Agenda Item 9a. Review, discussion, and possible action on proposed changes to the draft non-municipal demands for the 2026 Region F plan

This agenda item is to review and discuss the draft non-municipal demand projections released by the TWDB for the 2026 Region F plan. The non-municipal demand categories include irrigation, livestock, manufacturing, mining, and steam-electric power. The consultant will present potential revisions to the non-municipal demand projections for the RWPG to consider and potentially take action to approve.

Attachments:

1. Memorandum on Draft Irrigation Water Demand Projections
2. Memorandum on Draft Livestock Water Demand Projections
3. Memorandum on Draft Manufacturing Water Demand Projections
4. Memorandum on Draft Mining Water Demand Projections
5. Memorandum on Draft Steam-Electric Water Demand Projections

MEMORANDUM

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TO: Region F Water Planning Group

CC: File

FROM: Freese and Nichols, Inc.

SUBJECT: Memorandum on Draft Irrigation Water Demand Projections

DATE: 10/18/2022

PROJECT: CMD21867

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1 Background

In August 2022, the Texas Water Development Board (TWDB) released draft irrigation projections by county for the 2026 Regional Water Plans (RWPs). These projections will be reviewed by the planning groups, and recommendations are to be provided to the TWDB by July 2023 or sooner. The TWDB will consider the recommended changes from the planning groups, and the final projections will ultimately be incorporated into the 2026 Regional Water Plan. The purpose of this technical memorandum is to document information related to historical irrigation usage and provide information supporting recommended modifications to the draft irrigation demands.

Irrigation water use is defined by the TWDB as the water necessary for irrigation activities primarily field crops, but also includes orchards, pasture, turf grass farms, vineyards, and self-supplied golf courses.

1.1 Historical Irrigation Water Use Estimates

The TWDB's irrigation water use estimates are based on crops, acreage, climatic conditions, observations by local agricultural representatives, historical irrigation water right diversions, and data provided by irrigation and groundwater districts.

As of August 2022, historical irrigation water use estimates are available through the year 2019. Irrigation water use contributed between 60 and 84 percent of the total Region F water use in 2015-2019. Since 2015, the region-wide irrigation water use estimates have ranged from 413,831 to 484,102 acre-feet per year (ac-ft/yr). Counties with the largest irrigation water use during this period include Pecos, Reeves, and Tom Green.

1.2 TWDB Draft Irrigation Water Demand Projections

TWDB's draft non-municipal irrigation demand projections for the 2026 Regional Water Plans utilize an average of the 2015-2019 irrigation water use estimates and are either:

- held constant between 2030 and 2080 or
- in counties where the total groundwater availability over the planning period is projected to be less than the groundwater-portion of the baseline water demand projections, the irrigation water demand projections are held constant for 10 years beyond the point that the groundwater availability falls below the baseline demand after projected demands will begin to decline, depending on and corresponding with the groundwater availability.

The 2026 draft projected irrigation water demands for Region F by county along with historical irrigation water use estimate for 2015-2019 are shown in Table 1. Figure 1 shows the 2026 draft projections alongside the 2021 irrigation projections and the historical water use estimates. There is one county, Mitchell County, where the TWDB irrigation demand projection declined

Figure 1: Irrigation Water Use Projections (ac-ft/yr) for Region F

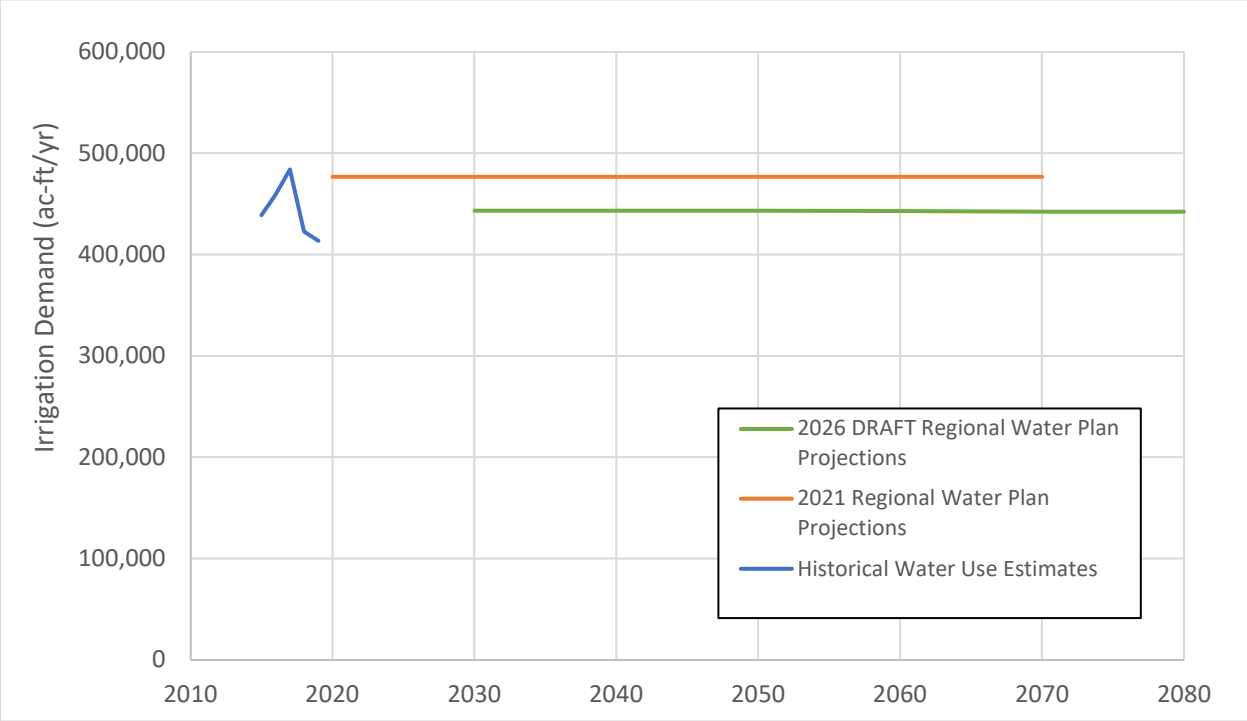

Table 1: Region F 2026 Draft Irrigation Demands (ac-ft/yr)

County	Historical Water Use Estimates					2026 DRAFT Regional Water Plan Projections					
	2015	2016	2017	2018	2019	2030	2040	2050	2060	2070	2080
ANDREWS	14,613	16,536	14,244	13,984	14,431	14,762	14,762	14,762	14,762	14,762	14,762
BORDEN	1,898	2,214	1,816	2,225	2,053	2,041	2,041	2,041	2,041	2,041	2,041
BROWN	7,592	6,622	6,306	8,985	6,713	7,244	7,244	7,244	7,244	7,244	7,244
COKE	429	511	572	563	647	544	544	544	544	544	544
COLEMAN	304	273	482	389	409	371	371	371	371	371	371
CONCHO	4,493	4,622	5,186	6,775	6,454	5,506	5,506	5,506	5,506	5,506	5,506
CRANE	0	0	0	0	0	0	0	0	0	0	0
CROCKETT	16	17	27	15	17	18	18	18	18	18	18
ECTOR	730	804	750	752	692	746	746	746	746	746	746
GLASSCOCK	25,274	37,376	39,419	36,551	39,239	35,572	35,572	35,572	35,572	35,572	35,572
HOWARD	3,701	3,662	3,750	2,070	3,361	3,309	3,309	3,309	3,309	3,309	3,309
IRION	647	910	1,259	1,163	1,298	1,055	1,055	1,055	1,055	1,055	1,055
KIMBLE	2,429	2,376	2,305	2,721	2,907	2,548	2,548	2,548	2,548	2,548	2,548
LOVING	0	0	0	0	0	0	0	0	0	0	0
MARTIN	35,488	28,245	26,890	29,266	26,984	29,375	29,375	29,375	29,375	29,375	29,375
MASON	4,971	4,894	4,538	3,959	4,845	4,641	4,641	4,641	4,641	4,641	4,641
MCCULLOCH	2,209	1,168	1,903	2,005	1,834	1,824	1,824	1,824	1,824	1,824	1,824
MENARD	4,186	3,738	2,228	3,824	2,360	3,267	3,267	3,267	3,267	3,267	3,267
MIDLAND	10,727	19,322	20,322	19,895	19,144	17,882	17,882	17,882	17,882	17,882	17,882
MITCHELL	13,236	11,943	12,797	13,385	14,555	13,183	13,183	13,183	12,606	12,202	12,202
PECOS	154,848	153,014	141,991	113,998	96,147	132,000	132,000	132,000	132,000	132,000	132,000
REAGAN	20,139	20,244	22,147	21,080	21,254	20,973	20,973	20,973	20,973	20,973	20,973
REEVES	49,250	65,423	83,313	50,448	57,132	61,113	61,113	61,113	61,113	61,113	61,113
RUNNELS	4,508	3,559	3,790	4,141	3,643	3,928	3,928	3,928	3,928	3,928	3,928
SCHLEICHER	1,751	2,209	2,368	2,362	2,399	2,218	2,218	2,218	2,218	2,218	2,218
SCURRY	6,220	5,995	7,362	5,797	6,661	6,407	6,407	6,407	6,407	6,407	6,407
STERLING	924	720	698	870	846	812	812	812	812	812	812
SUTTON	1,016	1,140	1,117	1,235	1,122	1,126	1,126	1,126	1,126	1,126	1,126
TOM GREEN	55,758	47,400	58,436	60,025	61,919	56,526	56,526	56,526	56,526	56,526	56,526
UPTON	6,486	6,685	6,824	5,881	6,289	6,433	6,433	6,433	6,433	6,433	6,433
WARD	3,351	4,830	8,244	5,711	5,400	5,507	5,507	5,507	5,507	5,507	5,507
WINKLER	1,628	2,740	3,018	2,678	3,076	2,628	2,628	2,628	2,628	2,628	2,628
TOTAL	**438,822**	**459,192**	**484,102**	**422,753**	**413,831**	**443,559**	**443,559**	**443,559**	**442,982**	**442,578**	**442,578**

1.3 Criteria for Revising the Draft Irrigation Water Demand Projections

One or more of the following criteria must be verified by the Planning Group and the Executive Administrator for consideration of revising the irrigation water demand projections:

- Evidence that irrigation water use estimates for a county from another information source or more recent modeled available groundwater volumes are more accurate than those used in the draft projections.
- Evidence that recent (10 years or less) irrigation trends are more indicative of future trends than the draft groundwater resource-constrained water demand projections.
- Evidence that the baseline projection is more likely as a future demand than the draft groundwater resource-constrained water demand projections.
- Region or county-specific studies that have developed water demand projections or trends for the planning period, or part of the planning period, and are deemed more accurate than the draft projections.
- Evidence of errors identified in historical water use, including volumes of reuse (treated effluent) or brackish groundwater that were not included in the draft projections.

During the review process, the TWDB also imposed one other restriction on revisions of the draft irrigation water demand projections: projections for all counties must have the same basis. For example, if the Planning Group recommends using the average of the 2010-2019 irrigation water use estimates to project future water demand, then it must recommend this basis for all counties. The Planning Group must provide the following data associated with the identified criteria to the Executive Administrator for justifying any adjustments to the irrigation water demand projections:

- Historical water use, diversion, or pumpage volumes for irrigation by county.
- Acreage and water use data for irrigated crops grown in a region as published by the Texas Agricultural Statistics Service, the Texas Agricultural Extension Service, the Farm Service Agency or other sources.
- Available economic, technical, and/or water supply-related evidence that may provide a basis for adjustments in the default baseline projection and/or the future rate of change in irrigation water demand. Alternative projected water availability volumes that may constrain water demand projections.
- Other data that the RWPG considers adequate to justify an adjustment to the irrigation water demand projections.

1.4 Data Used in the Evaluation of Draft Irrigation Demands

Data used to evaluate the draft irrigation demands were obtained from the following sources:

- NOAA-NWS historical rainfall at Midland Airpark in Midland County (surrogate for regional precipitation)[1]

[1] National Weather Service. NOAA Online Weather Data. Midland Airpark (KMDD). https://www.weather.gov/wrh/Climate?wfo=maf

- TWDB historical irrigation water use, 2010-2019
- 2021 Regional Water Plan Water Demand Projections by County for 2020-2070
- Projected total groundwater availability volumes based on the latest available MAG.

2 RECOMMENDED REVISIONS TO DRAFT IRRIGATION WATER DEMAND PROJECTIONS

As noted above, the TWDB irrigation water use methodology utilizes estimates of crop acreages, crop types and climatic conditions. Irrigation use does vary considerably with climatic conditions. The TWDB uses the average of the historical water use over the period of 2015 through 2019. The 5-year average rainfall for this period is greater than any other 5-year period since 1990. Figure 2 shows the historical irrigation water use and the annual precipitation at the Midland Airpark weather station from 2010 through 2019. The total precipitation during the growing season (defined as from April to October) is also shown as a gray line. In general, Figure 2 shows a pattern in which irrigation demands are greater in years with less precipitation. The 2021 Region F irrigation water use projections were based on the average historical irrigation estimates from 2010-2014. These projections are about 7% higher than the 2026 draft irrigation projections. This is likely due to lower average annual rainfall from 2010-2014 (10.1 inches) than from 2015-2019 (17.5 inches).

To avoid under-estimation of irrigation demands for Region F in the 2026 projections, it is recommended to revise the projection methodology. The annual average irrigation demands from 2010-2019 should be used to develop the baseline irrigation demand projections, instead of only using the annual average from the wetter 2015-2019 period. This revised methodology includes years with lower annual rainfall, which are important to consider when estimating future water demands for Regional Water Planning. We also did not decline the irrigation use in Mitchell County. The 2021 Joint Planning for GMA 7 declared the Dockum Aquifer in Mitchell County as non-relevant and no MAG was determined. The groundwater availability for Mitchell County for the 2026 Region F Water Plan will be determined by the RWPG. The availability for this resource in the 2021 Region F Plan does not decline. Therefore, there is no decline of the irrigation demands in Mitchell County.

Revising the projected irrigation demands increases the total projected irrigation demands for Region F by about 4%. A comparison of the draft projections for the 2026 RWP, the 2021 RWP projections, and the proposed revisions to the 2026 draft projections is presented in Table 2 and Figure 3. Recommended revisions to irrigation water use projections by county are shown in Table 3.

Figure 2: Comparison of Rainfall to Irrigation Water Use in Region F

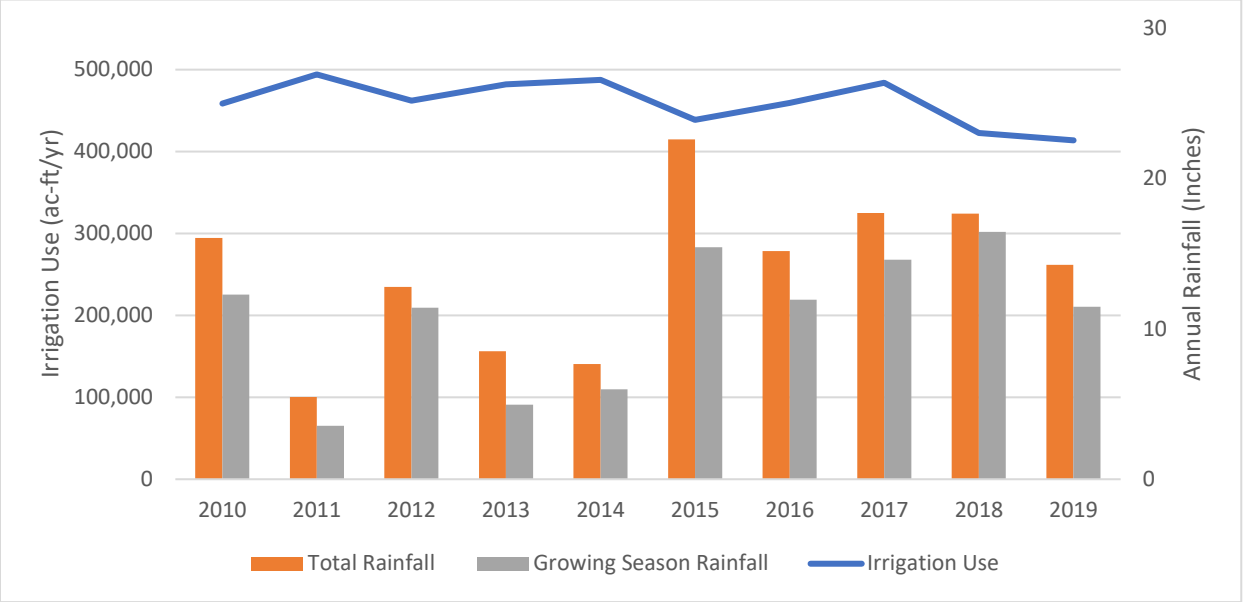

Table 2: Revised Irrigation Water Demand Projections (ac-ft/yr) for Region F

	2020	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
2021 Projections	476,941	476,941	476,941	476,941	476,941	476,941	
2026 Draft Projections		443,559	443,559	443,559	442,982	442,578	442,578
Revised 2026 Draft Projections		460,341	460,341	460,341	460,341	460,341	460,341

Figure 3: Revised Irrigation Water Demand Projections for Region F

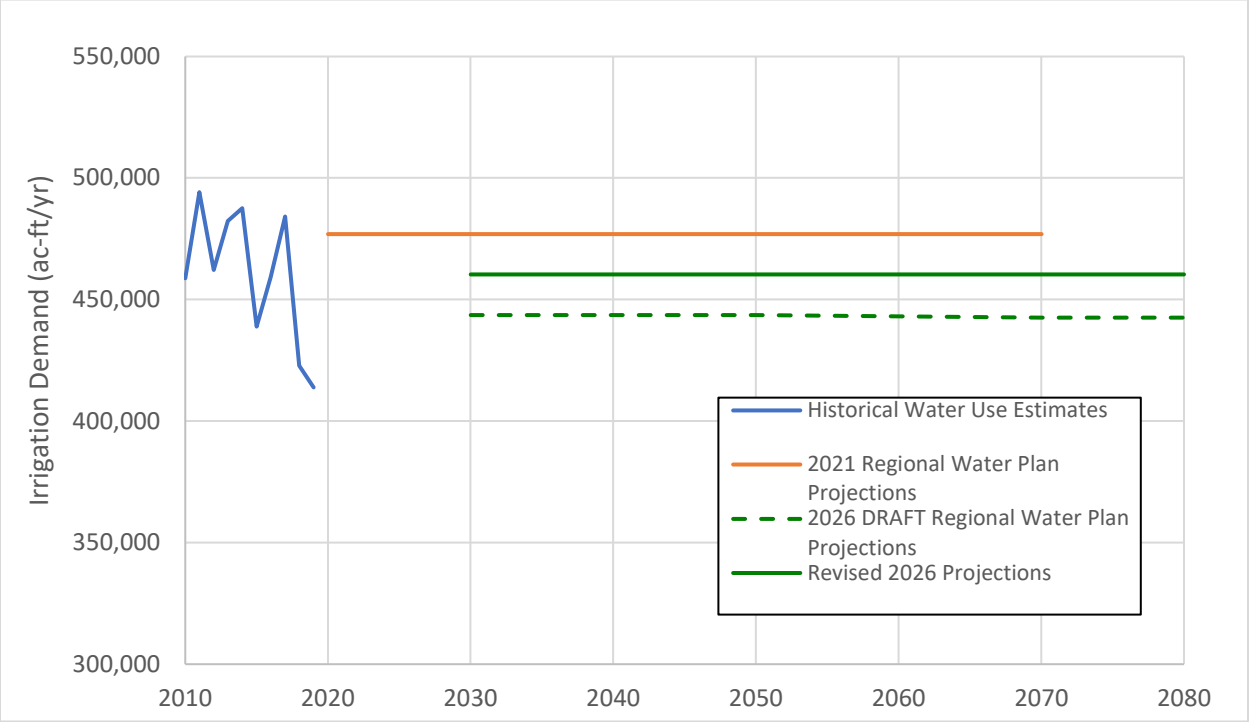

Table 3: Recommended Revisions to Irrigation Water Use Projections (ac-ft/yr) by County

County	*Revised* 2026 Regional Water Plan Projections					
	2030	2040	2050	2060	2070	2080
ANDREWS	17,563	17,563	17,563	17,563	17,563	17,563
BORDEN	2,495	2,495	2,495	2,495	2,495	2,495
BROWN	7,684	7,684	7,684	7,684	7,684	7,684
COKE	617	617	617	617	617	617
COLEMAN	418	418	418	418	418	418
CONCHO	5,204	5,204	5,204	5,204	5,204	5,204
CRANE	0	0	0	0	0	0
CROCKETT	77	77	77	77	77	77
ECTOR	751	751	751	751	751	751
GLASSCOCK	43,413	43,413	43,413	43,413	43,413	43,413
HOWARD	5,096	5,096	5,096	5,096	5,096	5,096
IRION	1,054	1,054	1,054	1,054	1,054	1,054
KIMBLE	2,602	2,602	2,602	2,602	2,602	2,602
LOVING	0	0	0	0	0	0
MARTIN	32,933	32,933	32,933	32,933	32,933	32,933
MASON	4,804	4,804	4,804	4,804	4,804	4,804
MCCULLOCH	2,074	2,074	2,074	2,074	2,074	2,074
MENARD	3,465	3,465	3,465	3,465	3,465	3,465
MIDLAND	17,995	17,995	17,995	17,995	17,995	17,995
MITCHELL	12,985	12,985	12,985	12,985	12,985	12,985
PECOS	137,672	137,672	137,672	137,672	137,672	137,672
REAGAN	21,502	21,502	21,502	21,502	21,502	21,502
REEVES	60,025	60,025	60,025	60,025	60,025	60,025
RUNNELS	3,517	3,517	3,517	3,517	3,517	3,517
SCHLEICHER	2,015	2,015	2,015	2,015	2,015	2,015
SCURRY	6,983	6,983	6,983	6,983	6,983	6,983
STERLING	855	855	855	855	855	855
SUTTON	1,123	1,123	1,123	1,123	1,123	1,123
TOM GREEN	49,600	49,600	49,600	49,600	49,600	49,600
UPTON	8,418	8,418	8,418	8,418	8,418	8,418
WARD	4,333	4,333	4,333	4,333	4,333	4,333
WINKLER	3,068	3,068	3,068	3,068	3,068	3,068
TOTAL	**460,341**	**460,341**	**460,341**	**460,341**	**460,341**	**460,341**

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TO: Region F Water Planning Group

CC: File

FROM: Freese and Nichols, Inc.

SUBJECT: Memorandum on Draft Livestock Water Demand Projections

DATE: 10/19/2022

PROJECT: CMD21867

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1 Background

In January 2022, the Texas Water Development Board (TWDB) released draft livestock projections by county for the 2026 Regional Water Plans (RWPs). These projections will be reviewed by the planning groups, and recommendations are to be provided to the TWDB by July 2023 or sooner. The TWDB will consider the recommended changes from the planning groups, and the final projections will ultimately be incorporated into the 2026 Regional Water Plan. The purpose of this technical memorandum is to document information related to historical livestock usage and provide information supporting recommended modifications to the draft livestock demands.

According to the TWDB, livestock water use is water used in the production of livestock, both for drinking and for cleaning or environmental purposes. It does not include the processing of livestock for food. Livestock processing water use is considered as part of the manufacturing water use.

1.1 Historical Livestock Water Use Estimates

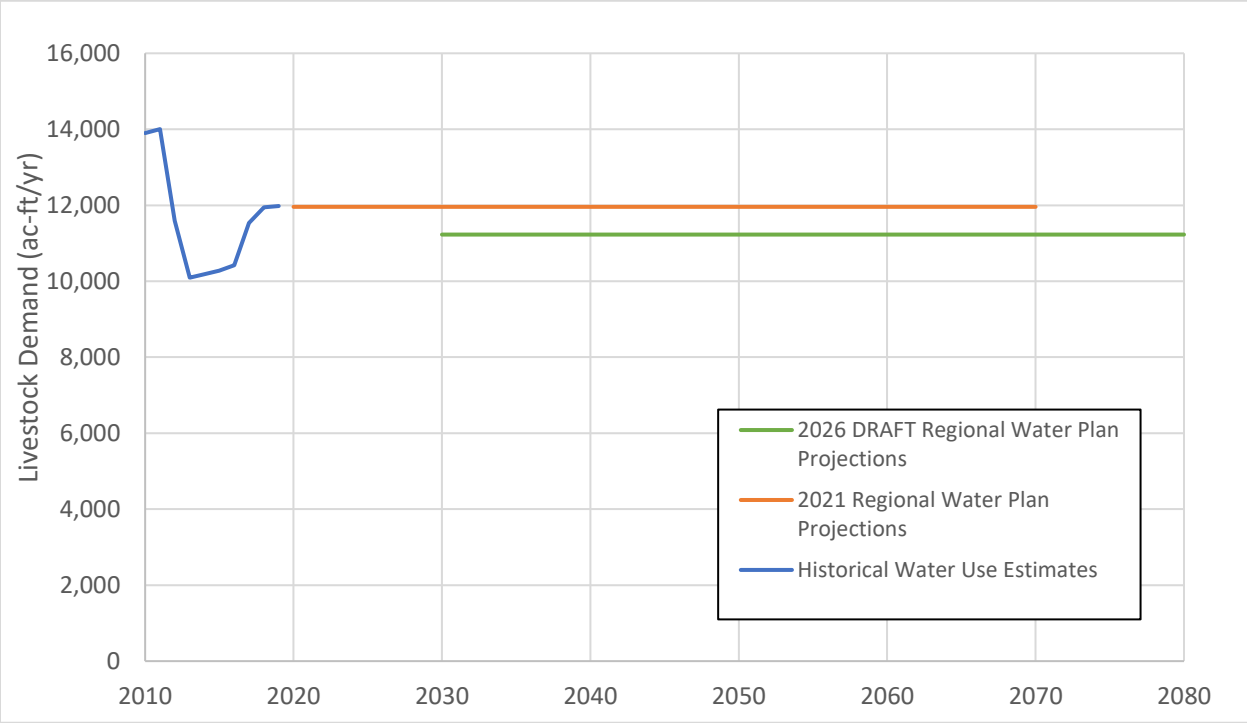
The TWDB historical livestock water use estimates from 2015 to 2019 consist of species-specific water use per head values, multiplied by annual inventory estimates, plus surveyed water use for non-standard livestock production such as fish hatcheries. From 2015 to 2019, livestock water use contributes to about 2 percent of the total non-municipal water use in Region F. The region-wide livestock water use estimates during this five-year period have ranged from 10,276 to 11,979 acre-feet per year (ac-ft/yr).

1.2 TWDB Draft Livestock Water Demand Projections

The draft livestock water demand projections for the 2026 Regional Water Plans (RWPs) were based upon the five-year average annual water use estimates (2015 through 2019) developed by the TWDB. This projection was held constant over the planning period.

The draft projected livestock water demands for the 2026 Region F Plan by county along with historical livestock water use estimate for 2015-2019 are shown in Table 1. **Error! Reference source not found.** shows the 2026 draft projections alongside the 2021 livestock projections and the historical water use estimates. The 2026 draft projections are slightly lower than the 2021 projections due to slightly lower average annual livestock water use across the Region in 2015-2019 compared to 2010-2014.

Figure 1: Livestock Water Use Projections (ac-ft/yr) for Region F



2 RECOMMENDED REVISIONS TO DRAFT LIVESTOCK WATER DEMAND PROJECTIONS

Based on the review of the historical estimates and 2026 draft projection methodology for livestock water use provided in the previous sections, there are no recommended revisions to the 2026 livestock water use projections in Region F.

Table 1: Region F 2026 Draft Livestock Demands (ac-ft/yr)

County	Historical Water Use Estimates					2026 DRAFT Regional Water Plan Projections					
	2015	2016	2017	2018	2019	2030	2040	2050	2060	2070	2080
ANDREWS	187	191	200	210	210	200	200	200	200	200	200
BORDEN	127	130	303	316	321	239	239	239	239	239	239
BROWN	934	961	962	999	1,003	972	972	972	972	972	972
COKE	245	247	272	281	281	265	265	265	265	265	265
COLEMAN	643	648	787	814	814	741	741	741	741	741	741
CONCHO	346	350	552	574	574	479	479	479	479	479	479
CRANE	64	65	56	58	58	60	60	60	60	60	60
CROCKETT	489	489	521	536	536	514	514	514	514	514	514
ECTOR	101	102	162	168	168	140	140	140	140	140	140
GLASSCOCK	112	113	116	120	120	116	116	116	116	116	116
HOWARD	213	221	184	189	189	199	199	199	199	199	199
IRION	202	204	264	271	271	242	242	242	242	242	242
KIMBLE	254	256	334	346	347	307	307	307	307	307	307
LOVING	33	35	44	45	45	40	40	40	40	40	40
MARTIN	83	84	66	70	70	75	75	75	75	75	75
MASON	674	687	674	702	702	688	688	688	688	688	688
MCCULLOCH	496	498	574	596	596	552	552	552	552	552	552
MENARD	299	304	315	327	328	315	315	315	315	315	315
MIDLAND	242	248	131	139	139	180	180	180	180	180	180
MITCHELL	347	354	288	300	299	318	318	318	318	318	318
PECOS	643	646	576	591	591	609	609	609	609	609	609
REAGAN	149	150	381	396	396	294	294	294	294	294	294
REEVES	460	468	201	208	208	309	309	309	309	309	309
RUNNELS	576	580	732	752	756	679	679	679	679	679	679
SCHLEICHER	353	355	457	472	472	422	422	422	422	422	422
SCURRY	389	401	467	482	487	445	445	445	445	445	445
STERLING	238	241	247	258	258	248	248	248	248	248	248
SUTTON	437	438	391	404	407	415	415	415	415	415	415
TOM GREEN	657	662	993	1,024	1,035	874	874	874	874	874	874
UPTON	134	137	107	114	114	121	121	121	121	121	121
WARD	62	62	74	76	76	70	70	70	70	70	70
WINKLER	87	90	105	108	108	100	100	100	100	100	100
TOTAL	**10,276**	**10,417**	**11,536**	**11,946**	**11,979**	**11,228**	**11,228**	**11,228**	**11,228**	**11,228**	**11,228**

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TO: Region F Water Planning Group

CC: File

FROM: Freese and Nichols, Inc.

SUBJECT: Memorandum on Draft Manufacturing Water Demand Projections

DATE: 10/17/2022

PROJECT: CMD21867

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1 Background

In January 2022, the Texas Water Development Board (TWDB) released draft manufacturing projections by county for the 2026 Regional Water Plans (RWPs). These projections will be reviewed by the planning groups, and recommendations are to be provided to the TWDB by July 2023 or sooner. The TWDB will consider the recommended changes from the planning groups, and the final projections will ultimately be incorporated into the 2026 Regional Water Plan. The purpose of this technical memorandum is to document information related to historical manufacturing usage and provide information supporting recommended modifications to the draft manufacturing demands.

Manufacturing water demand is defined by the TWDB as water used in the production process of manufactured products, including water used by employees for drinking and sanitation purposes. The manufacturing water use category does not include water use by all manufacturers, as described in the following section.

1.1 Historical Manufacturing Water Use Estimates

The TWDB's manufacturing water use estimates are obtained from manufacturing facilities that complete TWDB Water Use Surveys and from manufacturing use volumes reported by surveyed municipal water sellers. The TWDB historical manufacturing water use estimates focus on facilities that use large amounts of water and/or are self-supplied by groundwater or surface water. Facilities with smaller uses that are supplied by public utilities and cannot easily be tracked separately are included in municipal water demands.

As of January 2022, historical manufacturing water use estimates are available through the year 2019. Manufacturing water use contributed between 1 and 2 percent of the total Region F water use in 2015-2019. Since 2015, the region-wide manufacturing water use estimates have ranged from 5,889 to 12,793 acre-feet per year (ac-ft/yr). Counties with the largest manufacturing water use during this period

include Ector, Howard, Midland, and Tom Green. Several major manufacturing plants in Region F that began or stopped reporting water use during the five-year period are listed below:

- The Fullerton Field facility in Andrews County contributed to most of the water use in the county from 2010-2015. The facility did not report water use from 2016-2019. No information could be found regarding the plant's operational status.
- The Voca Plant owned by Covia Corp (formerly Unimin) in McCulloch County reported water use for 2017 and 2018 but has reportedly closed as of 2018[1]. McCulloch County reported no manufacturing water use in 2019.
- The Odessa/Pioneer Meter Station in Midland County began reporting water use in 2018. The facility reported over 5,800 ac-ft of use in 2018 and 2019 which was approximately half of the total Region F manufacturing use during those years. This increase is already captured in the TWDB draft 2026 manufacturing demands.

1.2 TWDB Draft Manufacturing Water Demand Projections

The TWDB's draft 2026 manufacturing demand projections are based on the maximum annual manufacturing water use that occurred in each county during 2015-2019 plus an estimate of the non-surveyed water use. Non-surveyed water use was determined using the U.S. Census Bureau's Business Patterns (CBP)[2] and an inventory of the industries from the Water Use Survey.

To obtain the 2030 demand projections, the 2020 demand projections were multiplied by the statewide annual historic water use rate of change from 2010-2019, which was determined to be 0.96%. This was to account for potential changes in production and water use that may occur between the baseline water use values and the first projected decade. For each planning decade after 2030, a statewide manufacturing growth proxy of 0.37% was applied annually to project increases in manufacturing water demands. This growth proxy was based on the CBP historical number of establishments in the manufacturing sector from 2010-2019. Both growth factors (0.96% and 0.37%) were applied equally by county across the state.

Table 1 contains the draft projected manufacturing water demands for the 2026 Region F Water Plan (RWP), along with historical manufacturing water use estimate for 2015-2019 by county. **Figure 1** shows the 2026 draft projections alongside the 2021 RWP manufacturing projections and the historical water use estimates. For Region F, the 2026 RWP draft regional projections are higher than the 2021 RWP projections. This is primarily due an increase in maximum historical annual water demand in Midland County in 2015-2019 compared to 2010-2014. The increase in Midland County can be attributed to the Odessa/Pioneer Meter Station which began reporting water use in 2018 at around 5,700 ac-ft/yr. The 2021 RWP manufacturing projections did not include a statewide manufacturing growth proxy and instead were held constant from 2030 on.

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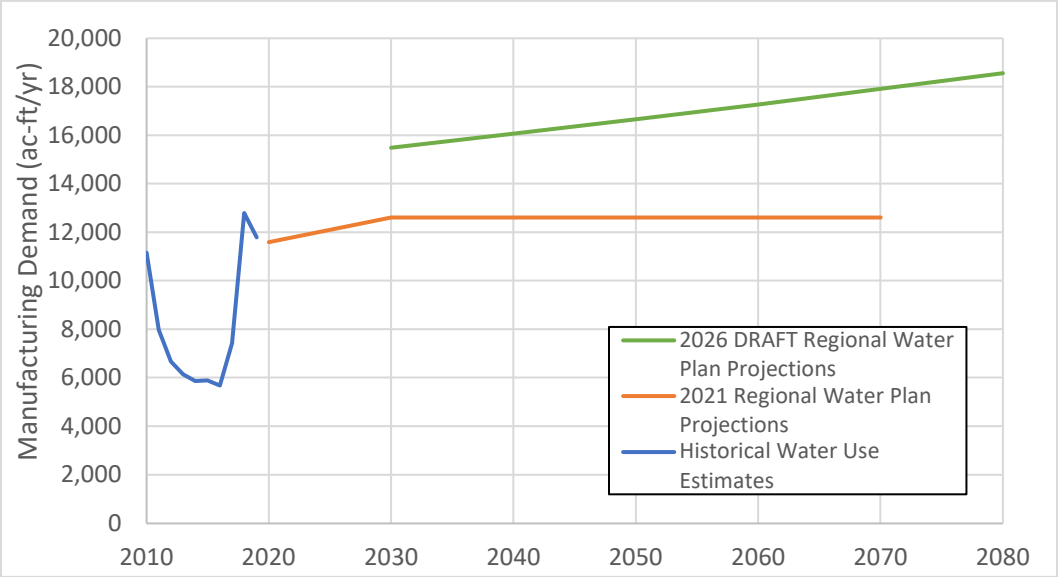
[1] https://www.myfoxzone.com/article/news/local/mcculloch-county-sand-facilities-pulling-up-roots-hundreds-of-jobs-impacted/504-614222770

[2] U.S. Census Bureau, *CBP Datasets*. URL: https://www.census.gov/programs-surveys/cbp/data/datasets.html, accessed January 2022.

Table 1: Region F 2026 Draft Manufacturing Demands (ac-ft/yr)

County	Historical Water Use Estimates					2026 DRAFT Regional Water Plan Projections					
	2015	2016	2017	2018	2019	2030	2040	2050	2060	2070	2080
ANDREWS	544	42	40	39	42	596	618	641	665	690	716
BORDEN	0	0	0	0	0	0	0	0	0	0	0
BROWN	382	382	414	413	327	454	471	488	506	525	544
COKE	0	0	0	0	0	0	0	0	0	0	0
COLEMAN	1	1	1	1	1	1	1	1	1	1	1
CONCHO	0	0	0	0	0	0	0	0	0	0	0
CRANE	320	288	428	418	376	469	486	504	523	542	562
CROCKETT	30	33	0	0	0	36	37	38	39	40	41
ECTOR	446	356	563	632	504	719	746	774	803	833	864
GLASSCOCK	38	35	25	16	16	42	44	46	48	50	52
HOWARD	1,955	2,557	3,573	3,374	3,191	3,916	4,061	4,211	4,367	4,529	4,697
IRION	6	5	6	5	5	7	7	7	7	7	7
KIMBLE	621	546	518	519	519	681	706	732	759	787	816
LOVING	0	0	0	0	0	0	0	0	0	0	0
MARTIN	0	0	0	0	0	0	0	0	0	0	0
MASON	0	0	0	0	0	0	0	0	0	0	0
MCCULLOCH	39	72	528	528	0	579	600	622	645	669	694
MENARD	0	0	0	0	0	0	0	0	0	0	0
MIDLAND	269	242	264	5,861	5,872	6,462	6,701	6,949	7,206	7,473	7,750
MITCHELL	4	2	1	1	1	4	4	4	4	4	4
PECOS	143	222	88	54	54	243	252	261	271	281	291
REAGAN	0	0	0	0	0	0	0	0	0	0	0
REEVES	41	6	6	9	4	45	47	49	51	53	55
RUNNELS	4	4	3	3	3	4	4	4	4	4	4
SCHLEICHER	0	0	0	0	0	0	0	0	0	0	0
SCURRY	153	117	124	182	173	199	206	214	222	230	239
STERLING	0	0	0	0	0	0	0	0	0	0	0
SUTTON	1	1	3	1	1	3	3	3	3	3	3
TOM GREEN	715	701	719	649	582	791	820	850	881	914	948
UPTON	117	41	19	25	22	128	133	138	143	148	153
WARD	0	0	0	0	0	0	0	0	0	0	0
WINKLER	60	32	98	63	93	107	111	115	119	123	128
TOTAL	**5,889**	**5,685**	**7,421**	**12,793**	**11,786**	**15,486**	**16,058**	**16,651**	**17,267**	**17,906**	**18,569**

Figure 1: Manufacturing Water Use Projections for Region F



1.3 Criteria for Revising the Draft Manufacturing Water Demand Projections

One or more of the following criteria must be verified by the Planning Group and the Executive Administrator for consideration of revising the manufacturing water demand projections:

- A new or existing facility that has not been included in the TWDB water use survey.
- An industrial facility has recently closed its operation in a county.
- Plans for new construction or expansion of an existing industrial facility in a county at some future date.
- Evidence of a long-term projected water demand of a facility or industry within a county that is substantially different than the draft projections.
- Evidence of errors identified in historical water use, including volumes of reuse (treated effluent) or brackish groundwater that were not included in the draft projections.

The Planning Group must provide the following data associated with the identified criteria to the Executive Administrator for justifying any adjustments to the manufacturing water demand projections:

- Historical water use data and the 6-digit North American Industrial Classification System (NAICS) code of a manufacturing facility. The NAICS code classifies establishments by type of activity in which they are engaged as defined by the U.S. Office of Management and Budget and is a successor of the Standard Industrial Classification (SIC).
- Documentation and analysis that justify that the new manufacturing facility not included in the Water Use Survey database will increase the future manufacturing water demand for the county above the draft projections.
- The 6-digit NAICS code of the industrial facility that has recently located in a county and annual water use volume.
- Documentation of plans for a manufacturing facility to locate in a county at some future date will include the following data:

- The quantity of water required by the planned facility on an annual basis.
- The proposed construction schedule for the facility including the date the facility will become operational.
- The 6-digit NAICS code for the planned facility.

- Other data that the RWPG considers adequate to justify an adjustment to the manufacturing water demand projections.

2 RECOMMENDED REVISIONS TO DRAFT MANUFACTURING WATER DEMAND PROJECTIONS

There are two counties in Region F where revisions to the 2026 draft manufacturing projections are recommended: Kimble County and McCulloch County. Since we could not verify the status of the Fullerton Field facility in Andrews County, we are not recommending changing Andrews County.

For Kimble County, the facilities that reported manufacturing water use from 2015-2019 are shown in Table 2. Nearly all of the reported manufacturing water use comes from the Grayden Cedarworks facility (NAICS #325). The annual reported use represents the total amount diverted by the facility, but the facility can only consume up to 49 ac-ft/yr in accordance with their water right (Certificate of Adjudication 14-1600A). The Colorado River Water Availability Model (WAM) uses the consumptive amount of up to 49 ac-ft/yr to model this facility's water right. Since the Colorado River WAM is used to estimate available water supplies in Region F to meet demand, the manufacturing demand projections for Kimble County should be revised to account for the consumptive water use instead of the diverted amount. Table 3 shows the revised 2026 draft manufacturing projections in Kimble County. The revised amount of 50 ac-ft/yr reflects the consumptive use amount of 49 ac-ft/yr for Grayden Cedarworks plus the additional 1 ac-ft/yr reported by the Ingram Concrete Junction Plant.

Table 2: Kimble County Facilities with Reported Manufacturing Water Use (ac-ft/yr)

Facility	2015	2016	2017	2018	2019
GRAYDEN INDUSTRIES INC	621	546	518	518	518
JUNCTION PLANT- INGRAM CONCRETE LLC	N/A	N/A	0	1	1

Table 3: Revised 2026 Draft Manufacturing Demand Projections (ac-ft/yr) for Kimble County

	2030	2040	2050	2060	2070	2080
2026 Draft Projections	579	600	622	645	669	694
Revised 2026 Draft Projections	**50**	**50**	**50**	**50**	**50**	**50**

For McCulloch County, Table 4 shows the two facilities that reported manufacturing water use from 2015-2019. With the confirmed closure of the Voca Plant in 2018 (NAICS #327), there are no facilities in McCulloch County with reported water use in 2015-2019. Unless the RWP group has knowledge of another manufacturing facility being planned in McCulloch County, it is recommended that the baseline water use for McCulloch be reduced to 0 ac-ft/yr (Table 5).

Table 4: McCulloch County Facilities with Reported Manufacturing Water Use (ac-ft/yr)

Facility	2015	2016	2017	2018	2019
VOCA PLANT- UNIMIN CORPORATION	39	72	528	528	N/A
BRADY PLANT- INGRAM CONCRETE LLC	0	0	0	0	0

Table 5: Revised 2026 Draft Manufacturing Demand Projections (ac-ft/yr) for McCulloch County

	2030	2040	2050	2060	2070	2080
2026 Draft Projections	579	600	622	645	669	694
Revised 2026 Draft Projections	0	0	0	0	0	0

Revising the projected demands for Kimble and McCulloch County reduces the total projected demands for Region F by about 8%. Figure 2 and Table 6 show a comparison between the 2021, 2026 and Revised manufacturing water demand projections.

Figure 2: Revised Manufacturing Water Demand Projections (ac-ft/yr) for Region F

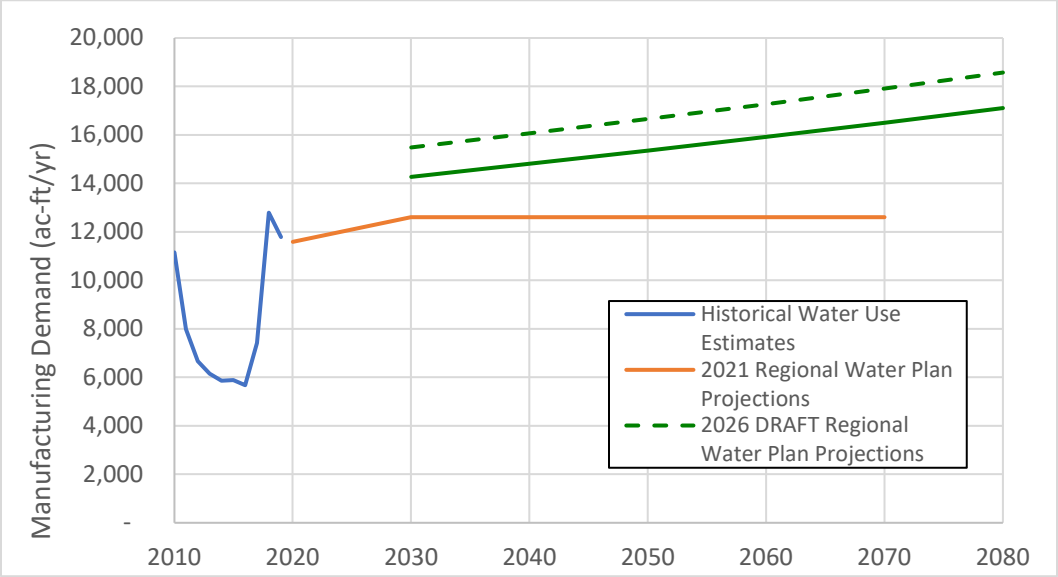


Table 6: Revised Manufacturing Water Demand Projections (ac-ft/yr) for Region F

	2020	2030	2040	2050	2060	2070	2080
2021 Projections	11,591	12,607	12,607	12,607	12,607	12,607	
2026 Draft Projections		15,486	16,058	16,651	17,267	17,906	18,569
Revised 2026 Draft Projections		14,276	14,802	15,347	15,913	16,500	17,109

MEMORANDUM

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TO: Region F Water Planning Group

CC: File

FROM: Freese and Nichols, Inc.

SUBJECT: Memorandum on Draft Mining Water Demand Projections

DATE: 10/19/2022

PROJECT: CMD21867

---

1 Background

In August 2022, the Texas Water Development Board (TWDB) released draft mining projections by county for the 2026 Regional Water Plans (RWPs). These projections will be reviewed by the planning groups, and recommendations are to be provided to the TWDB by July 2023 or sooner. The TWDB will consider the recommended changes from the planning groups, and the final projections will ultimately be incorporated into the 2026 Regional Water Plan. The purpose of this technical memorandum is to document information related to historical mining usage and provide information supporting recommended modifications to the draft mining demands.

According to the TWDB, mining water demands include water used for oil and gas development, as well as extraction of coal and lignite, sand aggregate, and other resources. Projections do not include water use required for the transportation or refining of materials. The TWDB's annual mining water use estimates are comprised of data from both surveyed and non-surveyed entities and are based on the mining study conducted in partnership with the US Geological Survey (USGS) and the University of Texas Bureau of Economic Geology (BEG).

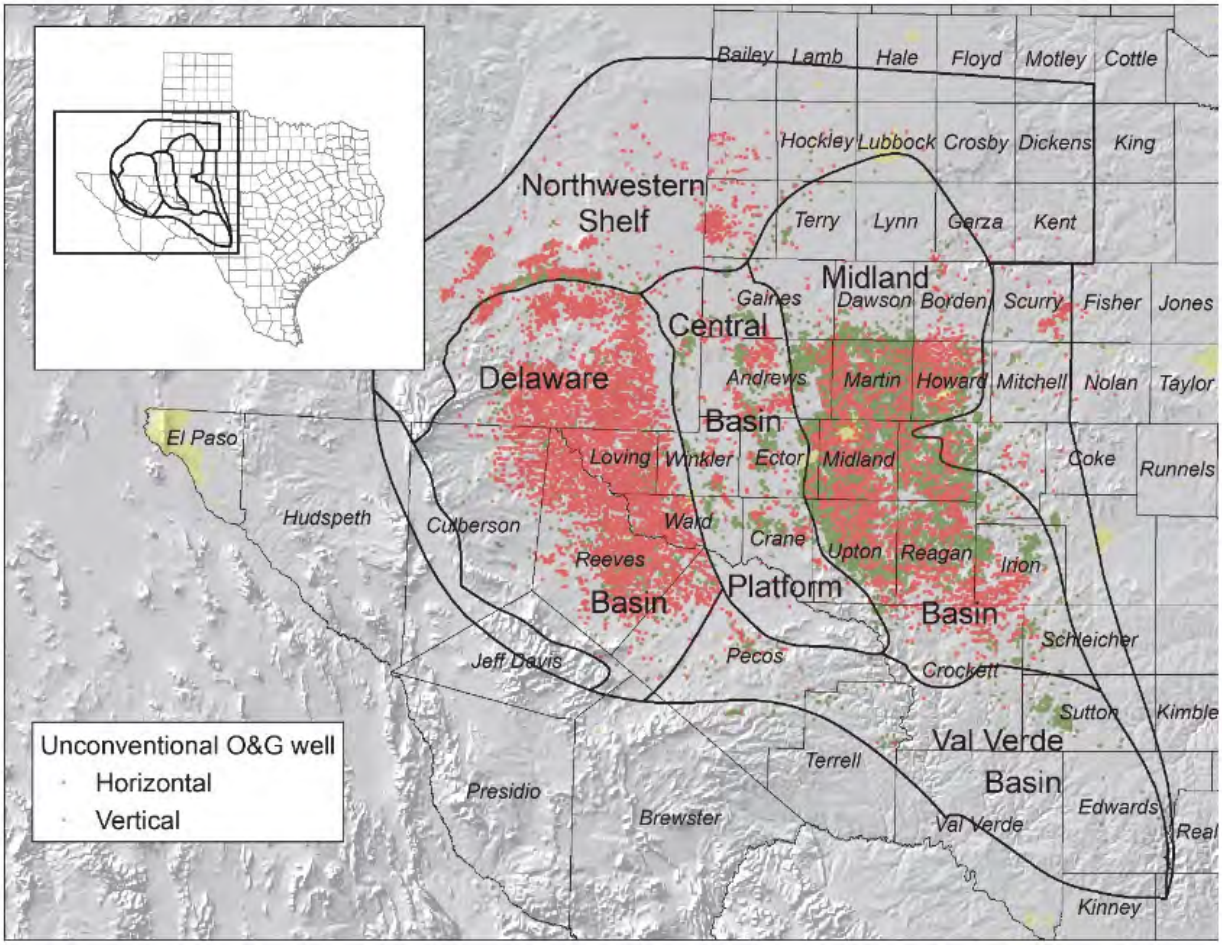
1.1 Historical Mining Water Use Estimates

The TWDB publishes historical annual mining water use estimates for each county. The estimates are based on 2022 TWDB Mining Water Use Study[1] conducted by the USGS and BEG. Mining water use in Texas is divided into three categories: Oil and Gas Industry Water Use, Coal Mining Water Use, and Aggregate Mining Water Use. Mining water use contributed between 12 and 35 percent of the total annual Region F water use from 2015-2019. Since 2015, the region-wide mining water use estimates have ranged from 63,036 to 236,247 acre-feet per year (ac-ft/yr). In 2019, the mining water use in Region F accounted for nearly 58% of the total mining water use in Texas. Most of the mining water use in Region F comes from oil and gas production in the Midland and Delaware Basins, which are sub-basins

[1] Reedy and Scanlon (2022). "Water Use by the Mining Industry in Texas" Final Report August 2022.

of the Permian Basin (Figure 1). These two basins include portions of 22 of 32 Region F counties. A small amount of mining water use in Region F comes from aggregate mining, and there is no coal mining water use reported in Region F.

Figure 1: Locations of Delaware and Midland Basins in West Texas



1.2 TWDB Draft Mining Water Demand Projections

The TWDB draft mining demand projections for the 2026 Regional Water Plans were developed from the 2022 TWDB Mining Water Use Study. The study used different methods to develops projections for each mining water use category: oil and gas, aggregate mining, and coal mining. Since there is no historical coal mining use reported in Region F, only the oil ang gas and aggregate mining water use methodologies were described.

1.2.1 Oil and Gas Water Use Projection Methodology

Oil and gas water use projections are based on three factors:

1. The amount of Technically Recoverable Resources (TRR) measured in numbers of wells for each major oil play;

2. The volume of water demand per well (differs by county); and
3. The number of new wells to be drilled per year (rate from 2018 to 2019).

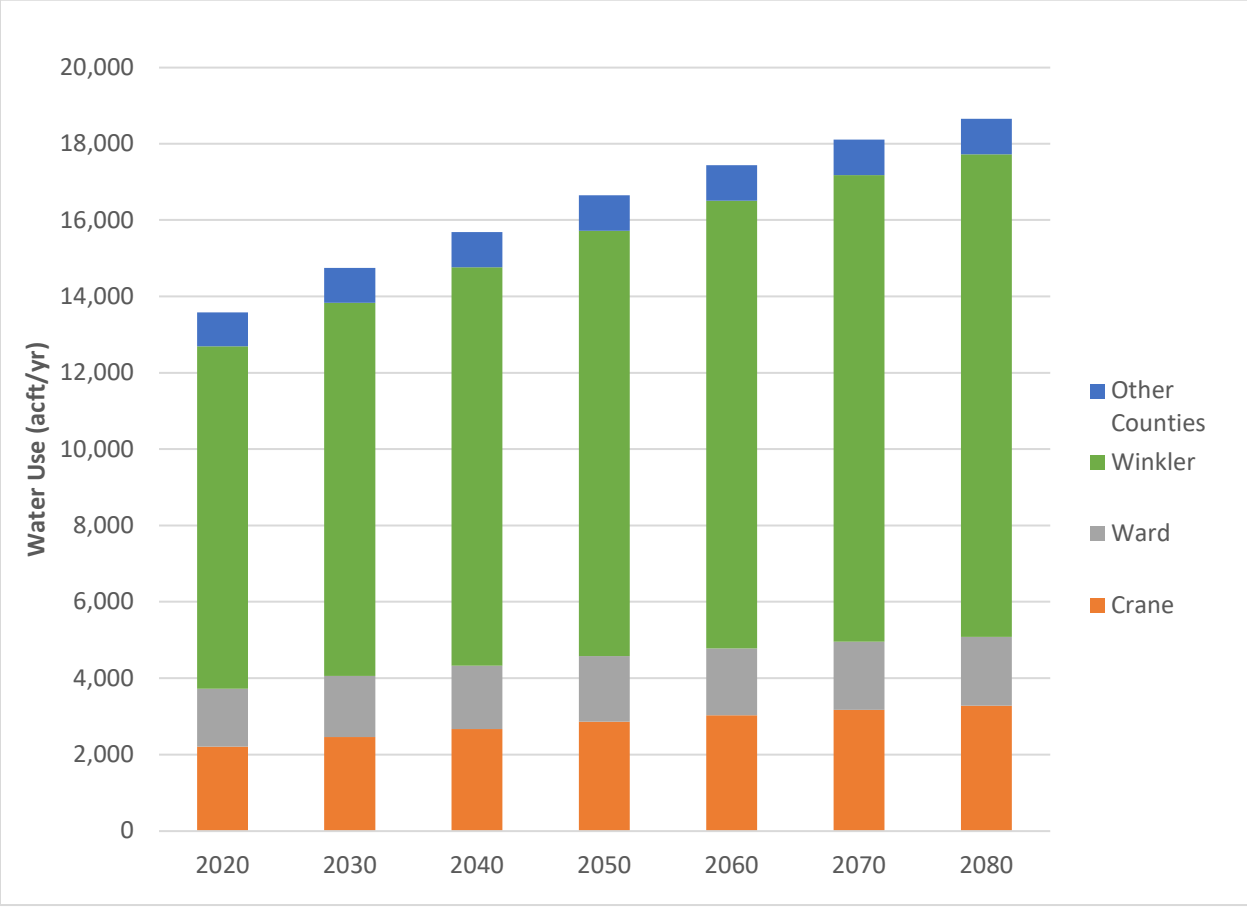
For Region F, the 2022 TWDB Mining Water Use Study focused on the Wolfcamp A and B formations in the Delaware and Midland Basins, stating that they have been the main producing formations in the Permian Basin to date. For the Delaware Basin, an estimated 137,000 wells of TRR are available with 7,000 being completed and 130,000 potential future wells. Based on a rate of 1,700 new wells per year, the TRR inventory would last for 77 years, and drilling would end in 2096. For the Midland Basin, an estimated 120,300 wells of TRR are available with 11,500 being completed and 108,800 potential future wells. Based on a rate of 2,400 new wells per year, the TRR inventory would last for 45 years, and drilling would end in 2064. Since the rate of new wells being drilled is held constant, the demand projections are constant from 2030 to 2080, except for when limited by available TRR inventory, as is the case for the Midland Basin after 2064. The 2022 TWDB Mining Water Use Study estimated the average water demand per well for each county. This was then multiplied by the number of wells to be completed in each county, separated by basin, to develop oil and gas demand projections for each county. Figure 2 shows the comparison in demand projections between the Delaware and Midland Basins in Region F. The significant decrease in projected mining demand in 2070 and 2080 is due to the prediction that the Midland Basin will be depleted of TRR by 2064.

Figure 2: Projected Oil and Gas Water Use in Region F

1.2.2 Aggregate Mining Water Use Projection Methodology

Aggregate mining water use projections are based on TWDB and TCEQ water use survey results for aggregate mining industry facilities, and estimated water use for non-reporting facilities. The 2022 TWDB Mining Water Use Study used Google imagery to examine non-reporting sites for evidence of recent activity and the absence or presence of on-site equipment. In making decisions whether to assign an estimated water use value to a given non-reporting site, the extent of the disturbed area and the nature of similar operations in the same county or surrounding counites were taken into consideration. Where water use was generally reported for similar operations in a county, the approximate water use per disturbed acre was applied to non-reporting sites that appeared to be active. Projected county-level total annual aggregate mining water use was estimated based on county-level population projections for 2020 to 2070 as published by TWDB in the 2022 State Water Plan. Populations for 2080 were calculated by extending trends defined by 2060 and 2070 populations. Projected aggregate mining water use by county is assumed to track population change in direct proportion. Most of the aggregate mining use in Region F occurs in Winkler County, followed by Crane and Ward counties. Smaller amounts of water use for aggregate mining is projected across the region. Figure 3 shows the projected aggregate mining water use for Region F.

Figure 3: Aggregate Mining Water Use Projections for Region F



1.2.3 Total Mining Water Use Projections for Region F

Table 1 contains the 2026 draft Region F mining water use projections for Region F, along with historical estimates from 2015-2019 by county. The projections represent the sum of oil and gas and aggregate mining water use for each Region F county. **Error! Reference source not found.** shows the 2026 draft mining water use projections for Region F, alongside mining water use projections from the 2021 Region F Water Plan and the historical mining water use estimates from 2015-2019 for Region F. As described in the oil and gas projection methodology, the dramatic decrease in mining water use projections after 2060 is due to the estimated depletion of the TRR inventory in the Midland Basin in 2064. Figure 5 shows the breakdown of projected mining water use by category in Region F. Oil and gas water use contributes to about 92 to 93 percent of the total mining water use projections from 2030 to 2060, and about 80 percent in 2070 and 2080 after the Midland Basin TRR are projected to be depleted.

Figure 4: Mining Water Use Projections (ac-ft/yr) for Region F

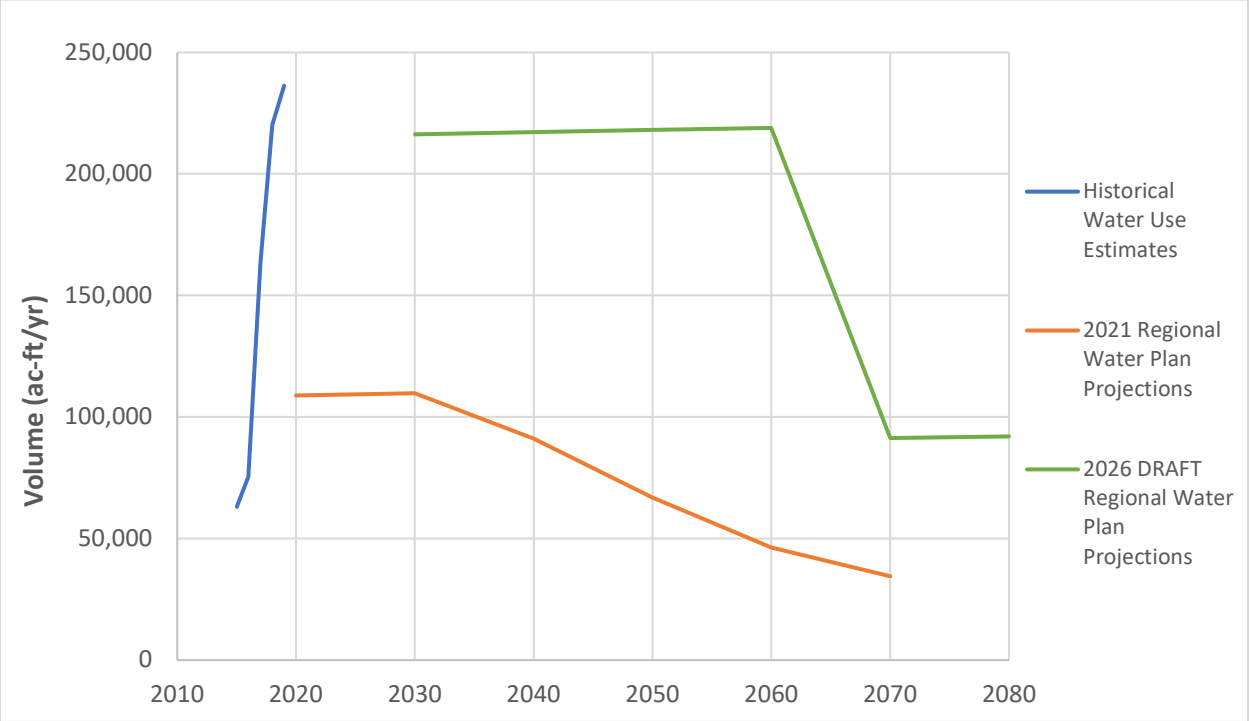
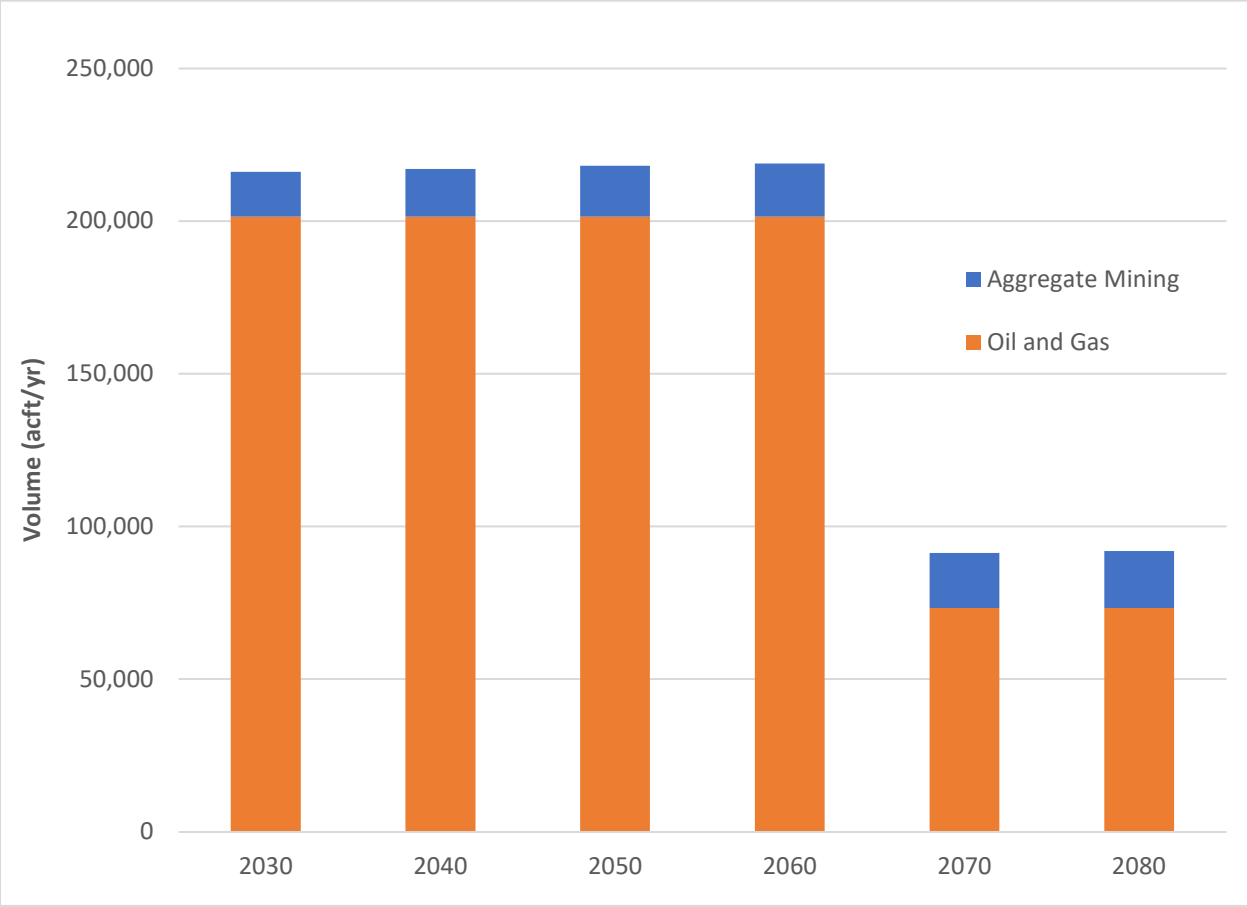


Table 1: Region F 2026 Draft Mining Demands (ac-ft/yr)

County	Historical Water Use Estimates					2026 DRAFT Regional Water Plan Projections					
	2015	2016	2017	2018	2019	2030	2040	2050	2060	2070	2080
ANDREWS	1,811	1,997	3,634	3,959	4,900	4,200	4,200	4,200	4,200	37	37
BORDEN	87	178	1,162	2,158	1,964	3,374	3,374	3,374	3,374	4	4
BROWN	0	0	0	0	0	0	0	0	0	0	0
COKE	1	39	15	22	40	106	106	106	106	106	106
COLEMAN	0	0	0	0	0	0	0	0	0	0	0
CONCHO	0	0	0	0	0	0	0	0	0	0	0
CRANE	141	43	47	603	1,336	3,071	3,279	3,475	3,640	3,194	3,306
CROCKETT	1,946	1,549	2,496	1,059	145	6,046	6,046	6,046	6,046	8	8
ECTOR	518	387	620	1,153	1,477	2,061	2,061	2,062	2,062	34	34
GLASSCOCK	4,599	3,852	9,612	11,794	13,700	13,854	13,854	13,854	13,854	11	11
HOWARD	3,047	4,894	14,632	18,939	19,887	12,340	12,340	12,340	12,340	20	20
IRION	2,368	1,606	2,317	4,906	5,438	10,662	10,662	10,662	10,662	13	13
KIMBLE	0	0	0	0	0	1	1	1	1	1	1
LOVING	4,403	5,948	12,970	16,010	16,963	12,002	12,002	12,002	12,002	12,002	12,002
MARTIN	6,663	6,629	17,475	24,172	29,302	16,590	16,590	16,590	16,590	11	11
MASON	116	187	177	176	176	176	176	176	176	176	176
MCCULLOCH	4,290	5,047	1,972	1,987	88	673	675	682	684	685	685
MENARD	0	0	0	0	0	0	0	0	0	0	0
MIDLAND	10,838	17,959	28,872	39,202	39,571	14,703	14,704	14,704	14,704	13	14
MITCHELL	10	0	1	2	0	368	368	368	368	2	2
PECOS	945	1,235	5,017	7,772	12,561	16,152	16,152	16,152	16,152	16,152	16,152
REAGAN	7,150	5,368	13,294	16,440	15,661	19,823	19,823	19,823	19,823	5	5
REEVES	6,856	7,791	28,240	39,999	40,577	34,986	34,986	34,986	34,986	34,986	34,986
RUNNELS	0	6	0	0	0	0	0	0	0	0	0
SCHLEICHER	55	10	0	0	0	3,529	3,529	3,529	3,529	2	2
SCURRY	22	909	902	1,057	987	306	306	306	306	8	8
STERLING	12	7	6	84	4	3,047	3,047	3,047	3,047	3	3
SUTTON	0	0	0	4	0	27	27	27	27	27	27
TOM GREEN	0	1	15	0	27	990	990	990	990	5	6
UPTON	6,142	7,566	12,412	13,447	14,305	15,851	15,851	15,851	15,851	6	6
WARD	669	1,292	5,525	9,800	8,366	8,170	8,232	8,282	8,321	8,351	8,370
WINKLER	347	813	2,122	5,370	8,772	13,048	13,711	14,418	14,996	15,498	15,912
TOTAL	**63,036**	**75,313**	**163,535**	**220,115**	**236,247**	**216,156**	**217,092**	**218,053**	**218,837**	**91,360**	**91,907**

Figure 5: Mining Water Use Projections (ac-ft/yr) by Category for Region F



2 RECOMMENDED REVISIONS TO DRAFT MINING WATER DEMAND PROJECTIONS

Based on the review of the historical estimates and 2026 draft projection methodology for mining water use provided in the previous sections, there are no recommended revision to the 2026 mining water use projections in Region F.

MEMORANDUM

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TO: Region F Water Planning Group

CC: File

FROM: Freese and Nichols, Inc.

SUBJECT: Memorandum on Draft Steam-Electric Water Demand Projections

DATE: 10/24/2022

PROJECT: CMD21867

---

1 Background

In January 2022, the Texas Water Development Board (TWDB) released draft steam-electric projections by county for the 2026 Regional Water Plans (RWPs). These projections will be reviewed by the planning groups, and recommendations are to be provided to the TWDB by July 2023 or sooner. The TWDB will consider the recommended changes from the planning groups, and the final projections will ultimately be incorporated into the 2026 Regional Water Plan. The purpose of this technical memorandum is to document information related to historical steam-electric usage and provide information supporting recommended modifications to the draft steam-electric demands.

According to the TWDB, steam-electric water use is consumptive use for steam-electric power generation reported to the TWDB through the annual Water Use Survey (WUS). Steam-electric power water demand projections do not include water used in cogeneration facilities (included in manufacturing projections) or facilities which do not require water for production (wind, solar, dry-cooled generation), or hydro-electric generation facilities. Projections do include proposed facilities that have begun the permitting process.

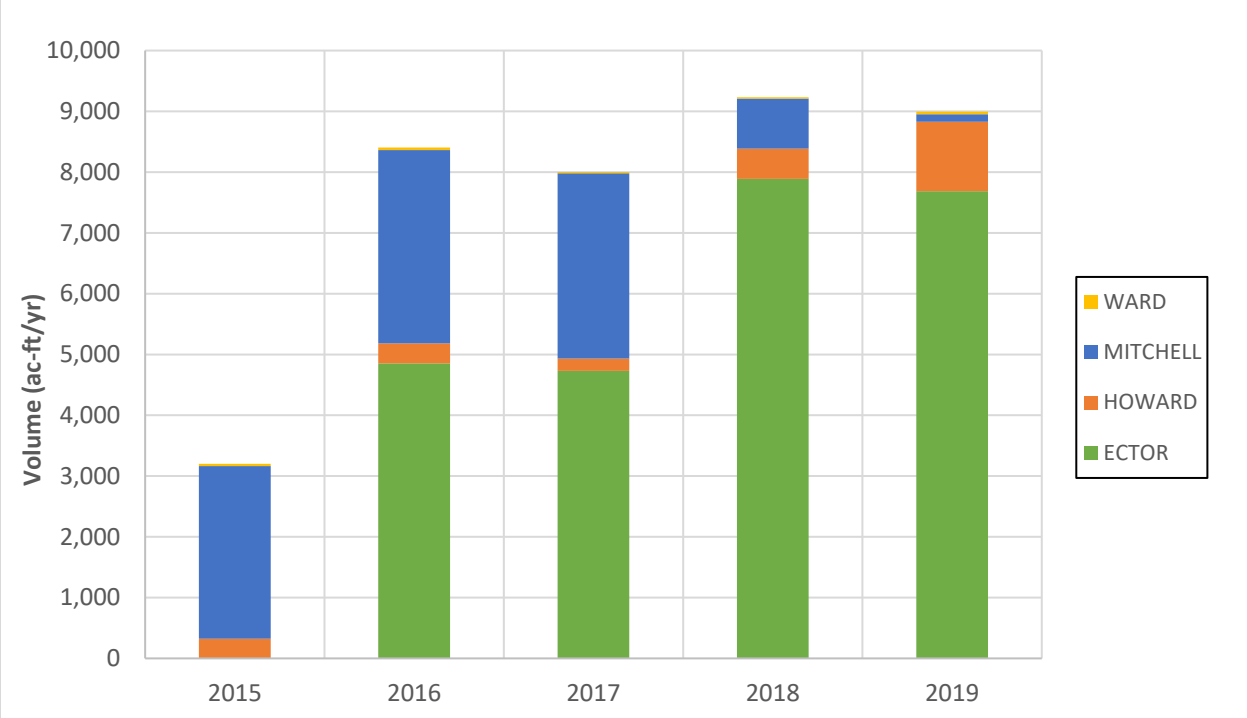
1.1 Historical Steam-electric Water Use Estimates

The TWDB historical steam-electric water use estimates from 2015 to 2019 are gathered by the TWDB annual WUS of power- generating facilities throughout the state. The water use volumes in the water planning process include volumes consumed by operable power generation facilities that sell power on the open market and exclude facilities which are included with manufacturing estimates. The water use estimates are composed of the reported intake volume of self-supplied groundwater, water purchased from a provider, and/or water withdrawn from a surface water source and not returned to the source. The volume of water withdrawn from a surface water source and not returned is referred to as consumptive use. Additionally, reuse volumes, such as treated effluent, were included in the historical water use intake estimates and water demand projections. Any water sales from the surveyed facility to other entities are subtracted from the intake volume.

If any known power generation facility was not surveyed in the TWDB's annual WUS, then that facility's water use was obtained from the operator or estimated using average water use per kilowatt-hour output for the associated fuel-type and added to the historical highest water use for that county.

From 2015 to 2019, steam-electric water use contributes to about 0.5 to 1.5 percent of the total non-municipal water use in Region F. The region-wide steam-electric water use estimates during this five-year period have ranged from 3,202 to 9,232 acre-feet per year (ac-ft/yr). There were four counties in Region F that reported steam-electric water use from 2015-2019: Ector, Howard, Mitchell, and Ward. The estimated steam-electric water use from 2015-2019 for each of these counties is shown in Figure 1. In 2016, three power-generation facilities began reporting water use in Ector County: Invenergy Ector County Energy Center, Luminant Generation Odessa-Ector Power Plant, and Quail Run Energy Center. The latter two combined contributed to over 85% of the steam-electric water use in Region F in 2018 and 2019. Also, over this time Luminant began retiring the steam generation units at the Morgan Creek Power Plant in Mitchell County. The steam generation portion of this plant is fully retired, but the combustion generation units are still fully operational.

Figure 1: Historical Steam-Electric Water Use Estimates (ac-ft/yr) by Region F County



1.2 TWDB Draft Steam-electric Water Demand Projections

The draft steam-electric water demand projections for the 2026 Regional Water Plans (RWPs) were based upon:

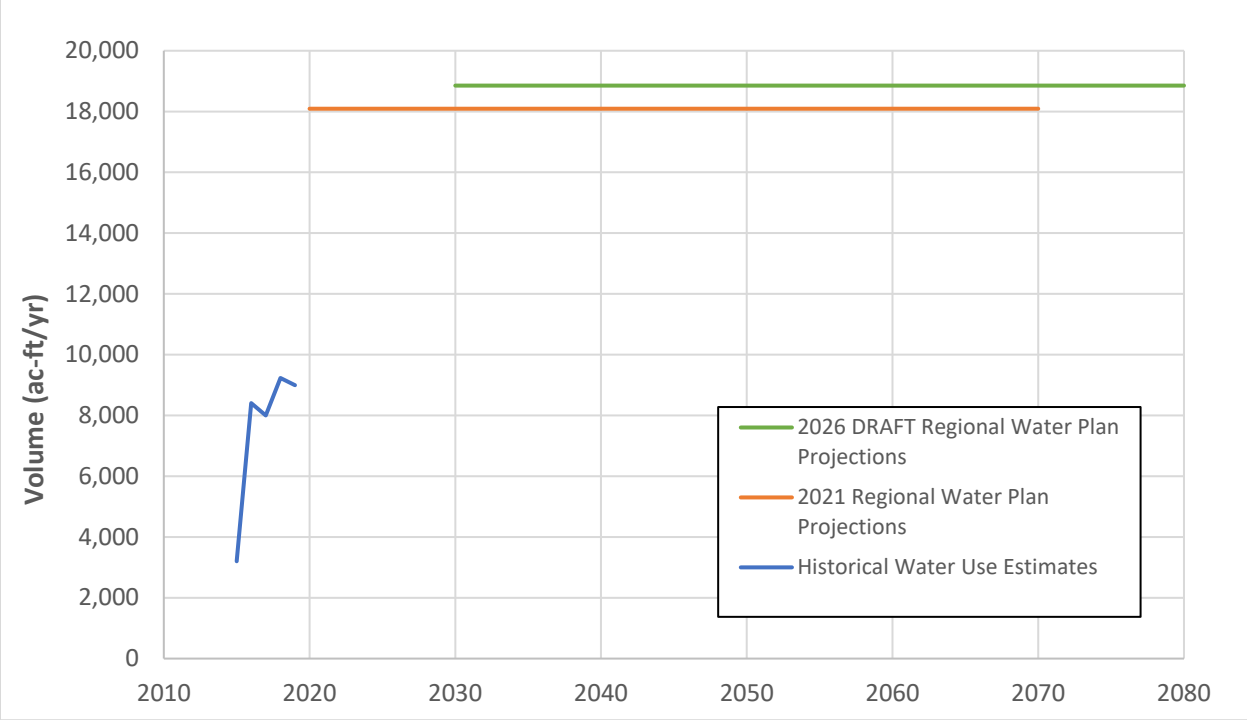
1) The highest single-year county water use from within the most recent five years of data for steam-electric power water users from the annual WUS,

2) Near-term additions and retirements of generating facilities, and

3) Holding the projected water demand volume constant through 2080.

In Region F, there is one new power generation facility planned to begin operation in Mitchell County. The FGE Texas Project is a two-phase power generation facility with Phase I planned to begin operation in Spring 2022[1]. However, construction has not yet begun on Phase I and it is uncertain when or if it will come online. Phase II was to be online by 2030 but the timing and if it will come online is also uncertain. Each phase is expected to use 3,300 acre-feet of water. The potential addition of the FGE Texas facility significantly increases the projected steam-electric water use for Region F. The TWDB projected annual water use in Mitchell County is 9,780 ac-ft/y), but these estimates do not account for the retiring of the steam generating units at the Morgan Creek Power Plant. The steam generation units are more water intensive unit at the power plant and there was a significant drop in historical use in Mitchell County. The combustion generation units at the Morgan Creek Power Plant are still operational and planned to continue operation into the future but will use significantly less water. Figure 2 shows the 2026 draft projections alongside the 2021 steam-electric projections and the historical water use estimates.

Figure 2: Steam-Electric Water Use Projections (ac-ft/yr) for Region F



[1] FGE Texas I. Triple Bottom Line Highlights. http://fgepower.com/portfolio/fge-texas-i/

2 RECOMMENDED REVISIONS TO DRAFT STEAM-ELECTRIC WATER DEMAND PROJECTIONS

Based on the review of the historical estimates and 2026 draft projection methodology for steam-electric water use provided in the previous sections, we recommend that the projected demand be reduced in Mitchell County to reflect the retired steam generation units at the Morgan Creek Power Plant. This would change the projected water use for this facility from 3,180 acre-feet per year to 125 acre-feet per year. A summary of the change for Mitchell County is shown on Table 1.

Table 1 Recommended Changes to Steam Electric Power for Mitchell County

Projections	Steam Electric Power Demands (acre-ft/yr)					
	2030	2040	2050	2060	2070	2080
TWDB	9,780	9,780	9,780	9,780	9,780	9,780
RWPG	6,725	6,725	6,725	6,725	6,725	6,725

The draft projected steam-electric water demands for the 2026 Region F Plan by county along with historical steam-electric water use estimate for 2015-2019 are shown in Table 2.

Table 2: Region F 2026 Draft Steam-Electric Demands (ac-ft/yr)

County	Historical Water Use Estimates					2026 DRAFT Regional Water Plan Projections					
	2015	2016	2017	2018	2019	2030	2040	2050	2060	2070	2080
ANDREWS	0	0	0	0	0	0	0	0	0	0	0
BORDEN	0	0	0	0	0	0	0	0	0	0	0
BROWN	0	0	0	0	0	0	0	0	0	0	0
COKE	0	0	0	0	0	0	0	0	0	0	0
COLEMAN	0	0	0	0	0	0	0	0	0	0	0
CONCHO	0	0	0	0	0	0	0	0	0	0	0
CRANE	0	0	0	0	0	0	0	0	0	0	0
CROCKETT	0	0	0	0	0	0	0	0	0	0	0
ECTOR	0	4,853	4,731	7,889	7,687	7,889	7,889	7,889	7,889	7,889	7,889
GLASSCOCK	0	0	0	0	0	0	0	0	0	0	0
HOWARD	323	331	203	497	1,141	1,141	1,141	1,141	1,141	1,141	1,141
IRION	0	0	0	0	0	0	0	0	0	0	0
KIMBLE	0	0	0	0	0	0	0	0	0	0	0
LOVING	0	0	0	0	0	0	0	0	0	0	0
MARTIN	0	0	0	0	0	0	0	0	0	0	0
MASON	0	0	0	0	0	0	0	0	0	0	0
MCCULLOCH	0	0	0	0	0	0	0	0	0	0	0
MENARD	0	0	0	0	0	0	0	0	0	0	0
MIDLAND	0	0	0	0	0	0	0	0	0	0	0
MITCHELL	2,840	3,180	3,046	825	124	**6,725**	**6,725**	**6,725**	**6,725**	**6,725**	**6,725**
PECOS	0	0	0	0	0	0	0	0	0	0	0
REAGAN	0	0	0	0	0	0	0	0	0	0	0
REEVES	0	0	0	0	0	0	0	0	0	0	0
RUNNELS	0	0	0	0	0	0	0	0	0	0	0
SCHLEICHER	0	0	0	0	0	0	0	0	0	0	0
SCURRY	0	0	0	0	0	0	0	0	0	0	0
STERLING	0	0	0	0	0	0	0	0	0	0	0
SUTTON	0	0	0	0	0	0	0	0	0	0	0
TOM GREEN	0	0	0	0	0	0	0	0	0	0	0
UPTON	0	0	0	0	0	0	0	0	0	0	0
WARD	39	40	21	21	43	43	43	43	43	43	43
WINKLER	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**3,202**	**8,404**	**8,001**	**9,232**	**8,995**	**15,798**	**15,798**	**15,798**	**15,798**	**15,798**	**15,798**