627	627	-	-	-	-	-	631	387	243
Carson	Anadarko	-	146	146	-	-	-	-	146	146	-	-	-	-	-	146	16	130
Cass	Misc	-	280	280	-	-	-	-	280	280	-	-	-	-	-	285	159	126
Castro	Anadarko	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chambers	None	-	10,249	10,249	-	-	-	-	10,249	10,249	1	-	-	1	-	10,649	576	10,073
Cherokee	Bossier	56	4,537	4,593	22	-	22	78	4,537	4,615	61	26	5	92	43	4,537	-	4,537
Childress	Anadarko	-	34	34	-	-	-	-	34	34	-	-	-	-	-	32	-	32

County	Play Name	All values in acre-ft																
		USGS 2015 Mining Groundwater			USGS 2015 Mining Surface Water			USGS 2015 Mining Total			TWDB 2015 Mining Water Use				2015 This Study			
		Fresh	Saline	Total	Fresh	Saline	Total	Fresh	Saline	Total	GW	SW	R/U	Total	HF	Injection	EOR	SWD
Clay	Barnett	-	829	829	11	-	11	11	829	840	3	11	1	15	12	828	556	272
Cochran	Permian	11	6,463	6,474	-	-	-	11	6,463	6,474	13	-	-	13	17	6,449	6,021	428
Coke	Permian	-	5,702	5,702	-	-	-	-	5,702	5,702	-	1	-	1	-	5,697	4,551	1,146
Coleman	Misc	-	650	650	-	-	-	-	650	650	-	-	-	-	-	652	557	95
Collin	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Collingsworth	Anadarko	-	11	11	-	-	-	-	11	11	-	-	-	-	-	6	2	3
Colorado	Eagle Ford	2,744	381	3,125	1,803	-	1,803	4,548	381	4,929	2,201	1,808	-	4,009	-	381	-	381
Comal	None	2,554	-	2,554	-	-	-	2,554	-	2,554	3,282	-	-	3,282	-	-	-	-
Comanche	Barnett	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2
Concho	Permian	-	437	437	-	-	-	-	437	437	-	-	-	-	-	449	414	35
Cooke	Barnett	11	5,489	5,500	34	-	34	45	5,489	5,534	8	31	2	41	82	5,576	3,659	1,917
Coryell	Barnett	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cottle	Permian	-	45	45	-	-	-	-	45	45	-	-	-	-	3	54	12	43
Crane	Permian	101	25,102	25,203	-	-	-	101	25,102	25,203	96	-	3	99	127	25,138	21,426	3,712
Crockett	Permian	1,322	11,201	12,523	-	-	-	1,322	11,201	12,523	1,323	-	39	1,362	2,488	11,130	3,178	7,953
Crosby	Permian	-	6,833	6,833	302	-	302	302	6,833	7,135	5	307	-	312	-	6,835	6,237	598
Culberson	PermianFW	437	3,618	4,055	-	-	-	437	3,618	4,055	432	-	-	432	2,114	3,603	82	3,521
Dallam	Anadarko	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dallas	Barnett	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-
Dawson	Permian	168	7,572	7,740	-	-	-	168	7,572	7,740	164	-	4	168	263	7,573	5,647	1,925
Deaf Smith	Anadarko	-	-	-	-	-	-	-	-	-	-	-	-	-	6,137	-	-	-
Delta	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denton	Barnett	190	650	840	762	-	762	952	650	1,602	191	764	52	1,007	-	651	7	644
DeWitt	Eagle Ford	4,593	2,756	7,348	515	-	515	5,108	2,756	7,863	4,588	510	-	5,098	774	2,751	-	2,751
Dickens	Permian	-	605	605	-	-	-	-	605	605	-	-	-	-	-	608	331	278
Dimmit	Eagle Ford	6,990	5,679	12,669	773	-	773	7,763	5,679	13,442	6,992	777	-	7,769	10,753	5,678	375	5,302
Donley	Anadarko	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Duval	Eagle Ford	414	5,265	5,679	-	-	-	414	5,265	5,679	375	-	-	375	-	5,060	1,789	3,271
Eastland	Barnett	-	1,131	1,131	34	-	34	34	1,131	1,165	1	33	-	34	-	1,129	837	292
Ector	Permian	358	71,734	72,092	-	-	-	358	71,734	72,092	360	-	9	369	512	71,880	64,906	6,974
Edwards	Permian	-	45	45	-	-	-	-	45	45	-	-	-	-	-	40	5	35
El Paso	Permian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ellis	Barnett	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-
Erath	Barnett	-	134	134	-	-	-	-	134	134	-	-	-	-	24	135	-	135
Falls	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
Fannin	None	-	-	-	-	-	-	-	-	-	1,535	-	1,535	-	-	-	-	-
Fayette	Eagle Ford	190	863	1,053	22	-	22	213	863	1,075	194	22	-	216	316	858	-	858
Fisher	Permian	-	3,293	3,293	-	-	-	-	3,293	3,293	-	-	-	-	-	3,293	2,796	497
Floyd	Permian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Foard	None	-	426	426	-	-	-	-	426	426	-	-	-	-	-	425	396	29
Fort Bend	Misc	11	3,853	3,864	-	-	-	11	3,853	3,864	6	-	-	6	-	3,850	767	3,083

County	Play Name	All values in acre-ft																
		USGS 2015 Mining Groundwater			USGS 2015 Mining Surface Water			USGS 2015 Mining Total			TWDB 2015 Mining Water Use				2015 This Study			
		Fresh	Saline	Total	Fresh	Saline	Total	Fresh	Saline	Total	GW	SW	R/U	Total	HF	Injection	EOR	SWD
Franklin	Bossier	-	4,133	4,133	-	-	-	-	4,133	4,133	-	-	-	-	-	4,138	34	4,104
Freestone	Haynesville	1,770	2,408	4,178	-	-	-	1,770	2,408	4,178	184	3	1	188	11	2,404	6	2,399
Frio	Eagle Ford	638	2,364	3,002	67	-	67	706	2,364	3,069	644	72	-	716	959	2,363	11	2,352
Gaines	Permian	4,850	52,792	57,643	-	-	-	4,850	52,792	57,643	4,851	-	861	5,712	97	52,630	39,196	13,434
Galveston	None	-	650	650	-	-	-	-	650	650	134	-	-	134	-	640	2	638
Garza	Permian	-	7,852	7,852	-	-	-	-	7,852	7,852	-	-	-	-	-	7,876	5,906	1,969
Gillespie	None	-	-	-	-	-	-	-	-	-	5	-	-	5	-	-	-	-
Glasscock	Permian	3,125	19,491	22,616	-	-	-	3,125	19,491	22,616	3,127	-	92	3,219	4,688	19,491	10,786	8,704
Goliad	Eagle Ford	-	459	459	-	-	-	-	459	459	-	-	-	-	-	463	-	463
Gonzales	Eagle Ford	2,532	3,472	6,004	280	-	280	2,812	3,472	6,284	2,537	687	-	3,224	3,995	3,471	-	3,471
Gray	Anadarko	-	1,445	1,445	-	-	-	-	1,445	1,445	-	-	-	-	-	1,439	978	461
Grayson	Misc	101	1,210	1,311	22	-	22	123	1,210	1,333	104	26	7	137	139	1,220	513	707
Gregg	Haynesville	-	23,165	23,165	-	-	-	-	23,165	23,165	-	-	-	-	-	23,169	739	22,429
Grimes	Eagle Ford	11	650	661	-	-	-	11	650	661	15	4	1	20	17	655	-	655
Guadalupe	Misc	11	39,911	39,922	-	-	-	11	39,911	39,922	-	-	-	-	-	39,907	2,655	37,251
Hale	Permian	-	3,416	3,416	-	-	-	-	3,416	3,416	-	-	-	-	-	3,417	3,358	59
Hall	Anadarko	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hamilton	Barnett	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-
Hansford	Anadarko	-	213	213	-	-	-	-	213	213	3	1	2	6	8	218	21	198
Hardeman	Barnett	-	538	538	-	-	-	-	538	538	-	-	-	-	-	543	138	405
Hardin	Misc	-	2,296	2,296	-	-	-	-	2,296	2,296	-	-	-	-	-	2,300	10	2,290
Harris	Misc	-	6,206	6,206	-	-	-	-	6,206	6,206	-	-	-	-	-	6,208	1,292	4,916
Harrison	Haynesville	302	2,296	2,599	67	-	67	370	2,296	2,666	306	151	13	470	263	2,275	141	2,134
Hartley	Anadarko	-	504	504	-	-	-	-	504	504	2	-	-	2	1	504	209	295
Haskell	Misc	-	1,423	1,423	-	-	-	-	1,423	1,423	-	-	-	-	-	1,427	1,039	388
Hays	None	302	-	302	-	-	-	302	-	302	300	-	-	300	-	-	-	-
Hemphill	Anadarko	314	3,148	3,461	78	-	78	392	3,148	3,540	316	79	159	554	1,024	3,147	-	3,147
Henderson	Misc	-	560	560	-	-	-	-	560	560	-	-	-	-	-	561	-	561
Hidalgo	Misc	650	1,423	2,072	-	-	-	650	1,423	2,072	645	1	-	646	5	1,420	86	1,334
Hill	Barnett	-	157	157	-	-	-	-	157	157	2	-	-	2	-	154	-	154
Hockley	Permian	22	34,321	34,344	-	-	-	22	34,321	34,344	17	-	1	18	42	34,321	32,640	1,681
Hood	Barnett	-	874	874	134	-	134	134	874	1,008	-	131	-	131	-	874	-	874
Hopkins	None	-	549	549	-	-	-	-	549	549	1	-	-	1	1	551	244	307
Houston	Bossier	56	3,999	4,055	22	-	22	78	3,999	4,077	57	25	4	86	302	4,004	386	3,618
Howard	Permian	2,072	30,714	32,787	-	-	-	2,072	30,714	32,787	2,072	-	61	2,133	2,657	30,710	20,819	9,890
Hudspeth	Permian	-	22	22	-	-	-	-	22	22	18	-	-	18	-	-	-	-
Hunt	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-
Hutchinson	Anadarko	-	1,210	1,210	-	-	-	-	1,210	1,210	89	1	2	92	-	1,209	37	1,172
Irion	Permian	1,613	3,338	4,951	-	-	-	1,613	3,338	4,951	1,610	-	47	1,657	3,403	3,334	1,243	2,092
Jack	Barnett	22	3,260	3,282	112	-	112	134	3,260	3,394	27	111	8	146	176	3,214	254	2,959
Jackson	Misc	-	4,626	4,626	-	-	-	-	4,626	4,626	-	-	-	-	-	4,617	880	3,736

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		Fresh	Saline	Total	Fresh	Saline	Total	Fresh	Saline	Total	GW	SW	R/U	Total	HF	Injection	EOR	SWD
Jasper	Eagle Ford	-	661	661	-	-	-	-	661	661	2	-	-	2	26	656	-	656
Jeff Davis	Permian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jefferson	Misc	11	5,119	5,130	-	11	11	11	5,130	5,141	13	-	-	13	-	5,123	-	5,123
Jim Hogg	Eagle Ford	-	123	123	-	-	-	-	123	123	42	1	-	43	9	126	34	91
Jim Wells	None	-	246	246	-	-	-	-	246	246	-	-	-	-	-	246	80	166
Johnson	Barnett	11	7,583	7,595	67	-	67	78	7,583	7,662	35	68	4	107	56	7,589	-	7,589
Jones	Misc	-	1,131	1,131	-	-	-	-	1,131	1,131	-	-	-	-	8	1,124	545	579
Karnes	Eagle Ford	6,676	6,866	13,543	739	-	739	7,415	6,866	14,282	6,677	742	-	7,419	9,842	6,872	106	6,765
Kaufman	None	-	459	459	-	-	-	-	459	459	-	-	-	-	-	462	34	428
Kendall	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kenedy	Misc	-	269	269	-	-	-	-	269	269	-	-	-	-	-	264	15	249
Kent	Permian	-	18,818	18,818	-	-	-	-	18,818	18,818	-	-	-	-	-	18,881	16,518	2,363
Kerr	None	22	-	22	179	-	179	202	-	202	27	174	-	201	-	-	-	-
Kimble	Permian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
King	Permian	-	2,677	2,677	-	-	-	-	2,677	2,677	1	-	-	1	-	2,658	2,048	610
Kinney	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kleberg	Misc	11	392	403	-	-	-	11	392	403	22	2	1	25	-	485	39	446
Knox	Misc	-	448	448	-	-	-	-	448	448	-	-	-	-	-	453	294	159
La Salle	Eagle Ford	-	-	-	-	-	-	-	-	-	7,764	863	-	8,627	12,307	7,265	58	7,207
Lamar	None	-	863	863	-	-	-	-	863	863	-	-	-	-	-	-	-	-
Lamb	Permian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	865	827	38
Lampasas	None	7,763	7,270	15,032	863	-	863	8,625	7,270	15,895	-	37	-	37	-	-	-	-
Lavaca	Eagle Ford	739	717	1,456	78	-	78	818	717	1,535	737	81	-	818	1,270	721	1	720
Lee	Eagle Ford	6,878	560	7,438	22	-	22	6,900	560	7,460	904	26	-	930	338	560	0	560
Leon	Eagle Ford	4,458	986	5,444	739	-	739	5,197	986	6,183	104	739	5	848	85	983	179	804
Liberty	Misc	-	2,162	2,162	-	-	-	-	2,162	2,162	-	-	-	-	-	2,165	187	1,978
Limestone	Haynesville	1,456	538	1,994	269	-	269	1,725	538	2,263	1,457	272	-	1,729	1	532	40	492
Lipscomb	Anadarko	112	638	750	22	-	22	134	638	773	107	27	54	188	519	634	75	559
Live Oak	Eagle Ford	907	1,008	1,915	101	-	101	1,008	1,008	2,016	904	100	-	1,004	1,380	1,009	23	986
Llano	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loving	PermianFW	885	15,133	16,018	-	-	-	885	15,133	16,018	881	-	-	881	4,154	15,130	374	14,756
Lubbock	Permian	-	3,562	3,562	-	-	-	-	3,562	3,562	3	1	-	4	1	3,559	3,327	231
Lynn	Permian	-	1,053	1,053	-	-	-	-	1,053	1,053	-	-	-	-	-	1,048	738	310
Madison	Eagle Ford	4,290	123	4,413	-	-	-	4,290	123	4,413	214	54	15	283	678	1,980	42	1,938
Marion	Bossier	-	-	-	-	-	-	-	-	-	1	1	-	2	-	348	46	302
Martin	Permian	4,257	3,887	8,143	470	-	470	4,727	3,887	8,614	4,545	-	132	4,677	6,190	15,082	548	14,535
Mason	None	213	1,983	2,195	56	-	56	269	1,983	2,251	116	-	-	116	-	-	-	-
Matagorda	Misc	-	347	347	-	-	-	-	347	347	1	-	-	1	-	830	-	830
Maverick	Eagle Ford	4,548	15,223	19,771	-	-	-	4,548	15,223	19,771	18	2	-	20	29	291	281	10
McCulloch	Permian	112	-	112	-	-	-	112	-	112	4,290	-	-	4,290	-	121	121	-
McLennan	None	-	829	829	-	-	-	-	829	829	-	-	-	-	-	-	-	-

County	Play Name	All values in acre-ft																
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McMullen	Eagle Ford	22	291	314	56	-	56	78	291	370	4,254	473	-	4,727	6,011	3,865	138	3,726
Medina	Olmos	11	-	11	-	-	-	11	-	11	11	-	-	11	-	6	5	0
Menard	Permian	-	56	56	-	-	-	-	56	56	-	-	-	-	-	58	31	27
Midland	Permian	7,147	14,215	21,361	-	-	-	7,147	14,215	21,361	7,145	-	210	7,355	9,059	14,214	969	13,245
Milam	Eagle Ford	-	56	56	-	-	-	-	56	56	2	-	-	2	-	61	41	20
Mills	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mitchell	Permian	11	7,707	7,718	-	-	-	11	7,707	7,718	7	-	-	7	7	7,703	6,917	786
Montague	Barnett	67	6,530	6,598	258	-	258	325	6,530	6,855	64	255	17	336	622	6,534	3,237	3,297
Montgomery	Misc	-	12,859	12,859	-	-	-	-	12,859	12,859	-	-	-	-	-	12,645	1,827	10,818
Moore	Anadarko	11	470	482	-	-	-	11	470	482	8	2	4	14	1	469	71	397
Morris	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Motley	Permian	-	258	258	-	-	-	-	258	258	-	-	-	-	-	260	-	260
Nacogdoches	Haynesville	67	750	818	34	-	34	101	750	851	71	30	5	106	96	751	-	751
Navarro	Haynesville	22	1,031	1,053	437	-	437	459	1,031	1,490	24	495	1	520	-	1,013	188	825
Newton	Misc	-	1,467	1,467	-	-	-	-	1,467	1,467	-	-	-	-	-	1,471	62	1,409
Nolan	Permian	-	2,453	2,453	-	-	-	-	2,453	2,453	1	-	-	1	2	2,729	1,757	973
Nueces	Misc	717	728	1,445	-	-	-	717	728	1,445	713	1	-	714	-	724	42	681
Ochiltree	Anadarko	157	1,815	1,971	34	-	34	190	1,815	2,005	155	39	77	271	397	1,815	674	1,141
Oldham	Anadarko	34	482	515	-	-	-	34	482	515	38	-	1	39	50	487	-	487
Orange	Misc	-	594	594	-	-	-	-	594	594	-	-	-	-	1	594	0	593
Palo Pinto	Barnett	11	1,389	1,400	1,243	-	1,243	1,255	1,389	2,644	6	25	2	33	36	1,391	112	1,279
Panola	Haynesville	1,703	7,729	9,432	907	-	907	2,610	7,729	10,339	1,705	909	94	2,708	2,213	7,719	200	7,519
Parker	Barnett	56	2,924	2,980	22	-	22	78	2,924	3,002	53	1,242	1	1,296	61	2,924	-	2,924
Parmer	Anadarko	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pecos	PermianFW	190	27,007	27,197	-	-	-	190	27,007	27,197	189	-	-	189	1,073	27,007	17,428	9,579
Polk	Misc	-	1,165	1,165	-	-	-	-	1,165	1,165	-	-	-	-	8	1,164	-	1,164
Potter	Anadarko	213	336	549	202	-	202	414	336	750	218	65	9	292	180	332	155	178
Presidio	Permian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rains	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Randall	Anadarko	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reagan	Permian	4,861	17,676	22,537	-	-	-	4,861	17,676	22,537	4,862	-	143	5,005	7,893	17,399	585	16,814
Real	Permian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Red River	None	-	168	168	-	-	-	-	168	168	-	-	-	-	-	170	170	-
Reeves	PermianFW	1,367	27,388	28,754	-	-	-	1,367	27,388	28,754	1,371	-	-	1,371	7,117	26,250	1,100	25,150
Refugio	None	-	12,075	12,075	-	-	-	-	12,075	12,075	-	-	-	-	-	11,456	3,336	8,121
Roberts	Anadarko	112	571	683	34	-	34	146	571	717	117	29	58	204	309	569	40	530
Robertson	Eagle Ford	3,047	661	3,708	22	-	22	3,069	661	3,730	3,056	28	5	3,089	122	662	-	662
Rockwall	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Runnels	Permian	-	1,109	1,109	-	-	-	-	1,109	1,109	-	-	-	-	-	1,106	33	1,072
Rusk	Haynesville	1,994	15,413	17,407	538	-	538	2,532	15,413	17,945	1,993	540	27	2,560	554	15,410	3,248	12,162
Sabine	Haynesville	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

County	Play Name	All values in acre-ft																
		USGS 2015 Mining Groundwater			USGS 2015 Mining Surface Water			USGS 2015 Mining Total			TWDB 2015 Mining Water Use				2015 This Study			
		Fresh	Saline	Total	Fresh	Saline	Total	Fresh	Saline	Total	GW	SW	R/U	Total	HF	Injection	EOR	SWD
San Augustine	Haynesville	325	403	728	134	-	134	459	403	863	323	139	24	486	385	401	-	401
San Jacinto	Misc	-	414	414	-	-	-	-	414	414	-	-	-	-	-	416	-	416
San Patricio	Misc	-	2,307	2,307	-	-	-	-	2,307	2,307	2	-	-	2	2	2,312	-	2,312
San Saba	Misc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schleicher	Permian	45	358	403	11	-	11	56	358	414	40	10	3	53	65	350	181	170
Scurry	Permian	11	44,907	44,918	-	-	-	11	44,907	44,918	15	-	-	15	54	44,904	41,762	3,142
Shackelford	Barnett	11	1,299	1,311	-	-	-	11	1,299	1,311	13	1	-	14	-	1,299	1,067	232
Shelby	Haynesville	78	3,876	3,954	34	-	34	112	3,876	3,988	84	36	6	126	226	3,877	-	3,877
Sherman	Anadarko	-	168	168	-	-	-	-	168	168	2	1	1	4	1	171	81	90
Smith	Haynesville	202	4,604	4,805	179	-	179	381	4,604	4,985	197	184	7	388	144	4,587	1,651	2,937
Somervell	Barnett	190	269	459	-	-	-	190	269	459	190	45	-	235	-	272	-	272
Starr	Misc	-	885	885	-	-	-	-	885	885	2	-	-	2	4	883	26	857
Stephens	Barnett	-	35,878	35,878	11	-	11	11	35,878	35,889	2	7	-	9	-	35,881	31,612	4,269
Sterling	Permian	11	1,400	1,411	-	-	-	11	1,400	1,411	8	-	-	8	29	1,473	978	495
Stonewall	Permian	-	4,985	4,985	-	-	-	-	4,985	4,985	1	-	-	1	-	4,982	4,640	342
Sutton	Permian	-	381	381	-	-	-	-	381	381	-	-	-	-	1	368	-	368
Swisher	Anadarko	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tarrant	Barnett	280	3,327	3,607	1,131	-	1,131	1,411	3,327	4,738	282	1,280	77	1,639	1,391	3,327	-	3,327
Taylor	Misc	-	437	437	-	-	-	-	437	437	-	-	-	-	-	436	229	207
Terrell	PermianFW	11	45	56	-	-	-	11	45	56	7	-	-	7	12	23	-	23
Terry	Permian	-	10,496	10,496	-	-	-	-	10,496	10,496	3	-	-	3	3	10,481	7,545	2,936
Throckmorton	Misc	22	1,479	1,501	-	-	-	22	1,479	1,501	21	5	1	27	45	1,484	456	1,028
Titus	None	-	4,929	4,929	638	-	638	638	4,929	5,567	-	704	-	704	-	4,930	620	4,310
Tom Green	Permian	-	1,378	1,378	-	-	-	-	1,378	1,378	-	-	-	-	25	1,380	1,023	357
Travis	None	-	-	-	157	-	157	157	-	157	-	-	-	-	-	0	-	0
Trinity	None	-	78	78	-	-	-	-	78	78	-	-	-	-	-	77	7	70
Tyler	Misc	-	638	638	-	-	-	-	638	638	-	-	-	-	-	639	-	639
Upshur	Haynesville	34	18,034	18,068	11	-	11	45	18,034	18,079	32	14	3	49	56	18,036	803	17,233
Upton	Permian	4,111	22,235	26,346	-	-	-	4,111	22,235	26,346	4,208	-	121	4,329	6,848	22,094	12,111	9,984
Uvalde	None	213	-	213	-	-	-	213	-	213	49	-	-	49	-	-	-	-
Val Verde	Permian	-	-	-	11	-	11	11	-	11	-	-	-	-	-	-	-	-
Van Zandt	Bossier	-	2,207	2,207	-	-	-	-	2,207	2,207	-	-	-	-	-	2,208	238	1,971
Victoria	None	-	3,450	3,450	-	-	-	-	3,450	3,450	3	-	-	3	-	3,453	687	2,766
Walker	Eagle Ford	11	302	314	-	-	-	11	302	314	11	3	1	15	41	298	-	298
Waller	Misc	-	2,251	2,251	-	-	-	-	2,251	2,251	-	-	-	-	-	2,252	770	1,482
Ward	Permian	459	19,972	20,431	-	-	-	459	19,972	20,431	455	-	13	468	724	19,675	9,052	10,624
Washington	Eagle Ford	11	45	56	-	-	-	11	45	56	7	2	-	9	8	48	-	48
Webb	Eagle Ford	3,775	1,199	4,973	459	-	459	4,234	1,199	5,433	3,774	463	-	4,237	5,651	1,202	145	1,058
Wharton	Misc	-	5,287	5,287	-	-	-	-	5,287	5,287	3	-	-	3	-	5,289	1,295	3,994
Wheeler	Anadarko	123	3,820	3,943	34	-	34	157	3,820	3,977	122	30	60	212	306	3,816	18	3,798
Wichita	Misc	11	10,440	10,451	-	-	-	11	10,440	10,451	11	3	1	15	-	10,445	9,351	1,094

County	Play Name	All values in acre-ft																
		USGS 2015 Mining Groundwater			USGS 2015 Mining Surface Water			USGS 2015 Mining Total			TWDB 2015 Mining Water Use				2015 This Study			
		Fresh	Saline	Total	Fresh	Saline	Total	Fresh	Saline	Total	GW	SW	R/U	Total	HF	Injection	EOR	SWD
Wilbarger	Misc	11	2,061	2,072	-	-	-	11	2,061	2,072	14	3	1	18	14	2,056	1,358	698
Willacy	Olmos	-	594	594	-	-	-	-	594	594	-	-	-	-	-	596	44	552
Williamson	None	829	-	829	-	-	-	829	-	829	828	11	-	839	-	-	-	-
Wilson	Eagle Ford	-	504	504	-	-	-	-	504	504	-	-	-	-	-	506	107	400
Winkler	Permian	235	13,834	14,069	-	-	-	235	13,834	14,069	238	-	7	245	330	13,890	6,499	7,391
Wise	Barnett	134	3,047	3,181	1,501	-	1,501	1,635	3,047	4,682	133	1,693	672	2,498	1,027	2,815	107	2,707
Wood	Bossier	11	6,990	7,001	-	-	-	11	6,990	7,001	8	3	1	12	10	6,991	788	6,203
Yoakum	Permian	45	40,112	40,157	-	-	-	45	40,112	40,157	44	-	1	45	228	40,172	31,994	8,178
Young	Barnett	-	2,610	2,610	-	-	-	-	2,610	2,610	-	2	-	2	-	2,614	1,718	896
Zapata	Misc	-	549	549	-	-	-	-	549	549	-	18	-	18	-	552	1	551
Zavala	Eagle Ford	515	123	638	56	-	56	571	123	694	511	57	-	568	883	122	27	94
Total		129,421	1,125,308	1,254,729	17,799	11	17,810	147,221	1,125,319	1,272,539	117,780	19,835	3,280	140,895	142,951	1,122,306	544,215	578,091

Table 1- 4b. Comparison of annual mining water use by county for 2015 as published by the United States Geological Survey (USGS), the Texas Water Development Board (TWDB) and the Texas Bureau of Economic Geology (This study) by play

Play Name	All values in acre-ft																
	USGS 2015 Mining Groundwater			USGS 2015 Mining Surface Water			USGS 2015 Mining Total			TWDB 2015 Mining Water Use				2015 This Study			
	Fresh	Saline	Total	Fresh	Saline	Total	Fresh	Saline	Total	GW	SW	Reuse	Total	HF	Injection	EOR	SWD
Anadarko	1,075	15,010	16,085	403	-	403	1,479	15,010	16,489	1,177	274	427	1,878	8,934	14,994	2,377	12,618
Barnett	986	80,382	81,367	5,321	-	5,321	6,306	80,382	86,688	1,011	5,699	836	7,546	3,489	80,222	45,253	34,969
Bossier	123	21,865	21,988	45	-	45	168	21,865	22,033	127	55	10	192	354	22,227	1,492	20,735
Eagle Ford	59,793	57,553	117,346	6,586	-	6,586	66,380	57,553	123,933	52,212	8,186	27	60,425	63,822	55,122	3,700	51,422
Haynesville	7,975	80,382	88,357	2,621	-	2,621	10,597	80,382	90,978	6,395	2,781	182	9,358	3,982	80,303	7,016	73,287
Misc	8,177	160,337	168,514	134	11	146	8,311	160,349	168,660	8,289	59	11	8,359	230	160,857	31,773	129,084
None	11,952	45,478	57,430	1,893	-	1,893	13,845	45,478	59,323	4,800	2,462	6	7,268	1	34,311	6,612	27,699
Olmos	11	594	605	-	-	-	11	594	605	11	-	-	11	-	602	50	552
Permian	36,438	590,517	626,956	795	-	795	37,234	590,517	627,751	40,878	319	1,781	42,978	47,668	601,654	426,959	174,695
Permian-Far West	2,890	73,190	76,080	-	-	-	2,890	73,190	76,080	2,880	-	-	2,880	14,470	72,013	18,984	53,029
Statewide Total	129,421	1,125,308	1,254,729	17,799	11	17,810	147,221	1,125,319	1,272,539	117,780	19,835	3,280	140,895	142,951	1,122,306	544,215	578,091

Table 1- 5. Summary of median concentrations for major water quality constituents by play by aquifer.

Play	Aquifer	Median concentration (mg/L)											
		Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarbonate	Chloride	Sulfate	Fluoride	Nitrate-N	TDS
Barnett	Trinity	15	13	4	173	2	-	386	35	66	0	0	551
	Cross Timbers	12	64	19	177	2	-	419	128	69	0	41	611
	Woodbine	14	12	4	237	2	-	403	72	260	1	0	953
Eagle Ford	Carrizo-Wilcox	20	32	7	88	4	-	278	48	50	0	0	429
	Queen City	17	28	7	120	5	-	245	72	82	0	0	538
	Gulf Coast	40	68	9	136	5	-	315	134	39	1	1	622
	Sparta	17	26	9	128	6	-	232	103	149	0	0	670
	Yegua-Jackson	35	22	2	259	7	-	322	168	97	0	0	890
Haynesville	Queen City	23	6	2	13	2	-	17	11	7	0	2	116
	Carrizo-Wilcox	14	2	1	118	1	4	251	16	17	0	0	326
	Sparta	13	1	1	131	2	17	222	15	15	0	0	467
	Yegua-Jackson	25	2	0	219	2	9	339	73	76	0	0	607
Permian	Igneous	51	43	5	32	3	-	215	11	17	2	4	290
	West Texas Bolson	39	26	6	111	4	-	228	24	63	2	7	443
	Edwards-Trinity Plat.	16	84	26	44	3	-	256	44	73	1	9	451
	Ogallala	52	70	52	76	9	-	287	122	147	3	15	737
	Dockum	23	86	32	116	5	-	288	135	210	1	8	881
	Edwards-Trinity HP	44	68	55	121	9	-	265	237	220	3	7	931
	Capitan Reef	17	150	66	118	8	-	272	164	476	1	1	1,443
	Pecos Valley	33	196	54	268	10	-	199	287	776	2	8	2,050
Rustler	20	523	123	87	11	-	150	70	1,695	2	3	2,602	

Table 1- 6. Barnett Play groundwater quality numbers of samples, mean concentrations, and selected percentile distribution concentrations

Aquifer	Parameter	Concentration (mg/L)											
		Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarbonate	Chloride	Sulfate	Fluoride	Nitrate-N	TDS
Trinity	Number of Samples >	502	540	540	540	512	540	540	540	540	540	529	540
	Mean	16	46	14	177	3	8	398	84	97	1	6	646
	Percentile 0	4	0	0	5	0	-	23	1	1	0	-	97
	Percentile 0.05	11	1	0	13	1	-	278	7	20	0	0	333
	Percentile 0.1	11	1	0	19	1	-	312	9	26	0	0	354
	Percentile 0.25	12	2	1	44	1	-	342	17	38	0	0	411
	Percentile 0.5	15	13	4	173	2	-	386	35	66	0	0	551
	Percentile 0.75	18	82	23	260	4	15	448	89	113	1	1	761
	Percentile 0.9	22	118	37	346	6	29	510	192	190	2	13	988
	Percentile 0.95	25	141	49	400	7	34	544	312	242	2	31	1,263
	Percentile 1	37	570	120	1,210	20	54	832	1,822	2,040	5	233	3,488
Woodbine	Number of Samples >	81	83	83	83	81	83	83	83	83	83	83	83
	Mean	17	84	23	299	3	8	416	164	367	1	2	1,173
	Percentile 0	3	0	0	28	0	-	17	9	6	0	-	163
	Percentile 0.05	10	1	0	39	1	-	124	12	37	0	0	315
	Percentile 0.1	11	1	0	64	1	-	156	17	54	0	0	379
	Percentile 0.25	12	2	1	110	2	-	287	32	86	0	0	534
	Percentile 0.5	14	12	4	237	2	-	403	72	260	1	0	953
	Percentile 0.75	18	92	20	416	3	17	532	142	436	2	0	1,376
	Percentile 0.9	27	228	57	596	5	25	662	305	644	3	2	1,828
	Percentile 0.95	36	399	94	709	6	27	734	406	1,072	4	9	2,189
	Percentile 1	53	950	370	1,600	19	92	927	3,100	3,300	6	44	8,150
Cross Timbers	Number of Samples >	2	3	3	3	2	3	3	3	3	3	3	3
	Mean	12	59	18	256	2	-	374	127	215	1	36	904
	Percentile 0	8	27	14	77	1	-	244	10	62	0	0	438
	Percentile 0.05	8	31	14	87	1	-	262	22	63	0	4	455
	Percentile 0.1	9	35	15	97	1	-	279	34	63	0	8	473
	Percentile 0.25	10	46	16	127	1	-	331	69	66	0	20	524
	Percentile 0.5	12	64	19	177	2	-	419	128	69	0	41	611
	Percentile 0.75	15	74	19	346	2	-	439	186	291	1	53	1,138
	Percentile 0.9	16	81	20	447	2	-	452	220	424	1	61	1,453
	Percentile 0.95	17	83	20	480	2	-	456	232	469	1	63	1,559
	Percentile 1	17	85	20	514	2	-	460	243	513	2	66	1,664

Table 1- 7. Eagle Ford play groundwater quality numbers of samples, mean concentrations, and selected percentile distribution concentrations.

Play	Parameter	Concentration (mg/L)											
		Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarbonate	Chloride	Sulfate	Fluoride	Nitrate-N	TDS
Carrizo-Wilcox	Number of Samples >	467	485	485	485	480	485	485	485	485	473	484	485
	Mean	22	47	10	197	5	4	334	154	98	1	1	702
	Percentile 0	6	0	0	10	-	-	26	2	-	-	-	78
	Percentile 0.05	14	2	0	17	1	-	74	12	2	0	0	183
	Percentile 0.1	14	2	1	23	2	-	140	16	5	0	0	217
	Percentile 0.25	16	4	1	38	3	-	201	27	25	0	0	316
	Percentile 0.5	20	32	7	88	4	-	278	48	50	0	0	429
	Percentile 0.75	25	70	13	210	6	-	347	110	85	1	0	680
	Percentile 0.9	35	102	19	454	9	12	602	275	204	1	1	1,331
	Percentile 0.95	42	132	27	737	11	19	850	573	409	2	4	2,007
	Percentile 1	66	909	194	3,780	37	170	2,375	4,532	1,779	7	64	9,707
Gulf Coast	Number of Samples >	444	457	457	457	444	457	457	457	457	455	451	457
	Mean	45	76	15	196	8	0	293	258	72	1	9	823
	Percentile 0	9	0	0	2	1	-	9	2	1	-	0	33
	Percentile 0.05	19	3	0	10	1	-	58	6	2	0	0	140
	Percentile 0.1	21	6	1	21	2	-	131	20	4	0	0	200
	Percentile 0.25	27	28	3	58	3	-	244	53	13	0	0	431
	Percentile 0.5	40	68	9	136	5	-	315	134	39	1	1	622
	Percentile 0.75	57	104	20	243	11	-	359	335	90	1	11	985
	Percentile 0.9	80	145	35	436	17	-	395	631	185	1	26	1,530
	Percentile 0.95	91	192	45	599	23	-	446	967	241	2	39	2,193
	Percentile 1	137	424	162	1,840	57	39	898	2,811	1,060	7	153	5,839
Queen City	Number of Samples >	96	102	102	102	102	102	102	102	102	96	102	102
	Mean	20	52	16	227	8	3	328	207	143	0	2	839
	Percentile 0	9	1	0	4	1	-	1	3	1	0	0	51
	Percentile 0.05	12	1	0	22	1	-	108	7	3	0	0	211
	Percentile 0.1	13	2	1	29	2	-	148	10	10	0	0	234
	Percentile 0.25	14	4	1	66	3	-	203	23	25	0	0	304
	Percentile 0.5	17	28	7	120	5	-	245	72	82	0	0	538
	Percentile 0.75	21	64	22	272	10	4	387	166	169	0	0	913
	Percentile 0.9	36	110	38	430	16	13	561	346	372	1	1	1,534
	Percentile 0.95	44	181	63	578	21	15	696	728	499	2	1	2,374
	Percentile 1	68	713	130	2,960	62	30	1,779	4,457	1,233	5	148	7,948
Sparta	Number of Samples >	74	77	77	77	77	77	77	77	77	74	77	77
	Mean	21	55	19	262	7	2	269	241	246	0	2	988
	Percentile 0	10	0	0	9	1	-	17	8	1	0	0	69

Play	Parameter	Concentration (mg/L)											
		Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarbonate	Chloride	Sulfate	Fluoride	Nitrate-N	TDS
Play	Percentile 0.05	12	1	0	15	2	-	94	11	5	0	0	156
	Percentile 0.1	13	2	1	33	2	-	132	16	15	0	0	204
	Percentile 0.25	14	5	2	76	3	-	162	31	46	0	0	319
	Percentile 0.5	17	26	9	128	6	-	232	103	149	0	0	670
	Percentile 0.75	22	58	24	296	9	-	293	284	347	1	0	1,279
	Percentile 0.9	28	115	41	543	13	7	397	473	608	1	1	2,131
	Percentile 0.95	43	212	65	759	19	12	565	623	804	1	6	2,649
	Percentile 1	91	651	151	2,550	26	71	1,355	3,590	1,480	3	50	6,782
Yegua-Jackson	Number of Samples >	71	72	72	72	71	72	72	72	72	72	72	72
	Mean	43	38	5	382	9	4	344	310	250	1	2	1,213
	Percentile 0	7	0	0	9	2	-	17	15	1	0	0	83
	Percentile 0.05	14	1	0	45	2	-	75	40	1	0	0	317
	Percentile 0.1	16	2	0	67	2	-	83	59	4	0	0	388
	Percentile 0.25	21	5	1	132	4	-	205	87	33	0	0	525
	Percentile 0.5	35	22	2	259	7	-	322	168	97	0	0	890
	Percentile 0.75	59	43	5	452	13	-	415	445	349	1	0	1,663
	Percentile 0.9	89	117	16	830	17	18	677	697	627	1	1	2,555
	Percentile 0.95	98	137	22	1,125	23	25	734	867	1,037	2	2	3,191
Percentile 1	125	199	58	1,670	29	45	1,127	1,600	1,740	3	63	4,643	

Table 1- 8. Haynesville play groundwater quality numbers of samples, mean concentrations, and selected percentile distribution concentrations.

Play	Parameter	Concentration (mg/L)											
		Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarbonate	Chloride	Sulfate	Fluoride	Nitrate-N	TDS
Carrizo-Wilcox	Number of Samples >	252	280	280	280	252	280	280	280	280	280	280	280
	Mean	16	7	2	144	2	11	300	39	26	0	1	393
	Percentile 0	1	0	0	2	0	-	-	2	1	0	-	26
	Percentile 0.05	11	0	0	30	1	-	75	3	1	0	0	125
	Percentile 0.1	11	1	0	41	1	-	95	5	2	0	0	149
	Percentile 0.25	12	1	0	73	1	-	178	8	7	0	0	248
	Percentile 0.5	14	2	1	118	1	4	251	16	17	0	0	326
	Percentile 0.75	16	7	2	182	2	18	399	41	36	0	0	475
	Percentile 0.9	23	17	6	307	3	29	606	93	60	1	0	742
	Percentile 0.95	30	34	8	363	4	34	677	168	79	1	2	883
Percentile 1	63	87	30	551	8	215	933	438	241	3	47	1,411	
Queen City	Number of Samples >	36	36	36	36	36	36	36	36	36	36	36	36
	Mean	31	9	4	34	3	1	80	20	17	0	7	166
	Percentile 0	11	0	0	4	0	-	1	3	1	0	0	46
	Percentile 0.05	12	1	0	5	1	-	3	3	1	0	0	55
	Percentile 0.1	14	2	1	6	1	-	5	4	1	0	0	67
	Percentile 0.25	16	3	1	6	1	-	8	7	2	0	0	84
	Percentile 0.5	23	6	2	13	2	-	17	11	7	0	2	116
	Percentile 0.75	41	11	4	21	3	-	90	23	17	0	7	166
	Percentile 0.9	57	21	6	119	6	-	294	41	51	0	16	341
	Percentile 0.95	77	28	16	177	8	5	381	65	59	0	33	458
Percentile 1	77	42	25	208	13	11	450	91	102	1	65	543	
Sparta	Number of Samples >	11	11	11	11	11	11	11	11	11	11	11	11
	Mean	13	7	2	174	2	17	369	24	40	1	2	462
	Percentile 0	10	0	0	9	1	-	15	8	1	0	0	93
	Percentile 0.05	11	0	0	46	1	-	70	8	1	0	0	159
	Percentile 0.1	11	1	0	84	1	-	126	8	2	0	0	225
	Percentile 0.25	12	1	0	111	1	-	162	11	6	0	0	313
	Percentile 0.5	13	1	1	131	2	17	222	15	15	0	0	467
	Percentile 0.75	14	3	1	245	2	28	604	17	59	1	0	595
	Percentile 0.9	16	6	3	286	4	38	666	23	84	1	1	699
	Percentile 0.95	17	31	7	338	6	44	749	78	131	1	9	795
Percentile 1	17	55	12	389	9	50	832	133	177	2	16	891	
Yegua-Jackson	Number of Samples >	25	25	25	25	25	25	25	25	25	25	25	25
	Mean	30	7	2	248	3	9	360	91	131	0	0	698
	Percentile 0	15	1	0	28	1	-	12	21	1	0	0	176
	Percentile 0.05	15	1	0	81	1	-	142	31	1	0	0	356
	Percentile 0.1	15	1	0	100	1	-	210	32	5	0	0	392
	Percentile 0.25	17	1	0	161	1	-	254	43	40	0	0	441
	Percentile 0.5	25	2	0	219	2	9	339	73	76	0	0	607
	Percentile 0.75	38	5	1	327	5	14	398	98	156	0	0	915
	Percentile 0.9	51	8	2	452	5	19	543	172	339	1	1	1,268
	Percentile 0.95	69	26	6	510	7	23	778	268	427	1	2	1,305
Percentile 1	74	72	19	532	12	26	857	326	515	1	3	1,400	

Table 1- 9. Permian Basin groundwater quality numbers of samples, mean concentrations, and selected percentile distribution concentrations.

Play	Parameter	Concentration (mg/L)											
		Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarbonate	Chloride	Sulfate	Fluoride	Nitrate-N	TDS
Ogallala	Number of Samples >	777	779	779	779	777	779	779	779	779	778	778	779
	Mean	55	91	68	122	11	0	289	198	237	3	24	954
	Percentile 0	1	6	0	10	2	-	49	2	5	0	0	249
	Percentile 0.05	31	35	17	29	4	-	193	15	24	1	2	360
	Percentile 0.1	36	39	23	33	5	-	207	18	29	1	3	384
	Percentile 0.25	45	48	34	47	7	-	241	42	48	2	7	453
	Percentile 0.5	52	70	52	76	9	-	287	122	147	3	15	737
	Percentile 0.75	62	110	85	140	13	-	328	244	296	4	29	1,141
	Percentile 0.9	73	170	131	272	18	-	359	505	547	5	56	1,838
	Percentile 0.95	80	230	164	363	22	-	388	671	751	6	73	2,369
	Percentile 1	382	592	454	1,550	52	23	659	1,980	2,660	15	419	7,447
Pecos Valley	Number of Samples >	177	177	177	177	176	177	177	177	177	174	175	177
	Mean	34	286	91	436	14	0	205	680	933	2	21	2,603
	Percentile 0	9	15	6	6	1	-	33	3	15	0	0	195
	Percentile 0.05	14	45	12	45	3	-	104	51	69	0	0	431
	Percentile 0.1	17	68	16	58	3	-	123	67	114	1	0	506
	Percentile 0.25	27	91	25	96	5	-	166	116	215	1	3	797
	Percentile 0.5	33	196	54	268	10	-	199	287	776	2	8	2,050
	Percentile 0.75	40	433	118	553	18	-	237	838	1,460	2	25	3,257
	Percentile 0.9	50	639	214	967	28	-	288	1,560	2,265	3	54	5,379
	Percentile 0.95	54	771	278	1,440	32	-	324	2,984	2,482	3	70	8,357
	Percentile 1	70	1,560	548	2,650	86	10	545	5,110	4,208	39	379	11,979
Edwards-Trinity Plateau	Number of Samples >	972	988	988	988	987	988	988	988	988	974	978	988
	Mean	18	121	41	136	5	0	263	190	267	1	16	926
	Percentile 0	2	33	3	1	0	-	84	2	1	0	0	147
	Percentile 0.05	11	45	10	6	1	-	201	9	7	0	0	234
	Percentile 0.1	11	51	12	8	1	-	214	12	9	0	1	255
	Percentile 0.25	13	62	18	13	1	-	232	18	16	0	5	294
	Percentile 0.5	16	84	26	44	3	-	256	44	73	1	9	451
	Percentile 0.75	20	142	48	149	7	-	288	153	371	2	18	1,159
	Percentile 0.9	26	237	93	298	12	-	326	390	820	2	33	1,943
	Percentile 0.95	35	314	119	395	16	-	353	551	1,030	3	47	2,495
	Percentile 1	85	853	385	10,610	55	25	812	16,090	2,638	5	298	27,825
Dockum	Number of Samples >	176	186	186	186	176	186	186	186	186	185	185	186
	Mean	26	134	51	605	7	0	294	716	592	2	21	2,300
	Percentile 0	5	5	2	6	1	-	54	4	8	0	0	206
	Percentile 0.05	10	15	6	20	2	-	125	17	20	0	0	325
	Percentile 0.1	11	34	11	37	2	-	162	23	30	0	0	375
	Percentile 0.25	15	51	20	57	4	-	223	51	68	1	1	508
	Percentile 0.5	23	86	32	116	5	-	288	135	210	1	8	881
	Percentile 0.75	34	153	52	361	8	-	347	363	807	2	26	2,266
	Percentile 0.9	46	306	129	1,062	11	-	439	943	1,670	3	53	3,594
	Percentile 0.95	50	412	181	1,963	14	-	504	2,028	2,347	3	78	6,208
	Percentile 1	91	908	287	16,164	43	28	675	26,868	5,514	8	241	46,520
Igneous	Number of Samples >	78	79	79	79	79	79	79	79	79	79	75	79

Play	Parameter	Concentration (mg/L)											
		Silica	Calcium	Magnesium	Sodium	Potassium	Carbonate	Bicarbonate	Chloride	Sulfate	Fluoride	Nitrate-N	TDS
	Mean	52	48	7	46	4	1	220	20	33	2	6	326
	Percentile 0	24	1	0	7	0	-	50	3	5	0	0	97
	Percentile 0.05	29	8	0	14	1	-	140	4	7	0	0	173
	Percentile 0.1	34	19	2	17	2	-	157	5	9	0	1	215
	Percentile 0.25	41	29	4	24	2	-	183	7	11	1	2	253
	Percentile 0.5	51	43	5	32	3	-	215	11	17	2	4	290
	Percentile 0.75	60	57	10	56	4	-	253	17	29	2	8	341
	Percentile 0.9	72	71	13	93	8	-	295	24	46	3	12	413
	Percentile 0.95	79	86	16	125	10	1	321	35	61	3	14	494
	Percentile 1	87	430	52	260	16	25	464	570	561	5	23	1,914
West Texas Bolson	Number of Samples >	103	103	103	103	103	103	103	103	103	103	98	103
	Mean	44	49	16	157	7	1	240	108	184	2	10	696
	Percentile 0	12	1	0	12	0	-	83	2	7	0	-	159
	Percentile 0.05	17	6	1	31	1	-	126	5	13	1	0	215
	Percentile 0.1	20	7	1	40	1	-	139	8	18	1	0	225
	Percentile 0.25	28	13	2	73	2	-	183	13	32	1	2	307
	Percentile 0.5	39	26	6	111	4	-	228	24	63	2	7	443
	Percentile 0.75	62	54	17	201	9	-	282	107	222	2	12	821
	Percentile 0.9	75	74	54	346	19	4	339	230	526	4	18	1,500
	Percentile 0.95	86	192	83	415	25	8	387	611	685	5	33	2,116
Percentile 1	101	422	97	687	38	45	581	982	1,480	9	76	3,358	
Edwards-Trinity (High Plains)	Number of Samples >	17	17	17	17	17	17	17	17	17	17	17	17
	Mean	39	84	68	188	10	3	268	270	282	3	13	1,096
	Percentile 0	9	3	2	45	1	-	188	37	31	1	0	426
	Percentile 0.05	11	4	2	45	2	-	189	44	36	2	0	434
	Percentile 0.1	11	6	5	52	3	-	192	52	43	2	0	465
	Percentile 0.25	26	26	22	76	6	-	204	124	106	2	2	773
	Percentile 0.5	44	68	55	121	9	-	265	237	220	3	7	931
	Percentile 0.75	50	131	103	264	13	-	320	297	303	4	13	1,158
	Percentile 0.9	56	184	138	415	18	14	364	529	528	4	29	1,790
	Percentile 0.95	61	224	186	456	22	17	411	799	689	4	42	2,517
Percentile 1	63	262	216	503	25	25	437	854	1,140	5	71	3,115	
Capitan Reef Complex	Number of Samples >	36	36	36	36	36	36	36	36	36	36	31	36
	Mean	18	287	95	252	10	0	289	419	854	1	5	2,087
	Percentile 0	1	20	19	2	1	-	33	1	6	0	0	262
	Percentile 0.05	9	57	25	6	1	-	173	7	12	0	0	287
	Percentile 0.1	12	69	28	15	1	-	200	14	48	0	0	379
	Percentile 0.25	14	121	45	61	3	-	255	51	263	1	0	785
	Percentile 0.5	17	150	66	118	8	-	272	164	476	1	1	1,443
	Percentile 0.75	21	353	103	343	13	-	315	515	1,518	2	4	2,658
	Percentile 0.9	24	745	214	471	22	-	413	1,051	2,245	3	12	4,787
	Percentile 0.95	30	773	244	870	29	-	464	2,102	2,310	3	17	6,591
Percentile 1	46	1,260	313	1,300	38	6	509	2,402	2,418	4	54	7,327	
Rustler	Number of Samples >	27	27	27	27	27	27	27	27	27	27	27	27
	Mean	21	468	148	790	17	0	171	1,263	1,604	2	15	4,419
	Percentile 0	1	156	49	10	1	-	12	7	486	0	0	948
	Percentile 0.05	12	163	50	40	2	-	103	20	504	0	0	1,132
	Percentile 0.1	15	188	51	43	3	-	116	26	552	1	0	1,473

<i>Play</i>	<i>Parameter</i>	<i>Concentration (mg/L)</i>											
		<i>Silica</i>	<i>Calcium</i>	<i>Magnesium</i>	<i>Sodium</i>	<i>Potassium</i>	<i>Carbonate</i>	<i>Bicarbonate</i>	<i>Chloride</i>	<i>Sulfate</i>	<i>Fluoride</i>	<i>Nitrate-N</i>	<i>TDS</i>
	Percentile 0.25	16	284	57	46	5	-	134	37	740	1	0	1,660
	Percentile 0.5	20	523	123	87	11	-	150	70	1,695	2	3	2,602
	Percentile 0.75	25	586	204	207	14	-	227	305	2,226	2	20	3,259
	Percentile 0.9	29	628	222	239	16	-	272	348	2,309	3	34	3,697
	Percentile 0.95	35	663	252	296	22	-	280	365	2,666	3	59	4,182
	Percentile 1	39	1,310	559	18,300	224	10	281	30,340	3,875	3	112	54,649

Table 1- 10a. Barnett Play numbers of fracking supply, rig supply, and industrial wells completed in the Submitted Drillers Reports (SDR) database as of January 2021 by county by aquifer

County	All Barnett				Trinity				Cross Timbers				Woodbine			
	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total
Bosque	-	10	-	10	-	10	-	10	-	-	-	-	-	-	-	-
Cooke	-	19	8	27	-	19	8	27	-	-	-	-	-	-	-	-
Dallas	-	-	3	3	-	-	3	3	-	-	-	-	-	-	-	-
Denton	2	88	26	116	2	88	26	116	-	-	-	-	-	-	-	-
Ellis	-	-	5	5	-	-	5	5	-	-	-	-	-	-	-	-
Erath	-	44	11	55	-	44	11	55	-	-	-	-	-	-	-	-
Hill	-	46	2	48	-	46	2	48	-	-	-	-	-	-	-	-
Hood	-	92	40	132	-	91	40	131	-	1	-	1	-	-	-	-
Jack	-	22	3	25	-	2	-	2	-	20	3	23	-	-	-	-
Johnson	4	285	35	324	4	280	35	319	-	-	-	-	-	5	-	5
Montague	4	83	26	113	4	78	17	99	-	5	9	14	-	-	-	-
Palo Pinto	-	7	3	10	-	-	-	-	-	7	3	10	-	-	-	-
Parker	2	172	35	209	2	168	34	204	-	3	1	4	-	1	-	1
Smith	-	1	-	1	-	1	-	1	-	-	-	-	-	-	-	-
Somervell	-	14	6	20	-	14	6	20	-	-	-	-	-	-	-	-
Tarrant	1	81	66	148	1	81	64	146	-	-	-	-	-	-	2	2
Wise	7	157	38	202	7	155	38	200	-	2	-	2	-	-	-	-
Total	20	1,121	307	1,448	20	1,077	289	1,386	-	38	16	54	-	6	2	8

Table 1- 10b. Eagle Ford Play numbers of fracking supply, rig supply, and industrial wells completed in the Submitted Drillers Reports (SDR) database as of January 2021 by county by aquifer

County	All Eagle Ford				Gulf Coast				Carrizo-Wilcox				Yegua-Jackson				Queen City				Other			
	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total
Atascosa	41	49	39	129	-	-	-	-	25	22	6	53	5	19	5	29	11	8	28	47	-	-	-	-
Austin	-	1	1	2	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bastrop	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	-	-	-	-
Bee	2	19	1	22	2	15	1	18	-	2	-	2	-	1	-	1	-	1	-	1	-	-	-	-
Caldwell	-	4	-	4	-	-	-	-	-	2	-	2	-	1	-	1	-	1	-	1	-	-	-	-
Colorado	-	4	4	8	-	4	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DeWitt	79	401	218	698	71	384	215	670	-	2	1	3	8	15	2	25	-	-	-	-	-	-	-	-
Dimmit	43	201	57	301	-	-	-	-	42	192	57	291	-	-	-	-	1	9	-	10	-	-	-	-
Fayette	23	96	105	224	1	23	24	48	1	-	-	1	21	69	78	168	-	4	3	7	-	-	-	-
Frio	15	31	11	57	-	-	-	-	15	24	4	43	-	-	-	-	-	7	7	14	-	-	-	-
Gonzales	34	185	124	343	3	23	5	31	7	9	1	17	24	111	87	222	-	42	31	73	-	-	-	-
Harris	-	-	1	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jackson	-	2	-	2	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Karnes	77	433	111	621	28	271	55	354	22	23	4	49	27	138	51	216	-	1	1	2	-	-	-	-
La Salle	77	251	37	365	-	-	-	-	75	233	9	317	-	7	7	14	2	11	21	34	-	-	-	-
Lavaca	28	165	43	236	11	80	20	111	-	-	-	-	17	85	22	124	-	-	1	1	-	-	-	-
Lee	17	28	24	69	-	-	-	-	-	-	-	-	8	19	21	48	9	9	3	21	-	-	-	-
Live Oak	28	67	36	131	1	22	6	29	12	8	4	24	13	37	26	76	2	-	-	2	-	-	-	-
Maverick	-	-	5	5	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-	1	1
McMullen	59	68	4	131	-	-	-	-	58	62	3	123	1	6	1	8	-	-	-	-	-	-	-	-
Polk	-	-	2	2	-	-	1	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
Refugio	-	2	-	2	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-
Victoria	-	8	1	9	-	3	-	3	-	-	-	-	-	5	-	5	-	-	1	1	-	-	-	-
Webb	34	204	8	246	-	-	-	-	27	164	2	193	-	4	-	4	7	36	6	49	-	-	-	-
Wilson	2	21	13	36	-	-	-	-	2	1	1	4	-	14	8	22	-	6	4	10	-	-	-	-
Zavala	13	47	1	61	-	-	-	-	12	46	1	59	-	-	-	-	1	1	-	2	-	-	-	-
Total	572	2,288	847	3,707	117	828	333	1,278	298	790	97	1,185	124	533	309	966	33	137	107	277	-	-	1	1

Table 1- 10c. Haynesville Play numbers of fracking supply, rig supply, and industrial wells completed in the Submitted Drillers Reports (SDR) database as of January 2021 by county by aquifer.

County	All Haynesville				Carrizo-Wilcox				Queen City				Yegua-Jackson			
	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total
Angelina	7	57	8	72	-	3	1	4	-	24	-	24	7	30	7	44
Cherokee	1	22	3	26	1	20	1	22	-	2	2	4	-	-	-	-
Gregg	5	294	62	361	3	287	58	348	2	7	4	13	-	-	-	-
Hall	-	1	-	1	-	1	-	1	-	-	-	-	-	-	-	-
Harris	-	4	-	4	-	4	-	4	-	-	-	-	-	-	-	-
Harrison	96	1,462	64	1,622	95	1,458	64	1,617	1	4	-	5	-	-	-	-
Hartley	-	1	-	1	-	1	-	1	-	-	-	-	-	-	-	-
Henderson	-	2	1	3	-	2	1	3	-	-	-	-	-	-	-	-
Jasper	-	-	1	1	-	-	-	-	-	-	-	-	-	-	1	1
Marion	-	24	1	25	-	24	1	25	-	-	-	-	-	-	-	-
Nacogdoches	28	963	69	1,060	23	834	63	920	5	125	6	136	-	4	-	4
Palo Pinto	-	1	-	1	-	1	-	1	-	-	-	-	-	-	-	-
Panola	119	1,797	212	2,128	119	1,789	211	2,119	-	-	-	-	-	8	1	9
Parker	-	1	-	1	-	1	-	1	-	-	-	-	-	-	-	-
Rusk	40	1,263	105	1,408	40	1,257	105	1,402	-	4	-	4	-	2	-	2
Sabine	-	13	1	14	-	13	-	13	-	-	1	1	-	-	-	-
San Augustine	38	273	41	352	37	233	31	301	-	35	7	42	1	5	3	9
Shelby	6	651	120	777	6	650	120	776	-	-	-	-	-	1	-	1
Smith	-	11	-	11	-	10	-	10	-	1	-	1	-	-	-	-
Tyler	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1
Upshur	-	47	3	50	-	21	3	24	-	26	-	26	-	-	-	-
Total	340	6,888	691	7,919	324	6,609	659	7,592	8	228	20	256	8	51	12	71

Table 1- 10d. Permian Basin numbers of fracking supply, rig supply, and industrial wells completed in the Submitted Drillers Reports (SDR) database as of January 2021 by county by aquifer

County	All Permian Basin				Edwards-Trinity Plateau				Ogallala				Pecos Valley				Dockum			
	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total
Andrews	26	315	83	424	-	2	-	2	6	198	66	270	-	2	2	4	9	106	15	130
Borden	13	23	2	38	-	-	-	-	5	5	-	10	-	-	-	-	8	17	1	26
Brewster	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cochran	2	3	7	12	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-	-
Coke	1	2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crane	3	58	53	114	-	1	-	1	-	-	-	-	-	12	7	19	3	38	31	72
Crockett	136	236	32	404	14	106	23	143	-	-	-	-	-	-	-	-	58	54	2	114
Crosby	-	9	4	13	-	-	-	-	-	6	1	7	-	-	-	-	-	3	3	6
Culberson	31	43	22	96	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Dawson	56	137	14	207	-	-	-	-	42	106	5	153	-	-	-	-	14	23	-	37
Ector	7	297	62	366	-	50	6	56	2	99	20	121	-	-	-	-	4	144	18	166
Edwards	-	2	1	3	-	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-
Gaines	1	30	110	141	-	-	-	-	-	15	51	66	-	-	-	-	-	10	19	29
Garza	-	2	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	4
Glasscock	128	787	30	945	73	264	6	343	1	76	5	82	-	-	-	-	44	432	19	495
Hale	-	-	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Haskell	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Hockley	-	13	14	27	-	-	-	-	-	2	4	6	-	-	-	-	-	-	-	-
Howard	1,008	1,480	29	2,517	6	6	1	13	900	1,273	19	2,192	-	-	-	-	91	187	8	286
Hudspeth	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Irion	126	268	113	507	5	64	40	109	-	-	-	-	-	-	-	-	41	67	57	165
Jeff Davis	-	3	1	4	-	3	1	4	-	-	-	-	-	-	-	-	-	-	-	-
Kent	-	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loving	110	241	9	360	-	-	-	-	-	-	-	-	57	85	2	144	-	5	q	5

County	All Permian Basin				Edwards-Trinity Plateau				Ogallala				Pecos Valley				Dockum			
	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total
Lubbock	-	-	36	36	-	-	-	-	-	-	9	9	-	-	-	-	-	-	1	1
Lynn	-	1	9	10	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-
Marion	-	4	-	4	-	-	-	-	-	4	-	4	-	-	-	-	-	-	-	-
Martin	385	1,842	46	2,273	1	23	-	24	281	1,434	24	1,739	-	-	-	-	40	307	19	366
Midland	322	1,397	167	1,886	17	137	16	170	123	804	107	1,034	-	-	-	-	121	385	44	550
Mitchell	-	23	26	49	-	-	-	-	-	2	-	2	-	-	-	-	-	12	22	34
Pecos	73	129	45	247	14	62	22	98	-	-	-	-	2	5	3	10	35	23	1	59
Reagan	271	996	128	1,395	15	255	57	327	-	-	-	-	-	-	-	-	231	684	71	986
Reeves	379	646	48	1,073	7	37	3	47	-	-	-	-	150	304	25	479	24	104	4	132
Roberts	-	1	-	1	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Schleicher	5	37	7	49	5	19	5	29	-	-	-	-	-	-	-	-	-	3	-	3
Scurry	-	32	27	59	-	-	-	-	-	-	-	-	-	-	-	-	-	26	25	51
Sterling	3	48	11	62	2	8	2	12	-	-	-	-	-	-	-	-	1	39	9	49
Sutton	1	1	2	4	1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-
Terrell	-	5	3	8	-	5	3	8	-	-	-	-	-	-	-	-	-	-	-	-
Terry	-	9	34	43	-	-	-	-	-	4	16	20	-	-	-	-	-	-	-	-
Tom Green	-	4	9	13	-	1	3	4	-	-	-	-	-	-	-	-	-	1	-	1
Upton	132	1,093	92	1,317	17	392	30	439	-	-	-	-	-	4	-	4	110	676	61	847
Val Verde	-	2	2	4	-	2	2	4	-	-	-	-	-	-	-	-	-	-	-	-
Ward	86	209	34	329	-	-	-	-	-	-	-	-	68	110	19	197	9	83	13	105
Winkler	18	82	225	325	-	-	-	-	-	-	-	-	9	33	99	141	8	39	93	140
Yoakum	13	28	14	55	-	-	-	-	9	11	2	22	-	-	-	-	-	5	1	6
Total	3,336	10,544	1,560	15,440	178	1,441	223	1,842	1,369	4,039	334	5,742	286	555	157	998	851	3,475	541	4,867

County	Permian				Rustler				Edwards-Trinity High Plains				Capitan Reef				Bone Spring - Victorio Peak			
	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total
Andrews	11	7	-	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borden	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brewster	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cochran	-	-	-	-	-	-	-	-	2	3	4	9	-	-	-	-	-	-	-	-
Coke	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crane	-	4	14	18	-	3	1	4	-	-	-	-	-	-	-	-	-	-	-	-
Crockett	64	76	7	147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crosby	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Culberson	20	15	9	44	1	15	1	17	-	-	-	-	-	-	-	-	-	-	-	-
Dawson	-	1	-	1	-	-	-	-	-	7	9	16	-	-	-	-	-	-	-	-
Ector	1	4	7	12	-	-	11	11	-	-	-	-	-	-	-	-	-	-	-	-
Edwards	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gaines	-	1	-	1	-	-	-	-	1	4	40	45	-	-	-	-	-	-	-	-
Garza	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glasscock	10	15	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hale	-	-	-	-	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-
Haskell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hockley	-	-	-	-	-	-	-	-	-	11	10	21	-	-	-	-	-	-	-	-
Howard	11	14	1	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hudspeth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2
Irion	78	136	16	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jeff Davis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loving	48	87	6	141	5	64	1	70	-	-	-	-	-	-	-	-	-	-	-	-
Lubbock	-	-	-	-	-	-	-	-	-	-	26	26	-	-	-	-	-	-	-	-
Lynn	-	-	-	-	-	-	-	-	-	1	7	8	-	-	-	-	-	-	-	-

County	Permian				Rustler				Edwards-Trinity High Plains				Capitan Reef				Bone Spring - Victorio Peak			
	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total
Marion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Martin	63	78	3	144	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Midland	61	71	-	132	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mitchell	-	9	4	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pecos	10	35	17	62	12	4	-	16	-	-	-	-	-	-	2	2	-	-	-	-
Reagan	25	57	-	82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reeves	112	125	12	249	86	74	4	164	-	-	-	-	-	-	-	-	-	-	-	-
Roberts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schleicher	-	15	2	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scurry	-	6	2	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sterling	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sutton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terrell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terry	-	-	-	-	-	-	-	-	-	5	18	23	-	-	-	-	-	-	-	-
Tom Green	-	2	4	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Upton	5	21	1	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Val Verde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ward	1	12	2	15	8	4	-	12	-	-	-	-	-	-	-	-	-	-	-	-
Winkler	1	10	29	40	-	-	4	4	-	-	-	-	-	-	-	-	-	-	-	-
Yoakum	-	-	-	-	-	-	-	-	4	12	11	27	-	-	-	-	-	-	-	-
Total	521	805	137	1,463	112	164	22	298	7	43	129	179	-	-	2	2	-	2	-	2

County	West Texas Bolsons				Lipan				Other			
	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total
Andrews	-	-	-	-	-	-	-	-	-	-	-	-
Borden	-	-	-	-	-	-	-	-	-	-	-	-
Brewster	-	-	-	-	-	-	-	-	-	-	-	-
Cochran	-	-	-	-	-	-	-	-	-	-	-	-
Coke	-	-	-	-	1	-	-	1	-	2	-	2
Crane	-	-	-	-	-	-	-	-	-	-	-	-
Crockett	-	-	-	-	-	-	-	-	-	-	-	-
Crosby	-	-	-	-	-	-	-	-	-	-	-	-
Culberson	-	-	3	3	-	-	-	-	9	13	9	31
Dawson	-	-	-	-	-	-	-	-	-	-	-	-
Ector	-	-	-	-	-	-	-	-	-	-	-	-
Edwards	-	-	-	-	-	-	-	-	-	-	-	-
Gaines	-	-	-	-	-	-	-	-	-	-	-	-
Garza	-	-	-	-	-	-	-	-	-	-	-	-
Glasscock	-	-	-	-	-	-	-	-	-	-	-	-
Hale	-	-	-	-	-	-	-	-	-	-	-	-
Haskell	-	-	-	-	-	-	-	-	-	-	-	-
Hockley	-	-	-	-	-	-	-	-	-	-	-	-
Howard	-	-	-	-	-	-	-	-	-	-	-	-
Hudspeth	-	-	-	-	-	-	-	-	-	-	-	-
Irion	-	-	-	-	2	1	-	3	-	-	-	-
Jeff Davis	-	-	-	-	-	-	-	-	-	-	-	-
Kent	-	-	-	-	-	-	-	-	-	2	1	3
Loving	-	-	-	-	-	-	-	-	-	-	-	-
Lubbock	-	-	-	-	-	-	-	-	-	-	-	-
Lynn	-	-	-	-	-	-	-	-	-	-	-	-

County	West Texas Bolsons				Lipan				Other			
	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total	Fracking Supply	Rig Supply	Industrial	Total
Marion	-	-	-	-	-	-	-	-	-	-	-	-
Martin	-	-	-	-	-	-	-	-	-	-	-	-
Midland	-	-	-	-	-	-	-	-	-	-	-	-
Mitchell	-	-	-	-	-	-	-	-	-	-	-	-
Pecos	-	-	-	-	-	-	-	-	-	-	-	-
Reagan	-	-	-	-	-	-	-	-	-	-	-	-
Reeves	-	-	-	-	-	-	-	-	-	2	-	2
Roberts	-	-	-	-	-	-	-	-	-	-	-	-
Schleicher	-	-	-	-	-	-	-	-	-	-	-	-
Scurry	-	-	-	-	-	-	-	-	-	-	-	-
Sterling	-	-	-	-	-	-	-	-	-	-	-	-
Sutton	-	-	-	-	-	-	-	-	-	-	-	-
Terrell	-	-	-	-	-	-	-	-	-	-	-	-
Terry	-	-	-	-	-	-	-	-	-	-	-	-
Tom Green	-	-	-	-	-	-	2	2	-	-	-	-
Upton	-	-	-	-	-	-	-	-	-	-	-	-
Val Verde	-	-	-	-	-	-	-	-	-	-	-	-
Ward	-	-	-	-	-	-	-	-	-	-	-	-
Winkler	-	-	-	-	-	-	-	-	-	-	-	-
Yoakum	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	3	3	3	1	2	6	9	19	10	38

Table 1- 11a. Barnett Play estimated percentages of fresh and brackish water for oil and gas industry wells based on SDR database wells and TDS indicator kriging maps

County	Numbers of GW Wells				Probability (%) of TDS>1000 mg/L			County GW Splits (%)	
	Total	Trinity	Woodbine	Cross Timbers	Trinity	Woodbine	Cross Timbers	Brackish	Fresh
Bosque	10	10			8			8	92
Cooke	27	27			0			0	100
Dallas	3	3			14			14	86
Denton	116	116			5			5	95
Ellis	5	5			13			13	87
Erath	55	55			2			2	98
Hill	48	48			21			21	79
Hood	132	131		1	0		0	0	100
Jack	25	2		23	25		0	2	98
Johnson	324	319	5		5	34		5	95
Montague	113	99		14	11		0	10	90
Palo Pinto	10	0		10			0	0	100
Parker	208	204		4	3		0	3	97
Somervell	20	20			0			0	100
Tarrant	148	146	2		18	51		18	82
Wise	202	200		2	9		0	9	91
<i>Total</i>	1,446	1,385	8	54	7	39	0	7	93

Table 1- 11b. Eagle Ford Play estimated percentages of fresh and brackish water for oil and gas industry wells based on SDR database wells and TDS indicator kriging maps

County	Numbers of GW Wells					Probability (%) of TDS>1000 mg/L					County GW Splits (%)		
	Total	Carrizo-Wilcox	Gulf Coast	Queen City	Jegua-Jackson	Other	Carrizo-Wilcox	Gulf Coast	Queen City	Jegua-Jackson	Other	Brackish	Fresh
Atascosa	129	53		47	29		9		33	97		38	62
Austin	2		2					6				6	94
Bastrop	2			2					32			32	68
Bee	22	2	18	1	1		59	54	77	100		58	42
Caldwell	3	2		1			9		44			21	79
Colorado	8		8					3				3	97
De Witt	698	3	670		25		100	5		94		9	91
Dimmit	301	291		10			19		100			22	78
Fayette	224	1	48	7	168		25	3	11	31		24	76
Frio	57	43		14			21		95			39	61
Gonzales	343	17	31	73	222		41	2	10	68		48	52
Harris	1		1					5				5	95
Jackson	2		2					5				5	95
Karnes	621	49	354	2	216		32	48	100	94		63	37
La Salle	365	317		34	14		41		98	87		48	52
Lavaca	236		111	1	124			2	39	37		21	79
Lee	69			21	48				26	49		42	58
Live Oak	131	24	29	2	76		17	51	100	93		70	30
Maverick	5	4				1	14				100	31	69
McMullen	131	123			8		25			97		29	71
Polk	2		1		1			14		93		54	47
Victoria	4		3	1				21	9			18	82
Webb	246	193		49	4		50		100	100		61	39
Wilson	36	4		10	22		5		7	89		57	43
Zavala	61	59		2			27		100			29	71
<i>Total</i>	3,699	1,185	1,278	277	958	1	32	18	52	67	100	38	62

Table 1- 11c. Haynesville Play estimated percentages of fresh and brackish water for oil and gas industry wells based on SDR database wells and TDS indicator kriging maps

County	Numbers of GW Wells				Probability (%) of TDS>1000 mg/L			County GW Splits (%)	
	Total	Carrizo-Wilcox	Queen City	Jegua-Jackson	Carrizo-Wilcox	Queen City	Jegua-Jackson	Brackish	Fresh
Angelina	72	4	24	44	0	0	16	10	90
Cherokee	26	22	4		2	0		2	98
Gregg	361	348	13		1	0		1	99
Harris	4	4			13			13	87
Harrison	1,622	1,617	5		9	0		9	91
Henderson	3	3			3			3	97
Jasper	1			1			21	21	79
Marion	25	25			11			11	89
Nacogdoches	1,060	920	136	4	2	0	11	2	98
Panola	2,128	2,119		9	8		23	8	92
Rusk	1,408	1,402	4	2	3	0	42	3	97
Sabine	14	13	1		2	0		2	98
San Augustine	352	301	42	9	11	0	14	10	90
Shelby	777	776		1	15		29	15	85
Smith	11	10	1		12	0		11	89
Tyler	1			1			28	28	72
Upshur	50	24	26		1	0		0	100
Total	7,915	7,588	256	71	7	0	18	7	93

Table 1- 11d. Permian Basin estimated percentages of fresh and brackish water for oil and gas industry wells based on SDR database wells and TDS indicator kriging maps

County	Numbers of GW Wells												Probability (%) of TDS>1000 mg/L											County GW Splits (%)			
	Total	Bone Spring – Victoria Peak	Capitan	Dockum	Edwards-Trinity High Plains	Edwards-Trinity Plateau	Lipan	Ogallala	Other	Pecos Valley	Permian	Rustler	West Texas Bolsons	Bone Spring – Victoria Pea	Capitan	Dockum	Edwards-Trinity High Plains	Edwards-Trinity Plateau	Lipan	Ogallala	Other	Pecos Valley	Permian	Rustler	WTB	Brackish	Fresh
Andrews	424			130		2		270		4	18					98		46		47		69	100			65	35
Borden	38			26				10			2					99				46			100			85	15
Brewster	1										1												100			100	0
Cochran	12				9			3									25		19							24	77
Coke	3						1		2									25		100						75	25
Crane	114			72		1			19	18	4				94		35				74	100	100			91	9
Crockett	404			114		143					147				90		28						100			72	28
Crosby	13			6				7							100				21							57	43
Culberson	96					1			31		44	17	3					82		100		100	100	52	98	2	
Dawson	207			37	16			153			1				100	83			55				100			65	35
Ector	366			166		56		121			12	11			95		54		38				100	100		70	30
Edwards	3					3												0								0	100
Gaines	141			29	45			66			1				96	35			55				100			57	43
Garza	5			4				0			1				100								100			100	0
Glasscock	945			495		343		82			25				97		33		79				100			72	28
Hale	5			1	4										100											20	80
Haskell	1			1											17											17	83
Hockley	27				21			6									38		20							34	66
Howard	2,517			286		13		2192			26				99		33		61				100			66	34
Hudspeth	2	2												100												100	0
Irion	507			165		109	3				230				85		32	25					100			80	20
Jeff Davis	4					4												26								26	74
Kent	3								3											100						100	0

County	Numbers of GW Wells												Probability (%) of TDS>1000 mg/L												County GW Splits (%)		
	Total	Bone Spring – Victoria Peak	Capitan	Dockum	Edwards-Trinity High Plains	Edwards-Trinity Plateau	Lipan	Ogallala	Other	Pecos Valley	Permian	Rustler	West Texas Balsons	Bone Spring – Victoria Pea	Capitan	Dockum	Edwards-Trinity High Plains	Edwards-Trinity Plateau	Lipan	Ogallala	Other	Pecos Valley	Permian	Rustler	WTB	Brackish	Fresh
Loving	360			5					144	141	70				46						68	100	100		86	14	
Lubbock	36			1	26		9								100	41			43						43	57	
Lynn	10				8		2									54			54						54	46	
Martin	2,273			366		24	1,739			144					100		48	66				100			73	27	
Midland	1,886			550		170	1,034			132					99		52	55				100			71	29	
Mitchell	49			34			2			13					47			40				100			61	39	
Pecos	247		2	59		98			10	62	16			97	63		53				57	100	100		71	29	
Reagan	1,395			986		327				82					94		71					100			89	11	
Reeves	1,073			132		47		2	479	249	164				35		66			100	97	100	100		89	11	
Schleicher	49			3		29				17					90		1					100			41	59	
Scurry	59			51						8					29							100			39	61	
Sterling	62			49		12				1					46		8					100			40	60	
Sutton	4					4											0								0	100	
Terrell	8					8											1								1	99	
Terry	43				23		20									71		64							68	32	
Tom Green	13			1		4	2			6					66		1	25				100			55	45	
Upton	1,317			847		439			4	27					100		81				100	100			94	6	
Val Verde	4					4											0								0	100	
Ward	329			105					197	15	12				45						73	100	100		66	34	
Winkler	325			140					141	40	4				34						36	100	100		44	56	
Yoakum	55			6	27		22								96	36		46							47	53	
Total	15,435	2	2	4,867	179	1,841	6	5,738	38	998	1,463	298	3	100	97	90	45	54	25	60	100	79	100	100	52	75	25

Table 1- 12a. Barnett Play historical unconventional well water use 2005-2021

<i>Year</i>	<i>Wells Completed</i>	<i>Median HF (gal/ft)</i>	<i>Median HF (acre-feet/well)</i>	<i>Total HF (acre-feet)</i>	<i>Median Lateral Length (ft)</i>
2005	689	1,386	8.8	7,744	2,260
2006	1,224	1,342	8.8	12,432	2,355
2007	2,295	1,209	8.2	21,998	2,397
2008	2669	1,226	9.37	26,992	2,657
2009	1560	1,229	10.12	17,281	2,733
2010	1775	1,229	11.34	22,923	3,073
2011	1,738	1,297	14.34	28,610	3,621
2012	1,179	1,215	14.02	19,076	3,866
2013	935	1,107	13.65	13,852	4,142
2014	582	1,032	13.39	8,842	4,273
2015	205	1,083	14.75	3,770	4,415
2016	64	1,145	15.44	1,406	4,599
2017	41	1,396	22.42	1,053	5,863
2018	77	1,304	20.22	1,927	4,979
2019	41	1,590	24.04	1,132	5,434
2020	19	1,018	27.63	573	7,520
2021*	27	1,190	27.65	721	7,283
2005-2019	15,074	1,226		189,036	

*Incomplete

Table 1- 12b. Barnett Play unconventional well completions by county for 2005-2021 and HF water use parameters for projected HF water Use

County	Historical unconventional wells completed																Total Wells	% of All Wells
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
Bosque	2	6	5	3	3	-	-	-	1	-	-	-	-	-	-	-	20	0.13
Clay	-	1	-	4	2	-	-	5	1	6	1	1	-	-	1	-	22	0.15
Comanche	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	0.01
Cooke	-	-	2	2	2	27	89	36	50	12	9	-	-	-	2	2	233	1.54
Dallas	-	-	-	12	9	9	5	2	2	4	-	-	2	6	-	-	51	0.34
Denton	118	139	145	211	159	138	177	77	69	81	28	18	9	5	8	4	1,386	9.18
Eastland	-	-	5	3	-	-	-	-	-	-	-	-	-	-	-	-	8	0.05
Ellis	2	-	12	10	19	12	3	4	1	-	-	-	-	-	-	-	63	0.42
Erath	3	32	47	65	23	4	1	2	-	-	3	-	-	-	-	-	180	1.19
Hamilton	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.01
Hill	-	32	45	109	30	21	6	-	-	-	-	-	-	-	-	-	243	1.61
Hood	44	71	227	231	60	41	53	42	25	11	-	2	-	-	-	-	807	5.35
Jack	6	18	51	22	7	5	-	2	-	-	-	1	-	-	-	-	112	0.74
Johnson	209	412	711	874	450	442	298	162	40	15	5	-	4	3	-	1	3,626	24.02
Montague	-	4	13	22	37	103	213	135	266	167	36	2	-	-	-	-	998	6.61
Palo Pinto	2	4	11	47	37	11	5	-	-	-	-	-	-	-	-	-	117	0.78
Parker	67	195	361	245	97	97	88	135	74	28	9	-	-	-	-	-	1,396	9.25
Shackelford	-	-	1	-	-	1	1	-	-	-	-	-	-	-	-	-	3	0.02
Somervell	1	3	34	23	11	22	28	3	-	-	-	-	-	-	-	-	125	0.83
Stephens	-	-	-	-	2	-	-	3	-	-	-	-	-	-	-	-	5	0.03
Tarrant	175	244	492	591	440	586	590	405	230	149	86	40	14	31	6	11	4,090	27.10
Wise	60	62	132	194	172	256	180	166	176	109	28	-	12	32	24	1	1,604	10.63
Young	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	0.01
Total	689	1,224	2,295	2,669	1,560	1,775	1,738	1,179	935	582	205	64	41	77	41	19	15,093	100.00

Table 1- 12c. Barnett Play projected HF water use by county for 2020-2080

County	Basis for projected HF water use				Projected HF water use (acre-feet)						
	2016-2020 wells (n)	2016-2020 Total HF (acre-feet)	Projected (wells/yr)	Total HF (acre-feet/well)	2020	2030	2040	2050	2060	2070	2080
Denton	44	961	8.9	21.8	194	194	-	-	-	-	-
Johnson	8	139	1.6	17.4	28	28	-	-	-	-	-
Tarrant	102	2,131	20.6	20.9	430	430	-	-	-	-	-
Wise	69	1,901	13.9	27.5	384	384	-	-	-	-	-
Total	223	5,131	45		1,035	1,035	-	-	-	-	-

Table 1- 13a. Eagle Ford Play historical unconventional well water use 2008-2021

<i>Year</i>	<i>Wells Completed</i>	<i>Median HF (gal/ft)</i>	<i>Median HF (acre-feet/well)</i>	<i>Total HF (acre-feet)</i>	<i>Median Lateral Length (ft)</i>
2008	2	331	3.71	4	3,321
2009	46	1,920	20.01	715	3,633
2010	380	1,180	16.10	4,576	4,390
2011	1,385	869	12.86	19,447	4,779
2012	2,513	820	12.80	37,786	4,952
2013	3,263	852	14.05	52,123	5,102
2014	3,596	1,086	18.14	70,988	5,294
2015	2,643	1,244	21.16	60,024	5,477
2016	1,337	1,405	23.40	35,980	5,659
2017	1,709	1,670	31.55	60,273	5,954
2018	1,928	1,917	36.07	77,870	6,245
2019	1,740	1,998	39.12	78,764	6,424
2020	845	1,882	36.79	36,374	6,575
2021*	694	2,045	41.01	32,217	6,493
2008-2019	20,542	1,195		162.45	5,322

*incomplete

Table 1- 13b. Eagle Ford Play numbers of wells completed by county by year for 2008-2020

<i>County</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2008-2019</i>	<i>% of All Wells</i>
Atascosa	-	-	12	61	121	143	274	162	67	79	97	108	47	1,124	5.5
Bee	-	-	2	3	13	3	3	1	-	-	-	1	-	26	0.1
Colorado	-	-	-	-	-	-	-	-	-	-	1	-	-	1	0.0
De Witt	-	1	23	141	230	241	406	374	140	145	188	183	86	2,072	10.1
Dimmit	1	10	73	216	395	634	589	474	253	257	406	199	41	3,507	17.1
Fayette	-	-	1	8	11	28	38	16	-	8	8	28	8	146	0.7
Frio	-	-	6	33	43	33	61	52	33	74	36	48	25	419	2.0
Gonzales	-	-	28	152	254	412	261	134	106	93	138	155	108	1,733	8.4
Karnes	-	3	54	224	482	530	591	541	341	457	464	430	246	4,117	20.0
La Salle	1	19	56	201	453	617	610	458	164	314	315	305	175	3,513	17.1
Lavaca	-	-	-	6	25	46	101	65	7	31	31	33	19	345	1.7
Live Oak	-	1	15	69	105	172	148	94	43	27	42	75	18	791	3.9
Maverick	-	2	12	12	8	3	6	-	1	1	2	-	-	47	0.2
Webb	-	10	89	219	286	310	407	224	170	207	175	145	42	2,242	10.9
Wilson	-	-	4	28	37	48	30	-	-	2	4	10	8	163	0.8
Zavala	-	-	5	12	50	43	71	48	12	14	21	20	22	296	1.4
Total	2	46	380	1,385	2,513	3,263	3,596	2,643	1,337	1,709	1,928	1,740	845	20,542	100.0

Table 1- 13c. Eagle Ford Play Technically Recoverable Resources (TRR) and Hydraulic Fracturing (HF) water use parameters used for HF water use projections based on 1800 wells completed per year resulting in a 51 year play lifetime.

County	TRR Total Well Inventory (n)	Wells completed 2008-2019 (n)	Wells Remaining			Mean Well Length* (ft)	Median HF (gal/ft)	Mean HF (acre-feet /well)	Annual HF (acre-feet)
			(n)	(% of Total)	(n/yr)				
Atascosa	9,523	1,124	8,399	9.2	165.1	5,552	1,834	31.2	5,158
Bee	384	26	358	0.4	7.0	4,990	2,090	32.0	225
Caldwell	488	-	488	0.5	9.6	5,742	2,060	36.3	348
Colorado	11	1	10	0.0	0.2	5,500	2,669	45.0	9
De Witt	4,855	2,072	2,783	3.0	54.7	4,220	2,125	27.5	1,505
Dimmit	13,167	3,507	9,660	10.5	189.9	5,692	1,525	26.6	5,057
Fayette	1,276	146	1,130	1.2	22.2	5,165	2,650	42.0	933
Frio	8,380	419	7,961	8.7	156.5	5,791	2,148	38.2	5,971
Gonzales	11,873	1,733	10,140	11.1	199.3	4,991	2,008	30.8	6,130
Guadalupe	1,086	-	1,086	1.2	21.3	5,704	2,060	36.1	770
Karnes	6,911	4,117	2,794	3.1	54.9	4,299	2,226	29.4	1,613
La Salle	11,025	3,513	7,512	8.2	147.6	5,736	1,835	32.3	4,769
Lavaca	3,491	345	3,146	3.4	61.8	5,225	2,687	43.1	2,664
Live Oak	2,795	791	2,004	2.2	39.4	4,933	1,932	29.2	1,152
Maverick	8,080	47	8,033	8.8	157.9	6,629	1,499	30.5	4,813
McMullen	7,029	1,993	7,029	7.7	138.1	5,612	1,750	30.1	4,164
Webb	5,642	2,242	3,400	3.7	66.8	5,362	1,784	29.3	1,961
Wilson	6,703	163	6,540	7.1	128.5	5,708	2,046	35.8	4,606
Zavala	9,410	296	9,114	10.0	179.1	6,062	1,472	27.4	4,906
Total	112,130	20,542	91,588	100	1,800				56,753

*mean well length per block

Table 1- 13d. Eagle Ford Play projected Hydraulic Fracturing (HF) water use by county for 2020-2080

County	Projected annual HF water use (arec-feet)						
	2020	2030	2040	2050	2060	2070	2080
Atascosa	5,158	5,158	5,158	5,158	5,158	5,158	-
Bee	225	225	225	225	225	225	-
Caldwell	348	348	348	348	348	348	-
Colorado	9	9	9	9	9	9	-
De Witt	1,505	1,505	1,505	1,505	1,505	1,505	-
Dimmit	5,057	5,057	5,057	5,057	5,057	5,057	-
Fayette	933	933	933	933	933	933	-
Frio	5,971	5,971	5,971	5,971	5,971	5,971	-
Gonzales	6,130	6,130	6,130	6,130	6,130	6,130	-
Guadalupe	770	770	770	770	770	770	-
Karnes	1,613	1,613	1,613	1,613	1,613	1,613	-
La Salle	4,769	4,769	4,769	4,769	4,769	4,769	-
Lavaca	2,664	2,664	2,664	2,664	2,664	2,664	-
Live Oak	1,152	1,152	1,152	1,152	1,152	1,152	-
Maverick	4,813	4,813	4,813	4,813	4,813	4,813	-
McMullen	4,164	4,164	4,164	4,164	4,164	4,164	-
Webb	1,961	1,961	1,961	1,961	1,961	1,961	-
Wilson	4,606	4,606	4,606	4,606	4,606	4,606	-
Zavala	4,906	4,906	4,906	4,906	4,906	4,906	-
Total	56,753	56,753	56,753	56,753	56,753	56,753	-

Table 1- 14a. Haynesville Play historical unconventional well water use 2008-2021

Year	Wells Completed	Median HF (gal/ft)	Median HF (acre-feet/well)	Total HF (acre-feet)	Median Lateral Length (ft)
2008	10	919	9.74	173	3,769
2009	85	1,215	13.43	800	4,011
2010	174	1,366	17.86	1,192	4,745
2011	241	1,395	19.83	3,386	4,959
2012	146	1,602	27.43	4,165	5,197
2013	86	2,053	30.71	3,021	5,218
2014	100	2,349	44.55	4,830	6,076
2015	58	2,281	49.01	2,862	6,717
2016	42	2,839	59.71	2,572	6,860
2017	45	2,972	58.19	2,976	6,744
2018	115	3,481	78.88	9,194	7,264
2019	121	3,567	86.18	11,000	8,290
2020	118	4,081	100.09	9,794	8,709
2021*	74	3,977	105.80	5,591	9,401
2008-2019	1,223	2,169		46,170	

*incomplete

Table 1- 14b. Haynesville Play numbers of wells completed by county by year for 2008-2020

County	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2008-2019	% of All Wells
Angelina	-	-	1	-	1	1	-	1	1	3	12	8	1	28	2.3
Gregg	-	-	-	-	-	-	-	-	-	-	5	-	-	5	0.4
Harrison	9	42	50	23	8	8	8	-	3	4	12	31	34	198	16.2
Nacogdoches	-	4	22	54	43	-	2	2	2	7	4	10	6	150	12.3
Panola	1	26	32	23	52	57	61	42	11	9	40	47	44	401	32.8
Ruks	-	2	3	-	1	-	-	-	-	4	3	-	-	13	1.1
Sabine	-	-	1	8	3	-	-	-	-	-	-	-	-	12	1.0
San Augustine	-	5	27	72	22	9	16	10	19	18	33	16	28	247	20.2
Shelby	-	6	38	61	16	11	13	3	6	-	6	9	5	169	13.8
Total	10	85	174	241	146	86	100	58	42	45	115	121	118	1,223	100.0

Table 1- 14c. Haynesville Play Technically Recoverable Resources (TRR) and Hydraulic Fracturing (HF) water use parameters used for HF water use projections based on 120 wells completed per year resulting in a 136-year play lifetime.

County	TRR Total Well Inventory (n)	Wells completed 2008-2019 (n)	Wells Remaining			Mean Well Length* (ft)	Median HF (gal/ft)	Mean HF (acre-feet /well)	Annual HF (acre-feet)
			(n)	(% of Total)	(n/yr)				
Angelina	95	28	67	0.4	0.5	5,280	2,693	43.6	21
Gregg	98	5	93	0.6	0.7	5,280	3,886	63.0	43
Harrison	3,612	198	3,414	20.9	25.1	5,280	3,886	63.0	1,578
Marion	18	-	18	0.1	0.1	5,280	3,886	63.0	8
Nacogdoches	1,732	150	1,582	9.7	11.6	5,280	3,734	60.5	703
Panola	4,701	401	4,300	26.3	31.6	5,280	3,909	63.3	1,998
Rusk	747	13	734	4.5	5.4	5,280	3,925	63.6	342
Sabine	458	12	446	2.7	3.3	5,280	3,816	61.8	202
San Augustine	2,371	247	2,124	13.0	15.6	5,280	3,691	59.8	932
Shelby	3,745	169	3,576	21.9	26.2	5,280	3,941	63.9	1,676
Total	17,576	1,223	16,353	100	120				7,504

*mean well length per model block

Table 1- 14d. Haynesville Play projected HF water use by county for 2020-2080

County	Projected annual HF water use (acre-feet)						
	2020	2030	2040	2050	2060	2070	2080
Angelina	21	21	21	21	21	21	21
Gregg	43	43	43	43	43	43	43
Harrison	1,578	1,578	1,578	1,578	1,578	1,578	1,578
Marion	8	8	8	8	8	8	8
Nacogdoches	703	703	703	703	703	703	703
Panola	1,998	1,998	1,998	1,998	1,998	1,998	1,998
Rusk	342	342	342	342	342	342	342
Sabine	202	202	202	202	202	202	202
San Augustine	932	932	932	932	932	932	932
Shelby	1,676	1,676	1,676	1,676	1,676	1,676	1,676
Total	7,504	7,504	7,504	7,504	7,504	7,504	7,504

Table 1- 15a. Permian Basin historical numbers of vertical and horizontal unconventional well and HF water use in Texas and New Mexico for 2005-2021

Permian	Unconventional Vertical Wells					Unconventional Horizontal Wells					
	Total (n)	Texas (n)	New Mexico (n)	Median HF (acre-foot/well)	Total HF (acre-foot)	Total (n)	Texas (n)	New Mexico (n)	Unc H Med Len (ft)	Median HF (acre-foot/well)	Total HF (acre-foot)
2005	484	466	18	1.4	1,354	47	31	16	3,346	2.10	117
2006	706	672	34	1.4	1,729	94	26	68	3,421	2.25	288
2007	968	932	36	1.7	2,499	92	35	57	3,320	2.02	278
2008	1,500	1,375	125	1.9	3,715	157	74	83	3,571	2.20	443
2009	1,327	1,070	257	2.0	3,125	140	54	86	3,728	2.42	445
2010	2,351	2,012	339	2.7	6,187	266	65	201	4,013	4.16	1,487
2011	3,964	3,493	471	2.9	12,229	618	271	347	4,183	5.72	4,849
2012	5,086	4,722	364	3.2	18,705	1,138	672	466	4,306	7.36	12,768
2013	4,441	4,087	354	3.8	20,098	1,808	1,244	564	4,570	11.57	27,963
2014	3,845	3,498	347	4.0	21,718	2,808	2,142	666	4,974	19.97	59,049
2015	1,688	1,553	135	4.2	11,010	2,696	2,082	614	5,292	23.92	71,687
2016	597	525	72	6.4	9,999	2,277	1,884	393	7,065	35.27	85,576
2017	731	617	114	6.9	15,806	3,621	3,057	564	7,423	45.19	167,158
2018	762	611	151	7.4	18,634	5,501	4,525	976	7,865	48.40	263,682
2019	487	429	58	5.7	10,129	5,206	4,132	1,074	9,603	54.98	276,432
2020	115	93	22	3.3	1,418	3,116	2,310	806	9,780	55.19	163,368
2021*	127	67	60	6.9	3,259	1,675	1,134	541	9,911	54.72	84,980
2005-2019	28,937	26,062	2,875	-	156,938	26,469	20,294	6,175	76,676	-	972,221

*Incomplete

Table 1- 15b. Permian Basin historical unconventional well development in Texas 2005-2021

Year	Unconventional Vertical Wells			Unconventional Horizontal Wells				
	Wells (n)	Median HF (acre-feet/well)	Total HF (acre-feet)	Wells (n)	Median Length (ft)	Median HF (gal/ft)	Median HF (acre-feet/well)	Total HF (acre-feet)
2005	466	1.35	1,280	31	3,567	222	2.10	78
2006	672	1.40	1,478	26	3,569	234	2.14	73
2007	932	1.66	1,729	35	2,819	242	1.96	137
2008	1375	1.95	3,493	74	3,663	216	2.20	231
2009	1070	2.31	2,726	54	3,591	212	2.13	161
2010	2012	2.83	5,523	65	3,776	289	3.91	304
2011	3,493	3.06	11,301	271	4,225	494	6.96	2,631
2012	4,722	3.24	17,727	672	4,436	762	10.30	9,382
2013	4,087	3.88	18,997	1,244	5,148	1,057	19.15	23,594
2014	3,498	4.13	20,194	2,142	5,612	1,269	23.44	51,507
2015	1,553	4.26	10,047	2,082	6,638	1,432	27.80	61,320
2016	525	6.60	9,097	1,884	7,377	1,716	38.33	76,052
2017	617	7.11	14,137	3,057	7,708	2,039	48.35	148,763
2018	611	7.14	15,764	4,525	8,547	2,048	51.42	228,890
2019	429	5.44	8,216	4,132	9,763	2,082	57.43	230,028
2020	93	2.37	581	2310	9,846	1,981	57.00	129,084
2021*	67	2.80	258	1134	10,042	1,967	56.68	63,466
2005-2019	26,062		141,708	20,294				833,149

*Incomplete

Table 1- 15c. Permian Basin historical unconventional well development in Texas 2005-2021

County	Numbers of Unconventional Vertical O&G wells completed																	% of All Vertical Wells
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2005-2019	
Andrews	7	4	14	54	55	203	327	351	250	234	118	41	44	82	29	2	1,813	6.96
Bandera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borden	-	-	1	-	-	4	4	11	4	6	3	2	4	3	1	-	43	0.16
Brewster	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	0.00
Cochran	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	2	0.01
Coke	-	-	-	-	-	1	-	1	1	-	-	-	-	-	-	-	3	0.01
Concho	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cottle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crane	6	4	7	9	6	16	12	15	34	61	51	4	5	14	39	33	283	1.09
Crockett	9	10	5	18	6	7	9	32	6	11	6	2	-	1	-	-	122	0.47
Crosby	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	2	0.01
Culberson	-	2	1	7	3	2	12	11	23	28	13	9	13	6	3	1	133	0.51
Dawson	-	1	5	3	11	12	34	56	46	39	3	4	1	7	2	-	224	0.86
Dickens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ector	12	6	26	68	92	198	212	293	278	277	70	18	31	20	47	14	1,648	6.32
Edwards	1	1	-	2	-	-	-	1	-	-	-	-	-	-	-	-	5	0.02
Isher	-	-	1	-	-	-	-	1	1	-	-	-	-	-	-	-	3	0.01
Gaines	2	1	3	5	1	8	16	23	37	44	43	7	12	15	25	-	242	0.93
Garza	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	4	0.02
Glasscock	15	19	59	64	56	128	431	655	563	465	176	33	30	30	15	3	2,739	10.51
Hale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Haskell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hockley	-	-	-	-	-	-	-	2	4	3	-	-	-	1	1	-	11	0.04
Howard	-	-	34	37	45	73	175	293	391	385	187	70	57	24	21	2	1,792	6.88
Hudspeth	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	3	0.01
Irion	4	4	12	27	17	33	79	115	102	82	26	16	21	3	4	1	545	2.09
Jeff Davis	-	-	-	1	-	-	-	-	-	1	-	-	1	1	-	-	4	0.02
Kent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	0.00
King	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	0.00
Lamb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loving	20	27	36	23	12	5	9	31	27	22	24	14	28	20	10	1	308	1.18
Lubbock	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2	0.01
Lynn	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	0.00
Martin	73	78	186	289	216	398	707	836	701	583	243	51	68	58	32	-	4,519	17.34
Mc Culloch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Menard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Midland	81	167	177	178	232	302	547	618	481	451	228	107	78	54	35	6	3,736	14.34
Mitchell	-	-	2	2	3	1	3	3	7	1	4	1	-	-	-	-	27	0.10

County	Numbers of Unconventional Vertical O&G wells completed																	% of All Vertical Wells
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2005-2019	
Motley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nolan	-	-	-	-	-	1	-	1	2	-	-	-	-	-	-	-	4	0.02
Pecos	3	2	20	16	5	7	8	12	31	46	23	5	16	23	12	-	229	0.88
Presidio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reagan	57	103	67	147	59	120	203	319	210	130	59	23	13	10	7	-	1,527	5.86
Real	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reeves	5	3	11	10	12	40	110	310	252	131	41	59	81	58	39	2	1,162	4.46
Runnels	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schleicher	-	-	-	1	-	6	12	22	14	11	-	4	-	-	-	-	70	0.27
Scurry	1	-	-	-	1	-	1	3	7	2	5	1	1	4	1	-	27	0.10
Sterling	2	4	4	5	10	16	19	24	23	20	10	2	3	3	2	1	147	0.56
Stonewall	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	2	0.01
Sutton	26	73	30	3	1	1	7	-	7	-	2	-	-	1	-	-	151	0.58
Terrell	1	3	3	5	1	2	-	-	-	4	6	1	1	1	-	-	28	0.11
Terry	-	1	-	-	1	-	4	18	4	3	2	2	2	2	-	-	39	0.15
Tom Green	1	1	-	-	-	-	-	-	-	-	8	2	10	5	3	1	30	0.12
Upton	131	152	210	381	207	404	525	617	514	397	163	17	20	25	8	-	3,771	14.47
Val Verde	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.01
Ward	3	4	12	15	16	17	25	44	53	53	29	17	44	51	50	4	433	1.66
Winkler	3	2	5	3	2	6	-	3	6	6	9	4	24	73	42	22	188	0.72
Yoakum	1	-	1	-	-	1	2	-	5	1	1	7	9	7	-	-	35	0.13
Total	466	672	932	1,375	1,070	2,012	3,493	4,722	4,087	3,498	1,553	525	617	611	429	93	26,062	100.00

Table 1- 15d. Permian Basin numbers of unconventional horizontal wells completed by county by year for 2008-2020

County	Numbers of Unconventional Horizontal O&G wells completed																		% of All Horizontal Wells
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2005-2019		
Andrews	1	-	-	-	-	5	9	35	50	112	91	61	92	135	98	53	689	3.40	
Bandera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Borden	-	-	-	1	1	1	-	6	12	4	2	3	13	40	30	5	113	0.56	
Brewster	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cochran	-	-	-	-	-	1	5	2	1	6	1	-	12	6	9	-	43	0.21	
Coke	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	3	0.01	
Concho	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cottle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Crane	-	-	-	-	-	5	26	56	71	26	7	1	1	-	-	3	193	0.95	
Crockett	1	-	-	-	1	1	22	79	151	178	78	36	51	26	-	1	624	3.07	
Crosby	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Culberson	-	-	1	1	4	1	5	23	50	76	98	43	88	145	139	53	674	3.32	
Dawson	-	-	1	2	-	-	-	-	-	5	6	1	7	1	3	2	26	0.13	
Dickens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ector	-	1	-	3	-	-	7	20	19	34	13	9	27	31	28	14	192	0.95	
Edwards	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.01	
Isher	-	-	-	-	-	-	-	1	3	1	-	-	-	-	-	-	5	0.02	
Gaines	-	-	-	-	-	-	1	-	1	2	4	10	30	40	3	1	91	0.45	
Garza	-	-	-	-	-	1	-	1	3	2	-	1	-	-	-	-	8	0.04	
Glasscock	-	-	-	-	2	3	22	28	57	115	163	81	154	252	181	96	1,058	5.21	
Hale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Haskell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hockley	-	-	-	-	-	-	-	-	3	4	2	-	-	-	1	-	10	0.05	
Howard	-	1	1	-	-	-	-	-	5	21	56	95	269	336	380	294	1,164	5.74	
Hudspeth	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	2	0.01	
Irion	-	-	-	-	2	3	29	80	169	188	93	39	46	72	94	17	815	4.02	
Jeff Davis	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	2	0.01	
Kent	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	3	0.01	
King	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Lamb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Loving	-	-	3	2	1	10	27	104	104	170	211	210	318	418	370	270	1,948	9.60	
Lubbock	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	3	0.01	
Lynn	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	3	0.01	
Martin	1	-	1	-	-	-	2	5	18	108	168	174	274	495	515	317	1,761	8.68	
McCulloch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Menard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Midland	2	4	-	2	4	1	2	1	33	147	248	428	483	660	615	438	2,630	12.96	
Mitchell	-	-	-	-	-	-	-	1	10	6	-	-	-	-	-	-	17	0.08	

County	Numbers of Unconventional Horizontal O&G wells completed																	
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2005-2019	% of All Horizontal Wells
Motley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nolan	-	-	-	-	-	-	-	1	4	4	-	-	-	-	-	-	9	0.04
Pecos	-	-	-	2	-	2	5	7	9	19	29	38	69	113	130	64	423	2.08
Presidio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reagan	1	-	-	-	-	-	10	54	136	291	233	141	218	307	247	87	1,638	8.07
Real	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reeves	1	2	7	25	5	3	36	38	95	261	293	246	500	847	781	252	3,140	15.47
Runnels	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schleicher	-	-	-	-	-	-	3	2	10	14	3	1	-	-	-	-	33	0.16
Scurry	-	-	-	5	14	5	5	2	5	4	3	3	3	15	6	12	70	0.34
Sterling	-	-	-	-	-	-	-	7	15	16	1	-	1	-	-	-	40	0.20
Stonewall	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	0.00
Sutton	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	0.00
Terrell	2	-	1	1	-	-	-	-	-	-	1	-	-	-	-	-	5	0.02
Terry	-	-	-	1	-	-	1	3	4	1	-	-	-	-	-	-	10	0.05
Tom Green	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	0.00
Upton	19	13	8	10	4	2	2	15	59	176	199	167	199	235	224	196	1,332	6.56
Val Verde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ward	3	3	7	19	10	20	49	87	121	111	36	34	85	156	152	84	893	4.40
Winkler	-	1	3	-	6	1	3	10	16	25	17	27	50	99	78	34	336	1.66
Yoakum	-	-	-	-	-	-	-	1	3	14	24	35	66	93	46	17	282	1.39
Total	31	26	35	74	54	65	271	672	1,244	2,142	2,082	1,884	3,057	4,525	4,132	2,310	20,294	100.00

Table 1- 15e. Delaware Basin Technically Recoverable Resources (TRR) and Hydraulic Fracturing (HF) water use parameters used for HF water use projections based on 1700 wells completed per year resulting in a 77-year play lifetime.

County	TRR Total Well Inventory (n)	Wells completed 2008-2019 (n)	Wells Remaining			Mean Well Length* (ft)	Median HF (gal/ft)	Mean HF (acre-feet/well)	Annual HF (acre-feet)
			(n)	(% of Total)	(n/yr)				
Culberson	15,931	663	15,268	11.7	199	7,465	2,169	49.7	9,892
Loving	27,295	1,948	25,347	19.4	330	6,525	1,807	36.2	11,958
Pecos	20,767	356	20,411	15.7	266	7,227	2,721	60.3	16,060
Reeves	57,343	2,934	54,409	41.7	709	7,008	2,286	49.2	34,877
Ward	10,184	875	9,309	7.1	121	7,607	2,280	53.2	6,460
Winkler	5,887	244	5,643	4.3	74	6,438	2,214	43.7	3,218
Total	137,407	7,020	130,387	100.0	1,700				82,465

*mean well length per model block

Table 1- 15f. Midland Basin Technically Recoverable Resources (TRR) and Hydraulic Fracturing (HF) water use parameters used for HF water use projections based on 2400 wells completed per year resulting in a 45-year play lifetime.

County	TRR Total Well Inventory (n)	Wells completed 2008-2019 (n)	Wells Remaining			Mean Well Length* (ft)	Median HF (gal/ft)	Mean HF (acre-feet /well)	Annual HF (acre-feet)
			(n)	(% of Total)	(n/yr)				
Andrews	3,309	236	3,073	2.8	68	8,608	1,987	52.5	3,557
Borden	3,661	91	3,570	3.3	79	8,561	1,625	42.7	3,361
Crane	446	3	443	0.4	10	8,917	2,019	55.3	540
Crockett	6,185	604	5,581	5.1	123	9,015	1,770	49.0	6,027
Dawson	3,164	22	3,142	2.9	69	8,768	1,915	51.5	3,570
Ector	1,382	84	1,298	1.2	29	8,823	1,919	52.0	1,487
Gaines	1,625	4	1,621	1.5	36	8,631	1,937	51.3	1,834
Glasscock	12,780	1,047	11,733	10.8	259	8,664	1,949	51.8	13,408
Howard	12,227	1,164	11,063	10.2	244	8,464	1,923	50.0	12,186
Irion	9,110	815	8,295	7.6	183	8,866	2,127	57.9	10,586
Martin	15,402	1,762	13,640	12.5	301	8,763	1,908	51.3	15,433
Midland	14,525	2,643	11,882	10.9	262	8,420	2,043	52.8	13,832
Mitchell	325	3	322	0.3	7	8,430	1,923	49.7	353
Reagan	17,079	1,638	15,441	14.2	340	8,935	2,097	57.5	19,579
Schleicher	2,704	29	2,675	2.5	59	9,139	2,127	59.7	3,519
Scurry	241	-	241	0.2	5	8,398	2,127	54.8	291
Sterling	2,427	9	2,418	2.2	53	8,640	2,127	56.4	3,007
Tom Green	776	1	775	0.7	17	8,960	2,096	57.6	985
Upton	12,968	1,344	11,624	10.7	256	8,885	2,097	57.2	14,656
Total	120,336	11,499	108,837	100.0	2,400				128,211

*mean well length per model block

Table 1- 15g. Permian Basin HF water use projections for 2020 through 2080

Region	County	Projected annual HF water use (acre-feet/yr)						
		2020	2030	2040	2050	2060	2070	2080
Delaware Basin	Culberson	9,892	9,892	9,892	9,892	9,892	9,892	9,892
	Loving	11,958	11,958	11,958	11,958	11,958	11,958	11,958
	Pecos	16,060	16,060	16,060	16,060	16,060	16,060	16,060
	Reeves	34,877	34,877	34,877	34,877	34,877	34,877	34,877
	Ward	6,460	6,460	6,460	6,460	6,460	6,460	6,460
	Winkler	3,218	3,218	3,218	3,218	3,218	3,218	3,218
Midland Basin	Andrews	3,557	3,557	3,557	3,557	3,557	-	-
	Borden	3,361	3,361	3,361	3,361	3,361	-	-
	Crane	540	540	540	540	540	-	-
	Crockett	6,027	6,027	6,027	6,027	6,027	-	-
	Dawson	3,570	3,570	3,570	3,570	3,570	-	-
	Ector	1,487	1,487	1,487	1,487	1,487	-	-
	Gaines	1,834	1,834	1,834	1,834	1,834	-	-
	Glasscock	13,408	13,408	13,408	13,408	13,408	-	-
	Howard	12,186	12,186	12,186	12,186	12,186	-	-
	Irion	10,586	10,586	10,586	10,586	10,586	-	-
	Martin	15,433	15,433	15,433	15,433	15,433	-	-
	Midland	13,832	13,832	13,832	13,832	13,832	-	-
	Mitchell	353	353	353	353	353	-	-
	Reagan	19,579	19,579	19,579	19,579	19,579	-	-
	Schleicher	3,519	3,519	3,519	3,519	3,519	-	-
	Scurry	291	291	291	291	291	-	-
Sterling	3,007	3,007	3,007	3,007	3,007	-	-	
Tom Green	985	985	985	985	985	-	-	
Upton	14,656	14,656	14,656	14,656	14,656	-	-	
Total		210,676	210,676	210,676	210,676	210,676	82,465	82,465

Table 1- 16. Comparison of Permian Basin TRR values with USGS analyses

<i>Item</i>	<i>Source</i>	<i>Wolfcamp A & B</i>	
		<i>Midland</i>	<i>Delaware</i>
TRR oil (10 ⁹ gal)	USGS	550	1170
	This study	1638	3271
Historical data	USGS	through 2015	through 2016
	This study	2015 - 2018	2015 - 2018
Spatial resolution	USGS	1 AU for WCA & 2 AUs for WCB	1 AU for WCA & 2 AUs for WCB
	This study	1 sq. mile	1 sq. mile
Number of wells	USGS	78,415	112,435
	This study	112,965	206,987
Average EUR per future well (10 ⁶ gal)	USGS	7	10
	This study	15	16

EUR: Estimated Ultimate Recovery

AU: Assessment Unit

WCA: Wolfcamp A formation

WCB: Wolfcamp B formation

Table 1- 17. Projected Hydraulic Fracturing (HF) water use for all counties

County	Projected HF water use (acre-feet/yr)						
	2020	2030	2040	2050	2060	2070	2080
Andrews	3,557	3,557	3,557	3,557	3,557		
Angelina	21	21	21	21	21	21	21
Atascosa	5,158	5,158	5,158	5,158	5,158	5,158	
Bee	225	225	225	225	225	225	
Borden	3,361	3,361	3,361	3,361	3,361		
Caldwell	348	348	348	348	348	348	
Colorado	9	9	9	9	9	9	
Crane	540	540	540	540	540		
Crockett	6,027	6,027	6,027	6,027	6,027		
Culberson	9,892	9,892	9,892	9,892	9,892	9,892	9,892
Dawson	3,570	3,570	3,570	3,570	3,570		
De Witt	1,505	1,505	1,505	1,505	1,505	1,505	
Denton	194	194					
Dimmit	5,057	5,057	5,057	5,057	5,057	5,057	
Ector	1,487	1,487	1,487	1,487	1,487		
Fayette	933	933	933	933	933	933	
Frio	5,971	5,971	5,971	5,971	5,971	5,971	
Gaines	1,834	1,834	1,834	1,834	1,834		
Glasscock	13,408	13,408	13,408	13,408	13,408		
Gonzales	6,130	6,130	6,130	6,130	6,130	6,130	
Gregg	43	43	43	43	43	43	43
Guadalupe	770	770	770	770	770	770	
Harrison	1,578	1,578	1,578	1,578	1,578	1,578	1,578
Howard	12,186	12,186	12,186	12,186	12,186		
Irion	10,586	10,586	10,586	10,586	10,586		
Johnson	28	28					
Karnes	1,613	1,613	1,613	1,613	1,613	1,613	
La Salle	4,769	4,769	4,769	4,769	4,769	4,769	
Lavaca	2,664	2,664	2,664	2,664	2,664	2,664	
Live Oak	1,152	1,152	1,152	1,152	1,152	1,152	
Loving	11,958	11,958	11,958	11,958	11,958	11,958	11,958
Marion	8	8	8	8	8	8	8
Martin	15,433	15,433	15,433	15,433	15,433		
Maverick	4,813	4,813	4,813	4,813	4,813	4,813	
Mcmullen	4,164	4,164	4,164	4,164	4,164	4,164	
Midland	13,832	13,832	13,832	13,832	13,832		
Mitchell	353	353	353	353	353		
Nacogdoches	703	703	703	703	703	703	703
Panola	1,998	1,998	1,998	1,998	1,998	1,998	1,998
Pecos	16,060	16,060	16,060	16,060	16,060	16,060	16,060
Reagan	19,579	19,579	19,579	19,579	19,579	-	-

County	Projected HF water use (acre-feet/yr)						
	2020	2030	2040	2050	2060	2070	2080
Reeves	34,877	34,877	34,877	34,877	34,877		
Rusk	342	342	342	342	342	342	342
Sabine	202	202	202	202	202	202	202
San Augustine	932	932	932	932	932	932	932
Schleicher	3,519	3,519	3,519	3,519	3,519		
Scurry	291	291	291	291	291		
Shelby	1,676	1,676	1,676	1,676	1,676	1,676	1,676
Sterling	3,007	3,007	3,007	3,007	3,007		
Tarrant	430	430					
Tom Green	985	985	985	985	985		
Upton	14,656	14,656	14,656	14,656	14,656		
Ward	6,460	6,460	6,460	6,460	6,460	6,460	6,460
Webb	1,961	1,961	1,961	1,961	1,961	1,961	
Wilson	4,606	4,606	4,606	4,606	4,606	4,606	
Winkler	3,218	3,218	3,218	3,218	3,218	3,218	3,218
Wise	384	384					
Zavala	4,906	4,906	4,906	4,906	4,906	4,906	
Total	275,968	275,968	274,932	274,932	274,932	111,845	55,092

Table 1- 18a. Projected total oil and gas industry water use by county. Counties that are located outside the play core areas are indicated with “N/A” and are not included in the HF water use time series historical trends (Table 1-2a).

County	TWDB Play Area	Play Core Area	Conventional Water Use (acre-feet/yr)	Projected Total Oil and Gas Industry Water Use (acre-feet/yr)						
				2020	2030	2040	2050	2060	2070	2080
Anderson	Misc	N/A	34	34	34	34	34	34	34	34
Andrews	Permian	Midland Basin	36	4,200	4,200	4,200	4,200	4,200	36	36
Angelina	Haynesville	Haynesville	-	34	34	34	34	34	34	34
Aransas	None	N/A	-	-	-	-	-	-	-	-
Archer	Barnett	N/A	1	1	1	1	1	1	1	1
Armstrong	Anadarko	N/A	-	-	-	-	-	-	-	-
Atascosa	Eagle Ford	Eagle Ford	-	5,178	5,178	5,178	5,178	5,178	5,178	-
Austin	Eagle Ford	N/A	8	8	8	8	8	8	8	8
Bailey	Permian	N/A	-	-	-	-	-	-	-	-
Bandera	None	N/A	-	-	-	-	-	-	-	-
Bastrop	Eagle Ford	N/A	55	55	55	55	55	55	55	55
Baylor	Misc	N/A	5	5	5	5	5	5	5	5
Bee	Eagle Ford	Eagle Ford	-	239	239	239	239	239	239	-
Bell	None	N/A	-	-	-	-	-	-	-	-
Bexar	Misc	N/A	-	-	-	-	-	-	-	-
Blanco	None	N/A	-	-	-	-	-	-	-	-
Borden	Permian	Midland Basin	4	3,374	3,374	3,374	3,374	3,374	4	4
Bosque	Barnett	N/A	-	-	-	-	-	-	-	-
Bowie	None	N/A	-	-	-	-	-	-	-	-
Brazoria	Misc	N/A	4	4	4	4	4	4	4	4
Brazos	Eagle Ford	N/A	2,511	2,511	2,511	2,511	2,511	2,511	2,511	2,511
Brewster	Permian	N/A	2	2	2	2	2	2	2	2
Briscoe	Anadarko	N/A	-	-	-	-	-	-	-	-
Brooks	Misc	N/A	16	16	16	16	16	16	16	16
Brown	None	N/A	-	-	-	-	-	-	-	-
Burleson	Eagle Ford	N/A	5,569	5,569	5,569	5,569	5,569	5,569	5,569	5,569
Burnet	None	N/A	-	-	-	-	-	-	-	-
Caldwell	Misc	Eagle Ford	2	352	352	352	352	352	352	2
Calhoun	None	N/A	-	-	-	-	-	-	-	-
Callahan	Misc	N/A	-	-	-	-	-	-	-	-
Cameron	None	N/A	-	-	-	-	-	-	-	-
Camp	None	N/A	-	-	-	-	-	-	-	-
Carson	Anadarko	N/A	3	3	3	3	3	3	3	3
Cass	Misc	N/A	35	35	35	35	35	35	35	35
Castro	Anadarko	N/A	-	-	-	-	-	-	-	-
Chambers	None	N/A	1	1	1	1	1	1	1	1
Cherokee	Bossier	N/A	187	187	187	187	187	187	187	187
Childress	Anadarko	N/A	-	-	-	-	-	-	-	-
Clay	Barnett	N/A	4	4	4	4	4	4	4	4
Cochran	Permian	N/A	166	166	166	166	166	166	166	166
Coke	Permian	N/A	59	59	59	59	59	59	59	59
Coleman	Misc	N/A	-	-	-	-	-	-	-	-
Collin	None	N/A	-	-	-	-	-	-	-	-
Collingsworth	Anadarko	N/A	-	-	-	-	-	-	-	-
Colorado	Eagle Ford	Eagle Ford	-	9	9	9	9	9	9	-
Comal	None	N/A	-	-	-	-	-	-	-	-
Comanche	Barnett	N/A	-	-	-	-	-	-	-	-
Concho	Permian	N/A	-	-	-	-	-	-	-	-
Cooke	Barnett	N/A	12	12	12	12	12	12	12	12
Coryell	Barnett	N/A	-	-	-	-	-	-	-	-
Cottle	Permian	N/A	6	6	6	6	6	6	6	6
Crane	Permian	Midland Basin	27	615	615	615	615	615	27	27
Crockett	Permian	Midland Basin	7	6,046	6,046	6,046	6,046	6,046	7	7
Crosby	Permian	N/A	15	15	15	15	15	15	15	15

County	TWDB Play Area	Play Core Area	Conventional Water Use (acre-feet/yr)	Projected Total Oil and Gas Industry Water Use (acre-feet/yr)						
				2020	2030	2040	2050	2060	2070	2080
Culberson	Permian-Far West	Delaware Basin	4	9,919	9,919	9,919	9,919	9,919	9,919	9,919
Dallam	Anadarko	N/A	-	-	-	-	-	-	-	-
Dallas	Barnett	N/A	31	31	31	31	31	31	31	31
Dawson	Permian	Midland Basin	4	3,603	3,603	3,603	3,603	3,603	4	4
De Witt	Eagle Ford	Eagle Ford	2	1,689	1,689	1,689	1,689	1,689	1,689	2
Deaf Smith	Anadarko	N/A	-	-	-	-	-	-	-	-
Delta	None	N/A	-	-	-	-	-	-	-	-
Denton	Barnett	Barnett	2	196	196	2	2	2	2	2
Dickens	Permian	N/A	-	-	-	-	-	-	-	-
Dimmit	Eagle Ford	Eagle Ford	3	6,146	6,146	6,146	6,146	6,146	6,146	3
Donley	Anadarko	N/A	-	-	-	-	-	-	-	-
Duval	Eagle Ford	N/A	1	1	1	1	1	1	1	1
Eastland	Barnett	N/A	-	-	-	-	-	-	-	-
Ector	Permian	Midland Basin	26	2,056	2,056	2,056	2,056	2,056	26	26
Edwards	Permian	N/A	11	11	11	11	11	11	11	11
El Paso	Permian	N/A	-	-	-	-	-	-	-	-
Ellis	Barnett	N/A	-	-	-	-	-	-	-	-
Erath	Barnett	N/A	-	-	-	-	-	-	-	-
Falls	None	N/A	-	-	-	-	-	-	-	-
Fannin	None	N/A	1	1	1	1	1	1	1	1
Fayette	Eagle Ford	Eagle Ford	2	934	934	934	934	934	934	2
Fisher	Permian	N/A	106	106	106	106	106	106	106	106
Floyd	Permian	N/A	-	-	-	-	-	-	-	-
Foard	None	N/A	-	-	-	-	-	-	-	-
Fort Bend	Misc	N/A	-	-	-	-	-	-	-	-
Franklin	Bossier	N/A	-	-	-	-	-	-	-	-
Freestone	Haynesville	N/A	200	200	200	200	200	200	200	200
Frio	Eagle Ford	Eagle Ford	1	5,995	5,995	5,995	5,995	5,995	5,995	1
Gaines	Permian	Midland Basin	22	1,870	1,870	1,870	1,870	1,870	22	22
Galveston	None	N/A	-	-	-	-	-	-	-	-
Garza	Permian	N/A	19	19	19	19	19	19	19	19
Gillespie	None	N/A	-	-	-	-	-	-	-	-
Glasscock	Permian	Midland Basin	8	13,851	13,851	13,851	13,851	13,851	8	8
Goliad	Eagle Ford	N/A	8	8	8	8	8	8	8	8
Gonzales	Eagle Ford	Eagle Ford	-	6,176	6,176	6,176	6,176	6,176	6,176	-
Gray	Anadarko	N/A	-	-	-	-	-	-	-	-
Grayson	Misc	N/A	295	295	295	295	295	295	295	295
Gregg	Haynesville	Haynesville	-	82	82	82	82	82	82	82
Grimes	Eagle Ford	N/A	228	228	228	228	228	228	228	228
Guadalupe	Misc	Eagle Ford	-	770	770	770	770	770	770	-
Hale	Permian	N/A	1	1	1	1	1	1	1	1
Hall	Anadarko	N/A	-	-	-	-	-	-	-	-
Hamilton	Barnett	N/A	-	-	-	-	-	-	-	-
Hansford	Anadarko	N/A	93	93	93	93	93	93	93	93
Hardeman	Barnett	N/A	5	5	5	5	5	5	5	5
Hardin	Misc	N/A	13	13	13	13	13	13	13	13
Harris	Misc	N/A	1	1	1	1	1	1	1	1
Harrison	Haynesville	Haynesville	-	2,691	2,691	2,691	2,691	2,691	2,691	2,691
Hartley	Anadarko	N/A	85	85	85	85	85	85	85	85
Haskell	Misc	N/A	4	4	4	4	4	4	4	4
Hays	None	N/A	-	-	-	-	-	-	-	-
Hemphill	Anadarko	N/A	1,555	1,555	1,555	1,555	1,555	1,555	1,555	1,555
Henderson	Misc	N/A	46	46	46	46	46	46	46	46
Hidalgo	Misc	N/A	76	76	76	76	76	76	76	76
Hill	Barnett	N/A	-	-	-	-	-	-	-	-
Hockley	Permian	N/A	69	69	69	69	69	69	69	69
Hood	Barnett	N/A	9	9	9	9	9	9	9	9

County	TWDB Play Area	Play Core Area	Conventional Water Use (acre-feet/yr)	Projected Total Oil and Gas Industry Water Use (acre-feet/yr)						
				2020	2030	2040	2050	2060	2070	2080
Hopkins	None	N/A	2	2	2	2	2	2	2	2
Houston	Bossier	N/A	302	302	302	302	302	302	302	302
Howard	Permian	Midland Basin	20	12,340	12,340	12,340	12,340	12,340	20	20
Hudspeth	Permian	N/A	8	8	8	8	8	8	8	8
Hunt	None	N/A	-	-	-	-	-	-	-	-
Hutchinson	Anadarko	N/A	67	67	67	67	67	67	67	67
Irion	Permian	Midland Basin	13	10,662	10,662	10,662	10,662	10,662	13	13
Jack	Barnett	N/A	35	35	35	35	35	35	35	35
Jackson	Misc	N/A	-	-	-	-	-	-	-	-
Jasper	Eagle Ford	N/A	28	28	28	28	28	28	28	28
Jeff Davis	Permian	N/A	28	28	28	28	28	28	28	28
Jefferson	Misc	N/A	2	2	2	2	2	2	2	2
Jim Hogg	Eagle Ford	N/A	9	9	9	9	9	9	9	9
Jim Wells	None	N/A	-	-	-	-	-	-	-	-
Johnson	Barnett	Barnett	2	30	30	2	2	2	2	2
Jones	Misc	N/A	9	9	9	9	9	9	9	9
Karnes	Eagle Ford	Eagle Ford	2	1,918	1,918	1,918	1,918	1,918	1,918	2
Kaufman	None	N/A	-	-	-	-	-	-	-	-
Kendall	None	N/A	-	-	-	-	-	-	-	-
Kenedy	Misc	N/A	3	3	3	3	3	3	3	3
Kent	Permian	N/A	15	15	15	15	15	15	15	15
Kerr	None	N/A	-	-	-	-	-	-	-	-
Kimble	Permian	N/A	-	-	-	-	-	-	-	-
King	Permian	N/A	4	4	4	4	4	4	4	4
Kinney	None	N/A	-	-	-	-	-	-	-	-
Kleberg	Misc	N/A	10	10	10	10	10	10	10	10
Knox	Misc	N/A	-	-	-	-	-	-	-	-
La Salle	Eagle Ford	Eagle Ford	-	5,396	5,396	5,396	5,396	5,396	5,396	-
Lamar	None	N/A	-	-	-	-	-	-	-	-
Lamb	Permian	N/A	-	-	-	-	-	-	-	-
Lampasas	None	N/A	3	3	3	3	3	3	3	3
Lavaca	Eagle Ford	Eagle Ford	-	2,665	2,665	2,665	2,665	2,665	2,665	-
Lee	Eagle Ford	N/A	1,236	1,236	1,236	1,236	1,236	1,236	1,236	1,236
Leon	Eagle Ford	N/A	337	337	337	337	337	337	337	337
Liberty	Misc	N/A	-	-	-	-	-	-	-	-
Limestone	Haynesville	N/A	106	106	106	106	106	106	106	106
Lipscomb	Anadarko	N/A	1,018	1,018	1,018	1,018	1,018	1,018	1,018	1,018
Live Oak	Eagle Ford	Eagle Ford	-	1,263	1,263	1,263	1,263	1,263	1,263	-
Llano	None	N/A	-	-	-	-	-	-	-	-
Loving	Permian-Far West	Delaware Basin	3	12,002	12,002	12,002	12,002	12,002	12,002	12,002
Lubbock	Permian	N/A	17	17	17	17	17	17	17	17
Lynn	Permian	N/A	15	15	15	15	15	15	15	15
Madison	Eagle Ford	N/A	975	975	975	975	975	975	975	975
Marion	Bossier	Haynesville	-	24	24	24	24	24	24	24
Martin	Permian	Midland Basin	9	16,588	16,588	16,588	16,588	16,588	9	9
Mason	None	N/A	-	-	-	-	-	-	-	-
Matagorda	Misc	N/A	1	1	1	1	1	1	1	1
Maverick	Eagle Ford	Eagle Ford	-	4,897	4,897	4,897	4,897	4,897	4,897	-
Mc Mullen	Eagle Ford	Eagle Ford	1	4,538	4,538	4,538	4,538	4,538	4,538	1
Mcculloch	Permian	N/A	-	-	-	-	-	-	-	-
Mclennan	None	N/A	-	-	-	-	-	-	-	-
Medina	Olmos	N/A	2	2	2	2	2	2	2	2
Menard	Permian	N/A	-	-	-	-	-	-	-	-
Midland	Permian	Midland Basin	10	14,701	14,701	14,701	14,701	14,701	10	10
Milam	Eagle Ford	N/A	802	802	802	802	802	802	802	802
Mills	None	N/A	-	-	-	-	-	-	-	-
Mitchell	Permian	Midland Basin	2	368	368	368	368	368	2	2

County	TWDB Play Area	Play Core Area	Conventional Water Use (acre-feet/yr)	Projected Total Oil and Gas Industry Water Use (acre-feet/yr)						
				2020	2030	2040	2050	2060	2070	2080
Montague	Barnett	N/A	6	6	6	6	6	6	6	6
Montgomery	Misc	N/A	11	11	11	11	11	11	11	11
Moore	Anadarko	N/A	33	33	33	33	33	33	33	33
Morris	None	N/A	-	-	-	-	-	-	-	-
Motley	Permian	N/A	-	-	-	-	-	-	-	-
Nacogdoches	Haynesville	Haynesville	-	891	891	891	891	891	891	891
Navarro	Haynesville	N/A	29	29	29	29	29	29	29	29
Newton	Misc	N/A	3	3	3	3	3	3	3	3
Nolan	Permian	N/A	70	70	70	70	70	70	70	70
Nueces	Misc	N/A	4	4	4	4	4	4	4	4
Ochiltree	Anadarko	N/A	797	797	797	797	797	797	797	797
Oldham	Anadarko	N/A	50	50	50	50	50	50	50	50
Orange	Misc	N/A	7	7	7	7	7	7	7	7
Palo Pinto	Barnett	N/A	7	7	7	7	7	7	7	7
Panola	Haynesville	Haynesville	1	2,280	2,280	2,280	2,280	2,280	2,280	2,280
Parker	Barnett	N/A	4	4	4	4	4	4	4	4
Parmer	Anadarko	N/A	-	-	-	-	-	-	-	-
Pecos	Permian-Far West	Delaware Basin	7	16,151	16,151	16,151	16,151	16,151	16,151	16,151
Polk	Misc	N/A	27	27	27	27	27	27	27	27
Potter	Anadarko	N/A	250	250	250	250	250	250	250	250
Presidio	Permian	N/A	-	-	-	-	-	-	-	-
Rains	None	N/A	-	-	-	-	-	-	-	-
Randall	Anadarko	N/A	-	-	-	-	-	-	-	-
Reagan	Permian	Midland Basin	4	19,822	19,822	19,822	19,822	19,822	4	4
Real	Permian	N/A	-	-	-	-	-	-	-	-
Red River	None	N/A	-	-	-	-	-	-	-	-
Reeves	Permian-Far West	Delaware Basin	14	34,984	34,984	34,984	34,984	34,984	34,984	34,984
Refugio	None	N/A	-	-	-	-	-	-	-	-
Roberts	Anadarko	N/A	684	684	684	684	684	684	684	684
Robertson	Eagle Ford	N/A	600	600	600	600	600	600	600	600
Rockwall	None	N/A	-	-	-	-	-	-	-	-
Runnels	Permian	N/A	-	-	-	-	-	-	-	-
Rusk	Haynesville	Haynesville	-	489	489	489	489	489	489	489
Sabine	Haynesville	Haynesville	-	202	202	202	202	202	202	202
San Augustine	Haynesville	Haynesville	-	1,411	1,411	1,411	1,411	1,411	1,411	1,411
San Jacinto	Misc	N/A	56	56	56	56	56	56	56	56
San Patricio	Misc	N/A	9	9	9	9	9	9	9	9
San Saba	Misc	N/A	-	-	-	-	-	-	-	-
Schleicher	Permian	Midland Basin	2	3,529	3,529	3,529	3,529	3,529	2	2
Scurry	Permian	Midland Basin	8	306	306	306	306	306	8	8
Shackelford	Barnett	N/A	-	-	-	-	-	-	-	-
Shelby	Haynesville	Haynesville	2	2,070	2,070	2,070	2,070	2,070	2,070	2,070
Sherman	Anadarko	N/A	7	7	7	7	7	7	7	7
Smith	Haynesville	N/A	229	229	229	229	229	229	229	229
Somervell	Barnett	N/A	-	-	-	-	-	-	-	-
Starr	Misc	N/A	123	123	123	123	123	123	123	123
Stephens	Barnett	N/A	10	10	10	10	10	10	10	10
Sterling	Permian	Midland Basin	3	3,047	3,047	3,047	3,047	3,047	3	3
Stonewall	Permian	N/A	20	20	20	20	20	20	20	20
Sutton	Permian	N/A	27	27	27	27	27	27	27	27
Swisher	Anadarko	N/A	-	-	-	-	-	-	-	-
Tarrant	Barnett	Barnett	1	431	431	1	1	1	1	1
Taylor	Misc	N/A	2	2	2	2	2	2	2	2
Terrell	Permian-Far West	N/A	16	16	16	16	16	16	16	16
Terry	Permian	N/A	101	101	101	101	101	101	101	101
Throckmorton	Misc	N/A	112	112	112	112	112	112	112	112
Titus	None	N/A	-	-	-	-	-	-	-	-

County	TWDB Play Area	Play Core Area	Conventional Water Use (acre-feet/yr)	Projected Total Oil and Gas Industry Water Use (acre-feet/yr)						
				2020	2030	2040	2050	2060	2070	2080
Tom Green	Permian	Midland Basin	1	986	986	986	986	986	1	1
Travis	None	N/A	-	-	-	-	-	-	-	-
Trinity	None	N/A	17	17	17	17	17	17	17	17
Tyler	Misc	N/A	42	42	42	42	42	42	42	42
Upshur	Haynesville	N/A	139	139	139	139	139	139	139	139
Upton	Permian	Midland Basin	6	15,851	15,851	15,851	15,851	15,851	6	6
Uvalde	None	N/A	-	-	-	-	-	-	-	-
Val Verde	Permian	N/A	-	-	-	-	-	-	-	-
Van Zandt	Bossier	N/A	6	6	6	6	6	6	6	6
Victoria	None	N/A	-	-	-	-	-	-	-	-
Walker	Eagle Ford	N/A	73	73	73	73	73	73	73	73
Waller	Misc	N/A	-	-	-	-	-	-	-	-
Ward	Permian	Delaware Basin	30	6,565	6,565	6,565	6,565	6,565	6,565	6,565
Washington	Eagle Ford	N/A	728	728	728	728	728	728	728	728
Webb	Eagle Ford	Eagle Ford	2	4,124	4,124	4,124	4,124	4,124	4,124	2
Wharton	Misc	N/A	2	2	2	2	2	2	2	2
Wheeler	Anadarko	N/A	4,143	4,143	4,143	4,143	4,143	4,143	4,143	4,143
Wichita	Misc	N/A	9	9	9	9	9	9	9	9
Wilbarger	Misc	N/A	26	26	26	26	26	26	26	26
Willacy	Olmos	N/A	2	2	2	2	2	2	2	2
Williamson	None	N/A	-	-	-	-	-	-	-	-
Wilson	Eagle Ford	Eagle Ford	3	4,619	4,619	4,619	4,619	4,619	4,619	3
Winkler	Permian	Delaware Basin	24	3,275	3,275	3,275	3,275	3,275	3,275	3,275
Wise	Barnett	Barnett	-	384	384	-	-	-	-	-
Wood	Bossier	N/A	259	259	259	259	259	259	259	259
Yoakum	Permian	N/A	746	746	746	746	746	746	746	746
Young	Barnett	N/A	1	1	1	1	1	1	1	1
Zapata	Misc	N/A	6	6	6	6	6	6	6	6
Zavala	Eagle Ford	Eagle Ford	1	4,932	4,932	4,932	4,932	4,932	4,932	1

Table 1- 18b. Projected total oil and gas industry water use by play

TWDB Play Name	Projected Total Oil and Gas Industry Water Use (acre-ft/yr)							
	Conventional	2020	2030	2040	2050	2060	2070	2080
Anadarko	8,785	8,785	8,785	8,785	8,785	8,785	8,785	8,785
Barnett	130	1,165	1,165	130	130	130	130	130
Bossier	754	778	778	778	778	778	778	778
Eagle Ford	13,184	73,883	73,883	73,883	73,883	73,883	73,883	13,184
Haynesville	707	10,853	10,853	10,853	10,853	10,853	10,853	10,853
Misc	998	2,118	2,118	2,118	2,118	2,118	2,118	998
None	23	23	23	23	23	23	23	23
Olmos	4	4	4	4	4	4	4	4
Permian	1,772	145,158	145,158	145,158	145,158	145,158	11,557	11,557
Permian-Far West	44	73,072	73,072	73,072	73,072	73,072	73,072	73,072
Total	26,401	315,839	315,839	314,804	314,804	314,804	181,203	119,384