



# List of Appendices

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Appendix 1  
DB17 Reports

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The Texas Water Development Board guidelines require submittal of the following database (DB17) reports as a hard-copy appendix in the Regional Water Plan. This section includes all DB17 reports available as of November 23, 2015:

- Report 1-Population Projections
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### Water User Group (WUG) Population

REGION N	WUG POPULATION					
	2020	2030	2040	2050	2060	2070
<b>ARANSAS COUNTY</b>						
SAN ANTONIO-NECES BASIN						
ARANSAS PASS	765	782	780	785	785	785
FULTON	1,435	1,466	1,463	1,472	1,473	1,473
ROCKPORT	9,260	9,460	9,440	9,502	9,503	9,503
COUNTY-OTHER	13,003	13,283	13,254	13,343	13,342	13,343
<b>SAN ANTONIO-NECES BASIN TOTAL POPULATION</b>	<b>24,463</b>	<b>24,991</b>	<b>24,937</b>	<b>25,102</b>	<b>25,103</b>	<b>25,104</b>
<b>ARANSAS COUNTY TOTAL POPULATION</b>	<b>24,463</b>	<b>24,991</b>	<b>24,937</b>	<b>25,102</b>	<b>25,103</b>	<b>25,104</b>
<b>BEE COUNTY</b>						
NECES BASIN						
EL OSO WSC	370	386	392	393	393	393
COUNTY-OTHER	77	79	81	81	82	82
<b>NECES BASIN TOTAL POPULATION</b>	<b>447</b>	<b>465</b>	<b>473</b>	<b>474</b>	<b>475</b>	<b>475</b>
SAN ANTONIO-NECES BASIN						
BEEVILLE	13,516	14,082	14,327	14,351	14,365	14,369
EL OSO WSC	16	16	17	17	17	17
COUNTY-OTHER	19,499	20,316	20,670	20,703	20,722	20,729
<b>SAN ANTONIO-NECES BASIN TOTAL POPULATION</b>	<b>33,031</b>	<b>34,414</b>	<b>35,014</b>	<b>35,071</b>	<b>35,104</b>	<b>35,115</b>
<b>BEE COUNTY TOTAL POPULATION</b>	<b>33,478</b>	<b>34,879</b>	<b>35,487</b>	<b>35,545</b>	<b>35,579</b>	<b>35,590</b>
<b>BROOKS COUNTY</b>						
NECES-RIO GRANDE BASIN						
FALFURRIAS	5,217	5,414	5,612	5,805	5,979	6,141
COUNTY-OTHER	2,566	2,838	3,110	3,376	3,616	3,838
<b>NECES-RIO GRANDE BASIN TOTAL POPULATION</b>	<b>7,783</b>	<b>8,252</b>	<b>8,722</b>	<b>9,181</b>	<b>9,595</b>	<b>9,979</b>
<b>BROOKS COUNTY TOTAL POPULATION</b>	<b>7,783</b>	<b>8,252</b>	<b>8,722</b>	<b>9,181</b>	<b>9,595</b>	<b>9,979</b>
<b>DUVAL COUNTY</b>						
NECES BASIN						
FREER	3,042	3,222	3,372	3,503	3,607	3,692
COUNTY-OTHER	306	324	340	353	363	372
<b>NECES BASIN TOTAL POPULATION</b>	<b>3,348</b>	<b>3,546</b>	<b>3,712</b>	<b>3,856</b>	<b>3,970</b>	<b>4,064</b>
NECES-RIO GRANDE BASIN						
BENAVIDES	1,470	1,558	1,630	1,693	1,744	1,785
SAN DIEGO	3,873	4,103	4,294	4,460	4,593	4,701
COUNTY-OTHER	4,024	4,263	4,462	4,635	4,773	4,885
<b>NECES-RIO GRANDE BASIN TOTAL POPULATION</b>	<b>9,367</b>	<b>9,924</b>	<b>10,386</b>	<b>10,788</b>	<b>11,110</b>	<b>11,371</b>
<b>DUVAL COUNTY TOTAL POPULATION</b>	<b>12,715</b>	<b>13,470</b>	<b>14,098</b>	<b>14,644</b>	<b>15,080</b>	<b>15,435</b>
<b>JIM WELLS COUNTY</b>						
NECES BASIN						
COUNTY-OTHER	2,908	3,147	3,364	3,589	3,787	3,969
<b>NECES BASIN TOTAL POPULATION</b>	<b>2,908</b>	<b>3,147</b>	<b>3,364</b>	<b>3,589</b>	<b>3,787</b>	<b>3,969</b>

### Water User Group (WUG) Population

REGION N	WUG POPULATION					
	2020	2030	2040	2050	2060	2070
<b>JIM WELLS COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
ALICE	21,045	22,778	24,350	25,979	27,414	28,728
ORANGE GROVE	1,452	1,572	1,680	1,793	1,892	1,982
PREMONT	2,923	3,164	3,382	3,608	3,807	3,990
SAN DIEGO	992	1,074	1,148	1,224	1,292	1,354
COUNTY-OTHER	15,667	16,955	18,128	19,340	20,408	21,387
<b>NUECES-RIO GRANDE BASIN TOTAL POPULATION</b>	<b>42,079</b>	<b>45,543</b>	<b>48,688</b>	<b>51,944</b>	<b>54,813</b>	<b>57,441</b>
<b>JIM WELLS COUNTY TOTAL POPULATION</b>	<b>44,987</b>	<b>48,690</b>	<b>52,052</b>	<b>55,533</b>	<b>58,600</b>	<b>61,410</b>
<b>KENEDY COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
COUNTY-OTHER	463	498	504	507	508	508
<b>NUECES-RIO GRANDE BASIN TOTAL POPULATION</b>	<b>463</b>	<b>498</b>	<b>504</b>	<b>507</b>	<b>508</b>	<b>508</b>
<b>KENEDY COUNTY TOTAL POPULATION</b>	<b>463</b>	<b>498</b>	<b>504</b>	<b>507</b>	<b>508</b>	<b>508</b>
<b>KLEBERG COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
KINGSVILLE	29,080	31,857	34,505	37,057	39,450	41,689
RICARDO WSC	2,919	3,198	3,464	3,720	3,960	4,185
COUNTY-OTHER	3,568	3,908	4,233	4,547	4,841	5,115
<b>NUECES-RIO GRANDE BASIN TOTAL POPULATION</b>	<b>35,567</b>	<b>38,963</b>	<b>42,202</b>	<b>45,324</b>	<b>48,251</b>	<b>50,989</b>
<b>KLEBERG COUNTY TOTAL POPULATION</b>	<b>35,567</b>	<b>38,963</b>	<b>42,202</b>	<b>45,324</b>	<b>48,251</b>	<b>50,989</b>
<b>LIVE OAK COUNTY</b>						
<b>NUECES BASIN</b>						
EL OSO WSC	661	661	661	661	661	661
GEORGE WEST	2,478	2,479	2,479	2,479	2,479	2,479
MCCOY WSC	172	172	172	172	172	172
THREE RIVERS	1,873	1,874	1,874	1,874	1,874	1,874
COUNTY-OTHER	6,499	6,504	6,504	6,504	6,504	6,504
<b>NUECES BASIN TOTAL POPULATION</b>	<b>11,683</b>	<b>11,690</b>	<b>11,690</b>	<b>11,690</b>	<b>11,690</b>	<b>11,690</b>
<b>LIVE OAK COUNTY TOTAL POPULATION</b>	<b>11,683</b>	<b>11,690</b>	<b>11,690</b>	<b>11,690</b>	<b>11,690</b>	<b>11,690</b>
<b>MCMULLEN COUNTY</b>						
<b>NUECES BASIN</b>						
COUNTY-OTHER	734	734	734	734	734	734
<b>NUECES BASIN TOTAL POPULATION</b>	<b>734</b>	<b>734</b>	<b>734</b>	<b>734</b>	<b>734</b>	<b>734</b>
<b>MCMULLEN COUNTY TOTAL POPULATION</b>	<b>734</b>	<b>734</b>	<b>734</b>	<b>734</b>	<b>734</b>	<b>734</b>
<b>NUECES COUNTY</b>						
<b>NUECES BASIN</b>						
CORPUS CHRISTI	26,853	29,248	30,754	31,635	32,291	32,730
NUECES WSC	127	139	146	150	153	155
RIVER ACRES WSC	2,662	2,899	3,049	3,136	3,201	3,245

### Water User Group (WUG) Population

REGION N	WUG POPULATION					
	2020	2030	2040	2050	2060	2070
<b>NUECES COUNTY</b>						
<b>NUECES BASIN</b>						
ROBSTOWN	12	12	12	12	12	12
COUNTY-OTHER	2,350	2,561	2,693	2,772	2,829	2,868
<b>NUECES BASIN TOTAL POPULATION</b>	<b>32,004</b>	<b>34,859</b>	<b>36,654</b>	<b>37,705</b>	<b>38,486</b>	<b>39,010</b>
<b>NUECES-RIO GRANDE BASIN</b>						
AGUA DULCE	892	972	1,022	1,052	1,073	1,088
BISHOP	3,446	3,754	3,947	4,060	4,144	4,201
CORPUS CHRISTI	308,804	336,351	353,666	363,805	371,347	376,399
DRISCOLL	812	885	930	957	977	990
NUECES WSC	2,426	2,642	2,778	2,858	2,917	2,957
PORT ARANSAS	3,827	4,168	4,383	4,508	4,602	4,664
ROBSTOWN	12,455	12,455	12,455	12,455	12,455	12,455
COUNTY-OTHER	9,476	11,432	12,661	13,379	13,917	14,274
<b>NUECES-RIO GRANDE BASIN TOTAL POPULATION</b>	<b>342,138</b>	<b>372,659</b>	<b>391,842</b>	<b>403,074</b>	<b>411,432</b>	<b>417,028</b>
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	15	16	17	18	18	18
<b>SAN ANTONIO-NUECES BASIN TOTAL POPULATION</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>18</b>	<b>18</b>
<b>NUECES COUNTY TOTAL POPULATION</b>	<b>374,157</b>	<b>407,534</b>	<b>428,513</b>	<b>440,797</b>	<b>449,936</b>	<b>456,056</b>
<b>SAN PATRICIO COUNTY</b>						
<b>NUECES BASIN</b>						
LAKE CITY	541	567	582	593	601	606
MATHIS	5,244	5,500	5,647	5,754	5,827	5,876
COUNTY-OTHER	3,333	3,495	3,589	3,658	3,703	3,735
<b>NUECES BASIN TOTAL POPULATION</b>	<b>9,118</b>	<b>9,562</b>	<b>9,818</b>	<b>10,005</b>	<b>10,131</b>	<b>10,217</b>
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	7,922	8,309	8,531	8,693	8,803	8,877
GREGORY	2,024	2,123	2,179	2,221	2,249	2,268
INGLESIDE	9,961	10,446	10,726	10,930	11,068	11,161
INGLESIDE ON THE BAY	653	685	703	717	726	732
ODEM	2,535	2,659	2,730	2,782	2,817	2,841
PORTLAND	16,021	16,803	17,252	17,580	17,802	17,953
RINCON WSC	3,441	3,609	3,706	3,776	3,824	3,856
SINTON	6,011	6,305	6,473	6,596	6,680	6,736
TAFT	3,235	3,392	3,483	3,549	3,594	3,624
COUNTY-OTHER	7,839	8,221	8,442	8,602	8,711	8,784
<b>SAN ANTONIO-NUECES BASIN TOTAL POPULATION</b>	<b>59,642</b>	<b>62,552</b>	<b>64,225</b>	<b>65,446</b>	<b>66,274</b>	<b>66,832</b>
<b>SAN PATRICIO COUNTY TOTAL POPULATION</b>	<b>68,760</b>	<b>72,114</b>	<b>74,043</b>	<b>75,451</b>	<b>76,405</b>	<b>77,049</b>
<b>REGION N TOTAL POPULATION</b>						
<b>REGION N TOTAL POPULATION</b>	<b>614,790</b>	<b>661,815</b>	<b>692,982</b>	<b>714,508</b>	<b>731,481</b>	<b>744,544</b>



### Water User Group (WUG) Demand

REGION N	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>ARANSAS COUNTY</b>						
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	110	108	106	105	104	104
FULTON	278	279	275	275	275	275
ROCKPORT	1,677	1,680	1,652	1,649	1,646	1,646
COUNTY-OTHER	1,446	1,415	1,362	1,347	1,342	1,342
MANUFACTURING	137	142	147	151	161	172
MINING	10	7	5	5	5	5
LIVESTOCK	44	44	44	44	44	44
<b>SAN ANTONIO-NUECES BASIN TOTAL DEMAND</b>	<b>3,702</b>	<b>3,675</b>	<b>3,591</b>	<b>3,576</b>	<b>3,577</b>	<b>3,588</b>
<b>ARANSAS COUNTY TOTAL DEMAND</b>	<b>3,702</b>	<b>3,675</b>	<b>3,591</b>	<b>3,576</b>	<b>3,577</b>	<b>3,588</b>
<b>BEE COUNTY</b>						
<b>NUECES BASIN</b>						
EL OSO WSC	79	81	81	80	77	77
COUNTY-OTHER	11	11	11	11	11	11
MINING	57	55	51	45	41	38
LIVESTOCK	89	89	89	89	89	89
IRRIGATION	238	263	290	320	354	399
<b>NUECES BASIN TOTAL DEMAND</b>	<b>474</b>	<b>499</b>	<b>522</b>	<b>545</b>	<b>572</b>	<b>614</b>
<b>SAN ANTONIO-NUECES BASIN</b>						
BEEVILLE	2,925	2,978	2,976	2,961	2,959	2,960
EL OSO WSC	4	4	4	4	3	3
COUNTY-OTHER	2,714	2,750	2,740	2,713	2,709	2,710
MANUFACTURING	1	1	1	1	1	1
MINING	415	403	377	327	297	280
LIVESTOCK	841	841	841	841	841	841
IRRIGATION	4,513	4,985	5,506	6,083	6,719	7,586
<b>SAN ANTONIO-NUECES BASIN TOTAL DEMAND</b>	<b>11,413</b>	<b>11,962</b>	<b>12,445</b>	<b>12,930</b>	<b>13,529</b>	<b>14,381</b>
<b>BEE COUNTY TOTAL DEMAND</b>	<b>11,887</b>	<b>12,461</b>	<b>12,967</b>	<b>13,475</b>	<b>14,101</b>	<b>14,995</b>
<b>BROOKS COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
FALFURRIAS	1,677	1,712	1,755	1,813	1,865	1,915
COUNTY-OTHER	326	347	370	397	424	449
MINING	357	360	340	324	308	298
LIVESTOCK	620	620	620	620	620	620
IRRIGATION	1,800	1,890	1,985	2,084	2,188	2,297
<b>NUECES-RIO GRANDE BASIN TOTAL DEMAND</b>	<b>4,780</b>	<b>4,929</b>	<b>5,070</b>	<b>5,238</b>	<b>5,405</b>	<b>5,579</b>
<b>BROOKS COUNTY TOTAL DEMAND</b>	<b>4,780</b>	<b>4,929</b>	<b>5,070</b>	<b>5,238</b>	<b>5,405</b>	<b>5,579</b>
<b>DUVAL COUNTY</b>						
<b>NUECES BASIN</b>						
FREER	650	672	691	717	737	754
COUNTY-OTHER	39	40	41	42	43	44
MINING	125	130	122	112	105	99
LIVESTOCK	111	111	111	111	111	111
IRRIGATION	150	158	166	174	183	192
<b>NUECES BASIN TOTAL DEMAND</b>	<b>1,075</b>	<b>1,111</b>	<b>1,131</b>	<b>1,156</b>	<b>1,179</b>	<b>1,200</b>

### Water User Group (WUG) Demand

REGION N	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>DUVAL COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
BENAVIDES	236	242	250	259	266	272
SAN DIEGO	724	746	765	791	813	832
COUNTY-OTHER	510	519	527	539	553	566
MINING	1,263	1,314	1,230	1,129	1,060	1,005
LIVESTOCK	643	643	643	643	643	643
IRRIGATION	2,854	2,996	3,146	3,304	3,468	3,642
<b>NUECES-RIO GRANDE BASIN TOTAL DEMAND</b>	<b>6,230</b>	<b>6,460</b>	<b>6,561</b>	<b>6,665</b>	<b>6,803</b>	<b>6,960</b>
<b>DUVAL COUNTY TOTAL DEMAND</b>	<b>7,305</b>	<b>7,571</b>	<b>7,692</b>	<b>7,821</b>	<b>7,982</b>	<b>8,160</b>
<b>JIM WELLS COUNTY</b>						
<b>NUECES BASIN</b>						
COUNTY-OTHER	413	433	453	477	502	526
MINING	4	4	3	2	1	1
LIVESTOCK	169	169	169	169	169	169
IRRIGATION	363	381	400	420	441	463
<b>NUECES BASIN TOTAL DEMAND</b>	<b>949</b>	<b>987</b>	<b>1,025</b>	<b>1,068</b>	<b>1,113</b>	<b>1,159</b>
<b>NUECES-RIO GRANDE BASIN</b>						
ALICE	4,192	4,425	4,643	4,912	5,175	5,421
ORANGE GROVE	376	400	422	447	471	494
PREMONT	710	752	792	841	886	929
SAN DIEGO	186	196	205	217	229	240
COUNTY-OTHER	2,221	2,331	2,437	2,570	2,705	2,834
MINING	67	70	52	38	25	16
LIVESTOCK	860	860	860	860	860	860
IRRIGATION	2,137	2,244	2,356	2,474	2,598	2,728
<b>NUECES-RIO GRANDE BASIN TOTAL DEMAND</b>	<b>10,749</b>	<b>11,278</b>	<b>11,767</b>	<b>12,359</b>	<b>12,949</b>	<b>13,522</b>
<b>JIM WELLS COUNTY TOTAL DEMAND</b>	<b>11,698</b>	<b>12,265</b>	<b>12,792</b>	<b>13,427</b>	<b>14,062</b>	<b>14,681</b>
<b>KENEDY COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
COUNTY-OTHER	244	261	262	263	264	264
MINING	118	123	92	68	43	27
LIVESTOCK	644	644	644	644	644	644
<b>NUECES-RIO GRANDE BASIN TOTAL DEMAND</b>	<b>1,006</b>	<b>1,028</b>	<b>998</b>	<b>975</b>	<b>951</b>	<b>935</b>
<b>KENEDY COUNTY TOTAL DEMAND</b>	<b>1,006</b>	<b>1,028</b>	<b>998</b>	<b>975</b>	<b>951</b>	<b>935</b>
<b>KLEBERG COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
KINGSVILLE	4,232	4,483	4,738	5,025	5,336	5,636
RICARDO WSC	341	361	382	405	430	454
COUNTY-OTHER	601	637	679	728	773	817
MINING	357	360	340	324	308	298
LIVESTOCK	1,276	1,276	1,276	1,276	1,276	1,276
IRRIGATION	600	630	662	695	729	766
<b>NUECES-RIO GRANDE BASIN TOTAL DEMAND</b>	<b>7,407</b>	<b>7,747</b>	<b>8,077</b>	<b>8,453</b>	<b>8,852</b>	<b>9,247</b>
<b>KLEBERG COUNTY TOTAL DEMAND</b>	<b>7,407</b>	<b>7,747</b>	<b>8,077</b>	<b>8,453</b>	<b>8,852</b>	<b>9,247</b>

### Water User Group (WUG) Demand

REGION N	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>LIVE OAK COUNTY</b>						
<b>NUECES BASIN</b>						
EL OSO WSC	143	139	137	135	129	129
GEORGE WEST	454	443	433	429	428	428
MCCOY WSC	22	21	21	20	20	20
THREE RIVERS	325	316	309	305	305	305
COUNTY-OTHER	802	783	768	760	758	758
MANUFACTURING	2,024	2,058	2,089	2,114	2,221	2,333
MINING	814	917	907	729	492	332
LIVESTOCK	933	933	933	933	933	933
IRRIGATION	2,200	2,310	2,426	2,547	2,674	2,808
<b>NUECES BASIN TOTAL DEMAND</b>	<b>7,717</b>	<b>7,920</b>	<b>8,023</b>	<b>7,972</b>	<b>7,960</b>	<b>8,046</b>
<b>LIVE OAK COUNTY TOTAL DEMAND</b>	<b>7,717</b>	<b>7,920</b>	<b>8,023</b>	<b>7,972</b>	<b>7,960</b>	<b>8,046</b>
<b>MCMULLEN COUNTY</b>						
<b>NUECES BASIN</b>						
COUNTY-OTHER	97	94	91	90	90	90
MINING	4,268	4,804	4,754	2,622	1,850	1,305
LIVESTOCK	355	355	355	355	355	355
IRRIGATION	40	42	44	46	49	51
<b>NUECES BASIN TOTAL DEMAND</b>	<b>4,760</b>	<b>5,295</b>	<b>5,244</b>	<b>3,113</b>	<b>2,344</b>	<b>1,801</b>
<b>MCMULLEN COUNTY TOTAL DEMAND</b>	<b>4,760</b>	<b>5,295</b>	<b>5,244</b>	<b>3,113</b>	<b>2,344</b>	<b>1,801</b>
<b>NUECES COUNTY</b>						
<b>NUECES BASIN</b>						
CORPUS CHRISTI	5,186	5,515	5,702	5,815	5,926	6,005
NUECES WSC	17	18	18	19	19	20
RIVER ACRES WSC	426	450	463	470	479	486
ROBSTOWN	3	3	3	3	3	3
COUNTY-OTHER	309	325	334	340	345	351
MANUFACTURING	3,017	3,206	3,390	3,549	3,799	4,066
MINING	644	759	843	909	1,006	1,121
STEAM ELECTRIC POWER	11,534	13,485	15,862	18,762	22,294	26,493
LIVESTOCK	54	54	54	54	54	54
IRRIGATION	57	60	63	66	69	72
<b>NUECES BASIN TOTAL DEMAND</b>	<b>21,247</b>	<b>23,875</b>	<b>26,732</b>	<b>29,987</b>	<b>33,994</b>	<b>38,671</b>
<b>NUECES-RIO GRANDE BASIN</b>						
AGUA DULCE	132	139	143	145	148	150
BISHOP	594	628	646	660	673	682
CORPUS CHRISTI	59,630	63,416	65,568	66,865	68,138	69,053
DRISCOLL	105	110	113	114	116	118
NUECES WSC	316	337	350	357	364	368
PORT ARANSAS	2,251	2,434	2,548	2,614	2,667	2,703
ROBSTOWN	2,954	2,894	2,845	2,840	2,836	2,836
COUNTY-OTHER	1,245	1,447	1,567	1,637	1,700	1,742
MANUFACTURING	47,259	50,219	53,110	55,601	59,514	63,703
MINING	51	60	66	71	79	88
STEAM ELECTRIC POWER	3,504	4,097	4,819	5,699	6,773	8,048
LIVESTOCK	261	261	261	261	261	261
IRRIGATION	381	400	420	441	464	487

### Water User Group (WUG) Demand

REGION N	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>NUECES COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN TOTAL DEMAND</b>	<b>118,683</b>	<b>126,442</b>	<b>132,456</b>	<b>137,305</b>	<b>143,733</b>	<b>150,239</b>
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	3	3	3	3	3	3
MINING	29	34	38	41	45	51
IRRIGATION	1	1	1	1	1	1
<b>SAN ANTONIO-NUECES BASIN TOTAL DEMAND</b>	<b>33</b>	<b>38</b>	<b>42</b>	<b>45</b>	<b>49</b>	<b>55</b>
<b>NUECES COUNTY TOTAL DEMAND</b>	<b>139,963</b>	<b>150,355</b>	<b>159,230</b>	<b>167,337</b>	<b>177,776</b>	<b>188,965</b>
<b>SAN PATRICIO COUNTY</b>						
<b>NUECES BASIN</b>						
LAKE CITY	64	65	64	64	65	66
MATHIS	670	676	672	679	685	691
COUNTY-OTHER	473	480	492	500	505	509
MANUFACTURING	18,279	19,825	21,351	22,695	24,392	26,216
MINING	78	88	92	97	103	112
LIVESTOCK	205	205	205	205	205	205
IRRIGATION	1,109	1,224	1,353	1,494	1,650	1,863
<b>NUECES BASIN TOTAL DEMAND</b>	<b>20,878</b>	<b>22,563</b>	<b>24,229</b>	<b>25,734</b>	<b>27,605</b>	<b>29,662</b>
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	1,131	1,148	1,149	1,155	1,167	1,176
GREGORY	339	344	348	354	358	361
INGLESIDE	1,051	1,062	1,060	1,064	1,074	1,083
INGLESIDE ON THE BAY	77	78	78	78	79	79
ODEM	379	384	384	387	391	394
PORTLAND	2,631	2,684	2,698	2,718	2,747	2,770
RINCON WSC	346	355	359	363	366	369
SINTON	1,409	1,448	1,463	1,478	1,495	1,507
TAFT	464	470	469	475	480	484
COUNTY-OTHER	1,111	1,129	1,155	1,174	1,186	1,196
MANUFACTURING	21,458	23,273	25,065	26,643	28,635	30,775
MINING	294	333	348	363	389	421
LIVESTOCK	201	201	201	201	201	201
IRRIGATION	9,976	11,020	12,172	13,446	14,854	16,769
<b>SAN ANTONIO-NUECES BASIN TOTAL DEMAND</b>	<b>40,867</b>	<b>43,929</b>	<b>46,949</b>	<b>49,899</b>	<b>53,422</b>	<b>57,585</b>
<b>SAN PATRICIO COUNTY TOTAL DEMAND</b>	<b>61,745</b>	<b>66,492</b>	<b>71,178</b>	<b>75,633</b>	<b>81,027</b>	<b>87,247</b>
<b>REGION N TOTAL DEMAND</b>						
	<b>261,970</b>	<b>279,738</b>	<b>294,862</b>	<b>307,020</b>	<b>324,037</b>	<b>343,244</b>



### Source Availability

<b>REGION N</b>									
<b>SURFACE WATER</b>	<b>COUNTY</b>	<b>BASIN</b>	<b>SALINITY</b>	<b>SOURCE AVAILABILITY (ACRE-FEET PER YEAR)</b>					
				<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	RESERVOIR	NUECES	FRESH	150,160	148,760	147,360	145,960	144,560	143,160
NUECES LIVESTOCK LOCAL SUPPLY	BEE	NUECES	FRESH	44	44	44	44	44	44
NUECES LIVESTOCK LOCAL SUPPLY	DUVAL	NUECES	FRESH	28	28	28	28	28	28
NUECES LIVESTOCK LOCAL SUPPLY	JIM WELLS	NUECES	FRESH	62	62	62	62	62	62
NUECES LIVESTOCK LOCAL SUPPLY	LIVE OAK	NUECES	FRESH	252	252	252	252	252	252
NUECES LIVESTOCK LOCAL SUPPLY	MCMULLEN	NUECES	FRESH	262	262	262	262	262	262
NUECES LIVESTOCK LOCAL SUPPLY	NUECES	NUECES	FRESH	34	34	34	34	34	34
NUECES LIVESTOCK LOCAL SUPPLY	SAN PATRICIO	NUECES	FRESH	102	102	102	102	102	102
NUECES RUN-OF-RIVER	LIVE OAK	NUECES	FRESH	1,500	1,500	1,500	1,500	1,500	1,500
NUECES RUN-OF-RIVER	NUECES	NUECES	FRESH	1,955	1,955	1,955	1,955	1,955	1,955
NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	BROOKS	NUECES-RIO GRANDE	FRESH	160	160	160	160	160	160
NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	DUVAL	NUECES-RIO GRANDE	FRESH	120	120	120	120	120	120
NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	JIM WELLS	NUECES-RIO GRANDE	FRESH	340	340	340	340	340	340
NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	NUECES	NUECES-RIO GRANDE	FRESH	2	2	2	2	2	2
NUECES-RIO GRANDE RUN-OF-RIVER	NUECES	NUECES-RIO GRANDE	FRESH	0	0	0	0	0	0
SAN ANTONIO-NUECES LIVESTOCK LOCAL SUPPLY	ARANSAS	SAN ANTONIO-NUECES	FRESH	21	21	21	21	21	21
SAN ANTONIO-NUECES LIVESTOCK LOCAL SUPPLY	BEE	SAN ANTONIO-NUECES	FRESH	420	420	420	420	420	420
SAN ANTONIO-NUECES LIVESTOCK LOCAL SUPPLY	SAN PATRICIO	SAN ANTONIO-NUECES	FRESH	13	13	13	13	13	13
SAN ANTONIO-NUECES RUN-OF-RIVER	BEE	SAN ANTONIO-NUECES	FRESH	0	0	0	0	0	0
SAN ANTONIO-NUECES RUN-OF-RIVER	SAN PATRICIO	SAN ANTONIO-NUECES	FRESH	0	0	0	0	0	0
<b>SURFACE WATER TOTAL SOURCE AVAILABILITY</b>				<b>155,475</b>	<b>154,075</b>	<b>152,675</b>	<b>151,275</b>	<b>149,875</b>	<b>148,475</b>
<b>REGION N TOTAL SOURCE AVAILABILITY</b>				<b>386,345</b>	<b>384,921</b>	<b>383,521</b>	<b>382,069</b>	<b>380,669</b>	<b>379,269</b>

### Water User Group (WUG) Existing Water Supply

REGION N	SOURCE REGION   SOURCE NAME	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
		2020	2030	2040	2050	2060	2070
<b>ARANSAS COUNTY</b>							
<b>SAN ANTONIO-NUECES BASIN</b>							
ARANSAS PASS	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	56	54	54	53	53	52
ARANSAS PASS	P   TEXANA LAKE/RESERVOIR	54	54	52	52	51	52
FULTON	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	139	139	137	137	137	137
FULTON	P   TEXANA LAKE/RESERVOIR	139	140	138	138	138	138
ROCKPORT	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	838	840	826	825	823	823
ROCKPORT	N   GULF COAST AQUIFER   ARANSAS COUNTY	69	69	69	69	69	69
ROCKPORT	P   TEXANA LAKE/RESERVOIR	770	771	757	755	754	754
COUNTY-OTHER	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	562	547	520	513	510	510
COUNTY-OTHER	N   GULF COAST AQUIFER   ARANSAS COUNTY	321	321	321	321	321	321
COUNTY-OTHER	P   TEXANA LAKE/RESERVOIR	563	547	521	513	511	511
MANUFACTURING	N   GULF COAST AQUIFER   ARANSAS COUNTY	265	265	265	265	265	265
MINING	N   GULF COAST AQUIFER   ARANSAS COUNTY	10	10	10	10	10	10
LIVESTOCK	N   GULF COAST AQUIFER   ARANSAS COUNTY	23	23	23	23	23	23
LIVESTOCK	N   SAN ANTONIO-NUECES LIVESTOCK LOCAL SUPPLY	21	21	21	21	21	21
<b>SAN ANTONIO-NUECES BASIN TOTAL EXISTING SUPPLY</b>		<b>3,830</b>	<b>3,801</b>	<b>3,714</b>	<b>3,695</b>	<b>3,686</b>	<b>3,686</b>
<b>ARANSAS COUNTY TOTAL EXISTING SUPPLY</b>		<b>3,830</b>	<b>3,801</b>	<b>3,714</b>	<b>3,695</b>	<b>3,686</b>	<b>3,686</b>
<b>BEE COUNTY</b>							
<b>NUECES BASIN</b>							
EL OSO WSC	N   GULF COAST AQUIFER   BEE COUNTY	125	125	125	125	125	125
COUNTY-OTHER	N   GULF COAST AQUIFER   BEE COUNTY	18	18	18	18	18	18
MINING	N   GULF COAST AQUIFER   BEE COUNTY	60	60	60	60	60	60
LIVESTOCK	N   GULF COAST AQUIFER   BEE COUNTY	45	45	45	45	45	45
LIVESTOCK	N   NUECES LIVESTOCK LOCAL SUPPLY	44	44	44	44	44	44
IRRIGATION	N   GULF COAST AQUIFER   BEE COUNTY	425	425	425	425	425	425
<b>NUECES BASIN TOTAL EXISTING SUPPLY</b>		<b>717</b>	<b>717</b>	<b>717</b>	<b>717</b>	<b>717</b>	<b>717</b>
<b>SAN ANTONIO-NUECES BASIN</b>							
BEEVILLE	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	2,925	2,978	2,976	2,961	2,959	2,960
EL OSO WSC	N   GULF COAST AQUIFER   BEE COUNTY	18	18	18	18	18	18
COUNTY-OTHER	N   GULF COAST AQUIFER   BEE COUNTY	2,752	2,752	2,752	2,752	2,752	2,752
MANUFACTURING	N   GULF COAST AQUIFER   BEE COUNTY	1	1	1	1	1	1
MINING	N   GULF COAST AQUIFER   BEE COUNTY	450	450	450	450	450	450
LIVESTOCK	N   GULF COAST AQUIFER   BEE COUNTY	421	421	421	421	421	421
LIVESTOCK	N   SAN ANTONIO-NUECES LIVESTOCK LOCAL SUPPLY	420	420	420	420	420	420
IRRIGATION	N   GULF COAST AQUIFER   BEE COUNTY	7,600	7,600	7,600	7,600	7,600	7,600
IRRIGATION	N   SAN ANTONIO-NUECES RUN-OF-RIVER	0	0	0	0	0	0
<b>SAN ANTONIO-NUECES BASIN TOTAL EXISTING SUPPLY</b>		<b>14,587</b>	<b>14,640</b>	<b>14,638</b>	<b>14,623</b>	<b>14,621</b>	<b>14,622</b>
<b>BEE COUNTY TOTAL EXISTING SUPPLY</b>		<b>15,304</b>	<b>15,357</b>	<b>15,355</b>	<b>15,340</b>	<b>15,338</b>	<b>15,339</b>

### Water User Group (WUG) Existing Water Supply

REGION N	SOURCE REGION   SOURCE NAME	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
		2020	2030	2040	2050	2060	2070
<b>BROOKS COUNTY</b>							
<b>NUECES-RIO GRANDE BASIN</b>							
FALFURRIAS	N   GULF COAST AQUIFER   BROOKS COUNTY	2,697	2,697	2,697	2,697	2,697	2,697
COUNTY-OTHER	N   GULF COAST AQUIFER   BROOKS COUNTY	450	450	450	450	450	450
MINING	N   GULF COAST AQUIFER   BROOKS COUNTY	360	360	360	360	360	360
LIVESTOCK	N   GULF COAST AQUIFER   BROOKS COUNTY	460	460	460	460	460	460
LIVESTOCK	N   NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	160	160	160	160	160	160
IRRIGATION	N   GULF COAST AQUIFER   BROOKS COUNTY	2,300	2,300	2,300	2,300	2,300	2,300
<b>NUECES-RIO GRANDE BASIN TOTAL EXISTING SUPPLY</b>		<b>6,427</b>	<b>6,427</b>	<b>6,427</b>	<b>6,427</b>	<b>6,427</b>	<b>6,427</b>
<b>BROOKS COUNTY TOTAL EXISTING SUPPLY</b>		<b>6,427</b>	<b>6,427</b>	<b>6,427</b>	<b>6,427</b>	<b>6,427</b>	<b>6,427</b>
<b>DUVAL COUNTY</b>							
<b>NUECES BASIN</b>							
FREER	N   GULF COAST AQUIFER   DUVAL COUNTY	931	931	931	931	931	931
COUNTY-OTHER	N   GULF COAST AQUIFER   DUVAL COUNTY	61	61	61	61	61	61
MINING	N   GULF COAST AQUIFER   DUVAL COUNTY	138	137	138	138	138	136
LIVESTOCK	N   GULF COAST AQUIFER   DUVAL COUNTY	83	83	83	83	83	83
LIVESTOCK	N   NUECES LIVESTOCK LOCAL SUPPLY	28	28	28	28	28	28
IRRIGATION	N   GULF COAST AQUIFER   DUVAL COUNTY	200	200	200	200	200	200
<b>NUECES BASIN TOTAL EXISTING SUPPLY</b>		<b>1,441</b>	<b>1,440</b>	<b>1,441</b>	<b>1,441</b>	<b>1,441</b>	<b>1,439</b>
<b>NUECES-RIO GRANDE BASIN</b>							
BENAVIDES	N   GULF COAST AQUIFER   DUVAL COUNTY	368	368	368	368	368	368
SAN DIEGO	N   GULF COAST AQUIFER   DUVAL COUNTY	725	725	725	725	725	725
COUNTY-OTHER	N   GULF COAST AQUIFER   DUVAL COUNTY	589	589	589	589	589	589
MINING	N   GULF COAST AQUIFER   DUVAL COUNTY	4,518	4,519	4,518	4,518	4,518	4,520
LIVESTOCK	N   GULF COAST AQUIFER   DUVAL COUNTY	523	523	523	523	523	523
LIVESTOCK	N   NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	120	120	120	120	120	120
IRRIGATION	N   GULF COAST AQUIFER   DUVAL COUNTY	3,700	3,700	3,700	3,700	3,700	3,700
<b>NUECES-RIO GRANDE BASIN TOTAL EXISTING SUPPLY</b>		<b>10,543</b>	<b>10,544</b>	<b>10,543</b>	<b>10,543</b>	<b>10,543</b>	<b>10,545</b>
<b>DUVAL COUNTY TOTAL EXISTING SUPPLY</b>		<b>11,984</b>	<b>11,984</b>	<b>11,984</b>	<b>11,984</b>	<b>11,984</b>	<b>11,984</b>
<b>JIM WELLS COUNTY</b>							
<b>NUECES BASIN</b>							
COUNTY-OTHER	N   GULF COAST AQUIFER   JIM WELLS COUNTY	530	530	530	530	530	530
MINING	N   GULF COAST AQUIFER   JIM WELLS COUNTY	4	4	4	4	4	4
LIVESTOCK	N   GULF COAST AQUIFER   JIM WELLS COUNTY	107	107	107	107	107	107
LIVESTOCK	N   NUECES LIVESTOCK LOCAL SUPPLY	62	62	62	62	62	62
IRRIGATION	N   GULF COAST AQUIFER   JIM WELLS COUNTY	500	500	500	500	500	500
<b>NUECES BASIN TOTAL EXISTING SUPPLY</b>		<b>1,203</b>	<b>1,203</b>	<b>1,203</b>	<b>1,203</b>	<b>1,203</b>	<b>1,203</b>
<b>NUECES-RIO GRANDE BASIN</b>							
ALICE	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	2,096	2,212	2,321	2,456	2,587	2,710
ALICE	P   TEXANA LAKE/RESERVOIR	2,096	2,213	2,322	2,456	2,588	2,711
ORANGE GROVE	N   GULF COAST AQUIFER   JIM WELLS COUNTY	827	827	827	827	827	827
PREMONT	N   GULF COAST AQUIFER   JIM WELLS COUNTY	1,808	1,808	1,808	1,808	1,808	1,808
SAN DIEGO	N   GULF COAST AQUIFER   DUVAL COUNTY	189	189	189	189	189	189



### Water User Group (WUG) Existing Water Supply

REGION N	SOURCE REGION   SOURCE NAME	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
		2020	2030	2040	2050	2060	2070
<b>JIM WELLS COUNTY</b>							
<b>NUECES-RIO GRANDE BASIN</b>							
COUNTY-OTHER	N   GULF COAST AQUIFER   JIM WELLS COUNTY	2,900	2,900	2,900	2,900	2,900	2,900
MINING	N   GULF COAST AQUIFER   JIM WELLS COUNTY	70	70	70	70	70	70
LIVESTOCK	N   GULF COAST AQUIFER   JIM WELLS COUNTY	520	520	520	520	520	520
LIVESTOCK	N   NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	340	340	340	340	340	340
IRRIGATION	N   GULF COAST AQUIFER   JIM WELLS COUNTY	2,800	2,800	2,800	2,800	2,800	2,800
<b>NUECES-RIO GRANDE BASIN TOTAL EXISTING SUPPLY</b>		<b>13,646</b>	<b>13,879</b>	<b>14,097</b>	<b>14,366</b>	<b>14,629</b>	<b>14,875</b>
<b>JIM WELLS COUNTY TOTAL EXISTING SUPPLY</b>		<b>14,849</b>	<b>15,082</b>	<b>15,300</b>	<b>15,569</b>	<b>15,832</b>	<b>16,078</b>
<b>KENEDY COUNTY</b>							
<b>NUECES-RIO GRANDE BASIN</b>							
COUNTY-OTHER	N   GULF COAST AQUIFER   KENEDY COUNTY	305	305	305	305	305	305
MINING	N   GULF COAST AQUIFER   KENEDY COUNTY	130	130	130	130	130	130
LIVESTOCK	N   GULF COAST AQUIFER   KENEDY COUNTY	644	644	644	644	644	644
<b>NUECES-RIO GRANDE BASIN TOTAL EXISTING SUPPLY</b>		<b>1,079</b>	<b>1,079</b>	<b>1,079</b>	<b>1,079</b>	<b>1,079</b>	<b>1,079</b>
<b>KENEDY COUNTY TOTAL EXISTING SUPPLY</b>		<b>1,079</b>	<b>1,079</b>	<b>1,079</b>	<b>1,079</b>	<b>1,079</b>	<b>1,079</b>
<b>KLEBERG COUNTY</b>							
<b>NUECES-RIO GRANDE BASIN</b>							
KINGSVILLE	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	229	283	338	482	637	787
KINGSVILLE	N   GULF COAST AQUIFER   KLEBERG COUNTY	4,130	4,130	4,130	4,130	4,130	4,130
KINGSVILLE	P   TEXANA LAKE/RESERVOIR	229	284	339	482	638	788
RICARDO WSC	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	170	180	191	202	215	227
RICARDO WSC	P   TEXANA LAKE/RESERVOIR	171	181	191	203	215	227
COUNTY-OTHER	N   GULF COAST AQUIFER   KLEBERG COUNTY	3,633	3,633	3,633	3,633	3,633	3,633
MINING	N   GULF COAST AQUIFER   KLEBERG COUNTY	380	380	380	380	380	380
LIVESTOCK	N   GULF COAST AQUIFER   KLEBERG COUNTY	1,276	1,276	1,276	1,276	1,276	1,276
IRRIGATION	N   GULF COAST AQUIFER   KLEBERG COUNTY	800	800	800	800	800	800
<b>NUECES-RIO GRANDE BASIN TOTAL EXISTING SUPPLY</b>		<b>11,018</b>	<b>11,147</b>	<b>11,278</b>	<b>11,588</b>	<b>11,924</b>	<b>12,248</b>
<b>KLEBERG COUNTY TOTAL EXISTING SUPPLY</b>		<b>11,018</b>	<b>11,147</b>	<b>11,278</b>	<b>11,588</b>	<b>11,924</b>	<b>12,248</b>
<b>LIVE OAK COUNTY</b>							
<b>NUECES BASIN</b>							
EL OSO WSC	N   GULF COAST AQUIFER   LIVE OAK COUNTY	451	451	451	451	451	451
GEORGE WEST	N   GULF COAST AQUIFER   LIVE OAK COUNTY	877	877	877	877	877	877
MCCOY WSC	N   CARRIZO-WILCOX AQUIFER   LIVE OAK COUNTY	30	30	30	30	30	30
THREE RIVERS	N   GULF COAST AQUIFER   LIVE OAK COUNTY	449	449	449	449	449	449
THREE RIVERS	N   NUECES RUN-OF-RIVER	700	700	700	700	700	700
COUNTY-OTHER	N   GULF COAST AQUIFER   LIVE OAK COUNTY	1,002	1,002	1,002	1,002	1,002	1,002
MANUFACTURING	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	3,363	3,363	3,363	3,363	3,363	3,363
MANUFACTURING	N   GULF COAST AQUIFER   LIVE OAK COUNTY	891	891	891	891	891	891
MANUFACTURING	N   NUECES RUN-OF-RIVER	800	800	800	800	800	800
MINING	N   GULF COAST AQUIFER   LIVE OAK COUNTY	920	920	920	920	920	920
LIVESTOCK	N   GULF COAST AQUIFER   LIVE OAK COUNTY	681	681	681	681	681	681

### Water User Group (WUG) Existing Water Supply

REGION N	SOURCE REGION   SOURCE NAME	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
		2020	2030	2040	2050	2060	2070
<b>LIVE OAK COUNTY</b>							
<b>NUECES BASIN</b>							
LIVESTOCK	N   NUECES LIVESTOCK LOCAL SUPPLY	252	252	252	252	252	252
IRRIGATION	N   GULF COAST AQUIFER   LIVE OAK COUNTY	2,900	2,900	2,900	2,900	2,900	2,900
<b>NUECES BASIN TOTAL EXISTING SUPPLY</b>		<b>13,316</b>	<b>13,316</b>	<b>13,316</b>	<b>13,316</b>	<b>13,316</b>	<b>13,316</b>
<b>LIVE OAK COUNTY TOTAL EXISTING SUPPLY</b>		<b>13,316</b>	<b>13,316</b>	<b>13,316</b>	<b>13,316</b>	<b>13,316</b>	<b>13,316</b>
<b>MCMULLEN COUNTY</b>							
<b>NUECES BASIN</b>							
COUNTY-OTHER	N   CARRIZO-WILCOX AQUIFER   MCMULLEN COUNTY	546	546	546	546	546	546
MINING	N   CARRIZO-WILCOX AQUIFER   MCMULLEN COUNTY	1,273	1,273	1,273	1,273	1,273	1,273
MINING	N   GULF COAST AQUIFER   MCMULLEN COUNTY	262	262	262	262	262	262
LIVESTOCK	N   GULF COAST AQUIFER   MCMULLEN COUNTY	93	93	93	93	93	93
LIVESTOCK	N   NUECES LIVESTOCK LOCAL SUPPLY	262	262	262	262	262	262
IRRIGATION		0	0	0	0	0	0
<b>NUECES BASIN TOTAL EXISTING SUPPLY</b>		<b>2,436</b>	<b>2,436</b>	<b>2,436</b>	<b>2,436</b>	<b>2,436</b>	<b>2,436</b>
<b>MCMULLEN COUNTY TOTAL EXISTING SUPPLY</b>		<b>2,436</b>	<b>2,436</b>	<b>2,436</b>	<b>2,436</b>	<b>2,436</b>	<b>2,436</b>
<b>NUECES COUNTY</b>							
<b>NUECES BASIN</b>							
CORPUS CHRISTI	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	5,174	5,502	5,546	5,547	5,546	5,529
CORPUS CHRISTI	P   TEXANA LAKE/RESERVOIR	12	13	156	268	380	476
RIVER ACRES WSC	N   NUECES RUN-OF-RIVER	426	450	463	470	479	486
ROBSTOWN	N   NUECES RUN-OF-RIVER	1	1	1	1	1	1
NUECES WSC	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	8	9	9	9	9	10
NUECES WSC	P   TEXANA LAKE/RESERVOIR	9	9	9	10	10	10
COUNTY-OTHER	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	83	84	84	84	85	85
COUNTY-OTHER	N   GULF COAST AQUIFER   NUECES COUNTY	166	166	166	166	166	166
COUNTY-OTHER	N   NUECES RUN-OF-RIVER	31	28	27	27	26	26
COUNTY-OTHER	P   TEXANA LAKE/RESERVOIR	72	73	74	74	74	74
MANUFACTURING	K   COLORADO RUN-OF-RIVER	1,215	1,233	1,251	1,305	1,287	1,305
MANUFACTURING	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	189	401	715	883	747	609
MANUFACTURING	N   GULF COAST AQUIFER   NUECES COUNTY	401	401	401	401	401	401
MANUFACTURING	P   TEXANA LAKE/RESERVOIR	1,212	1,171	1,023	887	746	616
MINING	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	220	349	443	517	626	756
MINING	N   GULF COAST AQUIFER   NUECES COUNTY	424	410	400	392	380	365
STEAM ELECTRIC POWER	K   COLORADO RUN-OF-RIVER	5,177	5,254	5,331	5,561	5,484	5,561
STEAM ELECTRIC POWER	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	590	2,163	4,107	6,362	7,313	7,823
STEAM ELECTRIC POWER	P   TEXANA LAKE/RESERVOIR	5,767	6,068	6,424	6,839	7,314	7,823
LIVESTOCK	N   GULF COAST AQUIFER   NUECES COUNTY	20	20	20	20	20	20
LIVESTOCK	N   NUECES LIVESTOCK LOCAL SUPPLY	34	34	34	34	34	34
IRRIGATION	N   GULF COAST AQUIFER   NUECES COUNTY	209	209	209	209	209	209

### Water User Group (WUG) Existing Water Supply

REGION N	SOURCE REGION   SOURCE NAME	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
		2020	2030	2040	2050	2060	2070
<b>NUECES COUNTY</b>							
<b>NUECES BASIN TOTAL EXISTING SUPPLY</b>		<b>21,440</b>	<b>24,048</b>	<b>26,893</b>	<b>30,066</b>	<b>31,337</b>	<b>32,385</b>
<b>NUECES-RIO GRANDE BASIN</b>							
CORPUS CHRISTI	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	59,487	63,263	63,775	63,778	63,766	63,576
CORPUS CHRISTI	P   TEXANA LAKE/RESERVOIR	143	153	1,793	3,087	4,372	5,477
AGUA DULCE	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	66	69	71	72	74	75
AGUA DULCE	P   TEXANA LAKE/RESERVOIR	66	70	72	73	74	75
BISHOP	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	176	193	202	209	215	220
BISHOP	N   GULF COAST AQUIFER   NUECES COUNTY	242	242	242	242	242	242
BISHOP	P   TEXANA LAKE/RESERVOIR	176	193	202	209	216	220
DRISCOLL	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	52	55	56	57	58	59
DRISCOLL	P   TEXANA LAKE/RESERVOIR	53	55	57	57	58	59
PORT ARANSAS	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	1,125	1,216	1,274	1,307	1,333	1,351
PORT ARANSAS	P   TEXANA LAKE/RESERVOIR	1,126	1,218	1,274	1,307	1,334	1,352
ROBSTOWN	N   NUECES RUN-OF-RIVER	1,373	1,349	1,336	1,329	1,320	1,313
NUECES WSC	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	158	168	175	179	182	184
NUECES WSC	P   TEXANA LAKE/RESERVOIR	158	169	175	178	182	184
COUNTY-OTHER	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	79	89	95	99	102	103
COUNTY-OTHER	N   GULF COAST AQUIFER   NUECES COUNTY	1,400	1,400	1,400	1,400	1,400	1,400
COUNTY-OTHER	N   NUECES RUN-OF-RIVER	124	127	128	128	129	129
COUNTY-OTHER	P   TEXANA LAKE/RESERVOIR	87	97	103	107	110	113
MANUFACTURING	K   COLORADO RUN-OF-RIVER	19,035	19,317	19,599	20,445	20,163	20,445
MANUFACTURING	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	3,635	6,948	11,880	13,828	11,698	9,542
MANUFACTURING	N   DIRECT REUSE	1,140	1,140	1,140	1,140	1,140	1,140
MANUFACTURING	N   GULF COAST AQUIFER   NUECES COUNTY	4,465	4,465	4,465	4,465	4,465	4,465
MANUFACTURING	P   TEXANA LAKE/RESERVOIR	18,984	18,349	16,026	13,891	11,685	9,643
MINING	N   GULF COAST AQUIFER   NUECES COUNTY	51	60	66	71	79	88
STEAM ELECTRIC POWER	K   COLORADO RUN-OF-RIVER	1,573	1,596	1,619	1,689	1,666	1,689
STEAM ELECTRIC POWER	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	179	657	1,248	1,932	2,222	2,376
STEAM ELECTRIC POWER	P   TEXANA LAKE/RESERVOIR	1,752	1,844	1,952	2,078	2,222	2,376
LIVESTOCK	N   GULF COAST AQUIFER   NUECES COUNTY	259	259	259	259	259	259
LIVESTOCK	N   NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	2	2	2	2	2	2
IRRIGATION	N   GULF COAST AQUIFER   NUECES COUNTY	491	491	491	491	491	491
IRRIGATION	N   NUECES-RIO GRANDE RUN-OF-RIVER	0	0	0	0	0	0
<b>NUECES-RIO GRANDE BASIN TOTAL EXISTING SUPPLY</b>		<b>117,657</b>	<b>125,254</b>	<b>131,177</b>	<b>134,109</b>	<b>131,259</b>	<b>128,648</b>
<b>SAN ANTONIO-NUECES BASIN</b>							
ARANSAS PASS	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	1	1	1	1	1	1
ARANSAS PASS	P   TEXANA LAKE/RESERVOIR	2	2	2	2	2	2



### Water User Group (WUG) Existing Water Supply

REGION N	SOURCE REGION   SOURCE NAME	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
		2020	2030	2040	2050	2060	2070
<b>SAN PATRICIO COUNTY</b>							
<b>SAN ANTONIO-NUECES BASIN</b>							
TAFT	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	232	235	235	238	240	242
TAFT	P   TEXANA LAKE/RESERVOIR	232	235	234	237	240	242
RINCON WSC	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	173	177	179	181	183	184
RINCON WSC	P   TEXANA LAKE/RESERVOIR	173	178	180	182	183	185
COUNTY-OTHER	N   GULF COAST AQUIFER   SAN PATRICIO COUNTY	1,111	1,129	1,155	1,174	1,186	1,196
MANUFACTURING	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	15,241	15,839	16,385	16,884	17,511	18,175
MANUFACTURING	N   DIRECT REUSE	448	448	448	448	448	448
MANUFACTURING	N   GULF COAST AQUIFER   SAN PATRICIO COUNTY	10	10	10	10	10	10
MANUFACTURING	P   TEXANA LAKE/RESERVOIR	2,485	2,431	2,423	2,398	2,368	2,346
MINING	N   GULF COAST AQUIFER   SAN PATRICIO COUNTY	450	450	450	450	450	450
LIVESTOCK	N   GULF COAST AQUIFER   SAN PATRICIO COUNTY	188	188	188	188	188	188
LIVESTOCK	N   SAN ANTONIO-NUECES LIVESTOCK LOCAL SUPPLY	13	13	13	13	13	13
IRRIGATION	N   GULF COAST AQUIFER   SAN PATRICIO COUNTY	12,172	12,172	12,172	12,947	12,791	12,578
IRRIGATION	N   SAN ANTONIO-NUECES RUN-OF-RIVER	0	0	0	0	0	0
<b>SAN ANTONIO-NUECES BASIN TOTAL EXISTING SUPPLY</b>		<b>40,505</b>	<b>41,174</b>	<b>41,758</b>	<b>43,075</b>	<b>43,596</b>	<b>44,089</b>
<b>SAN PATRICIO COUNTY TOTAL EXISTING SUPPLY</b>		<b>59,409</b>	<b>60,555</b>	<b>61,605</b>	<b>62,564</b>	<b>63,762</b>	<b>65,025</b>
<b>REGION N TOTAL EXISTING SUPPLY</b>							
		<b>278,782</b>	<b>290,524</b>	<b>300,606</b>	<b>308,218</b>	<b>308,429</b>	<b>308,706</b>

### Water User Group (WUG) Category Summary

REGION N	2020	2030	2040	2050	2060	2070
<b>MUNICIPAL</b>						
POPULATION	522,478	563,257	590,213	608,385	622,641	633,417
DEMANDS (acre-feet per year)	99,519	104,699	107,783	110,110	112,433	114,301
EXISTING SUPPLIES (acre-feet per year)	103,467	108,363	111,183	113,300	115,429	117,108
NEEDS (acre-feet per year)*	(1,583)	(1,575)	(1,567)	(1,607)	(1,646)	(1,683)
<b>COUNTY-OTHER</b>						
POPULATION	92,312	98,558	102,769	106,123	108,840	111,127
DEMANDS (acre-feet per year)	12,562	13,002	13,289	13,588	13,910	14,209
EXISTING SUPPLIES (acre-feet per year)	17,858	17,874	17,872	17,892	17,911	17,929
NEEDS (acre-feet per year)*	0	0	0	0	0	0
<b>MANUFACTURING</b>						
DEMANDS (acre-feet per year)	92,175	98,724	105,153	110,754	118,723	127,266
EXISTING SUPPLIES (acre-feet per year)	88,882	93,039	97,110	98,731	94,925	91,948
NEEDS (acre-feet per year)*	(6,451)	(8,804)	(11,126)	(15,077)	(26,735)	(38,132)
<b>MINING</b>						
DEMANDS (acre-feet per year)	8,951	9,821	9,660	7,206	6,157	5,497
EXISTING SUPPLIES (acre-feet per year)	9,864	9,993	10,087	10,161	10,270	10,400
NEEDS (acre-feet per year)*	(2,733)	(3,269)	(3,219)	(1,087)	(315)	0
<b>STEAM ELECTRIC POWER</b>						
DEMANDS (acre-feet per year)	15,038	17,582	20,681	24,461	29,067	34,541
EXISTING SUPPLIES (acre-feet per year)	15,038	17,582	20,681	24,461	26,221	27,648
NEEDS (acre-feet per year)*	0	0	0	0	(2,846)	(6,893)
<b>LIVESTOCK</b>						
DEMANDS (acre-feet per year)	7,306	7,306	7,306	7,306	7,306	7,306
EXISTING SUPPLIES (acre-feet per year)	7,306	7,306	7,306	7,306	7,306	7,306
NEEDS (acre-feet per year)*	0	0	0	0	0	0
<b>IRRIGATION</b>						
DEMANDS (acre-feet per year)	26,419	28,604	30,990	33,595	36,441	40,124
EXISTING SUPPLIES (acre-feet per year)	36,367	36,367	36,367	36,367	36,367	36,367
NEEDS (acre-feet per year)*	(40)	(42)	(44)	(545)	(2,112)	(4,242)
<b>REGION TOTALS</b>						
POPULATION	614,790	661,815	692,982	714,508	731,481	744,544
DEMANDS (acre-feet per year)	261,970	279,738	294,862	307,020	324,037	343,244
EXISTING SUPPLIES (acre-feet per year)	278,782	290,524	300,606	308,218	308,429	308,706
NEEDS (acre-feet per year)*	(10,807)	(13,690)	(15,956)	(18,316)	(33,654)	(50,950)

\*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Category Summary report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.

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**Categories of Water Use for WWPs (Regional Water Supply Plan Seller and Buyer Summary)**

2017 RWP Sales/Transfer Data by Seller & Buyer			Contract Demand by Planning Decade (acre-feet/year)								Total Sold/Transferred by Planning Decade (acre-feet/year)						Contract Demand Needs/Surplus by Planning Decade (acre-feet/year)					
SellerEntity	SellerEntityRegion	BuyerEntity	BuyerEntityRegion	BuyerWUGCategory	CD2020	CD2030	CD2040	CD2050	CD2060	CD2070	TS2020	TS2030	TS2040	TS2050	TS2060	TS2070	CNS2020	CNS2030	CNS2040	CNS2050	CNS2060	CNS2070
CORPUS CHRISTI	N	ALICE	N	MUNICIPAL	4,192	4,425	4,643	4,912	5,175	5,421	4,192	4,425	4,643	4,912	5,175	5,421	0	0	0	0	0	0
CORPUS CHRISTI	N	BEEVILLE	N	MUNICIPAL	2,925	2,978	2,976	2,961	2,959	2,960	2,925	2,978	2,976	2,961	2,959	2,960	0	0	0	0	0	0
CORPUS CHRISTI	N	COUNTY-OTHER, NUECES	N	MUNICIPAL	166	166	166	166	166	166	166	166	166	166	166	166	0	0	0	0	0	0
CORPUS CHRISTI	N	MANUFACTURING, NUECES	N	MANUFACTURING	45,919	46,686	49,761	52,411	56,574	61,030	73,499	65,115	58,137	51,239	46,326	42,160	27,580	18,429	8,376	-1,172	-10,248	-18,870
CORPUS CHRISTI	N	MATHIS	N	MUNICIPAL	670	676	672	679	685	691	670	676	672	679	685	691	0	0	0	0	0	0
CORPUS CHRISTI	N	MINING, NUECES	N	MINING	220	349	443	517	626	756	220	349	443	517	626	756	0	0	0	0	0	0
CORPUS CHRISTI	N	PORT ARANSAS	N	MUNICIPAL	1,035	1,119	1,172	1,202	1,226	1,243	1,035	1,119	1,172	1,202	1,226	1,243	0	0	0	0	0	0
CORPUS CHRISTI	N	SAN PATRICIO MWD	N	WWP	51,200	51,200	51,200	51,200	51,200	51,200	51,200	51,200	51,200	51,200	51,200	51,200	0	0	0	0	0	0
CORPUS CHRISTI	N	SOUTH TEXAS WATER AUTHORITY	N	WWP	1,876	2,095	2,277	2,620	2,988	3,334	1,876	2,095	2,277	2,620	2,988	3,334	0	0	0	0	0	0
CORPUS CHRISTI	N	STEAM ELECTRIC POWER, NUECES	N	STEAM ELECTRIC POWER	15,038	17,582	20,681	24,461	26,221	27,648	15,038	17,582	20,681	24,461	26,221	27,648	0	0	0	0	0	0
CORPUS CHRISTI	N	THREE RIVERS	N	MUNICIPAL	3,363	3,363	3,363	3,363	3,363	3,363	3,363	3,363	3,363	3,363	3,363	3,363	0	0	0	0	0	0
INGLESIDE	N	INGLESIDE ON THE BAY	N	MUNICIPAL	77	78	78	78	79	79	77	78	78	78	79	79	0	0	0	0	0	0
NUECES COUNTY WCID #3	N	COUNTY-OTHER, NUECES	N	MUNICIPAL	155	155	155	155	155	155	155	155	155	155	155	155	0	0	0	0	0	0
NUECES COUNTY WCID #3	N	RIVER ACRES WSC	N	MUNICIPAL	426	450	463	470	479	486	426	450	463	470	479	486	0	0	0	0	0	0
NUECES COUNTY WCID #3	N	ROBSTOWN	N	MUNICIPAL	2,957	2,897	2,848	2,843	2,839	2,839	1,374	1,350	1,337	1,330	1,321	1,314	-1,583	-1,547	-1,511	-1,513	-1,518	-1,525
ROCKPORT	N	FULTON	N	MUNICIPAL	278	279	275	275	275	275	278	279	275	275	275	275	0	0	0	0	0	0
SAN PATRICIO MWD	N	ARANSAS PASS	N	MUNICIPAL	1,244	1,259	1,258	1,263	1,274	1,283	1,244	1,259	1,258	1,263	1,274	1,283	0	0	0	0	0	0
SAN PATRICIO MWD	N	COUNTY-OTHER, ARANSAS	N	MUNICIPAL	1,125	1,094	1,041	1,026	1,021	1,021	1,125	1,094	1,041	1,026	1,021	1,021	0	0	0	0	0	0
SAN PATRICIO MWD	N	COUNTY-OTHER, SAN PATRICIO	N	MUNICIPAL	156	181	219	246	263	277	156	181	219	246	263	277	0	0	0	0	0	0
SAN PATRICIO MWD	N	GREGORY	N	MUNICIPAL	339	344	348	354	358	361	339	344	348	354	358	361	0	0	0	0	0	0
SAN PATRICIO MWD	N	INGLESIDE	N	MUNICIPAL	1,128	1,140	1,138	1,142	1,153	1,162	1,128	1,140	1,138	1,142	1,153	1,162	0	0	0	0	0	0
SAN PATRICIO MWD	N	MANUFACTURING, SAN PATRICIO	N	MANUFACTURING	39,277	42,638	45,956	48,878	52,567	56,531	32,826	33,834	34,830	35,706	36,813	38,002	-6,451	-8,804	-11,126	-13,172	-15,754	-18,529
SAN PATRICIO MWD	N	ODEM	N	MUNICIPAL	379	384	384	387	391	394	379	384	384	387	391	394	0	0	0	0	0	0
SAN PATRICIO MWD	N	PORT ARANSAS	N	MUNICIPAL	1,216	1,315	1,376	1,412	1,441	1,460	1,216	1,315	1,376	1,412	1,441	1,460	0	0	0	0	0	0
SAN PATRICIO MWD	N	PORTLAND	N	MUNICIPAL	2,631	2,684	2,698	2,718	2,747	2,770	2,631	2,684	2,698	2,718	2,747	2,770	0	0	0	0	0	0
SAN PATRICIO MWD	N	ROCKPORT	N	MUNICIPAL	1,886	1,890	1,858	1,855	1,852	1,852	1,886	1,890	1,858	1,855	1,852	1,852	0	0	0	0	0	0
SAN PATRICIO MWD	N	TAFT	N	MUNICIPAL	810	825	828	838	846	853	810	825	828	838	846	853	0	0	0	0	0	0
SOUTH TEXAS WATER AUTHORITY	N	AGUA DULCE	N	MUNICIPAL	132	139	143	145	148	150	132	139	143	145	148	150	0	0	0	0	0	0
SOUTH TEXAS WATER AUTHORITY	N	BISHOP	N	MUNICIPAL	352	386	404	418	431	440	352	386	404	418	431	440	0	0	0	0	0	0
SOUTH TEXAS WATER AUTHORITY	N	COUNTY-OTHER, NUECES	N	MUNICIPAL	155	177	190	198	205	209	155	177	190	198	205	209	0	0	0	0	0	0
SOUTH TEXAS WATER AUTHORITY	N	DRISCOLL	N	MUNICIPAL	105	110	113	114	116	118	105	110	113	114	116	118	0	0	0	0	0	0
SOUTH TEXAS WATER AUTHORITY	N	KINGSVILLE	N	MUNICIPAL	458	567	677	964	1,275	1,575	458	567	677	964	1,275	1,575	0	0	0	0	0	0
SOUTH TEXAS WATER AUTHORITY	N	NUECES WSC	N	MUNICIPAL	333	355	368	376	383	388	333	355	368	376	383	388	0	0	0	0	0	0
SOUTH TEXAS WATER AUTHORITY	N	RICARDO WSC	N	MUNICIPAL	341	361	382	405	430	454	341	361	382	405	430	454	0	0	0	0	0	0
TAFT	N	RINCON WSC	N	MUNICIPAL	346	355	359	363	366	369	346	355	359	363	366	369	0	0	0	0	0	0
THREE RIVERS	N	MANUFACTURING, LIVE OAK	N	MANUFACTURING	4,163	4,163	4,163	4,163	4,163	4,163	4,163	4,163	4,163	4,163	4,163	4,163	0	0	0	0	0	0



**Categories of Water Use for WWP (Seller Summary)**

2017 RWP Sales/Transfer Data by Seller		Contract Demand by Planning Decade (acre-feet/year)						Total Sold/Transferred by Planning Decade (acre-feet/year)						Contract Demand Needs by Planning Decade (acre-feet/year)					
SellerEntity	SellerEntityRegion	CD2020	CD2030	CD2040	CD2050	CD2060	CD2070	TS2020	TS2030	TS2040	TS2050	TS2060	TS2070	CNS2020	CNS2030	CNS2040	CNS2050	CNS2060	CNS2070
CORPUS CHRISTI	N	126,604	130,639	137,354	144,492	151,183	157,812	154,184	149,068	145,730	143,320	140,935	138,942	0	0	0	-1,172	-10,248	-18,870
INGLESIDE	N	77	78	78	78	79	79	77	78	78	78	79	79	0	0	0	0	0	0
NUECES COUNTY WCID #3	N	3,538	3,502	3,466	3,468	3,473	3,480	1,955	1,955	1,955	1,955	1,955	1,955	-1,583	-1,547	-1,511	-1,513	-1,518	-1,525
ROCKPORT	N	278	279	275	275	275	275	278	279	275	275	275	275	0	0	0	0	0	0
SAN PATRICIO MWD	N	50,191	53,754	57,104	60,119	63,913	67,964	43,740	44,950	45,978	46,947	48,159	49,435	-6,451	-8,804	-11,126	-13,172	-15,754	-18,529
SOUTH TEXAS WATER AUTHORITY	N	1,876	2,095	2,277	2,620	2,988	3,334	1,876	2,095	2,277	2,620	2,988	3,334	0	0	0	0	0	0
TAFT	N	346	355	359	363	366	369	346	355	359	363	366	369	0	0	0	0	0	0
THREE RIVERS	N	4,163	4,163	4,163	4,163	4,163	4,163	4,163	4,163	4,163	4,163	4,163	4,163	0	0	0	0	0	0

**Categories of Water Use for WWP (Sellers Associated with WUG Supplies)**

SellerEntity	SellerEntityRegion	BuyerEntity	BuyerEntityPrimaryRegion	BuyerEntitySplitRegion	BuyerEntitySplitCounty	BuyerEntitySplitBasin	PWS2020	PWS2020	PWS2020	PWS2020	PWS2020	PWS2020
CORPUS CHRISTI	N	ALICE	N	N	JIM WELLS	NUECES-RIO GRANDE	4192	4425	4643	4912	5175	5421
CORPUS CHRISTI	N	BEEVILLE	N	N	BEE	SAN ANTONIO-NUECES	2925	2978	2976	2961	2959	2960
CORPUS CHRISTI	N	COUNTY-OTHER, NUECES	N	N	NUECES	NUECES	124	124	124	124	124	124
CORPUS CHRISTI	N	COUNTY-OTHER, NUECES	N	N	NUECES	NUECES-RIO GRANDE	42	42	42	42	42	42
CORPUS CHRISTI	N	MANUFACTURING, NUECES	N	N	NUECES	NUECES	2616	2805	2989	3075	2780	2530
CORPUS CHRISTI	N	MANUFACTURING, NUECES	N	N	NUECES	NUECES-RIO GRANDE	41654	44614	47505	48164	43546	39630
CORPUS CHRISTI	N	MATHIS	N	N	SAN PATRICIO	NUECES	670	676	672	679	685	691
CORPUS CHRISTI	N	MINING, NUECES	N	N	NUECES	NUECES	220	349	443	517	626	756
CORPUS CHRISTI	N	PORT ARANSAS	N	N	NUECES	NUECES-RIO GRANDE	1035	1119	1172	1202	1226	1243
CORPUS CHRISTI	N	STEAM ELECTRIC POWER, NUECES	N	N	NUECES	NUECES	11534	13485	15862	18762	20111	21207
CORPUS CHRISTI	N	STEAM ELECTRIC POWER, NUECES	N	N	NUECES	NUECES-RIO GRANDE	3504	4097	4819	5699	6110	6441
INGLESIDE	N	INGLESIDE ON THE BAY	N	N	SAN PATRICIO	SAN ANTONIO-NUECES	77	78	78	78	79	79
NUECES COUNTY WCID #3	N	COUNTY-OTHER, NUECES	N	N	NUECES	NUECES	31	28	27	27	26	26
NUECES COUNTY WCID #3	N	COUNTY-OTHER, NUECES	N	N	NUECES	NUECES-RIO GRANDE	124	127	128	128	129	129
NUECES COUNTY WCID #3	N	RIVER ACRES WSC	N	N	NUECES	NUECES	426	450	463	470	479	486
NUECES COUNTY WCID #3	N	ROBSTOWN	N	N	NUECES	NUECES	1	1	1	1	1	1
NUECES COUNTY WCID #3	N	ROBSTOWN	N	N	NUECES	NUECES-RIO GRANDE	1373	1349	1336	1329	1320	1313
ROCKPORT	N	FULTON	N	N	ARANSAS	SAN ANTONIO-NUECES	278	279	275	275	275	275
SAN PATRICIO MWD	N	ARANSAS PASS	N	N	ARANSAS	SAN ANTONIO-NUECES	110	108	106	105	104	104
SAN PATRICIO MWD	N	ARANSAS PASS	N	N	NUECES	SAN ANTONIO-NUECES	3	3	3	3	3	3
SAN PATRICIO MWD	N	ARANSAS PASS	N	N	SAN PATRICIO	SAN ANTONIO-NUECES	1131	1148	1149	1155	1167	1176
SAN PATRICIO MWD	N	COUNTY-OTHER, ARANSAS	N	N	ARANSAS	SAN ANTONIO-NUECES	1125	1094	1041	1026	1021	1021
SAN PATRICIO MWD	N	COUNTY-OTHER, SAN PATRICIO	N	N	SAN PATRICIO	NUECES	156	181	219	246	263	277
SAN PATRICIO MWD	N	GREGORY	N	N	SAN PATRICIO	SAN ANTONIO-NUECES	339	344	348	354	358	361
SAN PATRICIO MWD	N	INGLESIDE	N	N	SAN PATRICIO	SAN ANTONIO-NUECES	1051	1062	1060	1064	1074	1083
SAN PATRICIO MWD	N	MANUFACTURING, SAN PATRICIO	N	N	SAN PATRICIO	NUECES	15100	15564	16022	16424	16934	17481
SAN PATRICIO MWD	N	MANUFACTURING, SAN PATRICIO	N	N	SAN PATRICIO	SAN ANTONIO-NUECES	17726	18270	18808	19282	19879	20521
SAN PATRICIO MWD	N	ODEM	N	N	SAN PATRICIO	SAN ANTONIO-NUECES	379	384	384	387	391	394
SAN PATRICIO MWD	N	PORT ARANSAS	N	N	NUECES	NUECES-RIO GRANDE	1216	1315	1376	1412	1441	1460
SAN PATRICIO MWD	N	PORTLAND	N	N	SAN PATRICIO	SAN ANTONIO-NUECES	2631	2684	2698	2718	2747	2770
SAN PATRICIO MWD	N	ROCKPORT	N	N	ARANSAS	SAN ANTONIO-NUECES	1608	1611	1583	1580	1577	1577
SAN PATRICIO MWD	N	TAFT	N	N	SAN PATRICIO	SAN ANTONIO-NUECES	464	470	469	475	480	484
SOUTH TEXAS WATER AUTHORITY	N	AGUA DULCE	N	N	NUECES	NUECES-RIO GRANDE	132	139	143	145	148	150
SOUTH TEXAS WATER AUTHORITY	N	BISHOP	N	N	NUECES	NUECES-RIO GRANDE	352	386	404	418	431	440
SOUTH TEXAS WATER AUTHORITY	N	COUNTY-OTHER, NUECES	N	N	NUECES	NUECES	31	33	34	34	35	35
SOUTH TEXAS WATER AUTHORITY	N	COUNTY-OTHER, NUECES	N	N	NUECES	NUECES-RIO GRANDE	124	144	156	164	170	174
SOUTH TEXAS WATER AUTHORITY	N	DRISCOLL	N	N	NUECES	NUECES-RIO GRANDE	105	110	113	114	116	118
SOUTH TEXAS WATER AUTHORITY	N	KINGSVILLE	N	N	KLEBERG	NUECES-RIO GRANDE	458	567	677	964	1275	1575
SOUTH TEXAS WATER AUTHORITY	N	NUECES WSC	N	N	NUECES	NUECES	17	18	18	19	19	20
SOUTH TEXAS WATER AUTHORITY	N	NUECES WSC	N	N	NUECES	NUECES-RIO GRANDE	316	337	350	357	364	368
SOUTH TEXAS WATER AUTHORITY	N	RICARDO WSC	N	N	KLEBERG	NUECES-RIO GRANDE	341	361	382	405	430	454
TAFT	N	RINCON WSC	N	N	SAN PATRICIO	SAN ANTONIO-NUECES	346	355	359	363	366	369
THREE RIVERS	N	MANUFACTURING, LIVE OAK	N	N	LIVE OAK	NUECES	4163	4163	4163	4163	4163	4163

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### Water User Group (WUG) Needs/Surplus

REGION N	WUG (NEEDS)/SURPLUS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>ARANSAS COUNTY</b>						
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	0	0	0	0	0	0
FULTON	0	0	0	0	0	0
ROCKPORT	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	128	123	118	114	104	93
MINING	0	3	5	5	5	5
LIVESTOCK	0	0	0	0	0	0
<b>BEE COUNTY</b>						
<b>NUECES BASIN</b>						
EL OSO WSC	46	44	44	45	48	48
COUNTY-OTHER	7	7	7	7	7	7
MINING	3	5	9	15	19	22
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	187	162	135	105	71	26
<b>SAN ANTONIO-NUECES BASIN</b>						
BEEVILLE	0	0	0	0	0	0
EL OSO WSC	14	14	14	14	15	15
COUNTY-OTHER	38	2	12	39	43	42
MANUFACTURING	0	0	0	0	0	0
MINING	35	47	73	123	153	170
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	3,087	2,615	2,094	1,517	881	14
<b>BROOKS COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
FALFURRIAS	1,020	985	942	884	832	782
COUNTY-OTHER	124	103	80	53	26	1
MINING	3	0	20	36	52	62
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	500	410	315	216	112	3
<b>DUVAL COUNTY</b>						
<b>NUECES BASIN</b>						
FREER	281	259	240	214	194	177
COUNTY-OTHER	22	21	20	19	18	17
MINING	13	7	16	26	33	37
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	50	42	34	26	17	8
<b>NUECES-RIO GRANDE BASIN</b>						
BENAVIDES	132	126	118	109	102	96
SAN DIEGO	1	(21)	(40)	(66)	(88)	(107)
COUNTY-OTHER	79	70	62	50	36	23
MINING	3,255	3,205	3,288	3,389	3,458	3,515
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	846	704	554	396	232	58
<b>JIM WELLS COUNTY</b>						
<b>NUECES BASIN</b>						
COUNTY-OTHER	117	97	77	53	28	4



### Water User Group (WUG) Needs/Surplus

REGION N	WUG (NEEDS)/SURPLUS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>NUECES COUNTY</b>						
<b>NUECES BASIN</b>						
ROBSTOWN	(2)	(2)	(2)	(2)	(2)	(2)
COUNTY-OTHER	43	26	17	11	6	0
MANUFACTURING	0	0	0	(73)	(618)	(1,135)
MINING	0	0	0	0	0	0
STEAM ELECTRIC POWER	0	0	0	0	(2,183)	(5,286)
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	152	149	146	143	140	137
<b>NUECES-RIO GRANDE BASIN</b>						
AGUA DULCE	0	0	0	0	0	0
BISHOP	0	0	0	0	0	0
CORPUS CHRISTI	0	0	0	0	0	0
DRISCOLL	0	0	0	0	0	0
NUECES WSC	0	0	0	0	0	0
PORT ARANSAS	0	0	0	0	0	0
ROBSTOWN	(1,581)	(1,545)	(1,509)	(1,511)	(1,516)	(1,523)
COUNTY-OTHER	445	266	159	97	41	3
MANUFACTURING	0	0	0	(1,832)	(10,363)	(18,468)
MINING	0	0	0	0	0	0
STEAM ELECTRIC POWER	0	0	0	0	(663)	(1,607)
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	110	91	71	50	27	4
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	0	0	0	0	0	0
MINING	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>SAN PATRICIO COUNTY</b>						
<b>NUECES BASIN</b>						
LAKE CITY	6	5	6	6	5	4
MATHIS	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	(3,177)	(4,259)	(5,327)	(6,269)	(7,456)	(8,733)
MINING	37	27	23	18	12	3
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	1,160	1,045	916	0	0	0
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	0	0	0	0	0	0
GREGORY	0	0	0	0	0	0
INGLESIDE	0	0	0	0	0	0
INGLESIDE ON THE BAY	0	0	0	0	0	0
ODEM	0	0	0	0	0	0
PORTLAND	0	0	0	0	0	0
RINCON WSC	0	0	0	0	0	0
SINTON	560	521	506	491	474	462
TAFT	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	(3,274)	(4,545)	(5,799)	(6,903)	(8,298)	(9,796)
MINING	156	117	102	87	61	29

### Water User Group (WUG) Needs/Surplus

REGION N	WUG (NEEDS)/SURPLUS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>SAN PATRICIO COUNTY</b> <b>SAN ANTONIO-NUECES BASIN</b>						
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	2,196	1,152	0	(499)	(2,063)	(4,191)

### Water User Group (WUG) Category Summary

REGION N	2020	2030	2040	2050	2060	2070
<b>MUNICIPAL</b>						
POPULATION	522,478	563,257	590,213	608,385	622,641	633,417
DEMANDS (acre-feet per year)	99,519	104,699	107,783	110,110	112,433	114,301
EXISTING SUPPLIES (acre-feet per year)	103,467	108,363	111,183	113,300	115,429	117,108
NEEDS (acre-feet per year)*	(1,583)	(1,575)	(1,567)	(1,607)	(1,646)	(1,683)
<b>COUNTY-OTHER</b>						
POPULATION	92,312	98,558	102,769	106,123	108,840	111,127
DEMANDS (acre-feet per year)	12,562	13,002	13,289	13,588	13,910	14,209
EXISTING SUPPLIES (acre-feet per year)	17,858	17,874	17,872	17,892	17,911	17,929
NEEDS (acre-feet per year)*	0	0	0	0	0	0
<b>MANUFACTURING</b>						
DEMANDS (acre-feet per year)	92,175	98,724	105,153	110,754	118,723	127,266
EXISTING SUPPLIES (acre-feet per year)	88,882	93,039	97,110	98,731	94,925	91,948
NEEDS (acre-feet per year)*	(6,451)	(8,804)	(11,126)	(15,077)	(26,735)	(38,132)
<b>MINING</b>						
DEMANDS (acre-feet per year)	8,951	9,821	9,660	7,206	6,157	5,497
EXISTING SUPPLIES (acre-feet per year)	9,864	9,993	10,087	10,161	10,270	10,400
NEEDS (acre-feet per year)*	(2,733)	(3,269)	(3,219)	(1,087)	(315)	0
<b>STEAM ELECTRIC POWER</b>						
DEMANDS (acre-feet per year)	15,038	17,582	20,681	24,461	29,067	34,541
EXISTING SUPPLIES (acre-feet per year)	15,038	17,582	20,681	24,461	26,221	27,648
NEEDS (acre-feet per year)*	0	0	0	0	(2,846)	(6,893)
<b>LIVESTOCK</b>						
DEMANDS (acre-feet per year)	7,306	7,306	7,306	7,306	7,306	7,306
EXISTING SUPPLIES (acre-feet per year)	7,306	7,306	7,306	7,306	7,306	7,306
NEEDS (acre-feet per year)*	0	0	0	0	0	0
<b>IRRIGATION</b>						
DEMANDS (acre-feet per year)	26,419	28,604	30,990	33,595	36,441	40,124
EXISTING SUPPLIES (acre-feet per year)	36,367	36,367	36,367	36,367	36,367	36,367
NEEDS (acre-feet per year)*	(40)	(42)	(44)	(545)	(2,112)	(4,242)
<b>REGION TOTALS</b>						
POPULATION	614,790	661,815	692,982	714,508	731,481	744,544
DEMANDS (acre-feet per year)	261,970	279,738	294,862	307,020	324,037	343,244
EXISTING SUPPLIES (acre-feet per year)	278,782	290,524	300,606	308,218	308,429	308,706
NEEDS (acre-feet per year)*	(10,807)	(13,690)	(15,956)	(18,316)	(33,654)	(50,950)

\*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Category Summary report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.



### Water User Group (WUG) Second-Tier Identified Water Need

REGION N	WUG SECOND-TIER NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>ARANSAS COUNTY</b>						
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	0	0	0	0	0	0
FULTON	0	0	0	0	0	0
ROCKPORT	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
<b>BEE COUNTY</b>						
<b>NUECES BASIN</b>						
EL OSO WSC	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>SAN ANTONIO-NUECES BASIN</b>						
BEEVILLE	0	0	0	0	0	0
EL OSO WSC	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>BROOKS COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
FALFURRIAS	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>DUVAL COUNTY</b>						
<b>NUECES BASIN</b>						
FREER	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>NUECES-RIO GRANDE BASIN</b>						
BENAVIDES	0	0	0	0	0	0
SAN DIEGO	0	0	0	0	0	12
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>JIM WELLS COUNTY</b>						
<b>NUECES BASIN</b>						
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0

**Water User Group (WUG) Second-Tier Identified Water Need**

REGION N	WUG SECOND-TIER NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>JIM WELLS COUNTY</b>						
<b>NUECES BASIN</b>						
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>NUECES-RIO GRANDE BASIN</b>						
ALICE	0	0	0	0	0	0
ORANGE GROVE	0	0	0	0	0	0
PREMONT	0	0	0	0	0	0
SAN DIEGO	0	0	0	3	14	24
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>KENEDY COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
<b>KLEBERG COUNTY</b>						
<b>NUECES-RIO GRANDE BASIN</b>						
KINGSVILLE	0	0	0	0	0	0
RICARDO WSC	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>LIVE OAK COUNTY</b>						
<b>NUECES BASIN</b>						
EL OSO WSC	0	0	0	0	0	0
GEORGE WEST	0	0	0	0	0	0
MCCOY WSC	0	0	0	0	0	0
THREE RIVERS	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>MCMULLEN COUNTY</b>						
<b>NUECES BASIN</b>						
COUNTY-OTHER	0	0	0	0	0	0
MINING	2,627	3,029	2,862	825	84	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	39	40	41	41	43	43
<b>NUECES COUNTY</b>						
<b>NUECES BASIN</b>						
CORPUS CHRISTI	0	0	0	0	0	0
NUECES WSC	0	0	0	0	0	0
RIVER ACRES WSC	0	0	0	0	0	0
ROBSTOWN	2	2	1	1	1	1
COUNTY-OTHER	0	0	0	0	0	0

**Water User Group (WUG) Second-Tier Identified Water Need**

REGION N	WUG SECOND-TIER NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>NUECES COUNTY</b>						
<b>NUECES BASIN</b>						
MANUFACTURING	0	0	0	0	0	0
MINING	0	0	0	0	0	0
STEAM ELECTRIC POWER	0	0	0	0	2,152	5,255
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>NUECES-RIO GRANDE BASIN</b>						
AGUA DULCE	0	0	0	0	0	0
BISHOP	0	0	0	0	0	0
CORPUS CHRISTI	0	0	0	0	0	0
DRISCOLL	0	0	0	0	0	0
NUECES WSC	0	0	0	0	0	0
PORT ARANSAS	0	0	0	0	0	0
ROBSTOWN	1,456	1,209	978	764	633	640
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	0	0	0	0	0	0
MINING	0	0	0	0	0	0
STEAM ELECTRIC POWER	0	0	0	0	654	1,598
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	0	0	0	0	0	0
MINING	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>SAN PATRICIO COUNTY</b>						
<b>NUECES BASIN</b>						
LAKE CITY	0	0	0	0	0	0
MATHIS	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	2,929	3,991	5,040	5,963	7,131	8,389
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
<b>SAN ANTONIO-NUECES BASIN</b>						
ARANSAS PASS	0	0	0	0	0	0
GREGORY	0	0	0	0	0	0
INGLESIDE	0	0	0	0	0	0
INGLESIDE ON THE BAY	0	0	0	0	0	0
ODEM	0	0	0	0	0	0
PORTLAND	0	0	0	0	0	0
RINCON WSC	0	0	0	0	0	0
SINTON	0	0	0	0	0	0
TAFT	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	742	1,991	3,222	4,304	5,677	7,152
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	206	1,675

## **Water User Group (WUG) Second-Tier Identified Water Need**

**\*Second-tier needs are WUG split needs adjusted to include the implementation of recommended demand reduction and direct reuse water management strategies.**

### Water User Group (WUG) Second-Tier Identified Water Need Summary

**REGION N**

	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>MUNICIPAL</b>	1,458	1,211	979	768	648	677
<b>COUNTY-OTHER</b>	0	0	0	0	0	0
<b>MANUFACTURING</b>	3,671	5,982	8,262	10,267	12,808	15,541
<b>MINING</b>	2,627	3,029	2,862	825	84	0
<b>STEAM ELECTRIC POWER</b>	0	0	0	0	2,806	6,853
<b>LIVESTOCK</b>	0	0	0	0	0	0
<b>IRRIGATION</b>	39	40	41	41	249	1,718

\*Second-tier needs are WUG split needs adjusted to include the implementation of recommended demand reduction and direct reuse water management strategies.



**Source Water Balance (Availability- WUG Supply)**

<b>REGION N</b>									
<b>SURFACE WATER</b>	<b>COUNTY</b>	<b>BASIN</b>	<b>SALINITY</b>	<b>SOURCE WATER BALANCE (ACRE-FEET PER YEAR)</b>					
				<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	RESERVOIR	NUECES	FRESH	36,689	23,947	12,865	5,053	3,042	1,765
NUECES LIVESTOCK LOCAL SUPPLY	BEE	NUECES	FRESH	0	0	0	0	0	0
NUECES LIVESTOCK LOCAL SUPPLY	DUVAL	NUECES	FRESH	0	0	0	0	0	0
NUECES LIVESTOCK LOCAL SUPPLY	JIM WELLS	NUECES	FRESH	0	0	0	0	0	0
NUECES LIVESTOCK LOCAL SUPPLY	LIVE OAK	NUECES	FRESH	0	0	0	0	0	0
NUECES LIVESTOCK LOCAL SUPPLY	MCMULLEN	NUECES	FRESH	0	0	0	0	0	0
NUECES LIVESTOCK LOCAL SUPPLY	NUECES	NUECES	FRESH	0	0	0	0	0	0
NUECES LIVESTOCK LOCAL SUPPLY	SAN PATRICIO	NUECES	FRESH	0	0	0	0	0	0
NUECES RUN-OF-RIVER	LIVE OAK	NUECES	FRESH	0	0	0	0	0	0
NUECES RUN-OF-RIVER	NUECES	NUECES	FRESH	0	0	0	0	0	0
NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	BROOKS	NUECES-RIO GRANDE	FRESH	0	0	0	0	0	0
NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	DUVAL	NUECES-RIO GRANDE	FRESH	0	0	0	0	0	0
NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	JIM WELLS	NUECES-RIO GRANDE	FRESH	0	0	0	0	0	0
NUECES-RIO GRANDE LIVESTOCK LOCAL SUPPLY	NUECES	NUECES-RIO GRANDE	FRESH	0	0	0	0	0	0
NUECES-RIO GRANDE RUN-OF-RIVER	NUECES	NUECES-RIO GRANDE	FRESH	0	0	0	0	0	0
SAN ANTONIO-NUECES LIVESTOCK LOCAL SUPPLY	ARANSAS	SAN ANTONIO-NUECES	FRESH	0	0	0	0	0	0
SAN ANTONIO-NUECES LIVESTOCK LOCAL SUPPLY	BEE	SAN ANTONIO-NUECES	FRESH	0	0	0	0	0	0
SAN ANTONIO-NUECES LIVESTOCK LOCAL SUPPLY	SAN PATRICIO	SAN ANTONIO-NUECES	FRESH	0	0	0	0	0	0
SAN ANTONIO-NUECES RUN-OF-RIVER	BEE	SAN ANTONIO-NUECES	FRESH	0	0	0	0	0	0
SAN ANTONIO-NUECES RUN-OF-RIVER	SAN PATRICIO	SAN ANTONIO-NUECES	FRESH	0	0	0	0	0	0
<b>SURFACE WATER TOTAL SOURCE WATER BALANCE</b>				<b>36,689</b>	<b>23,947</b>	<b>12,865</b>	<b>5,053</b>	<b>3,042</b>	<b>1,765</b>
<b>REGION N TOTAL SOURCE WATER BALANCE</b>				<b>176,403</b>	<b>163,637</b>	<b>152,555</b>	<b>144,691</b>	<b>142,680</b>	<b>141,403</b>

### Water User Group (WUG) Unmet Needs

REGION N	WUG UNMET NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
<b>MCMULLEN COUNTY</b>						
<b>NUECES BASIN</b>						
MINING	1,661	2,063	1,896	0	0	0
<b>SAN PATRICIO COUNTY</b>						
<b>SAN ANTONIO-NUECES BASIN</b>						
IRRIGATION	0	0	0	0	0	972

\*WUG supplies and projected demands are entered for each of a WUG’s region-county-basin divisions. The unmet needs shown in the WUG Unmet Needs report are calculated by first deducting the WUG split’s projected demand from the sum of its total existing water supply volume and all associated recommended water management strategy water volumes. If the WUG split has a greater future supply volume than projected demand in any given decade, this amount is considered a surplus volume. In order to display only unmet needs associated with the WUG split, these surplus volumes are updated to a zero and the unmet needs water volumes are shown as absolute values.



### Water User Group (WUG) Unmet Needs Summary

**REGION N**

	2020	2030	2040	2050	2060	2070
<b>MUNICIPAL</b>	0	0	0	0	0	0
<b>COUNTY-OTHER</b>	0	0	0	0	0	0
<b>MANUFACTURING</b>	0	0	0	0	0	0
<b>MINING</b>	1,661	2,063	1,896	0	0	0
<b>STEAM ELECTRIC POWER</b>	0	0	0	0	0	0
<b>LIVESTOCK</b>	0	0	0	0	0	0
<b>IRRIGATION</b>	0	0	0	0	0	972

\*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The unmet needs shown in the WUG Unmet Needs Summary report are calculated by first deducting the WUG split's projected demand from the sum of its total existing water supply volume and all associated recommended water management strategy water volumes. If the WUG split has a greater future supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG category level, calculated surpluses are updated to zero so that only the WUGs with unmet needs in the decade are included with the Needs totals. Unmet needs water volumes are shown as absolute values.

### Recommended Projects Associated with Water Management Strategies

**Project Sponsor Region: N**

Sponsor Name	Is Sponsor a WWP?	Project Name	Project Description	Capital Cost	Online Decade
ALICE	N	ALICE-STWA INTERCONNECTIONS	CONVEYANCE/TRANSMISSION PIPELINE	\$5,866,000	2020
ALICE	N	BRACKISH GROUNDWATER DEVELOPMENT - ALICE	MULTIPLE WELLS/WELL FIELD; NEW WATER TREATMENT PLANT	\$33,277,000	2020
ALICE	N	PIPELINE REPLACEMENT PROGRAM (ALICE)	CONVEYANCE/TRANSMISSION PIPELINE	\$21,384,000	2030
ALICE	N	REUSE - ALICE	CONVEYANCE/TRANSMISSION PIPELINE; NEW WATER TREATMENT PLANT; PUMP STATION; STORAGE TANK	\$8,661,000	2030
BEEVILLE	N	CHASE WELL FIELD - BEEVILLE	CONVEYANCE/TRANSMISSION PIPELINE; MULTIPLE WELLS/WELL FIELD; PUMP STATION; STORAGE TANK	\$4,777,000	2020
BEEVILLE	N	WELL CONVERSION PROJECT - BEEVILLE	CONVEYANCE/TRANSMISSION PIPELINE; NEW WATER TREATMENT PLANT; STORAGE TANK	\$261,000	2020
CORPUS CHRISTI	Y	ADDITIONAL REUSE - CORPUS CHRISTI	CONVEYANCE/TRANSMISSION PIPELINE; PUMP STATION; STORAGE TANK	\$52,097,000	2030
CORPUS CHRISTI	Y	O.N. STEVENS WTP IMPROVEMENTS	WATER TREATMENT PLANT EXPANSION	\$44,029,540	2020
CORPUS CHRISTI	Y	SEAWATER DESALINATION	NEW WATER TREATMENT PLANT	\$248,000,000	2030
IRRIGATION, MCMULLEN	N	GULF COAST AQUIFER SUPPLIES - MCMULLEN IRRIGATION	MULTIPLE WELLS/WELL FIELD	\$129,000	2020
IRRIGATION, SAN PATRICIO	N	GULF COAST AQUIFER DEVELOPMENT - SAN PAT IRRIGATION	MULTIPLE WELLS/WELL FIELD	\$1,156,000	2050
MINING, MCMULLEN	N	ADDITIONAL CARRIZO AQUIFER - MCMULLEN MINING	CONVEYANCE/TRANSMISSION PIPELINE; MULTIPLE WELLS/WELL FIELD	\$783,194	2020
MINING, MCMULLEN	N	ADDITIONAL GULF COAST AQUIFER - MCMULLEN MINING	MULTIPLE WELLS/WELL FIELD	\$195,362	2020
MINING, MCMULLEN	N	MCMULLEN COUNTY MINING MINOR AQUIFER DEVELOPMENT	CONVEYANCE/TRANSMISSION PIPELINE; MULTIPLE WELLS/WELL FIELD	\$706,444	2020
NUECES COUNTY WCID #3	Y	LOCAL BALANCING STORAGE - ROBSTOWN	CONVEYANCE/TRANSMISSION PIPELINE; NEW SURFACE WATER INTAKE; PUMP STATION; RESERVOIR CONSTRUCTION	\$8,182,000	2020
SAN DIEGO	N	GULF COAST AQUIFER SUPPLIES - SAN DIEGO	MULTIPLE WELLS/WELL FIELD; NEW WATER TREATMENT PLANT	\$940,000	2030
SAN PATRICIO MWD	Y	PORTLAND REUSE PIPELINE	CONVEYANCE/TRANSMISSION PIPELINE; PUMP STATION	\$21,291,600	2020
SAN PATRICIO MWD	Y	SPMWD INDUSTRIAL WTP IMPROVEMENTS	WATER TREATMENT PLANT EXPANSION	\$58,366,000	2020
<b>Region N Total Recommended Capital Cost</b>				<b>\$510,102,140</b>	

\*Projects with a capital cost of zero are excluded from the report list.

### Recommended Water User Group (WUG) Water Management Strategies (WMS)

**WUG Entity Primary Region: N**

#### Water Management Strategy Supplies

WUG Entity Name	WMS Sponsor Region	WMS Name	Source Name	2020	2030	2040	2050	2060	2070	Unit Cost 2020	Unit Cost 2070
ALICE	L	GBRA LOWER BASIN OFF-CHANNEL RESERVOIR	L   GBRA LOWER BASIN OFF-CHANNEL LAKE/ RESERVOIR	0	2,800	2,800	2,800	2,800	2,800	N/A	\$983
ALICE	N	BRACKISH GROUNDWATER DEVELOPMENT - ALICE	N   GULF COAST AQUIFER BRACKISH   JIM WELLS COUNTY	3,363	3,363	3,363	3,363	3,363	3,363	\$1474	\$646
ALICE	N	MUNICIPAL WATER CONSERVATION (RURAL)	DEMAND REDUCTION	143	289	352	262	300	340	\$500	\$500
ALICE	N	O.N. STEVENS WTP IMPROVEMENTS	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	1,204	0	0	0	0	0	\$1158	N/A
ALICE	N	PIPELINE REPLACEMENT PROGRAM (ALICE)	DEMAND REDUCTION	0	173	460	576	576	576	N/A	\$510
ALICE	N	REUSE - ALICE	N   DIRECT REUSE	0	897	897	897	897	897	N/A	\$512
BEEVILLE	N	CHASE FIELD PROJECT - BEEVILLE	N   GULF COAST AQUIFER   BEE COUNTY	1,457	1,457	1,457	1,457	1,457	1,457	\$484	\$209
BEEVILLE	N	MUNICIPAL WATER CONSERVATION (RURAL)	DEMAND REDUCTION	117	333	542	710	706	707	\$500	\$500
BEEVILLE	N	WELL CONVERSION PROJECT - BEEVILLE	N   GULF COAST AQUIFER   BEE COUNTY	340	340	340	340	340	340	\$135	\$135
BENAVIDES	N	MUNICIPAL WATER CONSERVATION (RURAL)	DEMAND REDUCTION	4	0	0	0	0	0	\$500	N/A
BISHOP	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	16	39	27	23	23	23	\$510	\$510
CORPUS CHRISTI	N	MUNICIPAL WATER CONSERVATION (URBAN)	DEMAND REDUCTION	2,305	7,354	10,985	10,667	10,765	10,898	\$470	\$470
COUNTY-OTHER, KENEDY	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	17	40	60	79	97	113	\$510	\$510
COUNTY-OTHER, KLEBERG	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	13	24	15	15	14	15	\$510	\$510
FALFURRIAS	N	MUNICIPAL WATER CONSERVATION (RURAL)	DEMAND REDUCTION	91	224	360	508	649	786	\$500	\$500
FREER	N	MUNICIPAL WATER CONSERVATION (RURAL)	DEMAND REDUCTION	24	73	124	168	171	175	\$500	\$500
FULTON	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	12	33	46	44	44	44	\$510	\$510
GEORGE WEST	N	MUNICIPAL WATER CONSERVATION (RURAL)	DEMAND REDUCTION	15	46	44	40	39	39	\$500	\$500
GREGORY	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	8	11	6	6	5	5	\$510	\$510
IRRIGATION, MCMULLEN	N	GULF COAST AQUIFER SUPPLIES - MCMULLEN IRRIGATION	N   GULF COAST AQUIFER   MCMULLEN COUNTY	43	43	43	43	43	43	\$302	\$47
IRRIGATION, MCMULLEN	N	IRRIGATION WATER CONSERVATION	DEMAND REDUCTION	1	2	3	5	6	8	\$230	\$230
IRRIGATION, SAN PATRICIO	N	GULF COAST AQUIFER - SAN PATRICIO IRRIGATION	N   GULF COAST AQUIFER   SAN PATRICIO COUNTY	0	0	0	237	237	237	N/A	\$21
IRRIGATION, SAN PATRICIO	N	IRRIGATION WATER CONSERVATION	DEMAND REDUCTION	0	0	0	1,494	2,063	2,795	N/A	\$230
IRRIGATION, SAN PATRICIO	N	SUPPLY REDUCTION FOR SAN PATRICIO IRRIGATION	N   GULF COAST AQUIFER   SAN PATRICIO COUNTY	0	0	0	466	466	466	N/A	\$21
MANUFACTURING, NUECES	L	GBRA LOWER BASIN OFF-CHANNEL RESERVOIR	L   GBRA LOWER BASIN OFF-CHANNEL LAKE/ RESERVOIR	0	5,200	5,200	5,200	5,200	5,200	N/A	\$532
MANUFACTURING, NUECES	N	ADDITIONAL REUSE - CORPUS CHRISTI	N   DIRECT REUSE	0	20,178	20,178	20,178	20,178	20,178	N/A	\$361
MANUFACTURING, NUECES	N	MANUFACTURING WATER CONSERVATION	DEMAND REDUCTION	501	542	583	626	668	709	\$0	\$0

### Recommended Water User Group (WUG) Water Management Strategies (WMS)

#### Water Management Strategy Supplies

WUG Entity Name	WMS Sponsor Region	WMS Name	Source Name	2020	2030	2040	2050	2060	2070	Unit Cost 2020	Unit Cost 2070
MANUFACTURING, NUECES	N	O.N. STEVENS WTP IMPROVEMENTS	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	20,739	13,095	5,656	0	0	0	\$572	N/A
MANUFACTURING, NUECES	N	SEAWATER DESALINATION	N   GULF OF MEXICO SALINE	0	9,000	9,000	9,000	9,000	9,000	N/A	\$550
MANUFACTURING, SAN PATRICIO	L	GBRA LOWER BASIN OFF-CHANNEL RESERVOIR	L   GBRA LOWER BASIN OFF-CHANNEL LAKE/ RESERVOIR	0	8,000	8,000	8,000	8,000	8,000	N/A	\$532
MANUFACTURING, SAN PATRICIO	N	MANUFACTURING WATER CONSERVATION	DEMAND REDUCTION	540	582	624	665	706	748	\$0	\$0
MANUFACTURING, SAN PATRICIO	N	PORTLAND REUSE PIPELINE	N   DIRECT REUSE	2,240	2,240	2,240	2,240	2,240	2,240	\$892	\$96
MANUFACTURING, SAN PATRICIO	N	SEAWATER DESALINATION	N   GULF OF MEXICO SALINE	0	9,000	9,000	9,000	9,000	9,000	N/A	\$550
MANUFACTURING, SAN PATRICIO	N	SPMWD INDUSTRIAL WTP IMPROVEMENTS	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	7,460	6,250	5,222	4,253	3,041	1,765	\$809	\$546
MINING, MCMULLEN	N	ADDITIONAL GULF COAST AQUIFER - MCMULLEN MINING	N   GULF COAST AQUIFER   MCMULLEN COUNTY	112	112	112	112	112	112	\$196	\$50
MINING, MCMULLEN	N	MCMULLEN COUNTY SUPPLY REDUCTION - MINING	N   CARRIZO-WILCOX AQUIFER   MCMULLEN COUNTY	449	449	449	449	449	449	\$196	\$50
MINING, MCMULLEN	N	MCMULLEN MINING MINOR AQUIFER DEVELOPMENT	N   QUEEN CITY AQUIFER   MCMULLEN COUNTY	136	136	136	136	136	136	\$196	\$50
MINING, MCMULLEN	N	MCMULLEN MINING MINOR AQUIFER DEVELOPMENT	N   SPARTA AQUIFER   MCMULLEN COUNTY	90	90	90	90	90	90	\$196	\$50
MINING, MCMULLEN	N	MCMULLEN MINING MINOR AQUIFER DEVELOPMENT	N   YEGUA-JACKSON AQUIFER   MCMULLEN COUNTY	179	179	179	179	179	179	\$196	\$50
MINING, MCMULLEN	N	MINING WATER CONSERVATION	DEMAND REDUCTION	106	240	357	262	231	196	\$0	\$0
ORANGE GROVE	N	MUNICIPAL WATER CONSERVATION (RURAL)	DEMAND REDUCTION	18	49	83	120	159	183	\$500	\$500
PORT ARANSAS	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	160	374	589	792	985	1,161	\$510	\$510
PORTLAND	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	74	49	0	0	0	0	\$510	N/A
PREMONT	N	MUNICIPAL WATER CONSERVATION (RURAL)	DEMAND REDUCTION	31	87	149	221	289	303	\$500	\$500
RIVER ACRES WSC	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	9	0	0	0	0	0	\$510	N/A
ROBSTOWN	N	LOCAL BALANCING RESERVOIR - ROBSTOWN	N   NUECES RUN-OF-RIVER	1,583	1,583	1,583	1,583	1,583	1,583	\$831	\$467
ROBSTOWN	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	125	336	532	748	884	884	\$510	\$510
ROCKPORT	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	66	192	172	159	156	156	\$510	\$510
SAN DIEGO	N	GULF COAST AQUIFER SUPPLIES - SAN DIEGO	N   GULF COAST AQUIFER   DUVAL COUNTY	0	158	158	158	158	158	N/A	\$171
SAN DIEGO	N	MUNICIPAL WATER CONSERVATION (RURAL)	DEMAND REDUCTION	29	94	117	117	119	122	\$500	\$500
SINTON	N	MUNICIPAL WATER CONSERVATION (SUBURBAN)	DEMAND REDUCTION	62	170	277	385	447	451	\$510	\$510
STEAM ELECTRIC POWER, NUECES	L	GBRA LOWER BASIN OFF-CHANNEL RESERVOIR	L   GBRA LOWER BASIN OFF-CHANNEL LAKE/ RESERVOIR	0	4,000	4,000	4,000	4,000	4,000	N/A	\$532
STEAM ELECTRIC POWER, NUECES	N	MANUFACTURING WATER CONSERVATION	DEMAND REDUCTION	40	40	40	40	40	40	\$0	\$0
STEAM ELECTRIC POWER, NUECES	N	O.N. STEVENS WTP IMPROVEMENTS	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	7,286	4,601	1,987	0	0	0	\$572	N/A
STEAM ELECTRIC POWER, NUECES	N	SEAWATER DESALINATION	N   GULF OF MEXICO SALINE	0	4,420	4,420	4,420	4,420	4,420	N/A	\$550

### Recommended Water User Group (WUG) Water Management Strategies (WMS)

#### Water Management Strategy Supplies

WUG Entity Name	WMS Sponsor Region	WMS Name	Source Name	2020	2030	2040	2050	2060	2070	Unit Cost 2020	Unit Cost 2070
THREE RIVERS	N	MUNICIPAL WATER CONSERVATION (RURAL)	DEMAND REDUCTION	11	22	15	15	14	15	\$500	\$500
<b>Region N Total Recommended WMS Supplies</b>				51,219	109,009	103,072	97,348	97,545	97,605		

### Alternative Projects Associated with Water Management Strategies

**Project Sponsor Region: N**

Sponsor Name	Is Sponsor a WWP?	Project Name	Project Description	Capital Cost	Online Decade
CORPUS CHRISTI	Y	BRACKISH GROUNDWATER DEVELOPMENT - REGIONAL	CONVEYANCE/TRANSMISSION PIPELINE; MULTIPLE WELLS/WELL FIELD; PUMP STATION	\$142,632,000	2040
SAN DIEGO	N	ALICE TO SAN DIEGO INTERCONNECTION	CONVEYANCE/TRANSMISSION PIPELINE	\$5,177,000	2020
<b>Region N Total Alternative Capital Cost</b>				<b>\$147,809,000</b>	

\*Projects with a capital cost of zero are excluded from the report list.

### Alternative Water User Group (WUG) Water Management Strategies (WMS)

**WUG Entity Primary Region: N**

#### Water Management Strategy Supplies

WUG Entity Name	WMS Sponsor Region	WMS Name	Source Name	2020	2030	2040	2050	2060	2070	Unit Cost 2020	Unit Cost 2070
MANUFACTURING, NUECES	N	BRACKISH GROUNDWATER DESALINATION - REGIONAL	N   GULF COAST AQUIFER   BEE COUNTY	0	0	4,000	4,000	4,000	4,000	N/A	\$419
MANUFACTURING, NUECES	N	BRACKISH GROUNDWATER DESALINATION - REGIONAL	N   GULF COAST AQUIFER   SAN PATRICIO COUNTY	0	0	4,000	4,000	4,000	4,000	N/A	\$419
MANUFACTURING, SAN PATRICIO	N	BRACKISH GROUNDWATER DESALINATION - REGIONAL	N   GULF COAST AQUIFER   BEE COUNTY	0	0	4,000	4,000	4,000	4,000	N/A	\$419
MANUFACTURING, SAN PATRICIO	N	BRACKISH GROUNDWATER DESALINATION - REGIONAL	N   GULF COAST AQUIFER   SAN PATRICIO COUNTY	0	0	4,000	4,000	4,000	4,000	N/A	\$419
SAN DIEGO	N	ALICE TO SAN DIEGO INTERCONNECTION	N   CORPUS CHRISTI-CHOKE CANYON LAKE/RESERVOIR SYSTEM	1,072	1,072	1,072	1,072	1,072	1,072	\$1301	\$897
STEAM ELECTRIC POWER, NUECES	N	BRACKISH GROUNDWATER DESALINATION - REGIONAL	N   GULF COAST AQUIFER   BEE COUNTY	0	0	4,000	4,000	4,000	4,000	N/A	\$419
STEAM ELECTRIC POWER, NUECES	N	BRACKISH GROUNDWATER DESALINATION - REGIONAL	N   GULF COAST AQUIFER   SAN PATRICIO COUNTY	0	0	4,000	4,000	4,000	4,000	N/A	\$419
<b>Region N Total Alternative WMS Supplies</b>				1,072	1,072	25,072	25,072	25,072	25,072		

### Water User Group (WUG) Management Supply Factor

REGION N	WUG MANAGEMENT SUPPLY FACTOR					
	2020	2030	2040	2050	2060	2070
AGUA DULCE	1.0	1.0	1.0	1.0	1.0	1.0
ALICE	2.1	2.7	2.7	2.6	2.5	2.5
ARANSAS PASS	1.0	1.0	1.0	1.0	1.0	1.0
BEEVILLE	1.7	1.7	1.8	1.8	1.8	1.8
BENAVIDES	1.6	1.5	1.5	1.4	1.4	1.4
BISHOP	1.0	1.1	1.0	1.0	1.0	1.0
CORPUS CHRISTI	1.0	1.1	1.2	1.1	1.1	1.1
COUNTY-OTHER, ARANSAS	1.0	1.0	1.0	1.0	1.0	1.0
COUNTY-OTHER, BEE	1.0	1.0	1.0	1.0	1.0	1.0
COUNTY-OTHER, BROOKS	1.4	1.3	1.2	1.1	1.1	1.0
COUNTY-OTHER, DUVAL	1.2	1.2	1.1	1.1	1.1	1.1
COUNTY-OTHER, JIM WELLS	1.3	1.2	1.2	1.1	1.1	1.0
COUNTY-OTHER, KENEDY	1.3	1.3	1.4	1.5	1.5	1.6
COUNTY-OTHER, KLEBERG	6.1	5.7	5.4	5.0	4.7	4.5
COUNTY-OTHER, LIVE OAK	1.2	1.3	1.3	1.3	1.3	1.3
COUNTY-OTHER, MCMULLEN	1.0	1.0	1.1	1.1	1.1	1.1
COUNTY-OTHER, NUECES	1.3	1.2	1.1	1.1	1.0	1.0
COUNTY-OTHER, SAN PATRICIO	1.0	1.0	1.0	1.0	1.0	1.0
DRISCOLL	1.0	1.0	1.0	1.0	1.0	1.0
FALFURRIAS	1.7	1.7	1.7	1.8	1.8	1.8
FREER	1.5	1.5	1.5	1.5	1.5	1.5
FULTON	1.0	1.1	1.2	1.2	1.2	1.2
GEORGE WEST	2.0	2.1	2.1	2.1	2.1	2.1
GREGORY	1.0	1.0	1.0	1.0	1.0	1.0
INGLESIDE	1.0	1.0	1.0	1.0	1.0	1.0
INGLESIDE ON THE BAY	1.0	1.0	1.0	1.0	1.0	1.0
IRRIGATION, BEE	1.7	1.5	1.4	1.3	1.1	1.0
IRRIGATION, BROOKS	1.3	1.2	1.2	1.1	1.1	1.0
IRRIGATION, DUVAL	1.3	1.2	1.2	1.1	1.1	1.0
IRRIGATION, JIM WELLS	1.3	1.3	1.2	1.1	1.1	1.0
IRRIGATION, KLEBERG	1.3	1.3	1.2	1.2	1.1	1.0
IRRIGATION, LIVE OAK	1.3	1.3	1.2	1.1	1.1	1.0
IRRIGATION, MCMULLEN	1.1	1.1	1.0	1.0	1.0	1.0
IRRIGATION, NUECES	1.6	1.5	1.4	1.4	1.3	1.3
IRRIGATION, SAN PATRICIO	1.3	1.2	1.1	1.1	1.0	1.0
KINGSVILLE	1.1	1.0	1.0	1.0	1.0	1.0
LAKE CITY	1.1	1.1	1.1	1.1	1.1	1.1
LIVESTOCK, ARANSAS	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, BEE	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, BROOKS	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, DUVAL	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, JIM WELLS	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, KENEDY	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, KLEBERG	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, LIVE OAK	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, MCMULLEN	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, NUECES	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, SAN PATRICIO	1.0	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, ARANSAS	1.9	1.9	1.8	1.8	1.6	1.5
MANUFACTURING, BEE	1.0	1.0	1.0	1.0	1.0	1.0



### Water User Group (WUG) Management Supply Factor

REGION N	WUG MANAGEMENT SUPPLY FACTOR					
	2020	2030	2040	2050	2060	2070
MANUFACTURING, LIVE OAK	2.5	2.5	2.4	2.4	2.3	2.2
MANUFACTURING, NUECES	1.4	1.9	1.7	1.6	1.4	1.2
MANUFACTURING, SAN PATRICIO	1.1	1.4	1.3	1.2	1.1	1.1
MATHIS	1.0	1.0	1.0	1.0	1.0	1.0
MINING, ARANSAS	1.0	1.4	2.0	2.0	2.0	2.0
MINING, BEE	1.1	1.1	1.2	1.4	1.5	1.6
MINING, BROOKS	1.0	1.0	1.1	1.1	1.2	1.2
MINING, DUVAL	3.4	3.2	3.4	3.8	4.0	4.2
MINING, JIM WELLS	1.0	1.0	1.3	1.9	2.8	4.4
MINING, KENEDY	1.1	1.1	1.4	1.9	3.0	4.8
MINING, KLEBERG	1.1	1.1	1.1	1.2	1.2	1.3
MINING, LIVE OAK	1.1	1.0	1.0	1.3	1.9	2.8
MINING, MCMULLEN	0.6	0.6	0.6	1.1	1.5	2.1
MINING, NUECES	1.0	1.0	1.0	1.0	1.0	1.0
MINING, SAN PATRICIO	1.5	1.3	1.3	1.2	1.1	1.1
NUECES WSC	1.0	1.0	1.0	1.0	1.0	1.0
ODEM	1.0	1.0	1.0	1.0	1.0	1.0
ORANGE GROVE	2.2	2.2	2.2	2.1	2.1	2.0
PORT ARANSAS	1.1	1.2	1.2	1.3	1.4	1.4
PORTLAND	1.0	1.0	1.0	1.0	1.0	1.0
PREMONT	2.6	2.5	2.5	2.4	2.4	2.3
RICARDO WSC	1.0	1.0	1.0	1.0	1.0	1.0
RINCON WSC	1.0	1.0	1.0	1.0	1.0	1.0
RIVER ACRES WSC	1.0	1.0	1.0	1.0	1.0	1.0
ROBSTOWN	1.0	1.1	1.2	1.3	1.3	1.3
ROCKPORT	1.0	1.1	1.1	1.1	1.1	1.1
SAN DIEGO	1.0	1.2	1.2	1.2	1.1	1.1
SINTON	1.4	1.5	1.5	1.3	1.3	1.3
STEAM ELECTRIC POWER, NUECES	1.5	1.7	1.5	1.3	1.2	1.0
TAFT	1.0	1.0	1.0	1.0	1.0	1.0
THREE RIVERS	3.6	3.7	3.8	3.8	3.8	3.8

\*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. To calculate the Management Supply Factor for each WUG as a whole, not split by region-county-basin the combined total of existing and future supply is divided by the total projected demand.

Summary of WMS Implementation (See Chapter 11.1)

Sponsor Region	wmsSponsorEntityId	Sponsor	Recommended Water Management Strategy	DBProjectId	CapitalCost	\$52010	\$52020	\$52030	\$52040	\$52050	\$52060	Y denotes strategies with supply volumes included in other strategies	Project Description	Infrastructure Type*	At what level of implementation is the project?*	If not implemented, why?*	Initial Volume of Water Provided (acft/yr)	Funds Expended to Date (\$)	Project Cost (\$ (should include development and construction costs)	Year the Project is Online?*	Is this a phased project?*	(Phased) Ultimate Volume (acft/yr)	(Phased) Ultimate Project Cost (\$)	Year project reaches maximum capacity?*	What is the project funding source(s)?*	Included in the 2016 Plan?*	Comments	
N	172	ALICE	Municipal water conservation	75	\$0	50	133	219	306	438	585	N	water conservation	No Infrastructure	Not Implemented	Other	N/A	N/A	N/A		No				TWDB	Yes	The 2016 Plan includes a pipeline replacement program (capital cost: \$21,384,000) in addition to a 1% annual reduction for all entities that exceed 140 gallons per person per day.	
N	34	CORPUS CHRISTI	Construction of Lavaca River off-channel reservoir diversion project (Region N)	653	\$138,753,917	0	0	0	0	0	16,242	N	OCR	Impoundment	Not Implemented	Other										Yes	LNRA project sponsor	
N	34	CORPUS CHRISTI	Desalination	87	\$260,914,000	0	28,000	28,000	28,000	28,000	28,000	N	Seawater Desalination	Water Treatment Plant	Feasibility Study Ongoing		22,420	\$639,064	\$248,000,000		No			2030	Unknown	Yes	included in existing supplies in 2016 Plan, not as a future water management strategy. Project estimated to be completed by end of 2015.	
N	34	CORPUS CHRISTI	Garwood Pipeline	86	\$112,798,000	0	35,000	35,000	35,000	35,000	35,000	N	MRP Phase II	Pipeline	Under Construction		35,000	\$131,829,496	\$150,000,000	2015	No			2020	Local (market issue)	Yes		
N	34	CORPUS CHRISTI	O.N. Stevens Water Treatment Plant	731	\$31,324,000	42,329	40,048	38,102	36,366	34,817	32,996	N	WTP Improvements	Water Treatment Plant	Feasibility Study Ongoing		28,000		\$44,000,000		No			2020	Local (market issue)	Yes		
N	34	CORPUS CHRISTI	Off-channel reservoir near Lake Corpus Christi	83	\$300,577,000	0	0	30,340	30,340	30,340	30,340	N	OCR near LCC	Impoundment	Not Implemented	Other										No		
N	34	CORPUS CHRISTI	Reclaimed wastewater supplies	79	\$0	250	250	250	250	250	250	N	Reuse	Other	Currently Operating			N/A			2011	No			2011	Yes	New reuse 18 MGD (20,178 acft/yr) project potential in the 2016 Plan	
N	415	COUNTY-OTHER, ARANSAS	Voluntary redistribution	573	\$0	0	0	0	0	1,527	1,443	N																
N	477	COUNTY-OTHER, DUVAL	Municipal water conservation	75	\$0	6	13	21	27	44	63	N																
N	536	COUNTY-OTHER, JIM WELLS	Gulf Coast Aquifer Supplies	80	\$980,000	565	565	565	565	565	565	N																
N	548	COUNTY-OTHER, KLEBERG	Gulf Coast Aquifer Supplies	80	\$587,000	0	400	400	400	400	400	N	new wells	Wells	Not Implemented											No	No shortage projected.	
N	560	COUNTY-OTHER, LIVE OAK	Gulf Coast Aquifer Supplies	80	\$315,000	0	80	80	80	80	80	N	new wells	Wells	Not Implemented											No	No shortage projected.	
N	567	COUNTY-OTHER, MCMULLEN	Municipal water conservation	75	\$0	1	2	3	5	7	10	N	conservation	No Infrastructure	Not Implemented											No	Per capita rate below 140 gpcd.	
N	589	COUNTY-OTHER, NUECES	Voluntary redistribution	573	\$0	261	0	0	0	0	0	N																
N	770	FALFURRIAS	Municipal water conservation	75	\$0	1	38	95	156	228	309	N	water conservation	No Infrastructure												Yes	The 2016 Plan recommends a 1% annual reduction for all entities that exceed 140 gallons per person per day	
N	833	GEORGE WEST	Municipal water conservation	75	\$0	5	14	25	33	45	57	N	water conservation	No Infrastructure												Yes	The 2016 Plan recommends a 1% annual reduction for all entities that exceed 140 gallons per person per day	
N	991	IRRIGATION, BEE	Gulf Coast Aquifer Supplies	80	\$1,763,000	0	0	0	0	2,016	2,016	N	new wells	Wells	Not Implemented											No	No shortage projected.	
N	1120	IRRIGATION, LIVE OAK	Gulf Coast Aquifer Supplies	80	\$1,058,000	1,210	1,210	1,210	1,210	1,210	1,210	N	new wells	Wells	Not Implemented											No	No shortage projected.	
N	1120	IRRIGATION, LIVE OAK	Irrigation water conservation	76	\$0	17	52	103	169	248	342	N	conservation	No Infrastructure	Not Implemented											No	No shortage projected.	
N	1170	IRRIGATION, SAN PATRICIO	Gulf Coast Aquifer Supplies	80	\$8,110,000	0	0	9,000	9,000	9,000	9,000	N	new wells	Wells	Not Implemented											Yes	Assumes portion of yield is transfer of unused MAG from City of Sinton.	
N	1291	LAKE CITY	Gulf Coast Aquifer Supplies	80	\$343,000	0	80	80	80	80	80	N	new groundwater well	Wells	Not Implemented											No	The 2016 Plan shows all needs are met with existing supplies.	
N	1623	MANUFACTURING, ARANSAS	Gulf Coast Aquifer Supplies	80	\$257,000	200	200	200	200	200	200	N																
N	1721	MANUFACTURING, LIVE OAK	Voluntary redistribution	573	\$0	337	483	559	615	657	764	N																
N	1744	MANUFACTURING, NUECES	Manufacturing water conservation	77	\$0	1,260	1,418	1,576	1,734	1,892	2,050	N																
N	1900	MINING, DUVAL	Mining water conservation	78	\$0	147	332	534	761	1,014	1,283	N																
N	1974	MINING, LIVE OAK	Mining water conservation	78	\$0	97	216	344	485	639	801	N	conservation	No Infrastructure	Currently Operating					2014	No					No	No shortage projected.	
N	2001	MINING, NUECES	Mining water conservation	78	\$0	37	78	120	164	210	259	N																
N	2143	NUECES COUNTY WCID #4	Municipal water conservation	75	\$0	0	0	56	135	261	384	N														Yes	The 2016 Plan recommends a 1% annual reduction for all entities that exceed 140 gallons per person per day	
N	2161	ORANGE GROVE	Municipal water conservation	75	\$0	3	8	14	18	28	38	N	water conservation	No Infrastructure												Yes	The 2016 Plan recommends a 1% annual reduction for all entities that exceed 140 gallons per person per day	
N	2220	PORT ARANSAS	Municipal water conservation	75	\$0	28	115	238	406	615	843	N	water conservation	No Infrastructure	Currently Operating			Total savings of 18% achieved as compared to use prior to conservation.								Yes	The 2016 Plan recommends a 1% annual reduction for all entities that exceed 140 gallons per person per day	
N	2233	PREMONT	Municipal water conservation	75	\$0	9	22	36	49	70	92	N	water conservation	No Infrastructure												Yes	The 2016 Plan recommends a 1% annual reduction for all entities that exceed 140 gallons per person per day	
N	2276	RIVER ACRES WSC	Voluntary redistribution	573	\$0	138	255	355	445	522	590	N	increase contract with NCWCD # 3	No Infrastructure	All Phases Fully Implemented											No		
N	128	SAN PATRICIO MWD	Gulf Coast Aquifer Supplies (regional)	755	\$59,245,000	0	0	11,000	11,000	11,000	18,000	N	regional groundwater project	Wells	Feasibility Study Ongoing	Other	11,120		65141950							No	Current MAG limitation.	
N	2524	THREE RIVERS	Municipal water conservation	75	\$0	3	8	14	18	27	34	N	water conservation	No Infrastructure												Yes	The 2016 Plan recommends a 1% annual reduction for all entities that exceed 140 gallons per person per day.	

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Appendix 2  
Socio-Economic Impact Report

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**Socioeconomic Impacts of Projected Water Shortages  
for the Region N Regional Water Planning Area**

**Prepared in Support of the 2016 Region N Regional Water Plan**



Dr. John R. Ellis  
Water Use Projections & Planning Division  
Texas Water Development Board

Yun Cho, Team Lead  
Water Use Projections & Planning Division  
Texas Water Development Board

Kevin Kluge, Manager  
Water Use Projections & Planning Division  
Texas Water Development Board

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## **Executive Summary**

Evaluating the social and economic impacts of not meeting identified water needs is a required part of the regional water planning process. The Texas Water Development Board (TWDB) estimates those impacts for regional water planning groups, and summarizes the impacts in the state water plan. The analysis presented is for the Region N Regional Water Planning Group.

Based on projected water demands and existing water supplies, the Region N planning group identified water needs (potential shortages) that would occur within its region under a repeat of the drought of record for six water use categories. The TWDB then estimated the socioeconomic impacts of those needs—if they are not met—for each water use category and as an aggregate for the region.

The analysis was performed using an economic modeling software package, IMPLAN (Impact for Planning Analysis), as well as other economic analysis techniques, and represents a snapshot of socioeconomic impacts that may occur during a single year during a drought of record within each of the planning decades. For each water use category, the evaluation focused on estimating income losses and job losses. The income losses represent an approximation of gross domestic product (GDP) that would be foregone if water needs are not met.

The analysis also provides estimates of financial transfer impacts, which include tax losses (state, local, and utility tax collections); water trucking costs; and utility revenue losses. In addition, social impacts were estimated, encompassing lost consumer surplus (a welfare economics measure of consumer wellbeing); as well as population and school enrollment losses.

It is estimated that not meeting the identified water needs in Region N would result in an annually combined lost income impact of approximately \$4.5 billion in 2020, decreasing to \$1.7 billion in 2070 (Table ES-1). In 2020, the region would lose approximately 24,000 jobs, and by 2070 job losses would decrease to approximately 8,400.

All impact estimates are in year 2013 dollars and were calculated using a variety of data sources and tools including the use of a region-specific IMPLAN model, data from the TWDB annual water use estimates, the U.S. Census Bureau, Texas Agricultural Statistics Service, and Texas Municipal League.



**Table ES-1: Region N Socioeconomic Impact Summary**

<b>Regional Economic Impacts</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>Income losses (\$ millions)*</b>	\$4,492	\$5,451	\$5,487	\$1,790	\$872	\$1,715
<b>Job losses</b>	24,228	29,394	29,595	9,758	4,635	8,412
<b>Financial Transfer Impacts</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>Tax losses on production and imports (\$ millions)*</b>	\$649	\$782	\$779	\$233	\$71	\$117
<b>Water trucking costs (\$ millions)*</b>	-	-	-	-	-	-
<b>Utility revenue losses (\$ millions)*</b>	\$4	\$4	\$4	\$4	\$4	\$4
<b>Utility tax revenue losses (\$ millions)*</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>Social Impacts</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>Consumer surplus losses (\$ millions)*</b>	\$1	\$1	\$1	\$1	\$1	\$1
<b>Population losses</b>	4,448	5,397	5,433	1,791	851	1,544
<b>School enrollment losses</b>	823	998	1,005	331	157	286

*\* Year 2013 dollars, rounded. Entries denoted by a dash (-) indicate no economic impact. Entries denoted by a zero (\$0) indicate income losses less than \$500,000.*

# 1 Introduction

Water shortages during a repeat of the drought of record would likely curtail or eliminate certain economic activity in businesses and industries that rely heavily on water. Insufficient water supplies could not only have an immediate and real impact on existing businesses and industry, but they could also adversely and chronically affect economic development in Texas. From a social perspective, water supply reliability is critical as well. Shortages could disrupt activity in homes, schools and government and could adversely affect public health and safety. For these reasons, it is important to evaluate and understand how water supply shortages during drought could impact communities throughout the state.

Administrative rules (31 Texas Administrative Code §357.33 (c)) require that regional water planning groups evaluate the social and economic impacts of not meeting water needs as part of the regional water planning process, and rules direct the TWDB staff to provide technical assistance upon request. Staff of the TWDB's Water Use, Projections, & Planning Division designed and conducted this analysis in support of the Region N Regional Water Planning Group.

This document summarizes the results of the analysis and discusses the methodology used to generate the results. Section 1 summarizes the water needs calculation performed by the TWDB based on the regional water planning group's data. Section 2 describes the methodology for the impact assessment and discusses approaches and assumptions specific to each water use category (i.e., irrigation, livestock, mining, steam-electric, municipal and manufacturing). Section 3 presents the results for each water use category with results summarized for the region as a whole. Appendix A presents details on the socioeconomic impacts by county.

## 1.1 Identified Regional Water Needs (Potential Shortages)

As part of the regional water planning process, the TWDB adopted water demand projections for each water user group (WUG) with input from the planning groups. WUGs are composed of cities, utilities, combined rural areas (designated as county-other), and the county-wide water use of irrigation, livestock, manufacturing, mining and steam-electric power. The demands are then compared to the existing water supplies of each WUG to determine potential shortages, or needs, by decade. Existing water supplies are legally and physically accessible for immediate use in the event of drought. Projected water demands and existing supplies are compared to identify either a surplus or a need for each WUG.

Table 1-1 summarizes the region's identified water needs in the event of a repeat of drought of the record. Demand management, such as conservation, or the development of new infrastructure to increase supplies are water management strategies that may be recommended by the planning group to meet those needs. This analysis assumes that no strategies are implemented, and that the identified needs correspond to future water shortages. Note that projected water needs generally increase over time, primarily due to anticipated population and economic growth. To provide a general sense of proportion, total projected needs as an overall percentage of total demand by water use category are presented in aggregate in Table 1-1. Projected needs for individual water user groups within the aggregate vary greatly, and may reach 100% for a given WUG and water use category. Detailed water needs by WUG and county appear in Chapter 4 of the 2016 Region N Regional Water Plan.

**Table 1-1 Regional Water Needs Summary by Water Use Category**

Water Use Category		2020	2030	2040	2050	2060	2070
<b>Irrigation</b>	Water Needs (acre-feet per year)	40	42	44	545	2,112	4,242
	% of the category's total water demand	<0.5%	<0.5%	<0.5%	2%	6%	11%
<b>Livestock</b>	Water Needs (acre-feet per year)	-	-	-	-	-	-
	% of the category's total water demand	-	-	-	-	-	-
<b>Manufacturing</b>	Water Needs (acre-feet per year)	6,451	8,804	11,126	15,077	26,735	38,132
	% of the category's total water demand	7%	9%	11%	14%	23%	30%
<b>Mining</b>	Water Needs (acre-feet per year)	2,733	3,269	3,219	1,087	315	-
	% of the category's total water demand	31%	33%	33%	15%	5%	0%
<b>Municipal</b>	Water Needs (acre-feet per year)	1,583	1,575	1,567	1,607	1,646	1,683
	% of the category's total water demand	1%	1%	1%	1%	1%	1%
<b>Steam-electric power</b>	Water Needs (acre-feet per year)	-	-	-	-	2,846	6,893
	% of the category's total water demand	-	-	-	-	10%	20%
<b>Total water needs (acre-feet per year)</b>		<b>10,807</b>	<b>13,690</b>	<b>15,956</b>	<b>18,316</b>	<b>33,654</b>	<b>50,950</b>

## 2 Economic Impact Assessment Methodology Summary

This portion of the report provides a summary of the methodology used to estimate the potential economic impacts of future water shortages. The general approach employed in the analysis was to obtain estimates for income and job losses on the smallest geographic level that the available data would support, tie those values to their accompanying historic water use estimate (volume), and thereby determine a maximum impact per acre-foot of shortage for each of the socioeconomic measures. The calculations of economic impacts were based on the overall composition of the economy using many underlying economic “sectors.” Sectors in this analysis refer to one or more of the 440 specific production sectors of the economy designated within IMPLAN (Impact for Planning Analysis), the economic impact modeling software used for this assessment. Economic impacts within this report are

estimated for approximately 310 of those sectors, with the focus on the more water intense production sectors. The economic impacts for a single water use category consist of an aggregation of impacts to multiple related economic sectors.

## 2.1 Impact Assessment Measures

A required component of the regional and state water plans is to estimate the potential economic impacts of shortages due to a drought of record. Consistent with previous water plans, several key variables were estimated and are described in Table 2-1.

**Table 2-1 Socioeconomic Impact Analysis Measures**

<b>Regional Economic Impacts</b>	<b>Description</b>
<b>Income losses - value added</b>	The value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry, sector, or group of sectors within a year. For a shortage, value added is a measure of the income losses to the region, county, or WUG and includes the direct, indirect and induced monetary impacts on the region.
<b>Income losses - electrical power purchase costs</b>	Proxy for income loss in the form of additional costs of power as a result of impacts of water shortages.
<b>Job losses</b>	Number of part-time and full-time jobs lost due to the shortage.
<b>Financial Transfer Impacts</b>	<b>Description</b>
<b>Tax losses on production and imports</b>	Sales and excise taxes (not collected due to the shortage), customs duties, property taxes, motor vehicle licenses, severance taxes, other taxes, and special assessments less subsidies.
<b>Water trucking costs</b>	Estimate for shipping potable water.
<b>Utility revenue losses</b>	Foregone utility income due to not selling as much water.
<b>Utility tax revenue losses</b>	Foregone miscellaneous gross receipts tax collections.
<b>Social Impacts</b>	<b>Description</b>
<b>Consumer surplus losses</b>	A welfare measure of the lost value to consumers accompanying less water use.
<b>Population losses</b>	Population losses accompanying job losses.
<b>School enrollment losses</b>	School enrollment losses (K-12) accompanying job losses.

### **2.1.1 Regional Economic Impacts**

Two key measures were included within the regional economic impacts classification: income losses and job losses. Income losses presented consist of the sum of value added losses and additional purchase costs of electrical power. Job losses are also presented as a primary economic impact measure.

#### ***Income Losses - Value Added Losses***

Value added is the value of total output less the value of the intermediate inputs also used in production of the final product. Value added is similar to Gross Domestic Product (GDP), a familiar measure of the productivity of an economy. The loss of value added due to water shortages was estimated by input-output analysis using the IMPLAN software package, and includes the direct, indirect, and induced monetary impacts on the region.

#### ***Income Losses - Electric Power Purchase Costs***

The electrical power grid and market within the state is a complex interconnected system. The industry response to water shortages, and the resulting impact on the region, are not easily modeled using traditional input/output impact analysis and the IMPLAN model. Adverse impacts on the region will occur, and were represented in this analysis by the additional costs associated with power purchases from other generating plants within the region or state. Consequently, the analysis employed additional power purchase costs as a proxy for the value added impacts for that water use category, and these are included as a portion of the overall income impact for completeness.

For the purpose of this analysis, it was assumed that power companies with insufficient water will be forced to purchase power on the electrical market at a projected higher rate of 5.60 cents per kilowatt hour. This rate is based upon the average day-ahead market purchase price of electricity in Texas from the recent drought period in 2011.

#### ***Job Losses***

The number of jobs lost due to the economic impact was estimated using IMPLAN output associated with the water use categories noted in Table 1-1. Because of the difficulty in predicting outcomes and a lack of relevant data, job loss estimates were not calculated for the steam-electric power production or for certain municipal water use categories.

### **2.1.2 Financial Transfer Impacts**

Several of the impact measures estimated within the analysis are presented as supplemental information, providing additional detail concerning potential impacts on a sub-portion of the economy or government. Measures included in this category include lost tax collections (on production and imports), trucking costs for imported water, declines in utility revenues, and declines in utility tax revenue collected by the state. Many of these measures are not solely adverse, with some having both positive and negative impacts. For example, cities and residents would suffer if forced to pay large costs for trucking in potable water. Trucking firms, conversely, would benefit from the transaction. Additional detail for each of these measures follows.

### ***Tax Losses on Production and Imports***

Reduced production of goods and services accompanying water shortages adversely impacts the collection of taxes by state and local government. The regional IMPLAN model was used to estimate reduced tax collections associated with the reduced output in the economy.

### ***Water Trucking Costs***

In instances where water shortages for a municipal water user group were estimated to be 80 percent or more of water demands, it was assumed that water would be trucked in to support basic consumption and sanitation needs. For water shortages of 80 percent or greater, a fixed cost of \$20,000 per acre-foot of water was calculated and presented as an economic cost. This water trucking cost was applied for both the residential and non-residential portions of municipal water needs and only impacted a small number of WUGs statewide.

### ***Utility Revenue Losses***

Lost utility income was calculated as the price of water service multiplied by the quantity of water not sold during a drought shortage. Such estimates resulted from city-specific pricing data for both water and wastewater. These water rates were applied to the potential water shortage to determine estimates of lost utility revenue as water providers sold less water during the drought due to restricted supplies.

### ***Utility Tax Losses***

Foregone utility tax losses included estimates of uncollected miscellaneous gross receipts taxes. Reduced water sales reduce the amount of utility tax that would be collected by the State of Texas for water and wastewater service sales.

## **2.1.3 Social Impacts**

### ***Consumer Surplus Losses of Municipal Water Users***

Consumer surplus loss is a measure of impact to the wellbeing of municipal water users when their water use is restricted. Consumer surplus is the difference between how much a consumer is willing and able to pay for the commodity (i.e., water) and how much they actually have to pay. The difference is a benefit to the consumer's wellbeing since they do not have to pay as much for the commodity as they would be willing to pay. However, consumer's access to that water may be limited, and the associated consumer surplus loss is an estimate of the equivalent monetary value of the negative impact to the consumer's wellbeing, for example, associated with a diminished quality of their landscape (i.e., outdoor use). Lost consumer surplus estimates for reduced outdoor and indoor use, as well as residential and commercial/institutional demands, were included in this analysis. Consumer surplus is an attempt to measure effects on wellbeing by monetizing those effects; therefore, these values should not be added to the other monetary impacts estimated in the analysis.

Lost consumer surplus estimates varied widely by location and type. For a 50 percent shortage, the estimated statewide consumer surplus values ranged from \$55 to \$2,500 per household (residential use), and from \$270 to \$17,400 per firm (non-residential).

### ***Population and School Enrollment Losses***

Population losses due to water shortages, as well as the related loss of school enrollment, were based upon the job loss estimates and upon a recent study of job layoffs and the resulting adjustment of the labor market, including the change in population.<sup>1</sup> The study utilized Bureau of Labor Statistics data regarding layoffs between 1996 and 2013, as well as Internal Revenue Service data regarding migration, to model an estimate of the change in the population as the result of a job layoff event. Layoffs impact both out-migration, as well as in-migration into an area, both of which can negatively affect the population of an area. In addition, the study found that a majority of those who did move following a layoff moved to another labor market rather than an adjacent county. Based on this study, a simplified ratio of job and net population losses was calculated for the state as a whole: for every 100 jobs lost, 18 people were assumed to move out of the area. School enrollment losses were estimated as a proportion of the population lost.

## **2.2 Analysis Context**

The context of the economic impact analysis involves situations where there are physical shortages of surface or groundwater due to drought of record conditions. Anticipated shortages may be nonexistent in earlier decades of the planning horizon, yet population growth or greater industrial, agricultural or other sector demands in later decades may result in greater overall demand, exceeding the existing supplies. Estimated socioeconomic impacts measure what would happen if water user groups experience water shortages for a period of one year. Actual socioeconomic impacts would likely become larger as drought of record conditions persist for periods greater than a single year.

### **2.2.1 IMPLAN Model and Data**

Input-Output analysis using the IMPLAN (Impact for Planning Analysis) software package was the primary means of estimating value added, jobs, and taxes. This analysis employed county and regional level models to determine key impacts. IMPLAN is an economic impact model, originally developed by the U.S. Forestry Service in the 1970's to model economic activity at varying geographic levels. The model is currently maintained by the Minnesota IMPLAN Group (MIG Inc.) which collects and sells county and state specific data and software. The year 2011 version of IMPLAN, employing data for all 254 Texas counties, was used to provide estimates of value added, jobs, and taxes on production for the economic sectors associated with the water user groups examined in the study. IMPLAN uses 440 sector-specific Industry Codes, and those that rely on water as a primary input were assigned to their relevant planning water user categories (manufacturing, mining, irrigation, etc.). Estimates of value added for a water use category were obtained by summing value added estimates across the relevant IMPLAN sectors

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<sup>1</sup> Foote, Andrew, Grosz, Michel, Stevens, Ann. "Locate Your Nearest Exit: Mass Layoffs and Local Labor Market Response." University of California, Davis. April 2015. <http://paa2015.princeton.edu/uploads/150194>

associated with that water use category. Similar calculations were performed for the job and tax losses on production and import impact estimates.

Note that the value added estimates, as well as the job and tax estimates from IMPLAN, include three components:

- *Direct effects* representing the initial change in the industry analyzed;
- *Indirect effects* that are changes in inter-industry transactions as supplying industries respond to reduced demands from the directly affected industries; and,
- *Induced effects* that reflect changes in local spending that result from reduced household income among employees in the directly and indirectly affected industry sectors.

### **2.2.2 Elasticity of Economic Impacts**

The economic impact of a water need is based on the relative size of the water need to the water demand for each water user group (Figure 2-1). Smaller water shortages, for example, less than 5 percent, were anticipated to result in no initial negative economic impact because water users are assumed to have a certain amount of flexibility in dealing with small shortages. As a water shortage deepens, however, such flexibility lessens and results in actual and increasing economic losses, eventually reaching a representative maximum impact estimate per unit volume of water. To account for such ability to adjust, an elasticity adjustment function was used in estimating impacts for several of the measures. Figure 2-1 illustrates the general relationship for the adjustment functions. Negative impacts are assumed to begin accruing when the shortage percentage reaches the lower bound b1 (10 percent in Figure 2-1), with impacts then increasing linearly up to the 100 percent impact level (per unit volume) once the upper bound for adjustment reaches the b2 level shortage (50 percent in Figure 2-1 example).

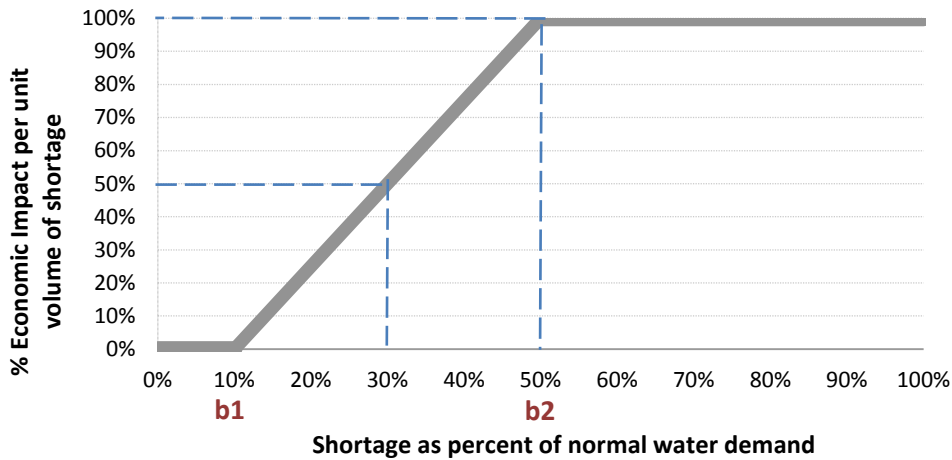
Initially, the combined total value of the three value added components (direct, indirect, and induced) was calculated and then converted into a per acre-foot economic value based on historical TWDB water use estimates within each particular water use category. As an example, if the total, annual value added for livestock in the region was \$2 million and the reported annual volume of water used in that industry was 10,000 acre-feet, the estimated economic value per acre-foot of water shortage would be \$200 per acre-foot. Negative economic impacts of shortages were then estimated using this value as the maximum impact estimate (\$200 per acre-foot in the example) applied to the anticipated shortage volume in acre-feet and adjusted by the economic impact elasticity function. This adjustment varied with the severity as percentage of water demand of the anticipated shortage. If one employed the sample elasticity function shown in Figure 2-1, a 30% shortage in the water use category would imply an economic impact estimate of 50% of the original \$200 per acre-foot impact value (i.e., \$100 per acre-foot).

Such adjustments were not required in estimating consumer surplus, nor for the estimates of utility revenue losses or utility tax losses. Estimates of lost consumer surplus relied on city-specific demand curves with the specific lost consumer surplus estimate calculated based on the relative percentage of the city's water shortage. Estimated changes in population as well as changes in school enrollment were indirectly related to the elasticity of job losses.

Assumed values for the bounds b1 and b2 varied with water use category under examination and are presented in Table 2-2.



**Figure 2-1 Example Economic Impact Elasticity Function (as applied to a single water user’s shortage)**



**Table 2-2 Economic Impact Elasticity Function Lower and Upper Bounds**

Water Use Category	Lower Bound (b1)	Upper Bound (b2)
Irrigation	5%	50%
Livestock	5%	10%
Manufacturing	10%	50%
Mining	10%	50%
Municipal (non-residential water intensive)	50%	80%
Steam-electric power	20%	70%

### 2.3 Analysis Assumptions and Limitations

Modeling of complex systems requires making assumptions and accepting limitations. This is particularly true when attempting to estimate a wide variety of economic impacts over a large geographic area and into future decades. Some of the key assumptions and limitations of the methodology include:

1. The foundation for estimating socioeconomic impacts of water shortages resulting from a drought are the water needs (potential shortages) that were identified as part of the regional water planning process. These needs have some uncertainty associated with them, but serve as a reasonable basis for evaluating potential economic impacts of a drought of record event.

2. All estimated socioeconomic impacts are snapshot estimates of impacts for years in which water needs were identified (i.e., 2020, 2030, 2040, 2050, 2060, and 2070). The estimates are independent and distinct “what if” scenarios for each particular year, and water shortages are assumed to be temporary events resulting from severe drought conditions. The evaluation assumed that no recommended water management strategies are implemented. In other words, growth occurs, future shocks are imposed on an economy at 10-year intervals, and the resulting impacts are estimated. Note that the estimates presented were not cumulative (i.e., summing up expected impacts from today up to the decade noted), but were simply an estimate of the magnitude of annual socioeconomic impacts should a drought of record occur in each particular decade based on anticipated supplies and demands for that same decade.
3. Input-output models such as IMPLAN rely on a static profile of the structure of the economy as it appears today. This presumes that the relative contributions of all sectors of the economy would remain the same, regardless of changes in technology, supplies of limited resources, and other structural changes to the economy that may occur into the future. This was a significant assumption and simplification considering the 50-year time period examined in this analysis. To presume an alternative future economic makeup, however, would entail positing many other major assumptions that would very likely generate as much or more error.
4. This analysis is not a cost-benefit analysis. That approach to evaluating the economic feasibility of a specific policy or project employs discounting future benefits and costs to their present value dollars using some assumed discount rate. The methodology employed in this effort to estimate the economic impacts of future water shortages did not use any discounting procedures to weigh future costs differently through time.
5. Monetary figures are reported in constant year 2013 dollars.
6. Impacts are annual estimates. The estimated economic model does not reflect the full extent of impacts that might occur as a result of persistent water shortages occurring over an extended duration. The drought of record in most regions of Texas lasted several years.
7. Value added estimates are the primary estimate of the economic impacts within this report. One may be tempted to add consumer surplus impacts to obtain an estimate of total adverse economic impacts to the region, but the consumer surplus measure represents the change to the wellbeing of households (and other water users), not an actual change in the flow of dollars through the economy. The two categories (value added and consumer surplus) are both valid impacts but should not be summed.
8. The value added, jobs, and taxes on production and import impacts include the direct, indirect and induced effects described in Section 2.2.1. Population and school enrollment losses also indirectly include such effects as they are based on the associated losses in employment. The remaining measures (consumer surplus, utility revenue, utility taxes, additional electrical power purchase costs, and potable water trucking costs), however, do not include any induced or indirect effects.

9. The majority of impacts estimated in this analysis may be considered smaller than those that might occur under drought of record conditions. Input-output models such as IMPLAN only capture “backward linkages” on suppliers (including households that supply labor to directly affected industries). While this is a common limitation in these types of economic impact modeling efforts, it is important to note that “forward linkages” on the industries that use the outputs of the directly affected industries can also be very important. A good example is impacts on livestock operators. Livestock producers tend to suffer substantially during droughts, not because there is not enough water for their stock, but because reductions in available pasture and higher prices for purchased hay have significant economic effects on their operations. Food processors could be in a similar situation if they cannot get the grains or other inputs that they need. These effects are not captured in IMPLAN, which is one reason why the impact estimates are likely conservative.
10. The methodology did not capture “spillover” effects between regions – or the secondary impacts that occur outside of the region where the water shortage is projected to occur.
11. The model did not reflect dynamic economic responses to water shortages as they might occur, nor does the model reflect economic impacts associated with a recovery from a drought of record including:
  - a. The likely significant economic rebound to the landscaping industry immediately following a drought;
  - b. The cost and years to rebuild liquidated livestock herds (a major capital item in that industry);
  - c. Direct impacts on recreational sectors (i.e., stranded docks and reduced tourism); or,
  - d. Impacts of negative publicity on Texas’ ability to attract population and business in the event that it was not able to provide adequate water supplies for the existing economy.
12. Estimates for job losses and the associated population and school enrollment changes may exceed what would actually occur. In practice, firms may be hesitant to lay off employees, even in difficult economic times. Estimates of population and school enrollment changes are based on regional evaluations and therefore do not accurately reflect what might occur on a statewide basis.
13. The results must be interpreted carefully. It is the general and relative magnitudes of impacts as well as the changes of these impacts over time that should be the focus rather than the absolute numbers. Analyses of this type are much better at predicting relative percent differences brought about by a shock to a complex system (i.e., a water shortage) than the precise size of an impact. To illustrate, assuming that the estimated economic impacts of a drought of record on the manufacturing and mining water user categories are \$2 and \$1 million, respectively, one should be more confident that the economic impacts on manufacturing are twice as large as those on mining and that these impacts will likely be in the millions of dollars. But one should have less confidence that the actual total economic impact experienced would be \$3 million.

### 3 Analysis Results

This section presents a breakdown of the results of the regional analysis for Region N. Projected economic impacts for six water use categories (irrigation, livestock, municipal, manufacturing, mining, and steam-electric power) are also reported by decade.

#### 3.1 Overview of the Regional Economy

Table 3-1 presents the 2011 economic baseline as represented by the IMPLAN model and adjusted to 2013 dollars for Region N. In year 2011, Region N generated about \$31.7 billion in gross state product associated with 302,400 jobs based on the 2011 IMPLAN data. These values represent an approximation of the current regional economy for a reference point.

**Table 3-1 Region N Economy**

<b>Income (\$ millions)*</b>	<b>Jobs</b>	<b>Taxes on production and imports (\$ millions)*</b>
<b>\$31,703</b>	<b>302,438</b>	<b>\$2,429</b>

*<sup>1</sup>Year 2013 dollars based on 2011 IMPLAN model value added estimates for the region.*

The remainder of Section 3 presents estimates of potential economic impacts for each water use category that could reasonably be expected in the event of water shortages associated with a drought of record and if no recommended water management strategies were implemented.

#### 3.2 Impacts for Irrigation Water Shortages

Two of the 11 counties in the region are projected to experience water shortages in the irrigated agriculture water use category for one or more decades within the planning horizon. Estimated impacts to this water use category appear in Table 3-2. Note that tax collection impacts were not estimated for this water use category. IMPLAN data indicates a negative tax impact (i.e., increased tax collections) for the associated production sectors, primarily due to past subsidies from the federal government. Two factors led to excluding any reported tax impacts: 1) Federal support (subsidies) has lessened greatly since the year 2011 IMPLAN data was collected, and 2) It was not considered realistic to report increasing tax revenue collections for a drought of record.

**Table 3-2 Impacts of Water Shortages on Irrigation in Region**

Impact Measure	2020	2030	2040	2050	2060	2070
Income losses (\$ millions)*	\$0	\$0	\$0	\$0	\$0	\$1
Job losses	1	1	1	1	8	36

\* Year 2013 dollars, rounded. Entries denoted by a dash (-) indicate no economic impact. Entries denoted by a zero (\$0) indicate income losses less than \$500,000.

### 3.3 Impacts for Livestock Water Shortages

None of the 11 counties in the region are projected to experience water shortages in the livestock water use category for one or more decades within the planning horizon. Estimated impacts to this water use category appear in Table 3-3. Note that tax impacts are not reported for this water use category for similar reasons that apply to the irrigation water use category described above.

**Table 3-3 Impacts of Water Shortages on Livestock in Region**

Impact Measures	2020	2030	2040	2050	2060	2070
Income losses (\$ millions)*	-	-	-	-	-	-
Jobs losses	-	-	-	-	-	-

\* Year 2013 dollars, rounded. Entries denoted by a dash (-) indicate no economic impact. Entries denoted by a zero (\$0) indicate income losses less than \$500,000

### 3.4 Impacts for Municipal Water Shortages

Three of the 11 counties in the region are projected to experience water shortages in the municipal water use category for one or more decades within the planning horizon. Impact estimates were made for the two subtypes of use within municipal use: residential, and non-residential. The latter includes commercial and institutional users. Consumer surplus measures were made for both residential and non-residential demands. In addition, available data for the non-residential, water-intensive portion of municipal demand allowed use of IMPLAN and TWDB Water Use Survey data to estimate income loss, jobs, and taxes. Trucking cost estimates, calculated for shortages exceeding 80 percent, assumed a fixed cost of \$20,000 per acre-foot to transport water for municipal use. The estimated impacts to this water use category appear in Table 3-4.

**Table 3-4 Impacts of Water Shortages on Municipal Water Users in Region**

<b>Impact Measures</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>Income losses<sup>1</sup> (\$ millions)*</b>	\$6	\$6	\$5	\$5	\$6	\$6
<b>Job losses<sup>1</sup></b>	120	112	99	104	113	121
<b>Tax losses on production and imports<sup>1</sup> (\$ millions)*</b>	\$1	\$1	\$0	\$0	\$1	\$1
<b>Consumer surplus losses (\$ millions)*</b>	\$1	\$1	\$1	\$1	\$1	\$1
<b>Trucking costs (\$ millions)*</b>	-	-	-	-	-	-
<b>Utility revenue losses (\$ millions)*</b>	\$4	\$4	\$4	\$4	\$4	\$4
<b>Utility tax revenue losses (\$ millions)*</b>	\$0	\$0	\$0	\$0	\$0	\$0

<sup>1</sup> Estimates apply to the water-intensive portion of non-residential municipal water use.

\* Year 2013 dollars, rounded. Entries denoted by a dash (-) indicate no economic impact. Entries denoted by a zero (\$0) indicate income losses less than \$500,000.

### 3.5 Impacts of Manufacturing Water Shortages

Manufacturing water shortages in the region are projected to occur in 2 of the 11 counties in the region for at least one decade of the planning horizon. Estimated impacts to this water use category appear in Table 3-5.

**Table 3-5 Impacts of Water Shortages on Manufacturing in Region**

<b>Impacts Measures</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>Income losses (\$ millions)*</b>	\$74	\$169	\$286	\$405	\$776	\$1,708
<b>Job losses</b>	410	935	1,583	2,241	4,034	8,256
<b>Tax losses on production and Imports (\$ millions)*</b>	\$6	\$13	\$23	\$32	\$57	\$117

\* Year 2013 dollars, rounded. Entries denoted by a dash (-) indicate no economic impact. Entries denoted by a zero (\$0) indicate income losses less than \$500,000.

### 3.6 Impacts of Mining Water Shortages

Mining water shortages in the region are projected to occur in 1 of the 11 counties in the region for at least one decade of the planning horizon. Estimated impacts to this water use type appear in Table 3-6.

**Table 3-6 Impacts of Water Shortages on Mining in Region**

Impact Measures	2020	2030	2040	2050	2060	2070
<b>Income losses (\$ millions)*</b>	\$4,411	\$5,276	\$5,196	\$1,380	\$89	-
<b>Job losses</b>	23,698	28,345	27,912	7,412	480	-
<b>Tax losses on production and Imports (\$ millions)*</b>	\$642	\$768	\$756	\$201	\$13	-

*\* Year 2013 dollars, rounded. Entries denoted by a dash (-) indicate no economic impact. Entries denoted by a zero (\$0) indicate income losses less than \$500,000.*

### 3.7 Impacts of Steam-Electric Water Shortages

Steam-electric water shortages in the region are projected to occur in 1 of the 11 counties in the region for at least one decade of the planning horizon. Estimated impacts to this water use category appear in Table 3-7.

Note that estimated economic impacts to steam-electric water users:

- Are reflected as an income loss proxy in the form of the estimated additional purchasing costs for power from the electrical grid that could not be generated due to a shortage;
- Do not include estimates of impacts on jobs. Because of the unique conditions of power generators during drought conditions and lack of relevant data, it was assumed that the industry would retain, perhaps relocating or repurposing, their existing staff in order to manage their ongoing operations through a severe drought.
- Does not presume a decline in tax collections. Associated tax collections, in fact, would likely increase under drought conditions since, historically, the demand for electricity increases during times of drought, thereby increasing taxes collected on the additional sales of power.

**Table 3-7 Impacts of Water Shortages on Steam-Electric Power in Region**

Impact Measures	2020	2030	2040	2050	2060	2070
<b>Income Losses (\$ millions)*</b>	-	-	-	-	-	-

*\* Year 2013 dollars, rounded. Entries denoted by a dash (-) indicate no economic impact. Entries denoted by a zero (\$0) indicate income losses less than \$500,000.*

### 3.8 Regional Social Impacts

Projected changes in population, based upon several factors (household size, population, and job loss estimates), as well as the accompanying change in school enrollment, were also estimated and are summarized in Table 3-8.

**Table 3-8 Region-wide Social Impacts of Water Shortages in Region**

<b>Impact Measures</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
<b>Consumer surplus losses (\$ millions)*</b>	\$1	\$1	\$1	\$1	\$1	\$1
<b>Population losses</b>	4,448	5,397	5,433	1,791	851	1,544
<b>School enrollment losses</b>	823	998	1,005	331	157	286

*\* Year 2013 dollars, rounded. Entries denoted by a dash (-) indicate no economic impact. Entries denoted by a zero (\$0) indicate income losses less than \$500,000.*



## Appendix A - County Level Summary of Estimated Economic Impacts for Region N

County level summary of estimated economic impacts of not meeting identified water needs by water use category and decade (in 2013 dollars, rounded). Values presented only for counties with projected economic impacts for at least one decade.

\* Entries denoted by a dash (-) indicate no economic impact. Entries denoted by a zero (\$0) indicate income losses less than \$500,000

County	Water Use Category	Income losses (Million \$)*						Job losses						Consumer Surplus (Million \$)*						
		2020	2030	2040	2050	2060	2070	2020	2030	2040	2050	2060	2070	2020	2030	2040	2050	2060	2070	
DUVAL	MUNICIPAL	-	-	-	-	-	-	-	-	-	-	-	-	-	\$0	\$0	\$0	\$0	\$0	\$0
<b>DUVAL Total</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
JIM WELLS	MUNICIPAL	-	-	-	-	-	-	-	-	-	-	-	-	-	\$0	\$0	\$0	\$0	\$0	\$0
<b>JIM WELLS Total</b>		-	-	-	-	-	-	-	-	-	-	-	-	-	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
MCMULLEN	IRRIGATION	\$0	\$0	\$0	\$0	\$0	\$0	-	-	-	-	-	-	-	-	-	-	-	-	-
MCMULLEN	MINING	\$4,411	\$5,276	\$5,196	\$1,380	\$89	-	23,698	28,345	27,912	7,412	480	-	-	-	-	-	-	-	-
<b>MCMULLEN Total</b>		<b>\$4,411</b>	<b>\$5,276</b>	<b>\$5,196</b>	<b>\$1,380</b>	<b>\$89</b>	-	<b>23,699</b>	<b>28,346</b>	<b>27,913</b>	<b>7,413</b>	<b>481</b>	-	-	-	-	-	-	-	-
NUECES	MANUFACTURING	-	-	-	-	\$204	\$940	-	-	-	-	871	4,006	-	-	-	-	-	-	-
NUECES	MUNICIPAL	\$6	\$6	\$5	\$5	\$6	\$6	120	112	99	104	113	121	\$1	\$1	\$1	\$1	\$1	\$1	\$1
<b>NUECES Total</b>		<b>\$6</b>	<b>\$6</b>	<b>\$5</b>	<b>\$5</b>	<b>\$210</b>	<b>\$946</b>	<b>120</b>	<b>112</b>	<b>99</b>	<b>104</b>	<b>983</b>	<b>4,127</b>	<b>\$1</b>	<b>\$1</b>	<b>\$1</b>	<b>\$1</b>	<b>\$1</b>	<b>\$1</b>	<b>\$1</b>
SAN PATRICIO	IRRIGATION	-	-	-	-	\$0	\$1	-	-	-	-	7	35	-	-	-	-	-	-	-
SAN PATRICIO	MANUFACTURING	\$74	\$169	\$286	\$405	\$572	\$768	410	935	1,583	2,241	3,163	4,249	-	-	-	-	-	-	-
<b>SAN PATRICIO Total</b>		<b>\$74</b>	<b>\$169</b>	<b>\$286</b>	<b>\$405</b>	<b>\$572</b>	<b>\$770</b>	<b>410</b>	<b>935</b>	<b>1,583</b>	<b>2,241</b>	<b>3,171</b>	<b>4,284</b>	-	-	-	-	-	-	-
<b>Regional Total</b>		<b>\$4,492</b>	<b>\$5,451</b>	<b>\$5,487</b>	<b>\$1,790</b>	<b>\$872</b>	<b>\$1,715</b>	<b>24,228</b>	<b>29,394</b>	<b>29,595</b>	<b>9,758</b>	<b>4,635</b>	<b>8,412</b>	<b>\$1</b>	<b>\$1</b>	<b>\$1</b>	<b>\$1</b>	<b>\$1</b>	<b>\$1</b>	<b>\$1</b>

## Appendix 3

### Comments Received on the Initially Prepared Regional Water Plan and Responses to Comments Received

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## Proposed Responses to Comments Received

### for the 2016 Coastal Bend Initially Prepared Plan (Draft Region N Water Plan)

June 11, 2015 – Public meeting at Johnny Calderon County Building, Robstown

1. Question if an individual's request to the Groundwater Management area to pump 20,000 AF in the Sinton area with the intent to supply it to industry was reflected in the plan.  
**Response** – No, not directly. A groundwater project north of Sinton was evaluated in the plan (Section 5D.7.2), but would need a Modeled Available Groundwater adjustment to be a recommended water management strategy.
2. Question as to the entity referred to for the local storage balance water management strategy to firm up their water rights.  
**Response** – Nueces County Water Control and Improvement District #3 / Robstown.
3. Question if the dredging of Lake Corpus Christi has been considered as a water management strategy.  
**Response** – Evaluated in 2001, summarized in Chapter 11.
4. Consider adding meter replacement as a specific municipal water conservation strategy (Chapter 5D.1).  
**Response** – The following text will be added to Section 5D.1.2.3: “The accurate metering of consumed water encourages personal accountability, water conservation and equity in billing rates. Meter replacement programs can be an effective measure for reducing apparent loss, or water that has been consumed but not properly measured or billed. The 2010 Water Loss Survey reported an overall customer meter accuracy of 98% and apparent loss in the Coastal Bend of 1.9% based on responses from 26 entities. However, 10 of the 26 entities in the Coastal Bend that responded to the survey reported apparent losses greater than 5%. Based on this information, these utilities may want to consider meter replacement programs. The majority of meters used in residential systems are between 5/8 and 1-inch with +/- 1.5% accuracy and the cost averages about \$120 per meter<sup>1</sup>. Estimated costs for meter replacement program for entities reporting apparent losses greater than 5% is shown in Table 5D.1.8.

**Table 5D.1.8  
Summary of Estimated Meter Replacement Costs for Entities Reporting Apparent Losses Greater than 5%**

UtilityName	# of Retail Service Connections	System Input Volume (gallons)	Total Apparent Loss (gallons)	Apparent Loss (%)	Number of Meters to be Replaced Annually to Achieve 100% of replacement in 10 years	Annual Cost (\$120 per meter; 10 year program)	Total 10 Year Program Meter Replacement Cost	Amortized Annual Cost of 10-Year Program (\$)
CITY OF PORTLAND	7,544	666,548,000	51,329,240	8%	755	\$90,600	\$905,280	\$75,753
NUECES COUNTY WCID 3	4,250	494,360,000	38,945,580	8%	425	\$51,000	\$510,000	\$42,676
FALFURRIAS UTILITY BOARD	2,398	428,360,727	58,967,027	14%	240	\$28,800	\$287,760	\$24,080
CITY OF THREE RIVERS	1,052	692,444,444	90,723,094	13%	106	\$12,720	\$126,240	\$10,564
RICARDO WSC	877	82,575,000	8,352,695	10%	88	\$10,560	\$105,240	\$8,806
CITY OF ODEM	1,153	98,221,000	8,551,710	9%	116	\$13,920	\$138,360	\$11,578
CITY OF GREGORY	685	101,053,060	5,464,840	5%	69	\$8,280	\$82,200	\$6,878
CITY OF ORANGE GROVE	697	96,284,848	13,226,855	14%	70	\$8,400	\$83,640	\$6,999
BAFFIN BAY WSC	366	40,430,000	2,920,000	7%	37	\$4,440	\$43,920	\$3,675
NUECES COUNTY WCID 5	270	31,042,424	1,561,826	5%	27	\$3,240	\$32,400	\$2,711

<sup>1</sup> Seametrics MJN Pulse Water Meter ¾” \$116/each and Assured Automation inline, multi-jet ½” \$117/each, internet October 2015.

June 23, 2015 – Email to Kristi Shaw and Rocky Freund

1. Page 11: In Table ES.4, the CCR/LCC/Texana/MRP Phase 2 Existing Water Supply, it lists 211,540 acre-feet. What is the difference between this and the Total Source Water Availability higher in the table?

**Response** – Existing Water Supply considers physical, treatment, and legal constraints. Total Source Water Availability is the safe yield available not limited by infrastructure constraints.

2. Page 19: Item 5D.6 in the table is modifying the operating policy. There is “none” listed in every column. Why do we have it listed if there is no change in anything?

**Response** – Safe Yield is considered a water management strategy and drought management measure. It was placed in the table of WMS for wholesale water providers (1) because it affects existing supply and water needs and (2) the TWDB guidance for planning is based on firm yield unless variance is filed and approved (which is was). The safe yield reduces the planned supply (yield) from the LCC/CCR/Lake Texana/MRP Phase II system as compared to firm yield, to account for unprecedented severe drought conditions in the future or underestimation in regional growth. It leaves flexibility for wholesale water providers that may want to pursue funding to implement recommended WMS based on the more conservative needs estimate resulting from safe yield.

3. Page 1-3: In footnote #2, it discusses updates to the CC water supply model. Does this mean our water supply model has been updated with recent inflow data?

**Response** – No, the model has not been updated with recent inflow data for the Nueces system. We did import new inflow data files from the Colorado WAM (1940-2013) provided by TCEQ into the Corpus Christi model to estimate the amount of MRP Phase II water available during the drought of record in the Colorado Basin. The drought of record for the Colorado River was modeled to coincide with the drought of record for the Nueces Basin in the Corpus Christi Model (1990s). A more detailed discussion of this approach is on Pages 7-1 through 7-3.

4. Page 2-14: In table 2.7, the counties of Jim Wells, Kleberg, and McMullen have manufacturing water demand in 2010 but no other time. Why is that?

**Response** – The 2010 water use was compiled from self-reported TWDB water use survey data, which totaled 1,573 ac-ft/yr for Jim Wells, Kleberg, and McMullen counties combined. The TWDB-developed projections from 2020 through 2070 did not include any manufacturing demands in Jim Wells, Kleberg, or McMullen counties. The TWDB explained in an email sent June 29, 2015 that the manufacturing demands for these three counties may have been inadvertently omitted from future projections. Jim Wells didn't report any manufacturing water use in 2013. The following discussion will be added to Chapter 2: “Historical manufacturing water demands were reported for Jim Wells, Kleberg, and McMullen counties but not included in TWDB demand projections from 2020-2070. According to TWDB staff, mining and manufacturing demands are often considered interchangeably. No manufacturing water use was reported for Jim Wells County in 2013. In future water planning cycles, manufacturing water demands for Jim Wells, Kleberg, and McMullen counties should be revisited to avoid underestimating supplies that might be needed.”

For water supply plans for Jim Wells-Manufacturing (Chapter 5B.6.6), Kleberg-Manufacturing (Chapter 5B.8.4), and McMullen- Manufacturing (5B.10.2) the following sentence will be added: Although the TWDB projections do not show any future manufacturing water demands, historical water use data indicates that xx ac-ft was used by xx- County manufacturers in 2013. For future planning cycles, this potential demand should be revisited.”

5. Page 2-15: The reference in the footnote is 25 years old. Are there no other more recent references?

**Response** – Industrial representatives were contacted. At this time, the 1990 study is the best estimate for the Coastal Bend area that is publicly available.

6. Page 5D.1-5: The values for the City in the middle of the table have a superscript value that was not superscripted.

**Response** – Superscript will be removed as recommended.

June 26, 2015 – Discussion with Kristi Shaw and follow-up phone call with Rocky Freund

1. Add Portland Reuse project as recommended water management strategy for San Patricio County- Industries beginning in Year 2020

**Response** – This strategy was fully evaluated in the Initially Prepared Plan and will be added as a recommended strategies as requested to the Water Supply Plan for San Patricio Manufacturing (Section 5B.12.13)

September 25, 2015 – Response to Infrastructure Financing Survey Report and follow-up discussion with Kristi Shaw

1. Add Pipeline Replacement project (Municipal Water Conservation) as recommended water management strategy for City of Alice beginning in Year 2030

**Response** – This strategy was fully evaluated in the Initially Prepared Plan (Table 5D.1.7) and will be added as a recommended strategy as requested to the Water Supply Plan for the City of Alice (Section 5B.6.1).

The proposed responses below were reviewed by TWDB staff and confirmed to fully satisfy statutory, agency rule, and/or contract requirements (October 12, 2015)

<b>Level 1:      Comments and questions must be satisfactorily addressed in order to meet statutory, agency rule, and/or contract requirements.</b>
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1. Please clarify in the plan whether the regional water plan was developed in accordance with the public participation requirements of the Texas Open Meetings Act in the final, adopted regional water plan. [31 Texas Administrative Code (TAC) §357.21, §357.50(d)]

**Response** – The following text will be added to Section 10.1- Public Involvement Program: “The Coastal Bend Regional Water Planning Group conducted all business in meetings that were posted and held in accordance with Texas Open Meetings Act. The plan was developed in accordance with Texas Administrative Code public participation requirements.”

2. Please include a summary of the municipal demand savings due to plumbing fixture requirements (as previously provided by TWDB) in the final, adopted regional water plan. [31 TAC §357.31 (d)]

**Response** – A table\* will be included in Section 5D- Municipal Conservation that summarizes municipal demand savings due to plumbing fixture requirements by water user group, as provided by the TWDB on June 3, 2015. \*Table is included on Page 15 of this submittal.

3. Chapter 3: The plan does not appear to tabulate the local supplies used in the plan, along with an explanation of the basis of the associated local supply water volumes. Please include the required information on local supplies in the final, adopted regional water plan. [Contract Exhibit ‘C’, Section 3.3]

**Response** – The following text will be added to Section 3.3: “Local supplies<sup>2</sup> are used in the plan to meet livestock needs only. All other surface water supplies are based on water rights and supply availability during the drought of record as discussed previously in Section 3.2. The volume of local supply available to livestock users is based on the percent of surface water used to meet demands after considering 2010 groundwater use reported by the TWDB, as discussed later in Section 4.2. Table 3.3 (new) shows the amount of local supplies by decade for each livestock-county user, which totals 1,860 ac-ft/yr for the region.

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<sup>2</sup> The TWDB defines local supplies in Exhibit C- First Amended General Guidelines for Regional Water Plan Development (October 2012) as “limited, unnamed individual surface water supplies that, separately, are available only to particular non-municipal WUGs”.

**Table 3.3 (New) Livestock Local Surface Water Supplies (ac-ft/yr)**

County	2020	2030	2040	2050	2060	2070
Aransas	21	21	21	21	21	21
Bee	464	464	464	464	464	464
Brooks	160	160	160	160	160	160
Duval	148	148	148	148	148	148
Jim Wells	402	402	402	402	402	402
Kenedy	0	0	0	0	0	0
Kleberg	0	0	0	0	0	0
Live Oak	252	252	252	252	252	252
McMullen	262	262	262	262	262	262
Nueces	36	36	36	36	36	36
San Patricio	115	115	115	115	115	115
Total	1,860	1,860	1,860	1,860	1,860	1,860

4. Page 3-13: Please clarify how the run-of-river availabilities were calculated for municipal water users to ensure that all monthly demands are fully met for the entire simulation of the unmodified Texas Commission on Environmental Quality (TCEQ) WAM Run 3 in the final, adopted regional water plan. [Contract Exhibit 'C', Section 3.4]

**Response** – The following text will be added at the end of 2<sup>nd</sup> paragraph on page 3-13: “Run-of-river availabilities were simulated for these water users using an unmodified Nueces WAM Run 3, which determined monthly availability subject to water right priority and hydrologic conditions. Minimum month conditions were assessed within the context of use-appropriate monthly percentage of the annual firm diversion. When the full amount sought was not available for a given month, storage was identified as a water management strategy to bridge potential seasonal water shortages to avoid overestimating the reliability of run-of-river water during drought.

5. Pages 5D.12-2 and 5D.13-3: Please clarify that the water management strategy evaluations were based upon the most current TCEQ WAM Run 3 in the final, adopted regional water plan. [31 TAC §357.34(d)(1)]

**Response** – The following text will be added to Section 5D.12.2: “The firm yield of the Lavaca Off-Channel Reservoir project was analyzed, using an unmodified version of the TCEQ WAM Run 3, to have no negative impacts to the freshwater inflows to Lavaca Bay as dictated by the latest TCEQ environmental flow standards adopted August 2012.”

The following text will be added to Section 5D.13: “The firm yield of the GBRA Lower Basin Storage project was analyzed, using an unmodified version of the TCEQ WAM Run 3, to have no negative impacts to the freshwater inflows as dictated by the latest TCEQ environmental flow standards adopted August 2012.”

6. Please confirm in the plan that the final, adopted regional water plan does not include any retail distribution-level infrastructure or associated costs unless associated with conservation strategies. [31 TAC 357.34(d)(3)(A); Contract Exhibit 'C', Sections 5.1.2.2 and 5.1.2.3]

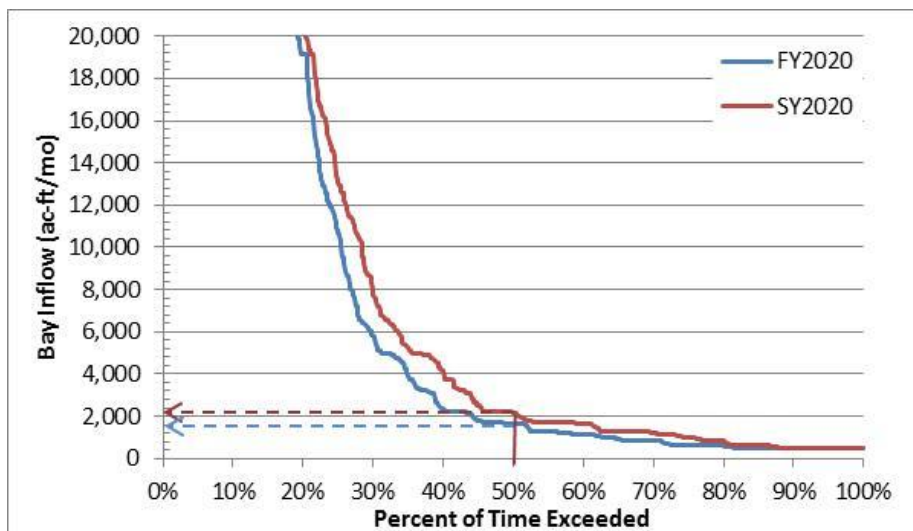
**Response** – The following text will be added to Section 5B.1: “The plan does not include any retail distribution-level infrastructure or associated costs, except those associated with conservation-related strategies such as pipeline replacement programs.”

7. The plan in some instances, does not appear to include a quantitative reporting of environmental factors. For example: page 5D.12-12 provides a qualitative description as a "general reduction in bay and estuary inflows" but does not appear to include quantification of the impact; and, page 5D.6-8 includes several references to "none or low impact" related to environmental factors but does not appear to include quantification of the non-zero impact. Please include quantitative reporting in the final, adopted regional water plan. [31 TAC §357.34(d)(3)(B)]



Proposed Response: Water management strategies evaluated in the Plan comply with TCEQ Environmental Flow Standards (EFS) and SB3 frequency attainment tables, where applicable. During strategy evaluation, if EFS are not met then the project is scaled downward until criteria are met. For example, Section 5D.12.2 references TCEQ Bay and Estuary Freshwater Inflow standards for the Lavaca Bay System and how the Lavaca OCR meets or exceeds required frequency standards goals for each seasonal period as modeled. Table 5D.12.2 presents frequency attainment results.

The following text will be added to Section 5D.6: “The modification of existing reservoir operating policy strategy from firm to safe yield reduces the planned supply (yield) from the LCC/CCR/Lake Texana/MRP Phase II system to account for unprecedented severe drought conditions in the future or underestimation in regional growth. The additional stored water in LCC/CCR under safe yield provisions results in higher system storage levels and therefore more frequent opportunities for larger pass-through events to the Nueces Bay<sup>[1]</sup> to meet inflow targets of the 2001 TCEQ Agreed Order. With safe yield, the median monthly flow to the Bay is 2,171 ac-ft/mo compared to 1,625 ac-ft/mo under firm yield conditions (increase of 546 ac-ft/mo). A flow frequency showing monthly Bay inflow comparing firm and safe yield is shown in Figure 5D.6.2. This figure shows that the safe yield scenario, with the lower system demand, results in more frequent larger monthly inflows into the Bay. When comparing the annual flow to the Bay and Estuary system over the 70 year model simulation period (1934-2003), the median annual flow with safe yield is 173,742 ac-ft/yr with safe yield, or about 40,000 ac-ft/yr higher than firm yield median annual flow of 133,183 ac-ft/yr.



**Figure 5D.6.2**  
**Comparison of Monthly Flow Frequency Distribution for Nueces Bay Inflow for Firm versus Safe Yield**

The following key will be added to Section 5B.1 to clarify evaluation summary tables presented at the end of each water management strategy. Each strategy includes a separate “Environmental Issues” discussion, which describes environmental factors and impacts with greater detail.

<sup>[1]</sup> Contingent on inflow into the reservoir system.

<b>Impacts to Environmental Factors Key</b>	<b>Criteria</b>
None or Low; Negligible	Reduction in environmental flows with implementation of the strategy is indiscernible (less than 1%) using the approved surface water availability model, as compared to flows without the project. Wildlife habitat is not expected to be altered by the project.
Moderate; Some	Reduction in environmental flows with implementation of the strategy is expected to range from 1% to 10% using the approved surface water availability model, as compared to flows without the project. Due to the nature of the strategy, localized impacts to small creeks or on-site tanks may be noticed (up to 10%). Wildlife habitat may be temporarily impacted during project construction, but long-term impacts to wildlife habitat are not expected.
High	Reduction in environmental flows with implementation of the strategy is expected to exceed 10% using the approved surface water availability model, as compared to flows without the project. Long-term wildlife habitat alteration is highly likely with project.

8. The plan in some instances, does not appear to include a quantitative reporting of impacts to agricultural resources. For example, page 5D.12-9 provides a qualitative description as "a marginal impact on local agricultural activities" but does not appear to include quantification of the non-zero impact. Please include quantitative reporting of impacts to agricultural resources in the final, adopted regional water plan. [31 TAC §357.34(d)(3)(C)]

**Response** – The underlined text will be added to the sentence in Section 5D.12.3 on page 5D.12-9: “Siting of the project and inundation of the off-channel reservoir would remove approximately 1,200 acres of agricultural land from production but would have minimal influence given the large quantity of agricultural land in the area.” The following legend will be added to Section 5B.1:

<b>Impacts to Agricultural Resources Key</b>	<b>Criteria</b>
None or Low; Negligible	Temporary impacts to agricultural land during project construction. Occasional disturbances due to maintenance on right of way for pipelines.
Moderate; Some	Loss of up to 50 irrigated acres permanently due to repurposing of land to support the project (i.e. impoundment).
High	Loss of more than 50 irrigated acres permanently due to repurposing of land to support the project (i.e. impoundment).

9. Sections 5D.1, 5D.3, 5D.4: The municipal, manufacturing, and mining conservation water management strategies appear to be combined with reuse strategies. Each project and strategy must be associated with volumes of water provided by a single strategy type and should not be lumped together with other types of strategies. Strategy types must remain independent of one another for purposes of accounting of water availability, to reflect implementation, and to facilitate project prioritizations. Please revise as appropriate throughout the final, adopted regional water plan. [31 TAC §357.10(26), §357.34(e); Contract Exhibit ‘D’, Section 5.3]

**Response** – The reuse strategies and resulting project yields described in Section 5D.5 and recommended in water supply plans are independent and do not duplicate water conservation strategies.

Municipal water conservation- The plan references a list of 21 best management practices (BMPs) from TWDB- Report 362 for municipal water users to consider when conservation is recommended. Reuse of reclaimed wastewater is shown as # 16 on the TWDB’s list. The following footnote will be added to # 16. Reuse of Reclaimed Water to read “It is assumed that any savings associated with reuse is a small contribution to the savings identified on Table 5D.1.8 and does not duplicate reuse projects identified in Section 5D.5.”

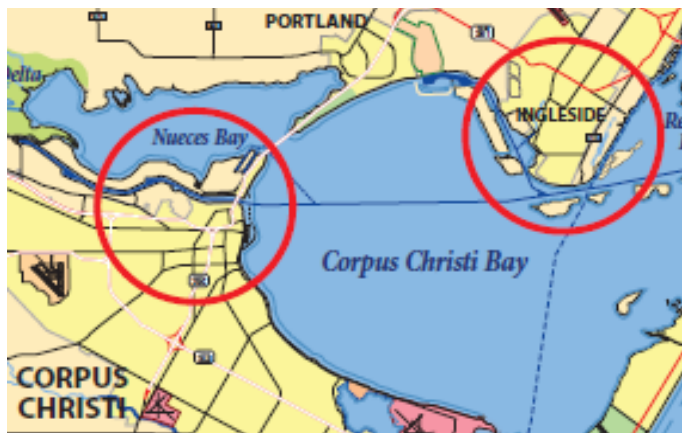
Manufacturing water conservation- The recommended strategy is associated with water quality enhancements achieved by adding Mary Rhodes Pipeline Phase II supplies to the existing regional system, and resulting ability for industries to increase the cycles of reuse for cooling purposes.

Mining water conservation- The plan recommends mining water conservation for McMullen County. The strategy includes a list of 14 best management practices (BMPs) from TWDB- Report 362 for industrial water users to consider when conservation is recommended. Reuse and recirculation is shown as # 6 on the TWDB’s list. Section 5D.5- Reclaimed Wastewater and Reuse does not include any strategies for McMullen County.

10. Section 5D.9 Seawater Desalination: The plan did not include water management strategy evaluation documentation with sufficient specificity for making consistency determinations regarding the location of the facility. Please include more detailed information about infrastructure and locations, for example, and consider including simple project map for infrastructure and conveyance facilities in the final, adopted regional water plan. [31 TAC §357.34(e); Contract Scope of Work Task 4D(d)]

**Response** – The project sponsor is currently studying two potential sites, which are both located near existing infrastructure for conveyance. The write-up will continue to include discussion of these two sites.

Based on feedback from the sponsor, the Inner Ship Channel site located south of Nueces Bay near the Broadway WWTP is the recommended site for the seawater desalination water management strategy. The text in Section 5D.9 will be updated accordingly.



11. Page 5D.9-7, Section 5D.9.3: The plan appears to indicate that the evaluated seawater desalination strategy is not associated with the Barney M. Davis Power Station, however the Environmental Issues discussion evaluates issues associated with the Barney M. Davis Power Station. Please update the environmental issues section of the strategy evaluation as appropriate in the final, adopted regional water plan. [31 TAC §357.34(e)]

Proposed Response: The environmental issues section of the strategy will be updated to reflect the two sites discussed in the strategy: Ingleside and Inner Ship Channel.

12. Section 5D.12 Lavaca Off-Channel Reservoir Project: It is not clear from the plan description which evaluated site, the West or East Alternative B, is the recommended water management strategy. Please clarify which site is the recommended site and confirm that only one site is the recommended strategy in the final, adopted regional water plan. [31 TAC §357.34(e); Contract Scope of Work Task 4D(d)]

**Response** – Based on feedback from the LNRA, East Alternative B is the recommended off-channel reservoir water management strategy. The text in Section 5D.12 will be updated accordingly.

13. Page 5D.6-8: The technical analysis presents "no project yield" for the supply volume from the reservoir operating policy strategy. Please indicate whether the recommended strategy reduces either existing water supplies or the yields of any other recommended strategies and, if so, please ensure that any associated reductions to other supplies are reflected in the final plan and online regional water planning database. [Contract Exhibit 'C', Section 3.4.2]

**Response** – As discussed previously for question # 7, the following text will be added to Section 5D.6: "The modification of existing reservoir operating policy strategy from firm to safe yield reduces the planned supply (yield) from the LCC/CCR/Lake Texana/MRP Phase II system to account for unprecedented severe drought conditions in the future or underestimation in regional growth."

14. The plan does not appear to include an update to the water management strategy N-12 "Voluntary Transfer of Water within the Region" as described in the contract scope of work. Please include this strategy evaluation update or explain why this subtask was not completed in the final, adopted regional water plan. [Contract Scope of Work, Task 4D Subtask 6]

**Response** – The discussion of Voluntary Transfer of Water strategy, otherwise referred to as Voluntary Redistribution of Available supplies, was combined with the Gulf Coast aquifer strategy (Section 5D.7) as described in Table 11.2. Voluntary transfers are recommended for McMullen County-Mining and San Patricio County- Irrigation based on unutilized Gulf Coast aquifer surpluses identified for McMullen County-Other and City of Sinton, respectively.

15. The plan does not appear to consider drought preparation and response recommendations regarding the State Drought Preparedness Plan. Please address in the final, adopted regional water plan. [31 TAC §357.42(i)(3)]

**Response** – The following text will be added to Section 7.7.2: "The State Drought Preparedness Plan, issued by the Drought Preparedness Council in February 2006, emphasizes the importance of pro-active drought monitoring and provides agency resources that collect drought-related data and provide assistance. The State Drought Preparedness Plan presents resources that are available for mitigation and preparedness, response, and recovery. It continues by identifying climatological, agriculture, and water availability indices for each of ten climatic regions in Texas to consider when assessing drought severity. The Coastal Bend Region (Region N) counties are located in two climatic regions (Region 7 and 8) and, as discussed in the report, "climatic regions are so large, that drought indices developed across regions of this magnitude routinely mask smaller, regional drought problems and emerging drought conditions". For this reason, Region N considered the State Drought Preparedness Plan and information from the DPC but selected information provided by local, approved drought contingency plans for development of drought response recommendations."

16. The plan does not appear to include region-specific model drought contingency plans for irrigation users or wholesale water providers. Please provide these model plans in the final, adopted regional water plan, for example, in an Appendix or as an active link to an electronic document. [31 TAC §357.42(j)]

**Response** – The Texas Administrative Code tasks RWPGs to “develop region-specific model drought contingency plans” but does not specify the user categories. Region N appointed a subcommittee on May 8, 2014, comprised of its members, to prepare drought response recommendations for Region N consideration. The subcommittee met on July 14<sup>th</sup> and developed a recommendation, which was approved by Region N on August 14, 2014, to include all TCEQ model drought contingency plans. For municipal water users only, a region-specific summary table was developed (Appendix B) based on Region N drought contingency plans on-file with TCEQ. Appendix B will be updated to include a link to TCEQ model Drought Contingency Plan forms for irrigation users and wholesale public water suppliers: [https://www.tceq.texas.gov/permitting/water\\_rights/wr\\_technical-resources/contingency.html/#forms](https://www.tceq.texas.gov/permitting/water_rights/wr_technical-resources/contingency.html/#forms)

17. Chapter 11: The plan does not appear to include a summary of how water demand projections differ from the 2011 regional water plan. Please include this summary in the final, adopted regional water plan. [31 TAC §357.45(b)(1)]

**Response** – The following text will be added to Section 11.2: “The total water demand projected for the region in the 2016 Regional Water Plan is generally the same as compared to the 2011 Regional Water Plan (+/- 2% for each decade). Municipal water demand projections are 9-17% lower in the 2016 Plan than in the 2011 Plan for each decade, amounting to 128,510 ac-ft/yr by the 2070 decade as compared to the previous plan projection of 151,474 ac-ft/yr by 2060. Non-Municipal demands, however, are 11-15% higher in the 2016 Plan than in the 2011 Plan, and are projected to increase from 149,889 ac-ft/yr in 2020 to 214,734 ac-ft/yr by 2070. Nearly 60% of the non-municipal demand for the region is attributable to manufacturing in Nueces and San Patricio Counties. In the 2011 Plan, the total water demands for all entities in the region were projected to increase from 232,503 ac-ft/yr in 2010 to 324,938 ac-ft/yr in 2060. The total water demand projections for the 2016 Plan increase from 261,970 ac-ft/yr in 2020 to 343,244 ac-ft/yr in 2070.

18. Chapter 11: The plan does not appear to include a summary of how drought of record or hydrologic and modeling assumptions differ from the 2011 regional water plan. Please include summary in the final, adopted regional water plan. [31 TAC §357.45(b)(2)]

**Response** – The following text will be added to Section 11.2: “The drought of record in the Lower Nueces Basin is the drought of the 1990’s which was most severe from 1992-1996. The drought of record did not change between the 2011 and 2016 Regional Water Plans although more recent droughts, as discussed in Section 7.1.4, may alter the drought of record in future planning cycles. A comparison of water modeling assumptions is provided in the following table.

<b>2016 Plan</b>	<b>2011 Plan</b>
Groundwater Availability based on <b><u>Modeled Available Groundwater</u></b>	Groundwater Availability based on <b><u>Central Gulf Coast GAM analyses and Region N-adopted criteria for acceptable drawdown and water quality</u></b>
MRP Phase II added. Existing Supply from CCR/LCC/Lake Texana/ <b><u>MRP Phase II</u></b> System based on Corpus Christi Water Supply Model safe yield analysis (12 <b><u>month storage reserve</u></b> )- for the City of Corpus Christi and its customers only	Existing Supply from CCR/LCC/Lake Texana System based on Corpus Christi Water Supply Model safe yield analysis ( <b><u>6 month storage reserve</u></b> )- for the City of Corpus Christi and its customers only
Run of the river water rights in the Nueces Basin, firm yield supplies based on minimum annual supply that could be diverted <b><u>limited by minimum month conditions.</u></b>	Run of the river water rights in the Nueces Basin, firm yield supplies based on minimum annual supply that could be diverted.
New Surface WMSs conform to TCEQ Environmental Flow Standards	New Surface WMSs conform to <b><u>2001 Agreed Order Provisions or Consensus Criteria for Environmental Flow Needs</u></b>

19. Chapter 11: The plan does not appear to include a summary of how groundwater availability, surface water availability, existing water supplies, and identified water needs for water user groups and wholesale water providers differ from the 2011 regional water plan. Please include in the final, adopted regional water plan. [31 TAC §357.45(b)(3)]

**Response** – The following text will be added to Section 11.2: Nearly 75% of the water used in the region comes from surface water supplies originating from the CCR/LCC/Texana/MRP Phase II system. The surface water availability increased in the 2016 Plan as compared to 2011 Plan with the addition of supplies from the MRP Phase II project. However, with the change in safe yield assumptions from a 6 month reserve to 12 month reserve (or 125,000 ac-ft during drought of record) the additional increase in system availability with the new project amounts to 15,000 ac-ft/yr. As discussed previously, the modeling assumptions used to develop groundwater availability for the 2016 Plan are different than those used for the 2011 Plan. The groundwater availability in the 2016 Plan amounts to twice the groundwater availability shown in the 2011 Plan. The 2016 Plan groundwater availability based on MAGs is approximately 227,000 ac-ft, as compared to 109,351 ac-ft in the 2011 Plan.

Existing water supplies for Region N entities have changed significantly since the last planning cycle. Municipal supplies have decreased on average by 12,400 ac-ft/yr for the comparable planning decades of 2020 through 2060. Non-Municipal WUG supplies have increased by an average of 66,000 ac-ft/yr over the same four planning decades. Some of this is due to the shift towards regional water supplies meeting the increased projected industrial water demands while projected municipal water demands have declined. Since most of the expected industrial growth occurs in San Patricio and Nueces counties, the regional CCR/LCC/Texana/MRP Phase II can accommodate flexibility in delivery of these supplies subject to physical delivery constraints and contract provisions. Overall the total difference in existing supplies between planning cycles range from 58,000 ac-ft increase in 2020 to 52,000 ac-ft increase in 2060. Much of this is attributable to existing groundwater supplies which increased on average by 31,200 ac-ft/yr for the comparable planning decades of 2020 through 2060.

Municipal and non-municipal need projections are lower in the 2016 Plan due to declines in municipal water demands and additional supplies that are available through groundwater and surface water supplies from MRP Phase II. The total WUG needs for the 2016 Plan increase from 10,807 ac-ft in 2020 to 50,950 ac-ft in 2070, and are larger than the needs in the 2011 Plan until 2030. The 2011 Plan showed needs of 3,404 ac-ft in 2010 that increase to 75,744 ac-ft by 2060. The 2016 Plan projections for Wholesale Water Provider (WWP) needs are less for every comparable decade than the 2011 Plan projections. The WWP needs are currently projected to increase from 8,034 ac-ft in 2020 to 46,550 ac-ft in 2070.

20. Please clarify whether the plan development was guided by the principal that the designated water quality and related water uses as shown in the state water quality management plan shall be improved or maintained. [31 TAC §358.3(19)]

**Response** – The following text will be added at the beginning of Section 6.1: “The plan development was guided by the principal that the designated water quality and related water uses as shown in the state water quality management plan shall be improved or maintained.”

21. Please clearly summarize which, if any, recommended water management strategies rely on or mutually exclude another recommended strategy. If such relationships exist, please ensure that the strategy interactions are reflected in the estimated water availability and yield associated with each impacted water management strategy in the final, adopted regional water plan. [Contract Exhibit 'C', Section 3.4.2]

**Response** – The following text will be added to Section 5B.1: “Strategies related to water treatment plant improvements (5D.14- San Patricio Municipal Water District WTP and 5D.15- O.N. Stevens WTP Improvements) rely on development of new raw water supplies to fully deliver at treated capacity. Without new raw water supplies, the treated water available with these strategies declines as existing raw water supplies become utilized by industrial customers to meet growing water demands. There are no Region N strategies that mutually exclude another recommended strategy.

22. Page 5D.2-7, Strategy 5D.2: It is not clear in the plan whether the Unified Costing Model was utilized for cost estimates or if other project-specific methodologies were utilized. Please clarify the costing methodology (e.g., data sources) utilized for any water management strategy cost estimates that were not produced using the Unified Costing Model in the final, adopted regional water plan. [Contract Exhibit 'C', Section 5.1]

**Response** – A footnote will be added to the average irrigation conservation cost provided in Section 5D.2.4: “The cost of implementing irrigation water conservation practices was calculated based on estimated water savings and application efficiencies from TWDB Report 347, Surveys of Irrigation in Texas (2001) and costs to implement furrow dikes, LESA, and LEPA programs by acre from TWDB Report 362- Water Conservation Best Management Practices Guide (2004).”

23. Sections 5D.12 and 5D.13, pages 5D.12-16 and 5D.13-14: Please present reservoir land acquisition costs for reservoir conservation pool footprint separately from mitigation acreage costs in the final, adopted regional water plan. [Contract Exhibit 'C', Section 5.1.2]

**Response** – The cost tables presented on pages 5D.12-16 and 5D.13-14 show a ‘Land Acquisition and Surveying’ line item for reservoir footprint and piping/pump stations. The mitigation of acreage affected by the project is included in the separate ‘Environmental & Archaeology and Mitigation’ line item.

For the Lavaca Off-Channel Reservoir Project (Table 5D.12.4), the total land acquisition and surveying costs related to the 1,065-acre project amounts to \$3,276,000. Of this, 1,019 acres is associated with the reservoir footprint at a cost of \$3,133,000 (or 96%). The remaining 46 acres associated with land and surveying of acreage associated with appurtenances is \$143,000.

For the GBRA Lower Basin Storage project (Table 5D.13.3), the total land acquisition and surveying costs related to the *entire* 636-acre project amounts to \$1,561,000. Of this, 625 acres is associated with the reservoir footprint at a cost of \$1,503,750 (or 96%). The remaining 11 acres associated with land and surveying of acreage associated with appurtenances is \$57,250. For Table 5D.13.4 related to the *portion of the project relevant to Region N interests (338 acres)*, the total land acquisition and surveying costs amounts to \$930,000. Of this, 241 acres is associated with the reservoir footprint at a cost of \$581,000. The remaining 97 acres associated with land and surveying of acreage associated with the pipeline right of way and appurtenances costs \$349,000. The land requirements comprise a large percentage of the total project (37%), primarily associated with right of way needs for the 36" diameter 16 mile pipeline for delivery of off-channel reservoir stored supplies to the Mary Rhodes Pipeline near the Bloomington Pump Station.

24. Tables ES.6, ES.7, 5A.1.1, 5B.1.1 and 5B.1.2: The plan does not appear to include a complete list of potentially feasible water management strategies considered by the planning group. Please include documentation that potentially feasible water management strategy types, as required by statute and rule were considered to meet identified needs. [Texas Water Code §16.053(e)(5), 31 TAC §357.34(c)(1-6); Contract Exhibit 'C', Section 5.0]

**Response** – The following text will be added to Section 5A.1: “Region N considered a complete list of potentially feasible water management strategies based on previous plans, local on-going studies, and feedback from local sponsors as summarized in Table 11.2. These potentially feasible strategies included all water management strategy types referenced in the Texas Water Code as presented above. On February 13, 2014, Region N removed non-relevant strategies no longer actively considered by local sponsors and selected water management strategies for evaluation in the 2016 Plan.” The title of Table 5A.1.1 will be revised to read “Potentially Feasible Water Management Strategies Selected by the CBRWPG for *Evaluation in the 2016 Plan*”



**Level 2: Comments and suggestions for consideration that may improve the readability and overall understanding of the regional water plan.**

1. Section 3.4: Please consider providing a more detailed description of how groundwater availability was estimated for non-relevant aquifers in the final, adopted regional plan.

**Response** – The following text will be added to Section 3.4: “The groundwater availability identified in the 2011 Plan and adopted for non-relevant aquifers include 394 acft/yr of supply available from the Carrizo Wilcox Aquifer in Bee County; and 2,399 acft/yr available from the Carrizo Wilcox Aquifer in Live Oak County, a portion of which is currently used by McCoy WSC. These groundwater availability estimates were developed during a previous planning cycle and met Coastal Bend RWPG criteria for drawdown and water quality using the region-specific, groundwater model which simulated this availability after considering on-going, current groundwater use.

2. Page 5-4: The footnote citation is not a relevant guideline reference for the current round of regional water planning. Suggest removing this reference in the final, adopted regional water plan.

**Response** – Footnote citation will be removed, as recommended.

3. Pages 13, 5-4, 5-32, 5-49, 5D.7-3, 5D.7-5 and 5D.7-9: The plan appears to mix the terms "projected needs" as "unmet needs." An unmet need is the result of not being able to identify a feasible water management strategy to meet an identified need. Suggest clarifying terms as appropriate in the final, adopted regional water plan.

**Response** – Two water user groups, McMullen County-Mining and San Patricio County-Irrigation, show unmet needs in the plan due to modeled available groundwater constraints as discussed in Section ES.9. The text on page 13 and 5D.7-9 will be revised to read “projected needs.”

**Table 5D.1.2. Projected Savings (ac-ft/yr) With Plumbing Fixture Code Requirements**

No.	County	Water User	Projected Municipal Demand Savings (ac-ft/yr) Due to Plumbing Fixture Code Requirements					
			2020	2030	2040	2050	2060	2070
1	SAN PATRICIO	RINCON WSC	28	38	44	48	50	50
2	SAN PATRICIO	INGLESIDE	99	144	178	197	204	206
3	ARANSAS	COUNTY-OTHER	143	208	256	283	288	288
4	KLEBERG	RICARDO WSC	29	44	57	66	72	76
5	SAN PATRICIO	INGLESIDE ON BAY	7	10	13	14	15	15
6	SAN PATRICIO	LAKE CITY	6	9	11	13	13	13
7	LIVE OAK	COUNTY-OTHER	57	77	92	100	103	103
8	LIVE OAK	MCCOY WSC	2	3	3	3	3	3
9	DUVAL	COUNTY-OTHER	48	73	94	107	112	115
10	BROOKS	COUNTY-OTHER	30	48	63	73	79	84
11	NUECES	NUECES WSC	22	32	38	42	44	45
12	SAN PATRICIO	MATHIS	59	89	113	121	125	126
13	NUECES	DRISCOLL	9	14	18	20	21	21
14	MCMULLEN	COUNTY-OTHER	8	11	14	15	15	15
15	NUECES	COUNTY-OTHER	128	219	284	321	337	346
16	BEE	COUNTY-OTHER	192	278	341	373	380	380
17	JIM WELLS	COUNTY-OTHER	196	299	385	446	479	503
18	ARANSAS + Others	ARANSAS PASS	94	140	176	196	202	204
19	SAN PATRICIO	COUNTY-OTHER	144	203	213	221	228	230
20	SAN PATRICIO	TAFT	36	55	70	74	76	77
21	KLEBERG	KINGSVILLE	328	514	674	787	851	902
22	NUECES	AGUA DULCE	10	15	19	22	22	23
23	SAN PATRICIO	ODEM	28	42	54	59	61	61
24	NUECES	RIVER ACRES WSC	30	47	60	68	70	71
25	DUVAL	BENAVIDES	18	27	32	34	35	36
26	SAN PATRICIO	PORTLAND	169	253	317	354	365	368
27	SAN PATRICIO	GREGORY	24	37	43	44	46	46
28	KLEBERG	COUNTY-OTHER	43	69	85	93	100	106
29	LIVE OAK	THREE RIVERS	20	29	36	39	40	40
30	NUECES	BISHOP	40	62	80	86	89	91
31	ARANSAS	ROCKPORT	87	122	146	161	164	164
32	LIVE OAK	GEORGE WEST	26	38	48	52	53	53
33	DUVAL, JIM WELLS	SAN DIEGO	56	86	111	120	126	130
34	ARANSAS	FULTON	13	18	22	24	24	24
35	NUECES	CORPUS CHRISTI	3,613	5,602	7,101	7,938	8,224	8,350
36	JIM WELLS	ALICE	240	373	485	559	599	629
37	LIVE OAK, BEE	EL OSO WSC	0	6	9	12	23	23
38	DUVAL	FREER	35	54	68	72	76	78
39	BEE	BEEVILLE	149	224	282	303	308	308
40	SAN PATRICIO	SINTON	66	99	125	140	144	146
41	NUECES	ROBSTOWN	144	203	253	257	261	262
42	JIM WELLS	PREMONT	34	53	69	77	82	86
43	JIM WELLS	ORANGE GROVE	16	25	32	37	40	42
44	BROOKS	FALFURRIAS	59	90	113	119	125	128
45	KENEDY	COUNTY-OTHER	5	7	9	10	10	10
46	NUECES	PORT ARANSAS	39	59	74	83	86	87
	<b>Total for Region N</b>		<b>6,629</b>	<b>10,146</b>	<b>12,809</b>	<b>14,283</b>	<b>14,867</b>	<b>15,163</b>

1. Remove Laguna Madre (segment 2491) from Table 1-1, which is outside Region N's boundary.

**Response** – A portion of the Laguna Madre segment is located in Region N. Table 1-1 will only include water quality concerns/impairments associated with the portion of the segment located in Region N.

2. The brown pelican was delisted as a federally endangered species in 2009. Revise Page 1-12 and Table 5D.8.1 to remove the 'endangered' description.

**Response** – The text in the plan will be updated to remove the brown pelican from the list of endangered species, as recommended.

3. Adopted DFCs for aquifers in the Coastal Bend Region do not address protection of springs or groundwater-surface water interaction. The TPWD would like to see DFCs adopted to protect these features.

**Response** – The DFCs are established by Groundwater Management Area/Groundwater Conservation Districts. The Plan limits groundwater availability to Modeled Available Groundwater (MAG) values set by the DFC process. The following text will be added to Section 6.3 and 8.4: "The Coastal Bend Region recognizes the importance of considering groundwater and surface water interaction when managing water resources and evaluating development of future water supplies. The Region encourages groundwater conservation districts and groundwater management areas to consider protection of springs and groundwater-surface water interaction during when considering new DFCs."

4. TPWD remains concerned about 'brine' disposal from seawater desalination projects and effects on surrounding habitats.

**Response** – The following text will be added to Section 5D.9-3: "HB 2031 passed by the 84<sup>th</sup> legislature requires consultation with TWDB and the General Land Office regarding siting of seawater desalination intakes and discharges to minimize ecological impacts."

Appendix A  
Model Water Conservation Plans (Region Specific)

## Municipal Water Users

For municipal water users, the CBRWPG compiled a summary of frequent best management practices and water conservation goals (5 year and 10 year) from existing water conservation plans submitted to the TCEQ for water user groups in the Coastal Bend Region. The CBRWPG recommends appending these region specific tables, beginning on the next page, with the TCEQ model water conservation form (also attached). The TCEQ form can also be accessed electronically on the TCEQ website at:

[https://www.tceq.texas.gov/permitting/water\\_rights/conserve.html](https://www.tceq.texas.gov/permitting/water_rights/conserve.html).

Municipal water user groups in the area seeking to develop a water conservation plan are encouraged to consider the attached information from the CBRWPG as a guide. However, a one-size-fits-all approach is often impractical for all municipal water utilities and accordingly, it is to the discretion of the utility to develop a water conservation approach and target goals that serves its utility the best.

Wholesale Water Provider	WCP Available	Date	Best Management Practices							
			Reduce Water Losses/Unaccounted for Water/Leak Detection	Water Conservation Pricing/Seasonal or Inverted Block Rates	Reuse	Improve Meter Accuracy	Toilet Replacement/Retrofit Programs	Public/School Education	Landscape Conservation/Xeriscape	Others
City of Corpus Christi <sup>1</sup>	Y	2013	√	√	√	√	√	√	√	
San Patricio Municipal Water District <sup>1</sup>	Y	2011	√	√	√	√		√	√	√
South Texas Water Authority <sup>1</sup>	Y	2013	√	√		√		√	√	√
Nueces County WCID # 3 <sup>1,2</sup>	Y	2009	√			√	√	√		
Water User Group										
Alice <sup>1</sup>	Y	2008	√	√	√	√		√	√	
Aransas Pass <sup>2</sup>	Y	2008	√	√		√	√	√	√	
Corpus Christi <sup>1</sup>	Y	2013	√	√	√	√	√	√	√	
El Oso WSC	Y	2009	√	√		√		√		√
Kingsville <sup>2</sup>	Y	2010	√	√	√	√		√	√	
McCoy WSC <sup>1</sup>	Y	2009	√	√		√		√		
Nueces WSC <sup>1</sup>	Y	2013	√	√		√		√		
Portland <sup>1</sup>	Y	2009	√	√	√	√	√	√	√	
Ricardo WSC <sup>1</sup>	Y	2013	√	√		√		√		
Robstown <sup>2</sup>	Y	2011						√		
Taft <sup>1</sup>	Y	2013	√	√	√	√	√	√	√	
Odem <sup>1</sup>	Y	2013	√	√		√		√	√	√
Three Rivers <sup>2</sup>	Y	2009	√			√	√	√	√	

<sup>1</sup>Water Conservation Plan on-file with the Nueces River Authority.

<sup>2</sup>Water Conservation Plan provided by the TWDB.

Wholesale Water Provider	5 year goal		10 year goal	
	GPCD Target	General	GPCD Target	General
City of Corpus Christi <sup>1</sup>	195 <sup>2</sup>	1% annual reduction over next decade	184 <sup>2</sup>	1% annual reduction over next decade
San Patricio Municipal Water District <sup>1</sup>	N/A	10% below 5-yr State avg. Limit unaccounted for water to no more than 3% amount diverted.	N/A	10% below 5-yr State avg. Limit unaccounted for water to no more than 3% amount diverted.
South Texas Water Authority <sup>1</sup>	140-145	Not Available	140-145	Not Available
Nueces County WCID # 3 <sup>1,3</sup>	140	Not Available	133	Not Available
<b>Water User Group</b>				
Alice <sup>1</sup>	N/A	Reduce per capita use by 3%	N/A	Reduce per capita use by 3%
Aransas Pass <sup>3</sup>	N/A	2.5% per capita	N/A	5% per capita
Corpus Christi <sup>1</sup>	195 <sup>2</sup>	1% annual reduction over next decade	184 <sup>2</sup>	1% annual reduction over next decade
El Oso WSC	N/A	Reduce water loss.	N/A	Reduce water loss.
Kingsville <sup>3</sup>	144	1% annual reduction	135	1% annual reduction
McCoy WSC <sup>1</sup>	115	Maintain current per capita usage; Reduce water loss to 4% of water pumped, not including line flushing and fire fighting	110	Reduce usage by 4.5%. Reduce water loss to 2% of water pumped, not including line flushing and fire fighting.
Nueces WSC <sup>1</sup>	118	Maintain current per capita usage	118	Maintain current per capita usage
Portland <sup>1</sup>	272	5% reduction	258	10% reduction
Ricardo WSC <sup>1</sup>	95	Maintain current per capita usage	95	Maintain current per capita usage
Robstown <sup>3</sup>	N/A	Not Available	N/A	Not Available
Taft <sup>1</sup>	147	Reduce per capita use by 3%	140	Reduce per capita use by 3%
Odem <sup>1</sup>	N/A	Reduce seasonal demands by 2%	N/A	Reduce per capita use by 5%; reduce unaccounted for water by 7%
Three Rivers <sup>3</sup>	N/A	200 gallons/person/day by 2015	N/A	Not Available

N/A = Not Available

<sup>1</sup>Water Conservation Plan on-file with the Nueces River Authority.

<sup>2</sup>Calculated by taking volume of treated water, excluding water sold to wholesale customers, and dividing by permanent population, divided by 365. Because industrial use is close to 40% of treated water, the per capita rate is higher. Target goal for residential use is 73 gpcd (2018) and 69 gpcd (Year 2023).

<sup>3</sup>Water Conservation Plan provided by the TWDB.



## Texas Commission on Environmental Quality

### UTILITY PROFILE AND WATER CONSERVATION PLAN REQUIREMENTS FOR MUNICIPAL WATER USE BY RETAIL PUBLIC WATER SUPPLIERS

This form is provided to assist retail public water suppliers in water conservation plan development. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resource Protection Team in the Water Availability Division at (512) 239-4691.

Name: Click to add text

Address: \_\_\_\_\_

Telephone Number: (    ) Fax: (    )

Water Right No.(s): \_\_\_\_\_

Regional Water Planning Group: \_\_\_\_\_

Form Completed by: \_\_\_\_\_

Title: \_\_\_\_\_

Person responsible for implementing conservation program: \_\_\_\_\_ Phone: (    )

Signature: \_\_\_\_\_ Date:  / /

**NOTE: If the plan does not provide information for each requirement, include an explanation of why the requirement is not applicable.**



## UTILITY PROFILE

### I. POPULATION AND CUSTOMER DATA

#### A. *Population and Service Area Data*

1. Attach a copy of your service-area map and, if applicable, a copy of your Certificate of Convenience and Necessity (CCN).
2. Service area size (in square miles):  
(Please attach a copy of service-area map)
3. Current population of service area:
4. Current population served for:
  - a. Water \_\_\_\_\_
  - b. Wastewater \_\_\_\_\_
5. Population served for previous five years:
6. Projected population for service area in the following decades:

<i>Year</i>	<i>Population</i>	<i>Year</i>	<i>Population</i>
		2020	
		2030	
		2040	
		2050	
		2060	

- List source or method for the calculation of current and projected population size.

**B. Customers Data**

Senate Bill 181 requires that uniform consistent methodologies for calculating water use and conservation be developed and available to retail water providers and certain other water use sectors as a guide for preparation of water use reports, water conservation plans, and reports on water conservation efforts. A water system must provide the most detailed level of customer and water use data available to it, however, any new billing system purchased must be capable of reporting data for each of the sectors listed below. [http://www.tceq.texas.gov/assets/public/permitting/watersupply/water\\_rights/sb181\\_guidance.pdf](http://www.tceq.texas.gov/assets/public/permitting/watersupply/water_rights/sb181_guidance.pdf)

- Current number of active connections. Check whether multi-family service is counted as  Residential or  Commercial?

<i>Treated Water Users</i>	<i>Metered</i>	<i>Non-Metered</i>	<b>Totals</b>
Residential			
Single-Family			
Multi-Family			
Commercial			
Industrial/Mining			
Institutional			
Agriculture			
Other/Wholesale			

- List the number of new connections per year for most recent three years.

<i>Year</i>			
<i>Treated Water Users</i>			
Residential			
Single-Family			

Multi-Family	_____	_____	_____
Commercial	_____	_____	_____
Industrial/Mining	_____	_____	_____
Institutional	_____	_____	_____
Agriculture	_____	_____	_____
Other/Wholesale	_____	_____	_____

3. List of annual water use for the five highest volume customers.

	<i>Customer</i>	<i>Use (1,000 gal/year)</i>	<i>Treated or Raw Water</i>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

**II. WATER USE DATA FOR SERVICE AREA**

*A. Water Accounting Data*

1. List the amount of water use for the previous five years (in 1,000 gallons). Indicate whether this is  diverted or  treated water.

<i>Year</i>	_____	_____	_____	_____	_____
<i>Month</i>	_____	_____	_____	_____	_____
January	_____	_____	_____	_____	_____
February	_____	_____	_____	_____	_____
March	_____	_____	_____	_____	_____
April	_____	_____	_____	_____	_____
May	_____	_____	_____	_____	_____
June	_____	_____	_____	_____	_____
July	_____	_____	_____	_____	_____
August	_____	_____	_____	_____	_____
September	_____	_____	_____	_____	_____
October	_____	_____	_____	_____	_____
November	_____	_____	_____	_____	_____
December	_____	_____	_____	_____	_____
<b>Totals</b>	_____	_____	_____	_____	_____

Describe how the above figures were determine (e.g, from a master meter located at the point of a diversion from the source, or located at a point where raw water enters the treatment plant, or from water sales).

- Amount of water (in 1,000 gallons) delivered/sold as recorded by the following account types for the past five years.

<i>Year</i>					
<i>Account Types</i>					
Residential					
Single-Family					
Multi-Family					
Commercial					
Industrial/Mining					
Institutional					
Agriculture					
Other/Wholesale					

- List the previous records for water loss for the past five years (the difference between water diverted or treated and water delivered or sold).

<i>Year</i>	<i>Amount (gallons)</i>	<i>Percent %</i>

*B. Projected Water Demands*

If applicable, attach or cite projected water supply demands from the applicable Regional Water Planning Group for the next ten years using information such as population trends, historical water use, and economic growth in the service area over the next ten years and any additional water supply requirements from such growth.

**III. WATER SUPPLY SYSTEM DATA**

*A. Water Supply Sources*

List all current water supply sources and the amounts authorized (in acre feet) with each.

<u>Water Type</u>	<u>Source</u>	<u>Amount Authorized</u>
Surface Water	_____	_____
Groundwater	_____	_____
Contracts	_____	_____
Other	_____	_____

*B. Treatment and Distribution System*

1. Design daily capacity of system (MGD):
2. Storage capacity (MGD):
  - a. Elevated \_\_\_\_\_
  - b. Ground \_\_\_\_\_
3. If surface water, do you recycle filter backwash to the head of the plant?  
 Yes       No      If yes, approximate amount (MGD):

**IV. WASTEWATER SYSTEM DATA**

*A. Wastewater System Data (if applicable)*

1. Design capacity of wastewater treatment plant(s) (MGD):
2. Treated effluent is used for  on-site irrigation,  off-site irrigation, for  plant wash-down, and/or for  chlorination/dechlorination.  
  
If yes, approximate amount (in gallons per month):

3. Briefly describe the wastewater system(s) of the area serviced by the water utility. Describe how treated wastewater is disposed. Where applicable, identify treatment plant(s) with the TCEQ name and number, the operator, owner, and the receiving stream if wastewater is discharged.

*B. Wastewater Data for Service Area (if applicable)*

1. Percent of water service area served by wastewater system: \_\_\_\_\_ %
2. Monthly volume treated for previous five years (in 1,000 gallons):

<i>Year</i>	_____	_____	_____	_____	_____
<i>Month</i>	_____	_____	_____	_____	_____
January	_____	_____	_____	_____	_____
February	_____	_____	_____	_____	_____
March	_____	_____	_____	_____	_____
April	_____	_____	_____	_____	_____
May	_____	_____	_____	_____	_____
June	_____	_____	_____	_____	_____
July	_____	_____	_____	_____	_____
August	_____	_____	_____	_____	_____
September	_____	_____	_____	_____	_____
October	_____	_____	_____	_____	_____
November	_____	_____	_____	_____	_____
December	_____	_____	_____	_____	_____
<b>Totals</b>	_____	_____	_____	_____	_____

**V. ADDITIONAL REQUIRED INFORMATION**

*In addition to the utility profile, please attach the following as required by Title 30, Texas Administrative Code, §288.2. Note: If the water conservation plan does not provide information for each requirement, an explanation must be included as to why the requirement is not applicable.*

*A. Specific, Quantified 5 & 10-Year Targets*

The water conservation plan must include specific, quantified five-year and ten-year targets for water savings to include goals for water loss programs and goals for municipal use in gallons per capita per day. Note that the goals established by a public water supplier under this subparagraph are not enforceable

*B. Metering Devices*

The water conservation plan must include a statement about the water suppliers metering device(s), within an accuracy of plus or minus 5.0% in order to measure and account for the amount of water diverted from the source of supply.

*C. Universal Metering*

The water conservation plan must include and a program for universal metering of both customer and public uses of water, for meter testing and repair, and for periodic meter replacement.

*D. Unaccounted- For Water Use*

The water conservation plan must include measures to determine and control unaccounted-for uses of water (for example, periodic visual inspections along distribution lines; annual or monthly audit of the water system to determine illegal connections; abandoned services; etc.).

*E. Continuing Public Education & Information*

The water conservation plan must include a description of the program of continuing public education and information regarding water conservation by the water supplier.

*F. Non-Promotional Water Rate Structure*

The water supplier must have a water rate structure which is not “promotional,” i.e., a rate structure which is cost-based and which does not encourage the excessive use of water. This rate structure must be listed in the water conservation plan.

*G. Reservoir Systems Operations Plan*

The water conservation plan must include a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin. The reservoir systems operations plan shall include optimization of water supplies as one of the significant goals of the plan.

*H. Enforcement Procedure and Plan Adoption*

The water conservation plan must include a means for implementation and enforcement, which shall be evidenced by a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and a description of the authority by which the water supplier will implement and enforce the conservation plan.

*I. Coordination with the Regional Water Planning Group(s)*

The water conservation plan must include documentation of coordination with the regional water planning groups for the service area of the wholesale water supplier in order to ensure consistency with the appropriate approved regional water plans.

*J. Plan Review and Update*

A public water supplier for municipal use shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. The public water supplier for municipal use shall review and update the next revision of its water conservation plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. The revised plan must also include an implementation report.

**VI. ADDITIONAL REQUIREMENTS FOR LARGE SUPPLIERS**

*Required of suppliers serving population of 5,000 or more or a projected population of 5,000 or more within ten years*

*A. Leak Detection and Repair*

The plan must include a description of the program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system in order to control unaccounted for uses of water.

*B. Contract Requirements*

A requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of this chapter.

**VII. ADDITIONAL CONSERVATION STRATEGIES**

*A. Conservation Strategies*

Any combination of the following strategies shall be selected by the water supplier, in addition to the minimum requirements of this chapter, if they are necessary in order to achieve the stated water conservation goals of the plan. The commission may require by commission order that any of the following strategies be implemented by the water supplier if the commission determines that the strategies are necessary in order for the conservation plan to be achieved:

1. Conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;



2. Adoption of ordinances, plumbing codes, and/or rules requiring water conserving plumbing fixtures to be installed in new structures and existing structures undergoing substantial modification or addition;
3. A program for the replacement or retrofit of water-conserving plumbing fixtures in existing structures;
4. A program for reuse and/or recycling of wastewater and/or graywater;
5. A program for pressure control and/or reduction in the distribution system and/or for customer connections;
6. A program and/or ordinance(s) for landscape water management;
7. A method for monitoring the effectiveness and efficiency of the water conservation plan; and
8. Any other water conservation practice, method, or technique which the water supplier shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

### ***Best Management Practices***

*The Texas Water Developmental Board's (TWDB) Report 362 is the Water Conservation Best Management Practices (BMP) guide. The BMP Guide is a voluntary list of management practices that water users may implement in addition to the required components of Title 30, Texas Administrative Code, Chapter 288. The Best Management Practices Guide broken out by sector, including Agriculture, Commercial, and Institutional, Industrial, Municipal and Wholesale along with any new or revised BMP's can be found at the following link on the Texas Water Developments Board's website: <http://www.twdb.state.tx.us/conservation/bmps/index.asp>*

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact 512-239-3282.

### Industrial Water Users

At the request of the CBRWPG, the TCEQ model water conservation form for mining water users is attached for consideration by industrial entities seeking to develop a water conservation plan. This form can also be accessed electronically on the TCEQ website at: [https://www.tceq.texas.gov/permitting/water\\_rights/conserve.html](https://www.tceq.texas.gov/permitting/water_rights/conserve.html).



Texas Commission on Environmental Quality

INDUSTRIAL/MINING WATER CONSERVATION PLAN

This form is provided to assist entities in conservation plan development for industrial/mining water use. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resource Protection Team in the Water Availability Division at (512) 239-4691.

Name: Click to add text.
Address:
Telephone Number: ( ) Fax: ( )
Form Completed by:
Title:
Signature: Date: / /

NOTE: If the plan does not provide information for each requirement, include an explanation of why the requirement is not applicable.

VIII. BACKGROUND DATA

A. Water Use

- 1. Annual diversion appropriated or requested (in acre-feet):
2. Maximum diversion rate (cfs):

B. Water Sources

- 1. Please indicate the maximum or average annual amounts of water currently used and anticipated to be used (in acre-feet) for industrial/mining purposes:

Table with 4 columns: Source, Water Right No.(s), Current Use, Anticipated Use. Rows include Surface Water, Groundwater, Purchased, and Total.

2. How was the surface water data and/or groundwater data provided above (B1) obtained?

Master meter \_\_\_\_\_; Customer meter \_\_\_\_\_; Estimated \_\_\_\_\_; Other \_\_\_\_\_

3. Was purchased water raw or treated?

If both, % raw \_\_\_\_\_; % treated \_\_\_\_\_ and Supplier(s): \_\_\_\_\_

*C. Industrial/Mining Information*

1. Major product(s) or service(s) produced by applicant:

2. North American Industry Classification System (NAICS):

\_\_\_\_\_

**IX. WATER USE AND CONSERVATION PRACTICES**

*A. Water Use in Industrial or Mining Processes*

<i>Production Use</i>	<i>% Groundwater</i>	<i>% Surface Water</i>	<i>% Saline Water</i>	<i>% Treated Water</i>	<i>Water Use (in acre-ft)</i>
Cooling, condensing, & refrigeration	_____	_____	_____	_____	_____
Processing, washing, transport	_____	_____	_____	_____	_____
Boiler feed	_____	_____	_____	_____	_____
Incorporated into product	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____

<i>Facility Use</i>	<i>% Groundwater</i>	<i>% Surface Water</i>	<i>% Saline Water</i>	<i>% Treated Water</i>	<i>Water Use (in acre-ft)</i>
Cooling tower(s)	_____	_____	_____	_____	_____
Pond(s)	_____	_____	_____	_____	_____
Once through	_____	_____	_____	_____	_____
Sanitary & drinking water	_____	_____	_____	_____	_____
Irrigation & dust control	_____	_____	_____	_____	_____

1. Was fresh water recirculated at this facility?  Yes  No

2. Provide a detailed description of how the water will be utilized in the industrial or mining process.

3. Estimate the quantity of water consumed in production and mining processes and is therefore unavailable for reuse, discharge or other means of disposal.

4. Monthly water demand for previous year (in acre-feet).

<i>Month</i>	<i>Diversion Amount</i>	<i>% of Water Returned (If Any)</i>	<i>Monthly Demand</i>
January	_____	_____	_____
February	_____	_____	_____
March	_____	_____	_____
April	_____	_____	_____
May	_____	_____	_____
June	_____	_____	_____
July	_____	_____	_____
August	_____	_____	_____
September	_____	_____	_____
October	_____	_____	_____
November	_____	_____	_____
December	_____	_____	_____
<b>Totals</b>	_____	_____	_____

5. Projected monthly water demand for next year (in acre-feet).

<i>Month</i>	<i>Diversion Amount</i>	<i>% of Water Returned</i>	<i>Monthly Demand</i>
January	_____	_____	_____
February	_____	_____	_____
March	_____	_____	_____
April	_____	_____	_____
May	_____	_____	_____
June	_____	_____	_____
July	_____	_____	_____
August	_____	_____	_____
September	_____	_____	_____
October	_____	_____	_____
November	_____	_____	_____
December	_____	_____	_____
<b>Totals</b>	_____	_____	_____

*B. Specific and Quantified Conservation Goal*

Water conservation goals for the industrial and mining sector are generally established either for (1) the amount of water recycled, (2) the amount of water reused, or (3) the amount of water not lost or consumed, and therefore is available for return flow.

1. Water conservation goal (water use efficiency measure)

Type of goal(s):

\_\_\_\_\_ % reused water

\_\_\_\_\_ % of water not consumed and therefore returned

\_\_\_\_\_ Other (specify)

2. Provide specific and quantified five-year and ten-year targets for water savings and the basis for development of such goals for this water use/facility.

3. Describe the methods and/or device(s) within an accuracy of plus or minus 5% used to measure and account for the amount of water diverted from the supply source.

4. Provide a description of the leak-detection and repair, and water-loss accounting measures used.
5. Equipment and/or process modifications used to improve water use efficiency.
6. Other water conservation techniques used.

### ***Best Management Practices***

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<http://www.twdb.state.tx.us/conservation/bmps/index.asp>

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact 512-239-3282.

### Irrigation Water Users

At the request of the CBRWPG, the TCEQ model water conservation forms for irrigation water users with (1) individually operated systems or (2) agricultural water suppliers providing water to more than one user are attached for consideration by agricultural entities seeking to develop a water conservation plan. This form can also be accessed electronically on the TCEQ website at:

[https://www.tceq.texas.gov/permitting/water\\_rights/conserve.html](https://www.tceq.texas.gov/permitting/water_rights/conserve.html).





**Texas Commission on Environmental Quality**

**SYSTEM INVENTORY AND WATER CONSERVATION PLAN  
FOR INDIVIDUALLY-OPERATED IRRIGATION SYSTEMS**

This form is provided to assist entities in conservation plan development for individually-operated irrigation systems. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resource Protection Team in the Water Availability Division at (512) 239-4691.

Name: Click to add text.

Address: \_\_\_\_\_

Telephone Number: (    ) Fax: (    )

Form Completed by: \_\_\_\_\_

Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date:  / /

**NOTE: If the plan does not provide information for each requirement, include an explanation of why the requirement is not applicable.**

**X. BACKGROUND DATA**

*A. Water Use*

- Annual diversion appropriated or requested (in acre-feet):

<i>Type of crop (include hybrid name e.g., type of coastal Bermuda)</i>	<i>Growing season (months)</i>	<i>Acres irrigated/year</i>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
<b>Total acres</b>		_____

2. In the table below, list the total amount of water (in acre-feet) on average that is or will be diverted monthly for irrigation during the year.

January	February	March	April	<b>Subtotals</b>
_____	_____	_____	_____	_____
May	June	July	August	
_____	_____	_____	_____	_____
September	October	November	December	
_____	_____	_____	_____	_____
<b>Total All Months</b>				_____

3. Are crops rotated seasonally or annually?  Yes  No  
If yes, please describe:

4. Describe soil type (including permeability characteristics, if applicable).

*B. Irrigation system information*

- Describe the existing irrigation method or system and associated equipment including pumps, flow rates, plans, and/or sketches of system the layout. Include the rate (in gallons per minute or cubic feet per second) that water is diverted from the source of supply.
- Describe the method(s) and/or device(s) within an accuracy of plus or minus 5% used to measure and account for the amount of water diverted from the source of supply.
- Describe the specific and quantified five-year and ten-year targets for water savings including, where appropriate, quantitative goals for irrigation water use efficiency.

Quantified five-year and ten-year targets are:

- 5 year goal \_\_\_\_\_ % system efficiency or save \_\_\_\_\_ acre-feet
  - 10 year goal \_\_\_\_\_ % system efficiency or save \_\_\_\_\_ acre-feet
- (Ex. System efficiencies 80 % sprinkler, 90 % LEPA, 95 % drip)

4. If there is an existing irrigation system, have any system evaluations been performed on the efficiency of the system?

Yes       No

If yes, please provide the date of the evaluation, evaluator's name and the results of the evaluation:

*C. Conservation practices*

1. Describe any water conserving equipment, application system or method in the irrigation system.
  
2. Describe any methods that will be used for water loss control and leak detection and repair.
  
3. Describe any water-saving scheduling or practices to be used in the application of water (e.g., irrigation only in early morning, late evening or night hours and/or during lower temperatures and winds) and the utilization of soil-moisture monitoring.
  
4. Describe any water-saving land improvements or plans to be incorporated into the irrigation practices (e.g., land leveling, conservation tillage, furrow diking, weed control, etc.).
  
5. Describe any recovery and reuse of tail water runoff.
  
6. Describe any other water conservation practices, methods, or techniques for preventing waste and achieving conservation.

### **Best Management Practices**

*The Texas Water Developmental Board's (TWDB) Report 362 is the Water Conservation Best Management Practices (BMP) guide. The BMP Guide is a voluntary list of management practices that water users may implement in addition to the required components of Title 30, Texas Administrative Code, Chapter 288. The Best Management Practices Guide broken out by sector, including Agriculture, Commercial, and Institutional, Industrial, Municipal and Wholesale along with any new or revised BMP's can be found at the following link on the Texas Water Developments Board's website:*

<http://www.twdb.state.tx.us/conservation/bmps/index.asp>

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## Texas Commission on Environmental Quality

### SYSTEM INVENTORY AND WATER CONSERVATION PLAN FOR AGRICULTURAL WATER SUPPLIERS PROVIDING WATER TO MORE THAN ONE USER

This form is provided to assist entities in conservation plan development for agricultural water suppliers providing water to more than one user. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resource Protection Team in the Water Availability Division at (512) 239-4691.

Name: Click to add text

Address: \_\_\_\_\_

Telephone Number: (    ) Fax: (    )

Form Completed by: \_\_\_\_\_

Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date:  / /

**NOTE: If the plan does not provide information for each requirement, include an explanation of why the requirement is not applicable.**

#### **XI. BACKGROUND DATA**

##### *A. Structural Facilities*

1. Description of service area:
  
2. Total miles of main canals and pipelines:
3. Total miles of lateral canals and pipelines:
4. Description of canal construction:
  - c. Miles of unlined canals \_\_\_\_\_
  - d. Miles of lined canals \_\_\_\_\_
  - e. Miles of enclosed pipelines \_\_\_\_\_
  - f. Other \_\_\_\_\_
5. Description of canal conditions and recent or planned improvements:

6. Reservoir capacity, if applicable:
7. Description of pumps and pumping stations:
8. Description of meters and/or measuring devices:
9. Description of customer gates and measuring devices:
10. Description of any other structural facilities not covered above:

*B. Management Practices*

1. Total water available to district (in acre-feet/year): \_\_\_\_\_
  - a. Maximum water rights allocation to district: \_\_\_\_\_
  - b. Water rights number(s): \_\_\_\_\_
  - c. Other water contracted to be delivered by district: \_\_\_\_\_
- 2.** Average annual water diverted by district (in acre-feet/year):
- 3.** Average annual water delivered to customers (in acre-feet/year):
4. Delivery efficiency (percentage):

5. Historical diversion and deliveries for the previous three years (**in acre-feet/year**):

<i>Year</i>	<i>Total Water Diverted Annually</i>	<i>Irrigation Water Delivered Annually</i>	<i>Municipal Water Delivered Annually</i>	<i>Total Water Delivered Annually</i>	<i>Estimated Delivery Efficiency (%)</i>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
<b>Average</b>	_____	_____	_____	_____	_____

6. Practices and/or devices used to account for water deliveries:

7. Water pricing policy:

8. Operating rules and policies which encourage water conservation:

9. Describe **specific and quantified five-year and ten-year targets for water savings** including maximum allowable losses for the storage and distribution system:

10. Describe the practice(s) and/or device(s) which will be utilized to measure and account for the amount of water diverted from the source(s) of supply:

11. Describe the monitoring and record management program for water deliveries, sales, and losses:

12. Describe any methods that will be used for water loss control, leak detection, and repair:
  
13. Describe any program for customer assistance in the development of on-farm water conservation and pollution prevention measures:
  
14. Describe any other water conservation practice, method, or technique which the supplier shows to be appropriate for achieving conservation (if applicable):

*C. User profile*

1. Total number of acres or square miles in service area:
2. Average number of acres irrigated annually:
3. Projected number of acres to be irrigated in 10 years:
4. Number of active irrigation customers:
5. Total irrigation water delivered annually (in acre-feet):
  
6. Types of crops grown by customers:
  
  
7. Types of irrigation systems used by customers:
  
  
8. Types of drainage systems used by customers:
  
  
9. Further description of irrigation customers:



10. List of municipal customers and number of acre-feet allocated annually:
  
11. List of industrial and other large customers and number of acre-feet allocated annually:

*D. Additional Requirements*

1. A requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in 30 TAC chapter 288; if the customer intends to resell the water, then the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter. Provide a detailed description of how the water will be utilized in the production process including how the water is diverted and transported from the supply source(s).
2. Evidence of official adoption of the water conservation plan and goals, by ordinance, rule, resolution, or tariff, indicating that the plan reflects official policy of the supplier.
3. Documentation of coordination with the Regional Water Planning Groups in order to insure consistency with the appropriate approved regional water plans.

***Best Management Practices***

*The Texas Water Developmental Board's (TWDB) Report 362 is the Water Conservation Best Management Practices (BMP) guide. The BMP Guide is a voluntary list of management practices that water users may implement in addition to the required components of Title 30, Texas Administrative Code, Chapter 288. The Best Management Practices Guide broken out by sector, including Agriculture, Commercial, and Institutional, Industrial, Municipal and Wholesale along with any new or revised BMP's can be found at the following link on the Texas Water Developments Board's website:*  
<http://www.twdb.state.tx.us/conservation/bmps/index.asp>

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact 512-239-3282.

Appendix B  
Model Drought Contingency Plans (Region Specific)

### Model Drought Contingency plans

For municipal water users, wholesale public water suppliers and irrigation districts the CBRWPG compiled a summary of common drought contingency measures identified in existing drought contingency plans for water user groups in the Coastal Bend Region. The CBRWPG recommends appending this region specific table, beginning on the next page, with the TCEQ model drought contingency plan for retail public water supplier (also attached). The TCEQ form can be accessed electronically on the TCEQ website, along with a handbook for drought contingency planning or customized drought contingency plan form for water supply corporations, at: [https://www.tceq.texas.gov/permitting/water\\_rights/contingency.html](https://www.tceq.texas.gov/permitting/water_rights/contingency.html)

Municipal water users, wholesale public water suppliers and irrigation districts, in the area seeking to develop a drought contingency plan are encouraged to consider the attached information from the CBRWPG as a guide for utilities comparable in size and with similar water source (included in summary table). However, a one-size-fits-all approach is often impractical for all municipal water utilities and accordingly, it is to the discretion of the utility to develop a drought contingency plan that serves its utility the best. Current links to TCEQ model drought contingency forms based on entity typed are listed blow.

Municipal Water Users (see attached Retail Public Water Supplier form)

<https://www.tceq.texas.gov/assets/public/permitting/watersupply/drought/20191.pdf>

Wholesale Public Water Providers (see attached Wholesale Public Water Supplier form)

<https://www.tceq.texas.gov/assets/public/permitting/watersupply/drought/20193.pdf>

Irrigation Districts (form not available on website at time of printing)

<https://www.tceq.texas.gov/assets/public/permitting/watersupply/drought/20192.pdf>

Wholesale Water Provider/Water User Group	Census 2010 (For Water User Groups Only)	DCP Available	Date	Drought Contingency Measures											Water Supplies		
				Watering schedules/Landscape irrigation restrictions	Water demand reduction targets	Potable water use restrictions	Vehicle washing restrictions	Restrictions on wash down of hard-surfaces, buildings, and/or structures	Restrictions on new service connections, pipeline extensions, etc.	Restrictions on serving water to patrons at restaurants	Restrictions on flushing gutters, controllable leaks, and/or permitting water to run or accumulate	Restrictions on the use of water for pools, ponds, or fountains	Restrictions on use of water for dust control	Others	SW	GW	
<b>Wholesale Water Providers</b>																	
City of Corpus Christi		Y	2015	√	√	√	√	√					√		√	√	
SPMWD		Y	2014	√	√	√	√	√					√	√	√	√	
South Texas Water Authority		Y	2013		√										√	√	
Nueces County WCID #3		Y	2013	√	√	√				√		√			√	√	
LNRA		Y	2014		√										√	√	
<b>Water User Groups</b>																	
Aransas Pass	8,204	Y	2008	√	√		√	√	√	√	√	√	√	√	√	√	√
Rockport	8,766	Y	2013	√	√		√	√	√			√	√	√	√	√	
Baffin Bay WSC	N/A	Y	2015	√			√	√				√	√				
Beeville	12,863	Y	2014	√	√	√	√	√					√		√	√	
City of Three Rivers	1,848	Y	2014	√	√		√	√				√	√	√		√	√
San Diego MUD #1	4,488	Y	2000	√	√		√	√				√	√	√	√	√	
Alice	19,104	Y	2014	√	√		√	√	√	√	√	√	√	√	√	√	
Orange Grove	1,318	Y	2000	√	√		√	√	√	√	√	√	√	√	√	√	√
Kingsville	26,213	Y	2002	√	√		√	√	√	√	√	√	√	√	√	√	√
Ricardo WSC	2,631	Y	2013	√	√	√	√	√	√	√	√	√	√	√	√	√	√
El Oso WSC	1,019	Y	2009	√	√		√	√	√	√	√	√	√	√	√	√	√
McCoy WSC	169	Y	2009	√	√		√	√	√	√	√	√	√	√	√	√	√
Nueces WSC	2,322	Y	2013	√	√	√	√	√	√	√	√	√	√	√	√	√	√
River Acres WSC	2,421	Y	2000	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Odem	2,389	Y	2014	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Ingleside	9,387	Y	2014	√		√	√	√	√	√	√	√	√	√	√	√	√
Taft	3,048	Y	2013	√	√		√	√	√	√	√	√	√	√	√	√	√
Portland	15,099	Y	2013	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Rincon WSC	3,243	Y	2009	√	√		√					√	√		√	√	
<b>County-Other Entities</b>																	
Aransas County MUD #1		Y	2009	√								√			√		√
Blueberry Hills		Y	2005	√	√		√	√				√	√	√	√		√
Copano Heights Water Company		Y	2005	√	√		√	√				√	√	√		√	
Escondido Creek Estates		Y	2000	√			√			√	√	√	√	√	√		√
Freer WCID		Y	2000	√	√		√	√	√	√	√	√	√	√	√	√	√
McMullen WCID #2		Y	2002	√	√		√	√	√	√	√	√	√	√	√	√	√
Riviera		Y	2000	√			√	√				√	√	√	√	√	√
Pettus MUD		Y	2000	√			√	√				√	√		√	√	√



# Drought Contingency Plan a Retail Public Water Supplier

Texas Commission on Environmental Quality

Instructions: The following form is a model of a drought contingency plan for a retail public water supplier. Not all items may apply to your system's situation. This form is supplied for your convenience, but you are not required to use this form to submit your plan to the TCEQ. Submit completed plans to: Water Supply Division MC 160, TCEQ, P.O. Box 13087, Austin TX 78711-3087.

---

**(Name of Utility)**

---

**(Address, City, Zip Code)**

---

**(CCN#)**

---

**(PWS #s)**

---

**(Date)**

**Section I: Declaration of Policy, Purpose, and Intent**

In order to conserve the available water supply and protect the integrity of water supply facilities, with particular regard for domestic water use, sanitation, and fire protection, and to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortage or other water supply emergency conditions, the \_\_\_\_\_ (name of your water supplier) hereby adopts the following regulations and restrictions on the delivery and consumption of water through an ordinance/or resolution (see Appendix C for an example).

Water uses regulated or prohibited under this Drought Contingency Plan (the Plan) are considered to be non-essential and continuation of such uses during times of water shortage or other emergency water supply condition are deemed to constitute a waste of water which subjects the offender(s) to penalties as defined in Section XI of this Plan.

**Section II: Public Involvement**

Opportunity for the public to provide input into the preparation of the Plan was provided by the \_\_\_\_\_ (name of your water supplier) by means of \_\_\_\_\_ (describe methods used to inform the public about the preparation of the plan and provide opportunities for input; for example, scheduling and providing public notice of a public meeting to accept input on the Plan).

**Section III: Public Education**

The \_\_\_\_\_ (name of your water supplier) will periodically provide the public with information about the Plan, including information about the conditions under which each stage of the Plan is to be initiated or terminated and the drought response measures to be implemented in each stage. This information will be provided by means of \_\_\_\_\_ (describe methods to be used to provide information to the public about the Plan; for example, public events, press releases or utility bill inserts).

**Section IV: Coordination with Regional Water Planning Groups**

The service area of the \_\_\_\_\_ (name of your water supplier) is located within the \_\_\_\_\_ (name of regional water planning area or areas) and \_\_\_\_\_ (name of your water supplier) has provided a copy of this Plan to the \_\_\_\_\_ (name of your regional water planning group or groups).

**Section V: Authorization**

The \_\_\_\_\_ (designated official; for example, the mayor, city manager, utility director, general manager, etc.), or his/her designee is hereby authorized and directed to implement the applicable provisions of this Plan upon determination that such implementation is necessary to protect public health, safety, and welfare. The \_\_\_\_\_, (designated official) or his/her designee shall have the authority to initiate or terminate drought or other water supply emergency response measures as described in this Plan.

**Section VI: Application**

The provisions of this Plan shall apply to all persons, customers, and property utilizing water provided by the \_\_\_\_\_ (name of your water supplier). The terms "person" and "customer" as used in the Plan include individuals, corporations, partnerships, associations, and all other legal entities.

## **Section VII: Definitions**

For the purposes of this Plan, the following definitions shall apply:

Aesthetic water use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Commercial and institutional water use: water use which is integral to the operations of commercial and non-profit establishments and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

Customer: any person, company, or organization using water supplied by \_\_\_\_\_ (name of your water supplier).

Domestic water use: water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Even number address: street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

Industrial water use: the use of water in processes designed to convert materials of lower value into forms having greater usability and value.



Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, and rights-of-way and medians.

Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

- (a) irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this Plan;
- (b) use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;
- (c) use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
- (d) use of water to wash down buildings or structures for purposes other than immediate fire protection;
- (e) flushing gutters or permitting water to run or accumulate in any gutter or street;
- (f) use of water to fill, refill, or add to any indoor or outdoor swimming pools or Jacuzzi-type pools;
- (g) use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;
- (h) failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and
- (i) use of water from hydrants for construction purposes or any other purposes other than fire fighting.

Odd numbered address: street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

**Section VIII: Criteria for Initiation and Termination of Drought Response Stages**

The \_\_\_\_\_ (designated official) or his/her designee shall monitor water supply and/or demand conditions on a \_\_\_\_\_ (example: daily, weekly, monthly) basis and shall determine when conditions warrant initiation or termination of each stage of the Plan, that is, when the specified triggers are reached.

The triggering criteria described below are based on \_\_\_\_\_

\_\_\_\_\_

*(provide a brief description of the rationale for the triggering criteria; for example, triggering criteria / trigger levels based on a statistical analysis of the vulnerability of the water source under drought of record conditions, or based on known system capacity limits).*

**Stage 1 Triggers -- MILD Water Shortage Conditions**

Requirements for initiation

Customers shall be requested to voluntarily conserve water and adhere to the prescribed restrictions on certain water uses, defined in Section VII Definitions, when

\_\_\_\_\_

*(Describe triggering criteria / trigger levels; see examples below).*

*Following are examples of the types of triggering criteria that might be used in one or more successive stages of a drought contingency plan. One or a combination of such criteria must be defined for each drought response stage, but usually not all will apply. Select those appropriate to your system:*

*Example 1: Annually, beginning on May 1 through September 30.*

*Example 2: When the water supply available to the \_\_\_\_\_ (name of your water supplier) is equal to or less than \_\_\_\_\_ (acre-feet, percentage of storage, etc.).*

*Example 3: When, pursuant to requirements specified in the \_\_\_\_\_ (name of your water supplier) wholesale water purchase contract with \_\_\_\_\_ (name of your wholesale water supplier), notification is received requesting initiation of Stage 1 of the Drought Contingency Plan.*

*Example 4: When flows in the \_\_\_\_\_ (name of stream or river) are equal to or less than \_\_\_\_\_ cubic feet per second.*

*Example 5: When the static water level in the \_\_\_\_\_ (name of your water supplier) well(s) is equal to or less than \_\_\_\_\_ feet above/below mean sea level.*

*Example 6: When the specific capacity of the \_\_\_\_\_ (name of your water supplier) well(s) is equal to or less than \_\_\_\_\_ percent of the well's original specific capacity.*

*Example 7: When total daily water demand equals or exceeds \_\_\_\_\_ million gallons for \_\_\_\_\_ consecutive days of \_\_\_\_\_ million gallons on a single day (example: based on the safe operating capacity of water supply facilities).*

*Example 8: Continually falling treated water reservoir levels which do not refill above \_\_\_\_\_ percent overnight (example: based on an evaluation of minimum treated water storage required to avoid system outage).*

*The public water supplier may devise other triggering criteria which are tailored to its system.*

#### Requirements for termination

Stage 1 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of \_\_\_\_ (e.g. 3) consecutive days.

## **Stage 2 Triggers -- MODERATE Water Shortage Conditions**

### Requirements for initiation

Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses provided in Section IX of this Plan when \_\_\_\_\_ (*describe triggering criteria; see examples in Stage 1*).

### Requirements for termination

Stage 2 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of \_\_\_\_ (example: 3) consecutive days. Upon termination of Stage 2, Stage 1 becomes operative.

## **Stage 3 Triggers ■ SEVERE Water Shortage Conditions**

### Requirements for initiation

Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 3 of this Plan when \_\_\_\_\_ (*describe triggering criteria; see examples in Stage 1*).

### Requirements for termination

Stage 3 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of \_\_\_\_ (example: 3) consecutive days. Upon termination of Stage 3, Stage 2 becomes operative.

## **Stage 4 Triggers -- CRITICAL Water Shortage Conditions**

### Requirements for initiation

Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 4 of this Plan when \_\_\_\_\_ (*describe triggering criteria; see examples in Stage 1*).

Requirements for termination

Stage 4 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of \_\_\_\_ (example: 3) consecutive days. Upon termination of Stage 4, Stage 3 becomes operative.

**Stage 5 Triggers -- EMERGENCY Water Shortage Conditions**

Requirements for initiation

Customers shall be required to comply with the requirements and restrictions for Stage 5 of this Plan when \_\_\_\_\_ (designated official), or his/her designee, determines that a water supply emergency exists based on:

1. Major water line breaks, or pump or system failures occur, which cause unprecedented loss of capability to provide water service; **or**
  
2. Natural or man-made contamination of the water supply source(s).

Requirements for termination

Stage 5 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of \_\_\_\_ (example: 3) consecutive days.

**Stage 6 Triggers -- WATER ALLOCATION**

Requirements for initiation

Customers shall be required to comply with the water allocation plan prescribed in Section IX of this

Plan and comply with the requirements and restrictions for Stage 5 of this Plan when \_\_\_\_\_  
(describe triggering criteria, see examples in Stage 1).

Requirements for termination - Water allocation may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of \_\_\_\_ (example: 3) consecutive days.

*Note: The inclusion of WATER ALLOCATION as part of a drought contingency plan may not be required in all cases. For example, for a given water supplier, an analysis of water supply availability under drought of record conditions may indicate that there is essentially no risk of water supply shortage. Hence, a drought contingency plan for such a water supplier might only address facility capacity limitations and emergency conditions (example: supply source contamination and system capacity limitations).*

**Section IX: Drought Response Stages**

The \_\_\_\_\_ (designated official), or his/her designee, shall monitor water supply and/or demand conditions on a daily basis and, in accordance with the triggering criteria set forth in Section VIII of this Plan, shall determine that a mild, moderate, severe, critical, emergency or water shortage condition exists and shall implement the following notification procedures:

**Notification**

Notification of the Public:

The \_\_\_\_\_ (designated official) or his/ her designee shall notify the public by means of:

*Examples:*

*publication in a newspaper of general circulation,*

*direct mail to each customer,*

*public service announcements,*

*signs posted in public places*

*take-home fliers at schools.*

Additional Notification:

The \_\_\_\_\_ (designated official) or his/ her designee shall notify directly, or cause to be notified directly, the following individuals and entities:

*Examples:*

*Mayor / Chairman and members of the City Council / Utility Board*

*Fire Chief(s)*

*City and/or County Emergency Management Coordinator(s)*

*County Judge & Commissioner(s)*

*State Disaster District / Department of Public Safety*

*TCEQ (required when mandatory restrictions are imposed)*

*Major water users*

*Critical water users, i.e. hospitals*

*Parks / street superintendents & public facilities managers*

*Note: The plan should specify direct notice only as appropriate to respective drought stages.*



**Stage 1 Response -- MILD Water Shortage Conditions**

**Target: Achieve a voluntary \_\_\_ percent reduction in \_\_\_\_\_(example: total water use, daily water demand, etc.).**

**Best Management Practices for Supply Management:**

*Describe additional measures, if any, to be implemented directly by (name of your water supplier) to manage limited water supplies and/or reduce water demand. Examples include: reduced or discontinued flushing of water mains, activation and use of an alternative supply source(s); use of reclaimed water for non-potable purposes.*

**Voluntary Water Use Restrictions for Reducing Demand :**

- (a) Water customers are requested to voluntarily limit the irrigation of landscaped areas to Sundays and Thursdays for customers with a street address ending in an even number (0, 2, 4, 6 or 8), and Saturdays and Wednesdays for water customers with a street address ending in an odd number (1, 3, 5, 7 or 9), and to irrigate landscapes only between the hours of midnight and 10:00 a.m. and 8:00 p.m. to midnight on designated watering days.
- (b) All operations of the \_\_\_\_\_ (name of your water supplier) shall adhere to water use restrictions prescribed for Stage 2 of the Plan.
- (c) Water customers are requested to practice water conservation and to minimize or discontinue water use for non-essential purposes.

**Stage 2 Response -- MODERATE Water Shortage Conditions**

**Target:** Achieve a \_\_\_ percent reduction in \_\_\_\_\_ (example: total water use, daily water demand, etc.).

Best Management Practices for Supply Management:

*Describe additional measures, if any, to be implemented directly by \_\_\_\_\_ (name of your water supplier) to manage limited water supplies and/or reduce water demand. Examples include: reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for non-potable purposes.*

Water Use Restrictions for Demand Reduction:

Under threat of penalty for violation, the following water use restrictions shall apply to all persons:

- (a) Irrigation of landscaped areas with hose-end sprinklers or automatic irrigation systems shall be limited to Sundays and Thursdays for customers with a street address ending in an even number (0, 2, 4, 6 or 8), and Saturdays and Wednesdays for water customers with a street address ending in an odd number (1, 3, 5, 7 or 9), and irrigation of landscaped areas is further limited to the hours of 12:00 midnight until 10:00 a.m. and between 8:00 p.m. and 12:00 midnight on designated watering days. However, irrigation of landscaped areas is permitted at anytime if it is by means of a hand-held hose, a faucet filled bucket or watering can of five (5) gallons or less, or drip irrigation system.
- (b) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight. Such washing, when allowed, shall be done with a hand-held bucket or a hand-held hose equipped with a positive shutoff nozzle for quick rises. Vehicle washing may be done at any time on the immediate premises of a commercial car wash or commercial service station. Further, such washing may be exempted from these regulations if the health, safety, and welfare of the public is contingent upon frequent vehicle cleansing, such as garbage trucks and vehicles used to transport food and perishables.
- (c) Use of water to fill, refill, or add to any indoor or outdoor swimming pools, wading pools, or Jacuzzi-type pools is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8 p.m. and 12:00 midnight.
- (d) Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountains or ponds are equipped with a recirculation system.
- (e) Use of water from hydrants shall be limited to fire fighting, related activities, or other activities necessary to maintain public health, safety, and welfare, except that use of

water from designated fire hydrants for construction purposes may be allowed under special permit from the \_\_\_\_\_ (name of your water supplier).

(f) Use of water for the irrigation of golf course greens, tees, and fairways is prohibited except on designated watering days between the hours 12:00 midnight and 10:00 a.m. and between 8 p.m. and 12:00 midnight. However, if the golf course utilizes a water source other than that provided by the \_\_\_\_\_ (name of your water supplier), the facility shall not be subject to these regulations.

(g) All restaurants are prohibited from serving water to patrons except upon request of the patron.

(h) The following uses of water are defined as non-essential and are prohibited:

1. wash down of any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
2. use of water to wash down buildings or structures for purposes other than immediate fire protection;
3. use of water for dust control;
4. flushing gutters or permitting water to run or accumulate in any gutter or street; and
5. failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s).

### **Stage 3 Response -- SEVERE Water Shortage Conditions**

**Target:** Achieve a \_\_\_ percent reduction in \_\_\_\_\_ (example: total water use, daily water demand, etc.).

Best Management Practices for Supply Management:

*Describe additional measures, if any, to be implemented directly by \_\_\_\_\_ (name of your water supplier) to manage limited water supplies and/or reduce water demand. Examples include: reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for non-potable purposes.*

Water Use Restrictions for Demand Reduction:

All requirements of Stage 2 shall remain in effect during Stage 3 except:

- (a) Irrigation of landscaped areas shall be limited to designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8 p.m. and 12:00 midnight and shall be by means of hand-held hoses, hand-held buckets, drip irrigation, or permanently installed automatic sprinkler system only. The use of hose-end sprinklers is prohibited at all times.
- (b) The watering of golf course tees is prohibited unless the golf course utilizes a water source other than that provided by the \_\_\_\_\_ (name of your water supplier).
- (c) The use of water for construction purposes from designated fire hydrants under special permit is to be discontinued.

**Stage 4 Response -- CRITICAL Water Shortage Conditions**

**Target: Achieve a \_\_\_ percent reduction in \_\_\_\_\_ (example: total water use, daily water demand, etc.).**

Best Management Practices for Supply Management:

*Describe additional measures, if any, to be implemented directly by \_\_\_\_\_ (name of your water supplier) to manage limited water supplies and/or reduce water demand. Examples include: reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for non-potable purposes.*

Water Use Restrictions for Reducing Demand:. All requirements of Stage 2 and 3 shall remain in effect during Stage 4 except:

- (a) Irrigation of landscaped areas shall be limited to designated watering days between the hours of 6:00 a.m. and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight and shall be by means of hand-held hoses, hand-held buckets, or drip irrigation only. The use of hose-end sprinklers or permanently installed automatic sprinkler systems are prohibited at all times.
- (b) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle not occurring on the premises of a commercial car wash and commercial service stations and not in the immediate interest of public health, safety, and welfare is prohibited. Further, such vehicle washing at commercial car washes and commercial service stations shall occur only between the hours of 6:00 a.m. and 10:00 a.m. and between 6:00 p.m. and 10 p.m.
- (c) The filling, refilling, or adding of water to swimming pools, wading pools, and Jacuzzi-type pools is prohibited.
- (d) Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountains or ponds are equipped with a recirculation system.

- (e) No application for new, additional, expanded, or increased-in-size water service connections, meters, service lines, pipeline extensions, mains, or water service facilities of any kind shall be approved, and time limits for approval of such applications are hereby suspended for such time as this drought response stage or a higher-numbered stage shall be in effect.

### **Stage 5 Response -- EMERGENCY Water Shortage Conditions**

**Target: Achieve a \_\_\_ percent reduction in \_\_\_\_\_ (example: total water use, daily water demand, etc.).**

**Best Management Practices for Supply Management:**

*Describe additional measures, if any, to be implemented directly by \_\_\_\_\_ (name of your water supplier) to manage limited water supplies and/or reduce water demand. Examples include: reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for non-potable purposes.*

**Water Use Restrictions for Reducing Demand.** All requirements of Stage 2, 3, and 4 shall remain in effect during Stage 5 except:

- (a) Irrigation of landscaped areas is absolutely prohibited.
- (b) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle is absolutely prohibited.

**Stage 6 Response -- WATER ALLOCATION**

In the event that water shortage conditions threaten public health, safety, and welfare, the \_\_\_\_\_ (designated official) is hereby authorized to allocate water according to the following water allocation plan:

**Single-Family Residential Customers**

The allocation to residential water customers residing in a single-family dwelling shall be as follows:

<b>Persons per Household</b>	<b>Gallons per Month</b>
1 or 2	6,000
3 or 4	7,000
5 or 6	8,000
7 or 8	9,000
9 or 10	10,000
11 or more	12,000



■Household• means the residential premises served by the customer's meter. ■Persons per household• include only those persons currently physically residing at the premises and expected to reside there for the entire billing period. It shall be assumed that a particular customer's household is comprised of two (2) persons unless the customer notifies the \_\_\_\_\_ (name of your water supplier) of a greater number of persons per household on a form prescribed by the \_\_\_\_\_ designated official). The \_\_\_\_\_ (designated official) shall give his/her best effort to see that such forms are mailed, otherwise provided, or made available to every residential customer. If, however, a customer does not receive such a

form, it shall be the customer's responsibility to go to the \_\_\_\_\_ (name of your water supplier) offices to complete and sign the form claiming more than two (2) persons per household. New customers may claim more persons per household at the time of applying for water service on the form prescribed by the \_\_\_\_\_ (designated official). When the number of persons per household increases so as to place the customer in a different allocation category, the customer may notify the \_\_\_\_\_ (name of water supplier) on such form and the change will be implemented in the next practicable billing period. If the number of persons in a household is reduced, the customer shall notify the \_\_\_\_\_ (name of your water supplier) in writing within two (2) days. In prescribing the method for claiming more than two (2) persons per household, the \_\_\_\_\_ (designated official) shall adopt methods to insure the accuracy of the claim. Any person who knowingly, recklessly, or with criminal negligence falsely reports the number of persons in a household or fails to timely notify the \_\_\_\_\_ (name of your water supplier) of a reduction in the number of person in a household shall be fined not less than \$\_\_\_\_\_.

Residential water customers shall pay the following surcharges:

\$\_\_\_\_\_ for the first 1,000 gallons over allocation.

\$\_\_\_\_\_ for the second 1,000 gallons over allocation.

\$\_\_\_\_\_ for the third 1,000 gallons over allocation.

\$\_\_\_\_\_ for each additional 1,000 gallons over allocation.

Surcharges shall be cumulative.

**Master-Metered Multi-Family Residential Customers**

The allocation to a customer billed from a master meter which jointly measures water to multiple permanent residential dwelling units (example: apartments, mobile homes) shall be allocated 6,000 gallons per month for each dwelling unit. It shall be assumed that such a customer's meter serves two dwelling units unless the customer notifies the \_\_\_\_\_ (name of your water supplier) of a greater number on a form prescribed by the \_\_\_\_\_ (designated official). The \_\_\_\_\_ (designated official) shall give his/her best effort to see that such forms are mailed, otherwise provided, or made available to every such customer. If, however, a customer does not receive such a form, it shall be the customer's responsibility to go to the \_\_\_\_\_ (name of your water supplier) offices to complete and sign the form claiming more than two (2) dwellings. A dwelling unit may be claimed under this provision whether it is occupied or not. New customers may claim more dwelling units at the time of applying for water service on the form prescribed by the \_\_\_\_\_ (designated official). If the number of dwelling units served by a master meter is reduced, the customer shall notify the \_\_\_\_\_ (name of your water supplier) in writing within two (2) days. In prescribing the method for claiming more than two (2) dwelling units, the \_\_\_\_\_ (designated official) shall adopt methods to insure the accuracy of the claim. Any person who knowingly, recklessly, or with criminal negligence falsely reports the number of dwelling units served by a master meter or fails to timely notify the \_\_\_\_\_ (name of your water supplier) of a reduction in the number of person in a household shall be fined not less than \$\_\_\_\_\_. Customers billed from a master meter under this provision shall pay the following monthly surcharges:

\$\_\_\_\_ for 1,000 gallons over allocation up through 1,000 gallons for each dwelling unit.

\$\_\_\_\_, thereafter, for each additional 1,000 gallons over allocation up through a second 1,000 gallons for each dwelling unit.

\$\_\_\_\_, thereafter, for each additional 1,000 gallons over allocation up through a third 1,000 gallons for each dwelling unit.

\$\_\_\_\_, thereafter for each additional 1,000 gallons over allocation.

Surcharges shall be cumulative.

## Commercial Customers

A monthly water allocation shall be established by the \_\_\_\_\_ (designated official), or his/her designee, for each nonresidential commercial customer other than an industrial customer who uses water for processing purposes. The non-residential customer's allocation shall be approximately \_\_\_ (e.g. 75%) percent of the customer's usage for corresponding month's billing period for the previous 12 months. If the customer's billing history is shorter than 12 months, the monthly average for the period for which there is a record shall be used for any monthly period for which no history exists. Provided, however, a customer, \_\_\_ percent of whose monthly usage is less than \_\_\_\_\_ gallons, shall be allocated \_\_\_\_\_ gallons. The \_\_\_\_\_ (designated official) shall give his/her best effort to see that notice of each non-residential customer's allocation is mailed to such customer. If, however, a customer does not receive such notice, it shall be the customer's responsibility to contact the \_\_\_\_\_ (name of your water supplier) to determine the allocation. Upon request of the customer or at the initiative of the \_\_\_\_\_ (designated official), the allocation may be reduced or increased if, (1) the designated period does not accurately reflect the customer's normal water usage, (2) one nonresidential customer agrees to transfer part of its allocation to another nonresidential customer, or (3) other objective evidence demonstrates that the designated allocation is inaccurate under present conditions. A customer may appeal an allocation established hereunder to the \_\_\_\_\_ (designated official or alternatively, a special water allocation review committee). Nonresidential commercial customers shall pay the following surcharges:

Customers whose allocation is \_\_\_\_\_ gallons through \_\_\_\_\_ gallons per month:

\$\_\_\_\_\_ per thousand gallons for the first 1,000 gallons over allocation.

\$\_\_\_\_\_ per thousand gallons for the second 1,000 gallons over allocation.

\$\_\_\_\_\_ per thousand gallons for the third 1,000 gallons over allocation.

\$\_\_\_\_\_ per thousand gallons for each additional 1,000 gallons over allocation.

Customers whose allocation is \_\_\_\_\_ gallons per month or more:

\_\_\_\_ times the block rate for each 1,000 gallons in excess of the

allocation up through 5 percent above allocation.

\_\_\_ times the block rate for each 1,000 gallons from 5 percent through 10 percent above allocation.

\_\_\_ times the block rate for each 1,000 gallons from 10 percent through 15 percent above allocation.

\_\_\_ times the block rate for each 1,000 gallons more than 15 percent above allocation.

The surcharges shall be cumulative. As used herein, ■block rate● means the charge to the customer per 1,000 gallons at the regular water rate schedule at the level of the customer's allocation.

### **Industrial Customers**

A monthly water allocation shall be established by the \_\_\_\_\_ (designated official), or his/her designee, for each industrial customer, which uses water for processing purposes. The industrial customer's allocation shall be approximately \_\_\_ (example: 90%) percent of the customer's water usage baseline. Ninety (90) days after the initial imposition of the allocation for industrial customers, the industrial customer's allocation shall be further reduced to \_\_\_ (example: 85%) percent of the customer's water usage baseline. The industrial customer's water use baseline will be computed on the average water use for the \_\_\_\_\_ month period ending prior to the date of implementation of Stage 2 of the Plan. If the industrial water customer's billing history is shorter than \_\_\_ months, the monthly average for the period for which there is a record shall be used for any monthly period for which no billing history exists. The \_\_\_\_\_ (designated official) shall give his/her best effort to see that notice of each industrial customer's allocation is mailed to such customer. If, however, a customer does not receive such notice, it shall be the customer's responsibility to contact the \_\_\_\_\_ (name of your water supplier) to determine the allocation, and the allocation shall be fully effective notwithstanding the lack of receipt of written notice. Upon request of the customer or at the initiative of the \_\_\_\_\_ (designated official), the allocation may be reduced or increased, (1) if the designated period does not accurately reflect the customer's normal water use because the customer had shutdown a major processing unit for repair or overhaul during the period, (2) the customer has added or is in the process of adding significant additional processing capacity, (3) the customer has shutdown or significantly reduced the production of a major processing unit, (4) the customer has previously implemented significant permanent water conservation measures such that the ability to further reduce water use is limited, (5) the customer agrees to transfer part of its allocation to another industrial customer, or (6) if other objective evidence demonstrates that the designated allocation is inaccurate under present conditions. A customer may

appeal an allocation established hereunder to the \_\_\_\_\_ (designated official or alternatively, a special water allocation review committee). Industrial customers shall pay the following surcharges:

Customers whose allocation is \_\_\_\_\_ gallons through \_\_\_\_\_ gallons per month:

\$\_\_\_\_\_ per thousand gallons for the first 1,000 gallons over allocation.

\$\_\_\_\_\_ per thousand gallons for the second 1,000 gallons over allocation.

\$\_\_\_\_\_ per thousand gallons for the third 1,000 gallons over allocation.

\$\_\_\_\_\_ per thousand gallons for each additional 1,000 gallons over allocation.

Customers whose allocation is \_\_\_\_\_ gallons per month or more:

\_\_\_\_\_ times the block rate for each 1,000 gallons in excess of the allocation up through 5 percent above allocation.

\_\_\_\_\_ times the block rate for each 1,000 gallons from 5 percent through 10 percent above allocation.

\_\_\_\_\_ times the block rate for each 1,000 gallons from 10 percent through 15 percent above allocation.

\_\_\_\_\_ times the block rate for each 1,000 gallons more than 15 percent above allocation.

The surcharges shall be cumulative. As used herein, "block rate" means the charge to the customer per 1,000 gallons at the regular water rate schedule at the level of the customer's allocation.

**Section X: Enforcement**

- (a) No person shall knowingly or intentionally allow the use of water from the \_\_\_\_\_ (name of your water supplier) for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this Plan, or in an amount in excess of that permitted by the drought response stage in effect at the time pursuant to action taken by \_\_\_\_\_ (designated official), or his/her designee, in accordance with provisions of this Plan.
- (b) Any person who violates this Plan is guilty of a misdemeanor and, upon conviction shall be punished by a fine of not less than \_\_\_\_\_ dollars (\$\_\_) and not more than \_\_\_\_\_ dollars (\$\_\_). Each day that one or more of the provisions in this Plan is violated shall constitute a separate offense. If a person is convicted of three or more distinct violations of this Plan, the \_\_\_\_\_ (designated official) shall, upon due notice to the customer, be authorized to discontinue water service to the premises where such violations occur. Services discontinued under such circumstances shall be restored only upon payment of a re-connection charge, hereby established at \$\_\_\_\_\_, and any other costs incurred by the \_\_\_\_\_ (name of your water supplier) in discontinuing service. In addition, suitable assurance must be given to the \_\_\_\_\_ (designated official) that the same action shall not be repeated while the Plan is in effect. Compliance with this plan may also be sought through injunctive relief in the district court.
- (c) Any person, including a person classified as a water customer of the \_\_\_\_\_ (name of your water supplier), in apparent control of the property where a violation occurs or originates shall be presumed to be the violator, and proof that the violation occurred on the person's property shall constitute a rebuttable presumption that the person in apparent control of the property committed the violation, but any such person shall have the right to show that he/she did not commit the violation. Parents shall be presumed to be responsible for violations of their minor children and proof that a violation, committed by a child, occurred on property within the parents' control shall constitute a rebuttable presumption that the parent committed the violation, but any such parent may be excused if he/she proves that he/she had previously directed the child not to use the water as it was used in violation of this Plan and that the parent could not have reasonably known of the violation.

(d) Any employee of the \_\_\_\_\_ (name of your water supplier), police officer, or other \_\_\_\_\_ employee designated by the \_\_\_\_\_ (designated official), may issue a citation to a person he/she reasonably believes to be in violation of this Ordinance. The citation shall be prepared in duplicate and shall contain the name and address of the alleged violator, if known, the offense charged, and shall direct him/her to appear in the \_\_\_\_\_ (example: municipal court) on the date shown on the citation for which the date shall not be less than 3 days nor more than 5 days from the date the citation was issued. The alleged violator shall be served a copy of \_\_\_\_\_ or is a resident of the violator's residence. The alleged violator shall appear in \_\_\_\_\_ (example: municipal court) to enter a plea of guilty or not guilty for the violation of this Plan. If the alleged violator fails to appear in \_\_\_\_\_ (example: municipal court), a warrant for his/her arrest may be issued. A summons to appear may be issued in lieu of an arrest warrant. These cases shall be expedited and given preferential setting in \_\_\_\_\_ (example: municipal court) before all other cases.

**Section XI: Variances**

The \_\_\_\_\_ (designated official), or his/her designee, may, in writing, grant temporary variance for existing water uses otherwise prohibited under this Plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the person requesting such variance and if one or more of the following conditions are met:

- (a) Compliance with this Plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the Plan is in effect.
- (b) Alternative methods can be implemented which will achieve the same level of reduction in water use.

Persons requesting an exemption from the provisions of this Ordinance shall file a petition for variance with the \_\_\_\_\_ (name of your water supplier) within 5 days after the Plan or a particular drought response stage has been invoked. All petitions for variances shall be reviewed by the \_\_\_\_\_ (designated official), or his/her designee, and shall include the following:

- (a) Name and address of the petitioner(s).
- (b) Purpose of water use.
- (c) Specific provision(s) of the Plan from which the petitioner is requesting relief.
- (d) Detailed statement as to how the specific provision of the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this Ordinance.
- (e) Description of the relief requested.
- (f) Period of time for which the variance is sought.
- (g) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this Plan and the compliance date.
- (h) Other pertinent information.



**If you have any questions on how to fill out this form or about the Drought Contingency program, please contact us at xxx-xxx-xxxx.**

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512-239-3282.

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# Drought Contingency Plan for a Wholesale Public Water Supplier

Texas Commission on Environmental Quality

Instructions: The following form is a model of a drought contingency plan for a wholesale public water supplier. Not all items may apply to your system's situation. This form is supplied for your convenience, but you are not required to use this form to submit your plan to the TCEQ. Submit completed plans to: Water Availability Division MC 160, TCEQ, P.O. Box 13087, Austin TX 78711-3087. If you have any questions on how to fill out this form, please contact the Resource Protection Team at 512/239-4691.

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(Name of Utility)

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(Address, City, Zip Code)

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(CCN#)

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(PWS #s)

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(Date)

## Section I: Declaration of Policy, Purpose, and Intent

In order to conserve the available water supply and/or to protect the integrity of water supply facilities, with particular regard for domestic water use, sanitation, and fire protection, and to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortage or other water supply emergency conditions, the \_\_\_\_\_ (name of your water supplier) adopts the following Drought Contingency Plan (the Plan).

**Section II: Public Involvement**

Opportunity for the public and wholesale water customers to provide input into the preparation of the Plan was provided by \_\_\_\_\_ (name of your water supplier) by means of \_\_\_\_\_ (describe methods used to inform the public and wholesale customers about the preparation of the plan and opportunities for input; for example, scheduling and providing public notice of a public meeting to accept input on the Plan).

**Section III: Wholesale Water Customer Education**

The \_\_\_\_\_ (name of your water supplier) will periodically provide wholesale water customers with information about the Plan, including information about the conditions under which each stage of the Plan is to be initiated or terminated and the drought response measures to be implemented in each stage. This information will be provided by means of \_\_\_\_\_ (e.g., describe methods to be used to provide customers with information about the Plan; for example, providing a copy of the Plan or periodically including information about the Plan with invoices for water sales).

**Section IV: Coordination with Regional Water Planning Groups**

The water service area of the \_\_\_\_\_ (name of your water supplier) is located within the \_\_\_\_\_ (name of regional water planning area or areas) and the \_\_\_\_\_ (name of your water supplier) has provided a copy of the Plan to the \_\_\_\_\_ (name of your regional water planning group or groups).

**Section V: Authorization**

The \_\_\_\_\_ (designated official; for example, the general manager or executive director), or his/her designee, is hereby authorized and directed to implement the applicable provisions of this Plan upon determination that such implementation is necessary to protect public health, safety, and welfare. The \_\_\_\_\_, or his/her designee, shall have the authority to initiate or terminate drought or other water supply emergency response measures as described in this Plan.

**Section VI: Application**

The provisions of this Plan shall apply to all customers utilizing water provided by the \_\_\_\_\_ (name of your water supplier). The terms “person” and “customer” as used in the Plan include individuals, corporations, partnerships, associations, and all other legal entities.

**Section VII: Criteria for Initiation and Termination of Drought Response Stages**

The \_\_\_\_\_ (designated official), or his/her designee, shall monitor water supply and/or demand conditions on a (e.g., weekly, monthly) basis and shall determine when conditions warrant initiation or termination of each stage of the Plan. Customer notification of the initiation or termination of drought response stages will be made by mail or telephone. The news media will also be informed.

The triggering criteria described below are based on:

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\_\_\_\_\_ (provide a brief description of the rationale for the triggering criteria; for example, triggering criteria are based on a statistical analysis of the vulnerability of the water source under drought of record conditions).

**Stage 1 Triggers -- MILD Water Shortage Conditions**

Requirements for initiation – The \_\_\_\_\_ (name of your water supplier) will recognize that a mild water shortage condition exists when \_\_\_\_\_ (describe triggering criteria, see examples below).

***Below are examples of the types of triggering criteria that might be used in a wholesale water supplier's drought contingency plan. One or a combination of such criteria may be defined for each drought response stage:***

***Example 1: Water in storage in the \_\_\_\_\_ (name of reservoir) is equal to or less than \_\_\_\_\_ (acre-feet and/or percentage of storage capacity).***

***Example 2: When the combined storage in the \_\_\_\_\_ (name of reservoirs) is equal to or less than \_\_\_\_\_ (acre-feet and/or percentage of storage capacity).***

***Example 3: Flows as measured by the U.S. Geological Survey gage on the \_\_\_\_\_ (name of river) near \_\_\_\_\_, Texas reaches \_\_\_ cubic feet per second (cfs).***

***Example 4: When total daily water demand equals or exceeds \_\_\_\_\_ million gallons for \_\_\_ consecutive days or \_\_\_\_\_ million gallons on a single day.***

***Example 5: When total daily water demand equals or exceeds \_\_\_ percent of the safe operating capacity of \_\_\_\_\_ million gallons per day for \_\_\_ consecutive days or \_\_\_ percent on a single day.***

Requirements for termination - Stage 1 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of \_\_\_ (e.g., 30) consecutive days. The \_\_\_\_\_ (name of water supplier) will notify its wholesale customers and the media of the termination of Stage 1.

### **Stage 2 Triggers -- MODERATE Water Shortage Conditions**

Requirements for initiation – The \_\_\_\_\_ (name of your water supplier) will recognize that a moderate water shortage condition exists when \_\_\_\_\_ (describe triggering criteria).

Requirements for termination - Stage 2 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of \_\_\_ (e.g., 30) consecutive days. Upon termination of Stage 2, Stage 1 becomes operative. The \_\_\_\_\_ (name of your water supplier) will notify its wholesale customers and the media of the termination of Stage 2.

### **Stage 3 Triggers -- SEVERE Water Shortage Conditions**

Requirements for initiation – The \_\_\_\_\_ (name of your water supplier) will recognize that a severe water shortage condition exists when \_\_\_\_\_ (*describe triggering criteria; see examples in Stage 1*).

Requirements for termination - Stage 3 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of \_\_\_ (e.g., 30) consecutive days. Upon termination of Stage 3, Stage 2 becomes operative. The \_\_\_\_\_ (name of your water supplier) will notify its wholesale customers and the media of the termination of Stage 3.

### **Stage 4 Triggers -- CRITICAL Water Shortage Conditions**

Requirements for initiation - The \_\_\_\_\_ (name of your water supplier) will recognize that an emergency water shortage condition exists when \_\_\_\_\_ (*describe triggering criteria; see examples below*).

**Example 1.**      ***Major water line breaks, or pump or system failures occur, which cause unprecedented loss of capability to provide water service; or***

**Example 2.**      ***Natural or man-made contamination of the water supply source(s).***

Requirements for termination - Stage 4 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of \_\_\_\_ (e.g., 30) consecutive days. The \_\_\_\_\_ (name of your water supplier) will notify its wholesale customers and the media of the termination of Stage 4.

#### **Section VIII:    Drought Response Stages**

The \_\_\_\_\_ (designated official), or his/her designee, shall monitor water supply and/or demand conditions and, in accordance with the triggering criteria set forth in Section VII, shall determine that mild, moderate, or severe water shortage conditions exist or that an emergency condition exists and shall implement the following actions:

#### **Stage 1 Response -- MILD Water Shortage Conditions**

Target: Achieve a voluntary \_\_ percent reduction in \_\_\_\_\_ (e.g., total water use, daily water demand, etc.).

Best Management Practices for Supply Management:

*Describe additional measures, if any, to be implemented directly by \_\_\_\_\_ (designated official), or his/her designee(s), to manage limited water supplies and/or reduce water demand. Examples include modifying reservoir operations procedures, interconnection with another water system, and use of reclaimed water for nonpotable purposes.*

Water Use Restrictions for Reducing Demand:

(a) The \_\_\_\_\_ (designated official), or his/her designee(s), will contact wholesale water customers to discuss water supply and/or demand conditions and will request that wholesale water customers initiate voluntary measures to reduce water use (e.g., implement Stage 1 or appropriate stage of the customer's drought contingency plan).

(b) The \_\_\_\_\_ (designated official), or his/her designee(s), will provide a weekly report to news media with information regarding current water supply and/or demand conditions, projected water supply and demand conditions if drought conditions persist, and consumer information on water conservation measures and practices.

**Stage 2 Response -- MODERATE Water Shortage Conditions**

**Target: Achieve a \_\_\_ percent reduction in \_\_\_\_\_ (e.g., total water use, daily water demand, etc.).**

Best Management Practices for Supply Management:

*Describe additional measures, if any, to be implemented directly by \_\_\_\_\_ (designated official), or his/her designee(s), to manage limited water supplies and/or reduce water demand. Examples include modifying reservoir operations procedures, interconnection with another water system, and use of reclaimed water for non-potable purposes.*

Water Use Restrictions for Reducing Demand:



(a) The \_\_\_\_\_ (designated official), or his/her designee(s), will request wholesale water customers to initiate mandatory measures to reduce non-essential water use (e.g., implement Stage 2 or appropriate stage of the customer's drought contingency plan).

(b) The \_\_\_\_\_ (designated official), or his/her designee(s), will initiate weekly contact with wholesale water customers to discuss water supply and/or demand conditions and the possibility of pro rata curtailment of water diversions and/or deliveries.

(c) The \_\_\_\_\_ (designated official), or his/her designee(s), will further prepare for the implementation of pro rata curtailment of water diversions and/or deliveries by preparing a monthly water usage allocation baseline for each wholesale customer.

(d) The \_\_\_\_\_ (designated official), or his/her designee(s), will provide a weekly report to news media with information regarding current water supply and/or demand conditions, projected water supply and demand conditions if drought conditions persist, and consumer information on water conservation measures and practices.

### **Stage 3 Response -- SEVERE Water Shortage Conditions**

**Target: Achieve a \_\_\_ percent reduction in \_\_\_\_\_ (e.g., total water use, daily water demand, etc.).**

**Best Management Practices for Supply Management:**

*Describe additional measures, if any, to be implemented directly by \_\_\_\_\_ (designated official), or his/her designee(s), to manage limited water supplies and/or reduce water demand. Examples include modifying reservoir operations procedures, interconnection with another water system, and use of reclaimed water for non-potable purposes.*

Water Use Restrictions for Reducing Demand:

(a) The \_\_\_\_\_ (designated official), or his/her designee(s), will contact wholesale water customers to discuss water supply and/or demand conditions and will request that wholesale water customers initiate additional mandatory measures to reduce non-essential water use (e.g., implement Stage 3 or appropriate stage of the customer's drought contingency plan).

(b) The \_\_\_\_\_ (designated official), or his/her designee(s), will initiate pro rata curtailment of water diversions and/or deliveries for each wholesale customer.

(c) The \_\_\_\_\_ (designated official), or his/her designee(s), will provide a weekly report to news media with information regarding current water supply and/or demand conditions, projected water supply and demand conditions if drought conditions persist, and consumer information on water conservation measures and practices.

**Stage 4 Response -- EMERGENCY Water Shortage Conditions**

Whenever emergency water shortage conditions exist as defined in Section VII of the Plan, the \_\_\_\_\_ (designated official) shall:

1. Assess the severity of the problem and identify the actions needed and time required to solve the problem.
2. Inform the utility director or other responsible official of each wholesale water customer by telephone or in person and suggest actions, as appropriate, to alleviate problems (e.g., notification of the public to reduce water use until service is restored).
3. If appropriate, notify city, county, and/or state emergency response officials for assistance.

4. Undertake necessary actions, including repairs and/or clean-up as needed.
  
5. Prepare a post-event assessment report on the incident and critique of emergency response procedures and actions.

**Section IX: Pro Rata Water Allocation**

In the event that the triggering criteria specified in Section VII of the Plan for Stage 3 – Severe Water Shortage Conditions have been met, the \_\_\_\_\_ (designated official) is hereby authorized initiate allocation of water supplies on a pro rata basis in accordance with Texas Water Code, §11.039.

**Section X: Contract Provisions**

The \_\_\_\_\_ (name of your water supplier) will include a provision in every wholesale water contract entered into or renewed after adoption of the plan, including contract extensions, that in case of a shortage of water resulting from drought, the water to be distributed shall be divided in accordance with Texas Water Code, §11.039.

**Section XI: Enforcement**

**Example of surcharge:**

During any period when either mandatory water use restrictions or pro rata allocation of available water supplies are in effect, wholesale customers shall pay the following surcharges on excess water diversions and/or deliveries:

\_\_\_\_\_ times the normal water charge per acre-foot for water diversions and/or deliveries in excess of the monthly allocation from \_\_\_ percent through \_\_\_ percent above the monthly allocation.

**Examples of fines and/or discontinuation of service:**

Mandatory water use restrictions or pro rata allocation of available water supplies may be imposed during drought stages and emergency water management actions. These water use restrictions will be enforced by warnings and penalties as follows:

- On the first violation, customers will be notified by written notice that they have violated the mandatory water use restriction.
- If the first violation has not been corrected after ten (10) days from the written notice, \_\_\_\_\_ (name of your water supplier) may assess a fine up to \$\_\_\_\_\_ per violation.
- \_\_\_\_\_ (name of your water supplier) may install a flow restricting device in the line to limit the amount of water which will pass through the meter in a 24-hour period. The utility may charge the customer for the actual cost of installing and removing the flow restricting device, not to exceed fifty dollars (\$50.00);
- \_\_\_\_\_ (name of your water supplier) maintains the right, at any violation or action level, to disconnect irrigation systems and/or suspend water services to a customer for public safety issues with reconnection fees and possible citations.
- Subsequent violations of the plan shall result in increased fines or upon the occurrence of \_\_\_\_\_ violations, after notice, the discontinuation of services. Services discontinued under this provision shall be restored only upon payment of a reconnection fee and any other costs incurred by the utility in discontinuing service.

**Section XII: Variances**

The \_\_\_\_\_ (designated official), or his/her designee, may, in writing, grant a temporary variance to the pro rata water allocation policies provided by this Plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the public health, welfare, or safety and if one or more of the following conditions are met:

- (a) Compliance with this Plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the Plan is in effect.
- (b) Alternative methods can be implemented which will achieve the same level of reduction in water use.

Persons requesting an exemption from the provisions of this Plan shall file a petition for variance with the \_\_\_\_\_ (designated official) within 5 days after pro rata allocation has been invoked.

All petitions for variances shall be reviewed by the \_\_\_\_\_ (governing body), and shall include the following:

- (a) Name and address of the petitioner(s).
- (b) Detailed statement with supporting data and information as to how the pro rata allocation of water under the policies and procedures established in the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this Ordinance.
- (c) Description of the relief requested.
- (d) Period of time for which the variance is sought.
- (e) Alternative measures the petitioner is taking or proposes to take to meet the intent of this Plan and the compliance date.
- (f) Other pertinent information.

Variances granted by the \_\_\_\_\_ (governing body) shall be subject to the following conditions, unless waived or modified by the \_\_\_\_\_ (governing body) or its designee:

- (a) Variances granted shall include a timetable for compliance.
- (b) Variances granted shall expire when the Plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

No variance shall be retroactive or otherwise justify any violation of this Plan occurring prior to the issuance of the variance.

### **Section XIII: Severability**

It is hereby declared to be the intention of the \_\_\_\_\_ (governing body of your water supplier) that the sections, paragraphs, sentences, clauses, and phrases of this Plan are severable and, if any phrase, clause, sentence, paragraph, or section of this Plan shall be declared unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such unconstitutionality shall not affect

any of the remaining phrases, clauses, sentences, paragraphs, and sections of this Plan, since the same would not have been enacted by the \_\_\_\_\_ (governing body of your water supplier) without the incorporation into this Plan of any such unconstitutional phrase, clause, sentence, paragraph, or section



Appendix C  
WAM Files

(These files are in non-standard file format, and therefore were not included in the pdf.  
Files are available upon request.)



## Model Runs for Region N Surface Water Availability

<u>WAM Input Files</u>	<u>Output Files</u>	<u>Run Date(s)</u>
DAY.exe HYD.exe SALT.exe SIM.exe SIMD.exe TAB.exe WinWRAP.exe N_RUN3.DAT N_RUN3.DIS N_RUN3.EVA N_RUN3.INF	N_RUN3.OUT	1/12/2015

<u>NUBAY Files</u>	<u>Output Files</u>	<u>Run Date(s)</u>
addsour	BETargets	2/3/2015
DAILY	datnb12	2/19/2015
datnb12_bottom	OASYSOP	
datnb12_top	OBAY	
DEBUG_CHECK	OBBEST	
ERRCHECK	OCCR	
fort.24	OLCC	
NEDATA	OPOWER	
nubay	OQUEST	
nubay1	OQM	
nubay2	OSALTTRC	
NUBAY12	OSPILLBANK	
OBAY_CHECK	OSUM	
SCRATCH	OSYSOP	
shrimp	OTEX	
TESTER	OTEXOP	
WQ	OTRACE	
	OTREAT	
	OWQ	
	PROMPTS	

Appendix D  
GAM Files

(These files are in non-standard file format, and therefore were not included in the pdf.  
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## Appendix D- GAM Files

The CBRWPG used Modeled Available Groundwater (MAG) values identified during the GMA process for determining groundwater availability according to TWDB guidelines.

A couple of minor aquifers areas identified in the previous 2011 Region N Plan that were designated as 'non-relevant' by the GCDs in the GMAs where a DFC was not set and therefore a MAG value was not determined: Bee County (Carrizo Wilcox aquifer) and Live Oak County (Carrizo Wilcox aquifer). The TWDB developed DFC-compatible groundwater availability numbers for some non-relevant areas during the same model runs that produced the MAGs, but were not developed for the Carrizo Wilcox Aquifer in Bee and Live Oak Counties. However, groundwater does exist in the non-relevant areas, and is water from this aquifer system is used for Bee and Live Oak County water user groups.

On June 13, 2013, the CBRWPG adopted groundwater availability estimates of 394 ac-ft/yr from the Carrizo Wilcox Aquifer in Bee County and 2,399 ac-ft/yr from the Carrizo Wilcox Aquifer in Live Oak County. Both of these groundwater availability values were determined from GAM runs performed on July 22, 2009 used to develop the 2011 Plan, as included in this electronic appendix.

Appendix E  
Geodatabase of WMS

(These files are in non-standard file format, and therefore were not included in the pdf.  
Files are available upon request.)

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Appendix F  
Infrastructure Financing Survey- TWDB Spreadsheet

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EntityName	EntityPlanning Region	Respondent ContactName	Area Code	Phone	Extension	Email	Comment	EntityRwpld
ALICE	N	Demetrio Duarte	361	664-9082		<a href="mailto:dduarte@cityofalice.org">dduarte@cityofalice.org</a>		163
BEEVILLE	N	Jack Hamlett	361	358-4641		<a href="mailto:jack.hamlett@beevilletx.org">jack.hamlett@beevilletx.org</a>		222
CORPUS CHRISTI	N	Brent Clayton	361	826-1670		<a href="mailto:BrentC@cctexas.com">BrentC@cctexas.com</a>		32
IRRIGATION, MCMULLEN	N	Lonnie Stewart	361	449-7017		<a href="mailto:mcmullengcd@yahoo.com">mcmullengcd@yahoo.com</a>		2922
IRRIGATION, SAN PATRICIO	N	Lonnie Stewart	361	449-7017		<a href="mailto:louwcd@yahoo.com">louwcd@yahoo.com</a>		1070
MINING, MCMULLEN	N	Lonnie Stewart	361	449-7017		<a href="mailto:mcmullengcd@yahoo.com">mcmullengcd@yahoo.com</a>		1863
NUECES COUNTY WCID #3	N	John Herrera				<a href="mailto:jherrera@nueceswater3.com">jherrera@nueceswater3.com</a>		104
SAN DIEGO	N	Vic Casas				<a href="mailto:sdmudviccasas@yahoo.com">sdmudviccasas@yahoo.com</a>		2176
SAN PATRICIO MWD	N	Brian Williams	361	643-6521		<a href="mailto:BGW@spmwd.net">BGW@spmwd.net</a>		119



SponsorEntityName	SponsorEntityPrimaryRegion	ProjectName	WMSProjectSponsorRegion	IFRElementName	IFRElementValue
ALICE	N	ALICE-STWA INTERCONNECTIONS	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$676,872
ALICE	N	ALICE-STWA INTERCONNECTIONS	N	CONSTRUCTION FUNDING	\$5,189,352
ALICE	N	ALICE-STWA INTERCONNECTIONS	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
ALICE	N	BRACKISH GROUNDWATER DEVELOPMENT - ALICE	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$4,000,000
ALICE	N	BRACKISH GROUNDWATER DEVELOPMENT - ALICE	N	CONSTRUCTION FUNDING	\$29,300,000
ALICE	N	BRACKISH GROUNDWATER DEVELOPMENT - ALICE	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
ALICE	N	REUSE - ALICE	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$1,000,000
ALICE	N	REUSE - ALICE	N	CONSTRUCTION FUNDING	\$7,700,000
ALICE	N	REUSE - ALICE	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
ALICE	N	MUNICIPAL WATER CONSERVATION- PIPELINE REPLACEMENT	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$2,600,000
ALICE	N	MUNICIPAL WATER CONSERVATION- PIPELINE REPLACEMENT	N	CONSTRUCTION FUNDING	\$19,800,000
ALICE	N	MUNICIPAL WATER CONSERVATION- PIPELINE REPLACEMENT	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
BEEVILLE	N	CHASE WELL FIELD - BEEVILLE	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$1,442,000
BEEVILLE	N	CHASE WELL FIELD - BEEVILLE	N	CONSTRUCTION FUNDING	\$3,335,000
BEEVILLE	N	CHASE WELL FIELD - BEEVILLE	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
BEEVILLE	N	WELL CONVERSION PROJECT - BEEVILLE	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$0
BEEVILLE	N	WELL CONVERSION PROJECT - BEEVILLE	N	CONSTRUCTION FUNDING	\$0
BEEVILLE	N	WELL CONVERSION PROJECT - BEEVILLE	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
CORPUS CHRISTI	N	ADDITIONAL REUSE - CORPUS CHRISTI	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$18,233,950
CORPUS CHRISTI	N	ADDITIONAL REUSE - CORPUS CHRISTI	N	CONSTRUCTION FUNDING	\$33,863,050
CORPUS CHRISTI	N	ADDITIONAL REUSE - CORPUS CHRISTI	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
CORPUS CHRISTI	N	O.N. STEVENS WTP IMPROVEMENTS	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$15,410,339
CORPUS CHRISTI	N	O.N. STEVENS WTP IMPROVEMENTS	N	CONSTRUCTION FUNDING	\$28,619,201
CORPUS CHRISTI	N	O.N. STEVENS WTP IMPROVEMENTS	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
CORPUS CHRISTI	N	SEAWATER DESALINATION	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$86,800,000
CORPUS CHRISTI	N	SEAWATER DESALINATION	N	CONSTRUCTION FUNDING	\$161,200,000
CORPUS CHRISTI	N	SEAWATER DESALINATION	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
IRRIGATION, MCMULLEN	N	GULF COAST AQUIFER SUPPLIES - MCMULLEN IRRIGATION	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$0
IRRIGATION, MCMULLEN	N	GULF COAST AQUIFER SUPPLIES - MCMULLEN IRRIGATION	N	CONSTRUCTION FUNDING	\$0
IRRIGATION, MCMULLEN	N	GULF COAST AQUIFER SUPPLIES - MCMULLEN IRRIGATION	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
IRRIGATION, SAN PATRICIO	N	GULF COAST AQUIFER DEVELOPMENT - SAN PAT IRRIGATION	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$0
IRRIGATION, SAN PATRICIO	N	GULF COAST AQUIFER DEVELOPMENT - SAN PAT IRRIGATION	N	CONSTRUCTION FUNDING	\$0
IRRIGATION, SAN PATRICIO	N	GULF COAST AQUIFER DEVELOPMENT - SAN PAT IRRIGATION	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
MINING, MCMULLEN	N	ADDITIONAL CARRIZO AQUIFER - MCMULLEN MINING	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$0
MINING, MCMULLEN	N	ADDITIONAL CARRIZO AQUIFER - MCMULLEN MINING	N	CONSTRUCTION FUNDING	\$0
MINING, MCMULLEN	N	ADDITIONAL CARRIZO AQUIFER - MCMULLEN MINING	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
MINING, MCMULLEN	N	ADDITIONAL GULF COAST AQUIFER - MCMULLEN MINING	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$0
MINING, MCMULLEN	N	ADDITIONAL GULF COAST AQUIFER - MCMULLEN MINING	N	CONSTRUCTION FUNDING	\$0
MINING, MCMULLEN	N	ADDITIONAL GULF COAST AQUIFER - MCMULLEN MINING	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
MINING, MCMULLEN	N	MCMULLEN COUNTY MINING MINOR AQUIFER DEVELOPMENT	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$0
MINING, MCMULLEN	N	MCMULLEN COUNTY MINING MINOR AQUIFER DEVELOPMENT	N	CONSTRUCTION FUNDING	\$0
MINING, MCMULLEN	N	MCMULLEN COUNTY MINING MINOR AQUIFER DEVELOPMENT	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
NUECES COUNTY WCID #3	N	LOCAL BALANCING STORAGE - ROBSTOWN	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$8,182,000

SponsorEntityName	Sponsor Entity Primary Region	ProjectName	WMSProjectSponsorRegion	IFRElementName	IFRElementValue
NUECES COUNTY WCID #3	N	LOCAL BALANCING STORAGE - ROBSTOWN	N	CONSTRUCTION FUNDING	
NUECES COUNTY WCID #3	N	LOCAL BALANCING STORAGE - ROBSTOWN	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
SAN DIEGO	N	GULF COAST AQUIFER SUPPLIES - SAN DIEGO	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$940,000
SAN DIEGO	N	GULF COAST AQUIFER SUPPLIES - SAN DIEGO	N	CONSTRUCTION FUNDING	
SAN DIEGO	N	GULF COAST AQUIFER SUPPLIES - SAN DIEGO	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
SAN PATRICIO MWD	N	SPMWD INDUSTRIAL WTP IMPROVEMENTS	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$20,428,100
SAN PATRICIO MWD	N	SPMWD INDUSTRIAL WTP IMPROVEMENTS	N	CONSTRUCTION FUNDING	\$37,937,900
SAN PATRICIO MWD	N	SPMWD INDUSTRIAL WTP IMPROVEMENTS	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%
SAN PATRICIO MWD	N	PORTLAND REUSE	N	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	\$4,791,600
SAN PATRICIO MWD	N	PORTLAND REUSE	N	CONSTRUCTION FUNDING	\$16,500,000
SAN PATRICIO MWD	N	PORTLAND REUSE	N	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	0%

\$507,949,364

SponsorEntityName	YearOfNeed	IFRProjectDataId	EntityRwpld	WMSProjectId	IFRProjectElementsId
ALICE	2020		163	2550	1
ALICE	2020		163	2550	2
ALICE			163	2550	3
ALICE	2016		163	2091	1
ALICE	2017		163	2091	2
ALICE			163	2091	3
ALICE	2030		163	2092	1
ALICE	2030		163	2092	2
ALICE			163	2092	3
ALICE	2024		163		1
ALICE	2025		163		2
ALICE			163		3
BEEVILLE	2016		222	1676	1
BEEVILLE	2017		222	1676	2
BEEVILLE			222	1676	3
BEEVILLE			222	1677	1
BEEVILLE			222	1677	2
BEEVILLE			222	1677	3
CORPUS CHRISTI	2021		32	2096	1
CORPUS CHRISTI	2025		32	2096	2
CORPUS CHRISTI			32	2096	3
CORPUS CHRISTI	2020		32	2415	1
CORPUS CHRISTI	2020		32	2415	2
CORPUS CHRISTI			32	2415	3
CORPUS CHRISTI	2021		32	2097	1
CORPUS CHRISTI	2027		32	2097	2
CORPUS CHRISTI			32	2097	3
IRRIGATION, MCMULLEN			2922	1716	1
IRRIGATION, MCMULLEN			2922	1716	2
IRRIGATION, MCMULLEN			2922	1716	3
IRRIGATION, SAN PATRICIO			1070	2098	1
IRRIGATION, SAN PATRICIO			1070	2098	2
IRRIGATION, SAN PATRICIO			1070	2098	3
MINING, MCMULLEN			1863	2417	1
MINING, MCMULLEN			1863	2417	2
MINING, MCMULLEN			1863	2417	3
MINING, MCMULLEN			1863	1713	1
MINING, MCMULLEN			1863	1713	2
MINING, MCMULLEN			1863	1713	3
MINING, MCMULLEN			1863	2551	1
MINING, MCMULLEN			1863	2551	2
MINING, MCMULLEN			1863	2551	3
NUECES COUNTY WCID #3			104	2093	1

SponsorEntityName	YearOfNeed	IFRProjectDataId	EntityRwpld	WMSProjectId	IFRProjectElementsId
NUECES COUNTY WCID #3			104	2093	2
NUECES COUNTY WCID #3			104	2093	3
SAN DIEGO			2176	1678	1
SAN DIEGO			2176	1678	2
SAN DIEGO			2176	1678	3
SAN PATRICIO MWD	2019		119	2414	1
SAN PATRICIO MWD	2019		119	2414	2
SAN PATRICIO MWD			119	2414	3
SAN PATRICIO MWD	2016		119		1
SAN PATRICIO MWD	2017		119		2
SAN PATRICIO MWD			119		3

