OCTMDL Sampling & Analysis Report 2023

Prepared in Cooperation with the Texas Commission on Environmental Quality

www.sratx.org

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Introduction

The Orange County Total Maximum Daily Load Project (OCTMDL) includes the Adams Bayou and the Cow Bayou watersheds located in the southern section of the Sabine Basin in Orange County. Impairments in these water bodies were first identified in Adams Bayou Tidal (0508) in 1992 and Cow Bayou Tidal (0511) in 1994. The Texas Commission on Environmental Quality (TCEQ) adopted the original Total Maximum Daily Loads (TMDL) for indicator bacteria, dissolved oxygen (DO), and pH for both bayous and their tributaries on June 13, 2007. The Implementation Plan (I-Plan) was adopted eight years later on August 5, 2015.

Since the adoption of the I-Plan, the Sabine River Authority (SRA-TX) has conducted routine water quality monitoring at two stations within the impaired watersheds under the Texas Clean Rivers Program. Beginning in FY2021, SRA-TX began collecting water quality data from several of the other original OCTMDL sampling stations. These stations have not been monitored since the original OCTMDL sampling program was completed. This additional data will be used to assess the current status of impairments to the primary contact recreation, aquatic life, and general uses in these waterbodies. An additional component of the project involving monthly grab sample collections to determine the tidal influence in Adams Bayou Above Tidal (0508A) and Gum Gully (0508B) took place during FY2021 and FY2022. In FY2023, bacteria monitoring sites were added on Nichols Creek and Caney Creek. Data from these sites will be used in future assessments of the waterbodies.

This report provides an overview of the water quality data collected under the TMDL Program within the Adams Bayou and Cow Bayou watersheds, along with Nichols Creek and Caney Creek, from July 2021 through June 2023.

Figure 1. Hudson Gully at Lexington Drive.

Water Quality Monitoring

The SRA-TX is monitoring twelve sites within the OCTMDL watersheds and one site each on Nichols Creek and Caney Creek (Table 1) under the TMDL program. Indicator bacteria is sampled at ten sites monthly, while 24-hour parameters are collected at six sites quarterly (Table 1). The tidal determination sampling took place at three sites monthly (Table 1).

Table 1. Sampling Stations and Parameters

Site ID	AU	Bacteria Sampling	24-hour Sampling	Tidal Determination
16049 (GG)	0508B_01	*E. coli*		√
15107 (AB7)	0508A_01			√
14964 (AB8)	0508A_01			√
10457 (CB5)	0511_04	*Enterococcus*	√	
13781 (CB4)	0511_03	*Enterococcus*	√	
10453 (CB3)	0511_02		√	
16052 (CNB)	0511B_01	*Enterococcus*		
10441 (AB2)	0508_01		√	
10442 (AB3)	0508_02	*Enterococcus*	√	
16059 (AB4)	0508_03	*Enterococcus*	√	
16041 (HG)	0508C_01	*Enterococcus*		
14990 (AB5)	0508_04	*Enterococcus*		
15652 (NC1)	0502A_01	*E. coli*		
17464 (CNY505)	0502B_02	*E. coli*		

Table 2. Abbreviation List

Abbreviation	Meaning
MPN	Most Probable Number
^{o}C	Degrees Celsius
µS/cm	Micro Siemen per Centimeter
mg/L	Milligrams per Liter
ppt	Part per Thousand

Table 3. 24-Hour Sampling Parameters

Storet Code	Parameter
00209	24-hour Average Water Temperature (°C)
00210	Maximum Daily Water Temperature (°C)
00211	Minimum Daily Water Temperature (°C)
00221	Number of Water Temperature Measurements
00212	24-Hour Average Specific Conductance (µS/cm)
00213	Maximum Daily Specific Conductance (µS/cm)
00214	Minimum Daily Specific Conductance (µS/cm)
00222	Number of Specific Conductance Measurements
89857	24-Hour Average Dissolved Oxygen (mg/L)
89856	Maximum Daily Dissolved Oxygen (mg/L)
89855	Minimum Daily Dissolved Oxygen (mg/L)
89858	Number of Dissolved Oxygen Measurements
00215	Maximum Daily pH (pH units)
00216	Minimum Daily pH (pH units)
00223	Number of pH Measurements
00218	24-Hour Average Salinity (ppt)
00217	Maximum Daily Salinity (ppt)
00219	Minimum Daily Salinity (ppt)
00220	Number of Salinity Measurements

Table 4. Tidal Determination Parameters

Storet Code	Parameter
00010	Surface Water Temperature (°C)
	Bottom Water Temperature (°C)
00094	Surface Specific Conductance (µS/cm)
	Bottom Specific Conductance (µS/cm)
00480	Surafce Salinity (ppt)
	Bottom Salinity (ppt)
89870	% Pool Coverage
01351	Flow Severity

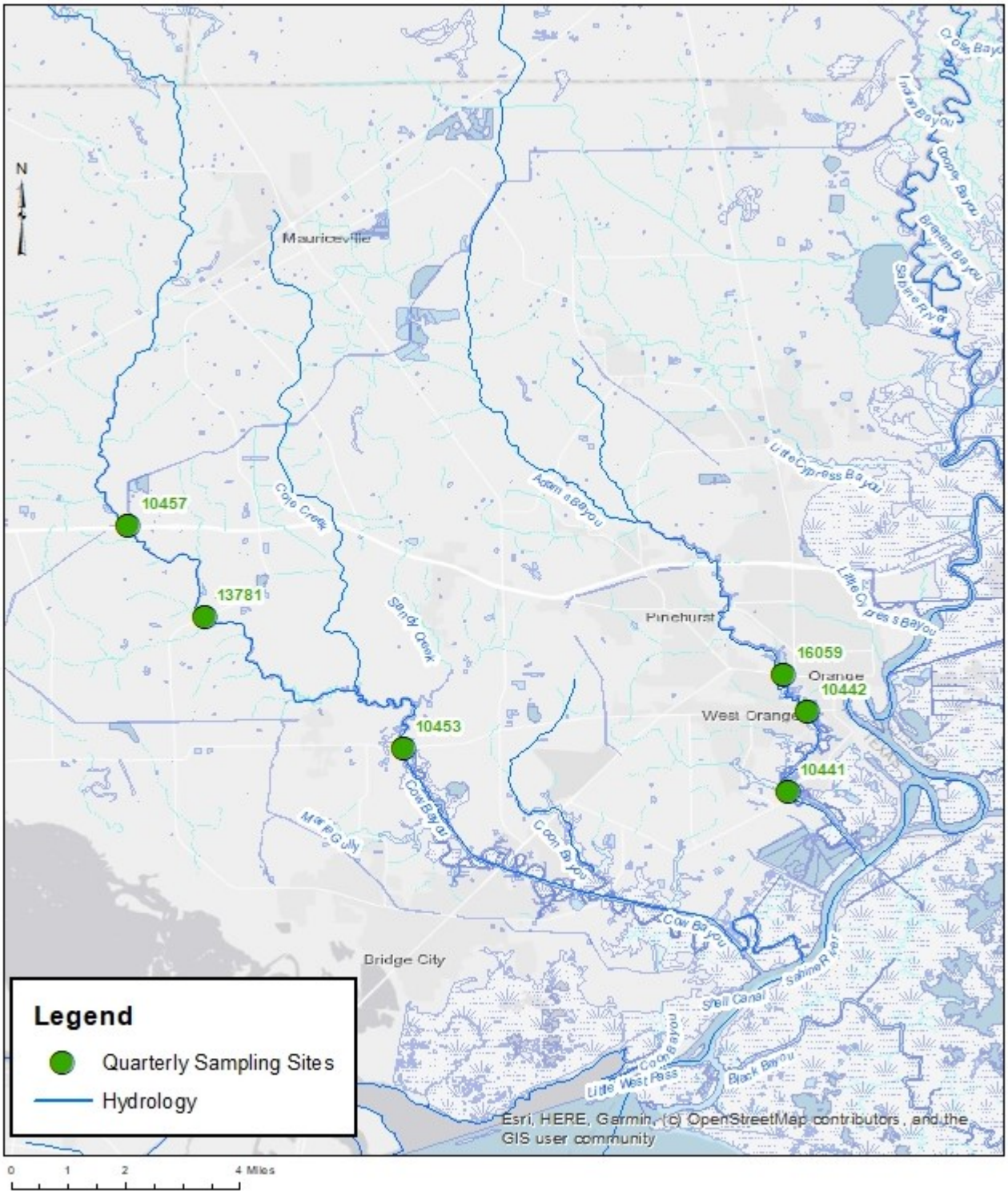

Figure 2. Quarterly 24-hour Monitoring Sites.

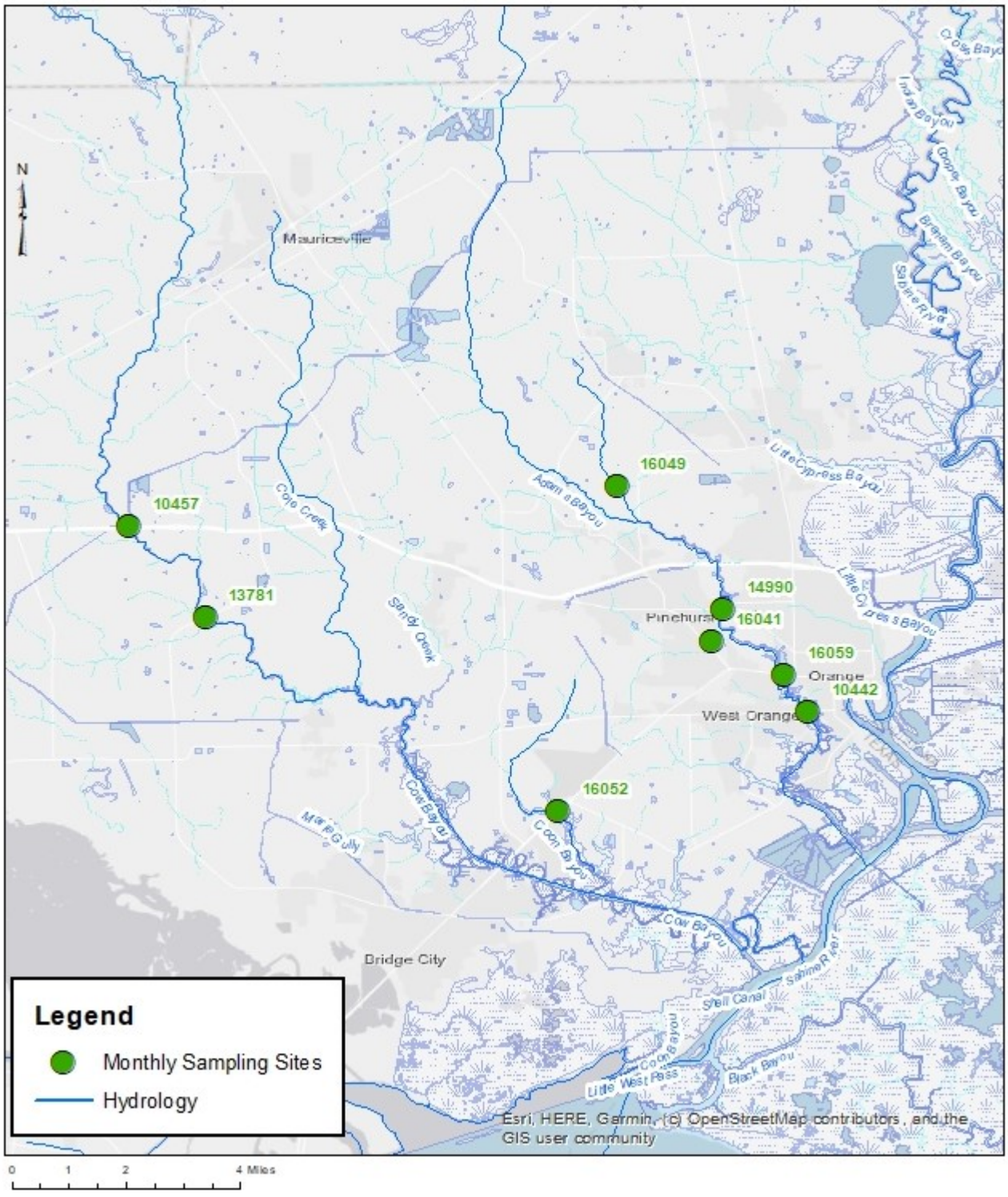

Figure 3. Monthly Cow Bayou and Adams Bayou Bacteria Sampling Sites.

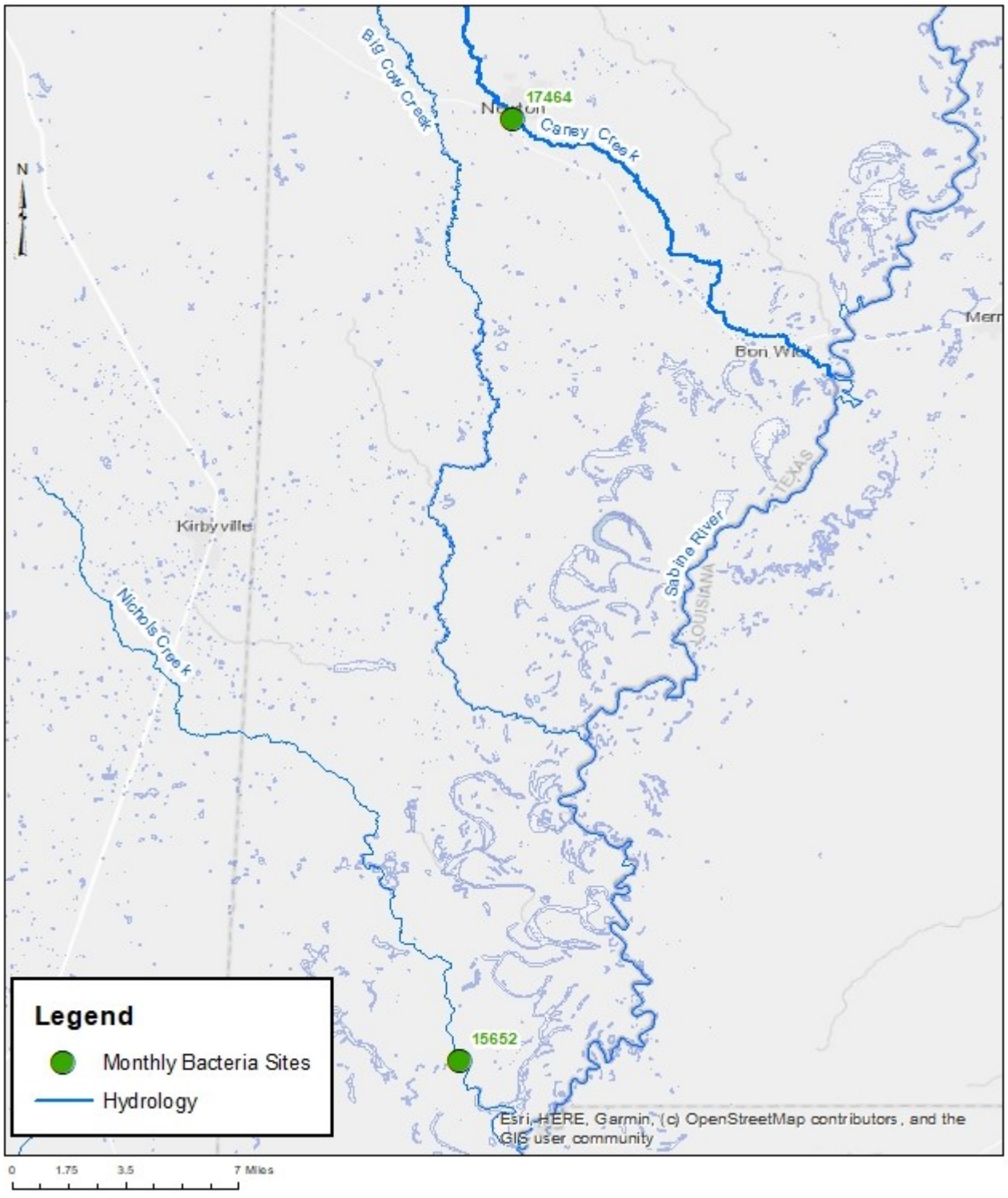

Figure 4. Monthly Nichols Creek and Caney Creek Bacteria Sampling Sites.

Bacteria Monitoring

Bacteria monitoring sites within the Adams Bayou watershed.

Station 16049 (GG) – Gum Gully at Haliburton Rd. upstream of the confluence with Adams Bayou.
Station 10442 (AB3) – Adams Bayou immediately downstream of Western Ave. in Orange, TX.
Station 16059 (AB4) – Adams Bayou at Green Ave. in Orange, TX.
Station 14990 (AB5) – Adams Bayou at Park Ave. in Pinehurst, TX
Station 16041 (HG) – Hudson Gully at Lexington Dr. upstream of the confluence with Adams Bayou.

Table 5. Adams Bayou Watershed *Enterococcus* Sampling Results

Date	Enterococcus (MPN)			
	10442 (AB3)	**16059 (AB4)**	**14990 (AB5)**	**16041 (HG)**
7/15/21	1,150	1,500	226	1,900
8/25/21	238	135	269	6,130
9/23/21	41	63	52	292
10/14/21	216	85	41	97
11/9/21	31	73	63	135
12/9/21	52	97	41	41
1/20/22	NR	NR	NR	NR
2/23/22	189	158	173	857
3/23/22	17,000	15,000	24,000	8,200
4/6/22	108	195	473	301
5/19/22	275	275	197	73
6/23/22	120	96	20	934
7/21/22	134	233	31	173
8/18/22	160	181	84	52
9/15/22	120	84	10	108
10/27/22	20	52	20	74
11/17/22	880	1,150	2,850	336
12/28/22	110	201	148	118
1/26/23	15,500	8,160	3,080	1,380
2/23/23	262	148	97	379
3/30/23	120	275	85	135
4/18/23	132	201	169	85
5/25/23	75	132	119	96
6/12/23	74	63	155	75
Geomean	200	231	144	259

NR= No Result

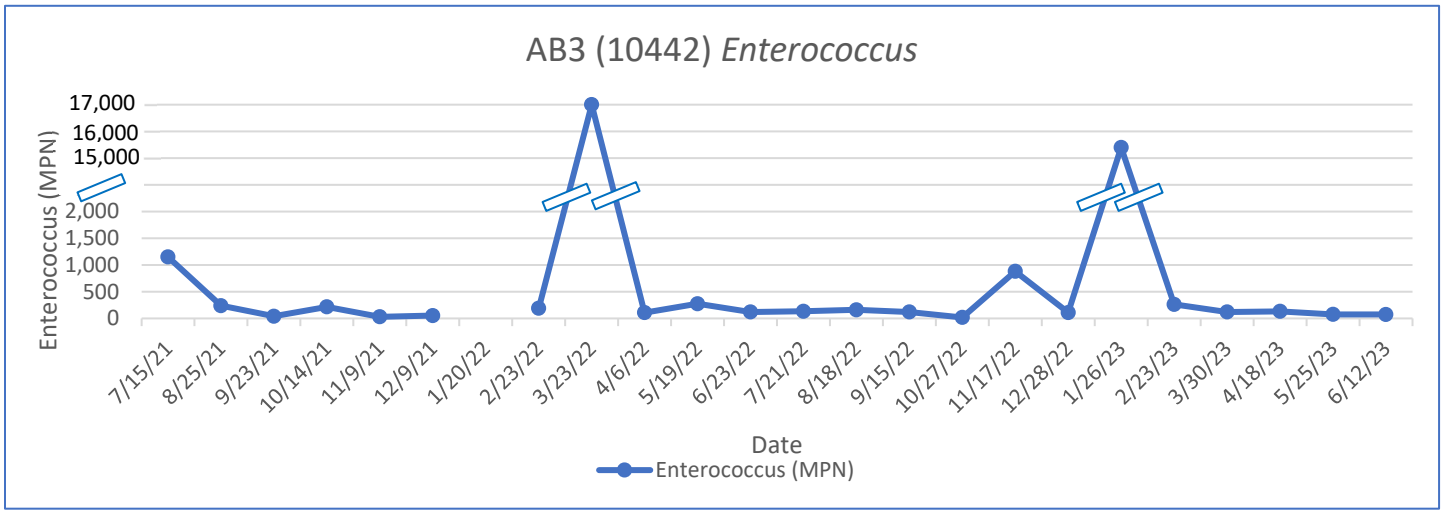

Figure 5. Site AB3 (10442) Enterococcus results over time.

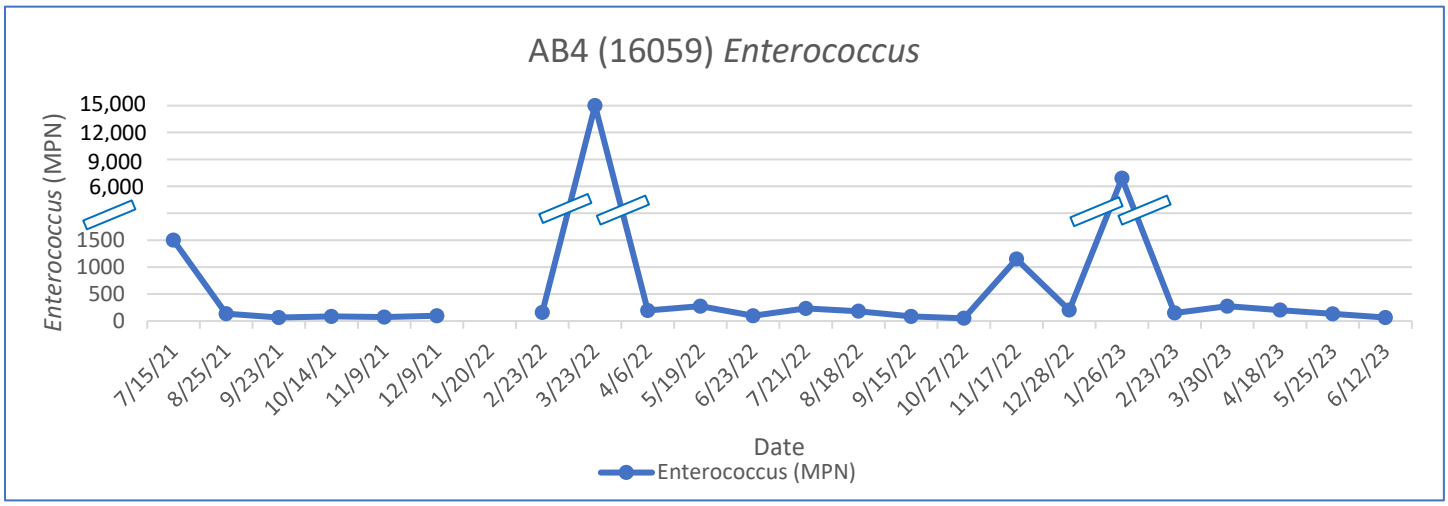

Figure 6. Site AB4 (16059) Enterococcus results over time.

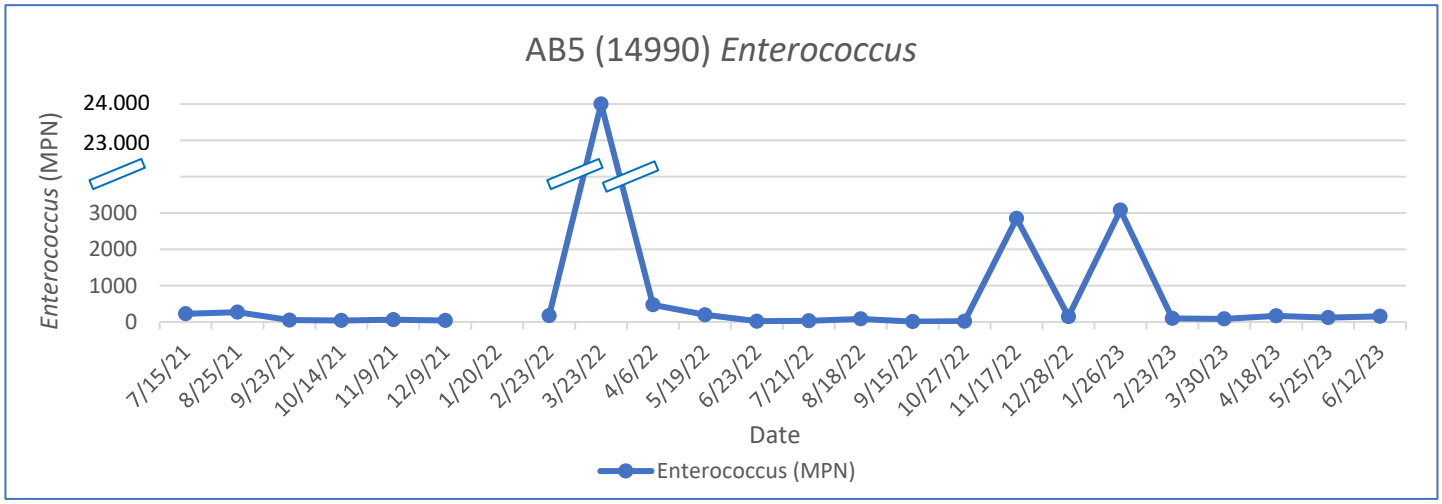

Figure 7. Site AB5 (14990) Enterococcus results over time.

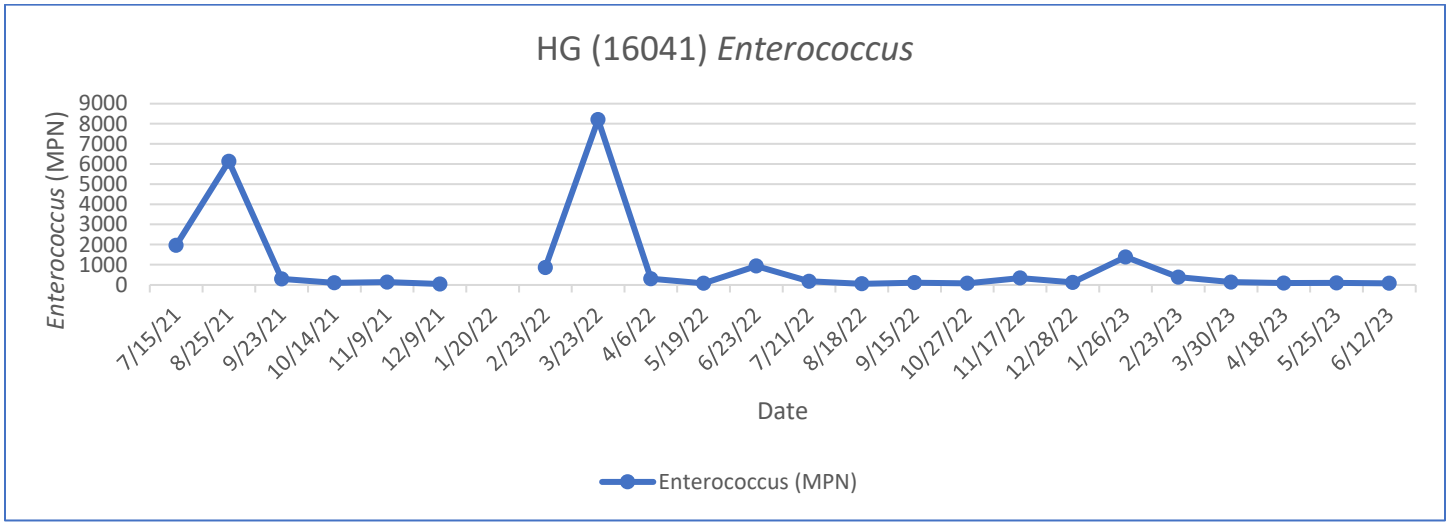

Figure 8. Site HG (16041) Enterococcus results over time.

Table 6. Adams Bayou *E. coli* Sampling Results

Date	E. coli (MPN)
	16049 (GG)
7/15/21	84
8/25/21	9
9/23/21	30
10/14/21	320
11/9/21	86
12/9/21	201
1/20/22	2,400
2/23/22	12
3/23/22	1,400
4/6/22	26
5/19/22	5
6/23/22	2
7/21/22	5
8/18/22	261
9/15/22	12
10/27/22	119
11/17/22	488
12/28/22	84
1/26/23	2,400
2/23/23	82
3/30/23	13
4/18/23	980
5/25/23	20
6/12/23	53
Geomean	71

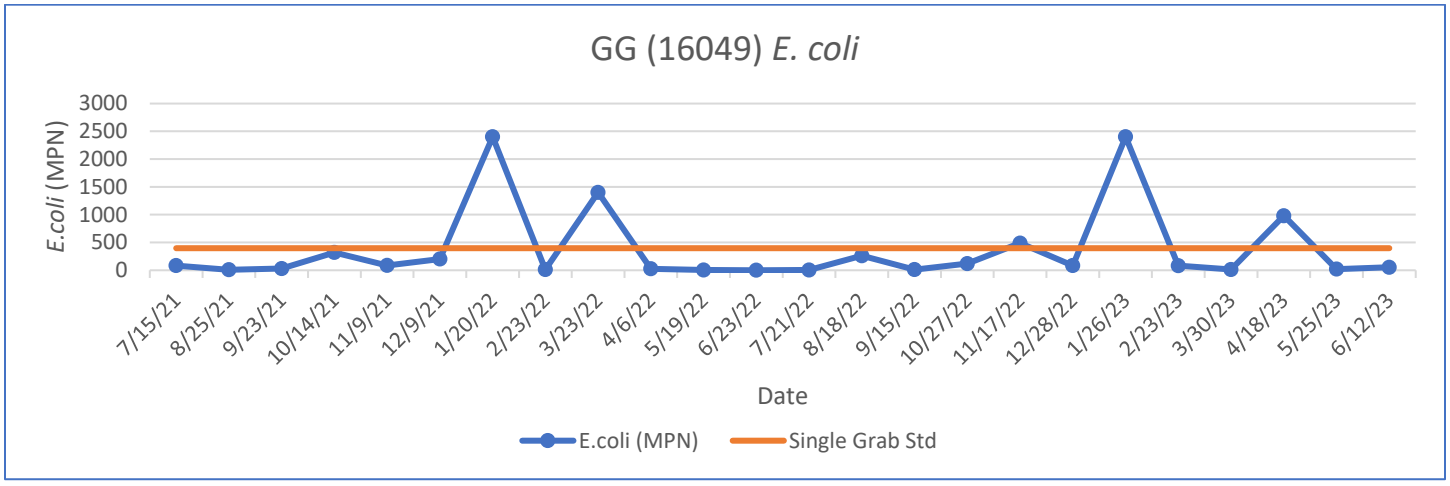

Figure 9. Site GG (16049) E. coli results over time.

Bacteria monitoring stations within the Cow Bayou watershed.

Station 10457 (CB5) – Cow Bayou immediately upstream of IH10 west service road west of Orange, TX.
Station 13781 (CB4) – Cow Bayou at FM 1442/North crossing between FM 105 and IH10.
Station 16052 (CNB) – Coons Bayou at SH 87 NE of Bridge City, TX.

Figure 20. Cow Bayou at IH-10

Table 7. Cow Bayou *Enterococcus* Sampling Results

Date	Enterococcus (MPN)		
	10457 (CB5)	**13781 (CB4)**	**16052 (CNB)**
7/15/21	336	181	2,140
8/25/21	650	305	135
9/23/21	148	97	120
10/14/21	145	158	266
11/9/21	183	20	NR
12/9/21	624	20	320
1/20/22	NR	NR	NR
2/23/22	243	52	121
3/23/22	6,000	10,000	4,900
4/6/22	31	20	121
5/19/22	645	63	417
6/23/22	135	187	199
7/21/22	146	86	226
8/18/22	86	121	231
9/15/22	266	62	1,330
10/27/22	52	20	72
11/17/22	288	246	1,070
12/28/22	121	52	605
1/26/23	1,420	2,190	1,230
2/23/23	86	10	2,600
3/30/23	109	52	309
4/18/23	134	63	448
5/25/23	455	121	148
6/12/23	269	250	379
Geomean	233	102	396

NR = No Result

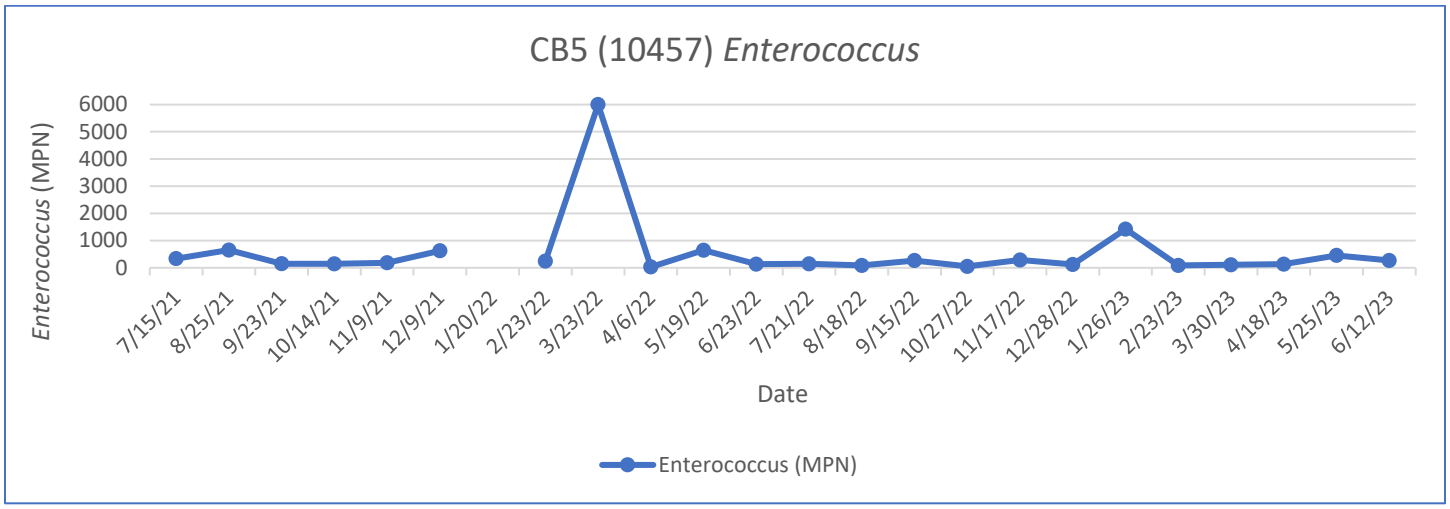

Figure 11. Site CB5 (10457) Enterococcus results over time.

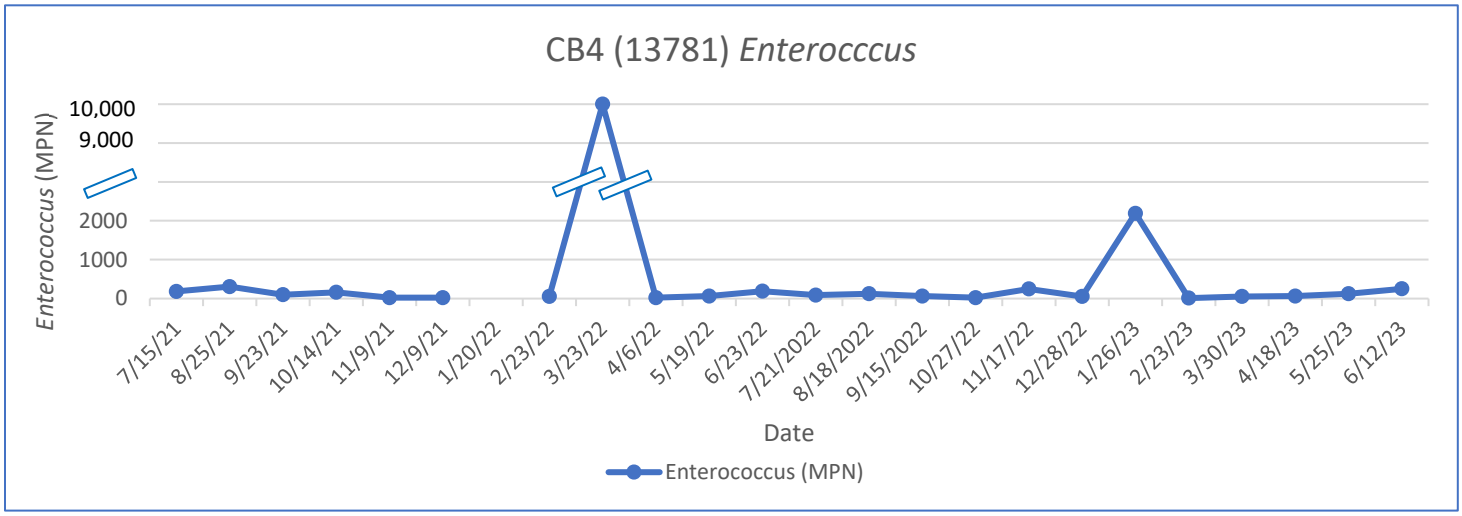

Figure 12. Site CB4 (13781) Enterococcus results over time.

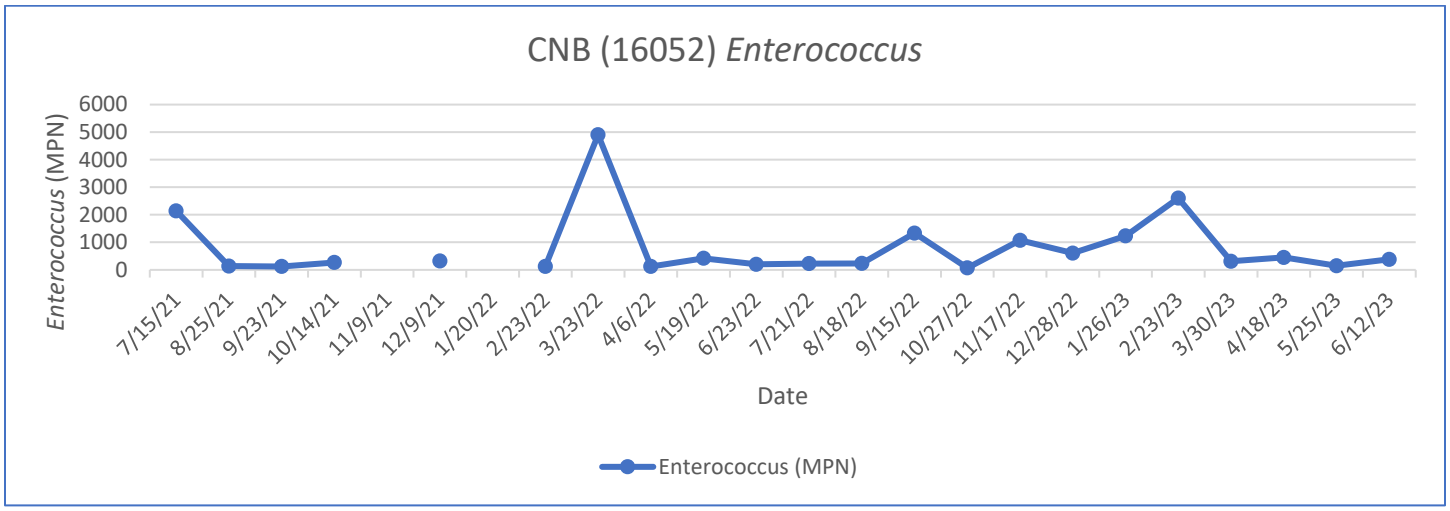

Figure 13. Site CNB (16052) Enterococcus results over time.

Bacteria monitoring stations within Nichols Creek and Caney Creek.

Station 15652 (NC1) – Nichols Creek at FM 253 in Newton County.
Station 17464 (CNY505) – Caney Creek at Loop 505 in Newton, TX.

Figure 34. Nichols Creek at FM 253.

Table 8. Nichols Creek and Caney Creek *E. coli* Sampling Results

Date	E. coli (MPN)	
	15652 (NC1)	**17464 (CNY505)**
9/21/22	36	185
10/19/22	2,400	326
11/9/22	260	194
12/14/22	1,120	2,400
1/11/23	411	228
2/8/823	96	91
3/30/23	147	345
4/12/23	435	115
5/10/23	214	1,550
6/14/23	260	179
Geomean	285	302

NR = No Result

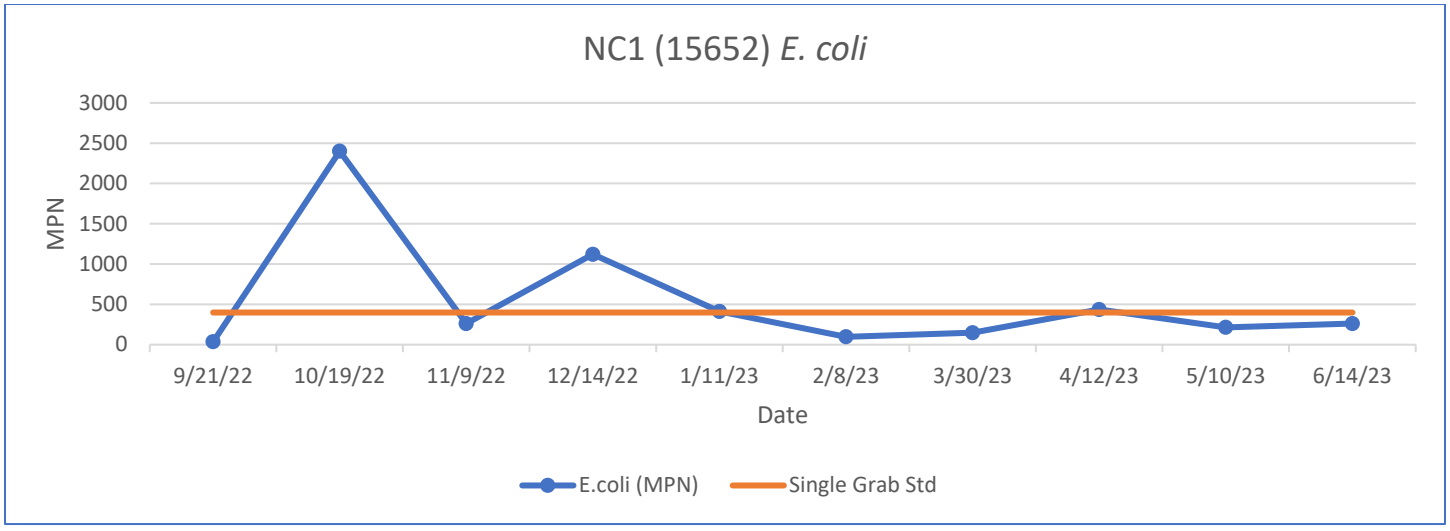

Figure 15. Site NC1 (15652) E. coli results over time.

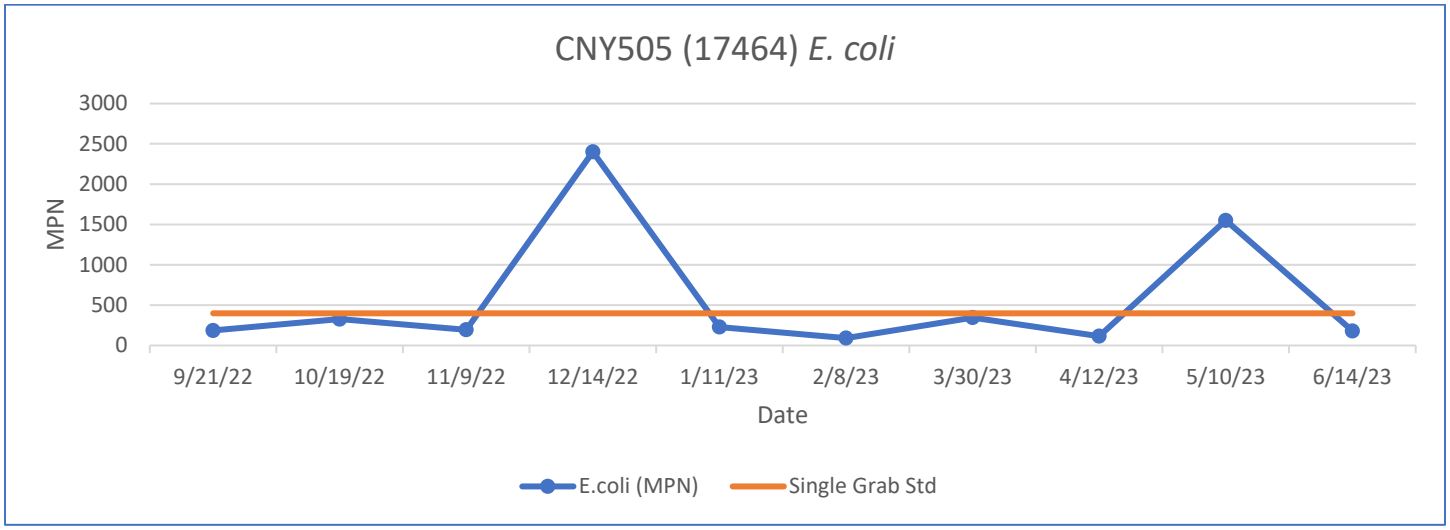

Figure 16. Site CNY505 (17464) E. coli results over time.

Bacteria Monitoring Results

Bacteria results greater than the single grab standard were commonly found throughout the sampling period. The sampling events on 3/23/22 and 1/26/23 occurred one day after heavy rainfall and the results from these dates were significantly greater than the others at each site.

The geomean over the sampling period was greater than the standard of 35 MPN at each of the seven *Enterococcus* sites. The one *E. coli* sampling site in the Adams Bayou watershed (Site 16049) had a geomean well below the standard of 126 MPN.

Samples collected at Caney Creek resulted in a geomean greater than the 126 MPN standard, while samples collected at Nichols Creek did meet the new secondary contact recreation 1 geomean of 630 MPN.

24-hour Monitoring

24-hour monitoring sites within the Adams Bayou watershed.

Station 10441 (AB2) – Adams Bayou at FM 1006 in Orange, TX.
Station 10442 (AB3) – Adams Bayou immediately downstream of Western Ave. in Orange, TX.
Station 16059 (AB4) – Adams Bayou at Green Ave. in Orange, TX.

Table 9. Station 10441 (AB2) 24-hour results.

Date	Water temp (°C)			Sp. Conductance (µS/cm)			DO (mg/L)			pH (units)		Salinity (ppt)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Min	Max	Mean
8/12/21	31.2	34.4	32.0	314	359	333	4.0	9.3	5.8	6.9	7.8	0.2	0.2	0.2
10/8/21	25.3	27.3	25.9	311	646	446	1.9	4.6	2.6	6.1	6.3	0.2	0.3	0.2
1/5/22	14.7	15.7	15.0	3,340	4,060	3,720	6.6	7.9	7.5	7.2	7.3	1.8	2.2	2.0
4/22/22	23.7	25.2	24.4	1,678	3,094	2,449	3.5	7.0	5.6	6.8	7.1	0.9	1.7	1.3
8/3/22	30.5	31.7	31.1	2,630	3,010	2,840	4.9	8.3	6.6	6.9	7.4	1.4	1.6	1.5
11/3/22	20.9	21.7	21.2	8,400	13,800	11,200	4.4	6.6	5.4	7.0	7.2	4.7	8.0	6.4
2/11/23	15.2	17.1	16.2	91	104	98	4.6	5.3	5.1	6.4	6.6	<0.1	<0.1	<0.1
5/17/23	27.0	28.0	27.4	162	173	167	0.8	2.2	1.3	6.6	6.7	0.1	0.1	0.1

Figure 17. Adams Bayou at FM 1006.

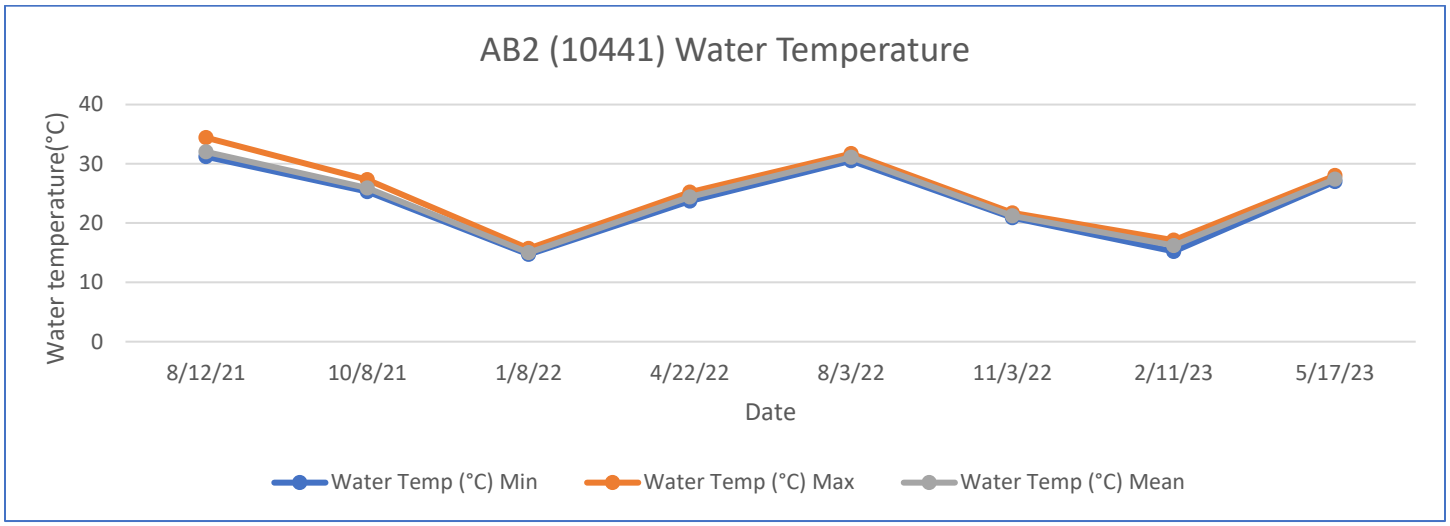

Figure 18. Site AB2 (10441) Water Temperature over time.

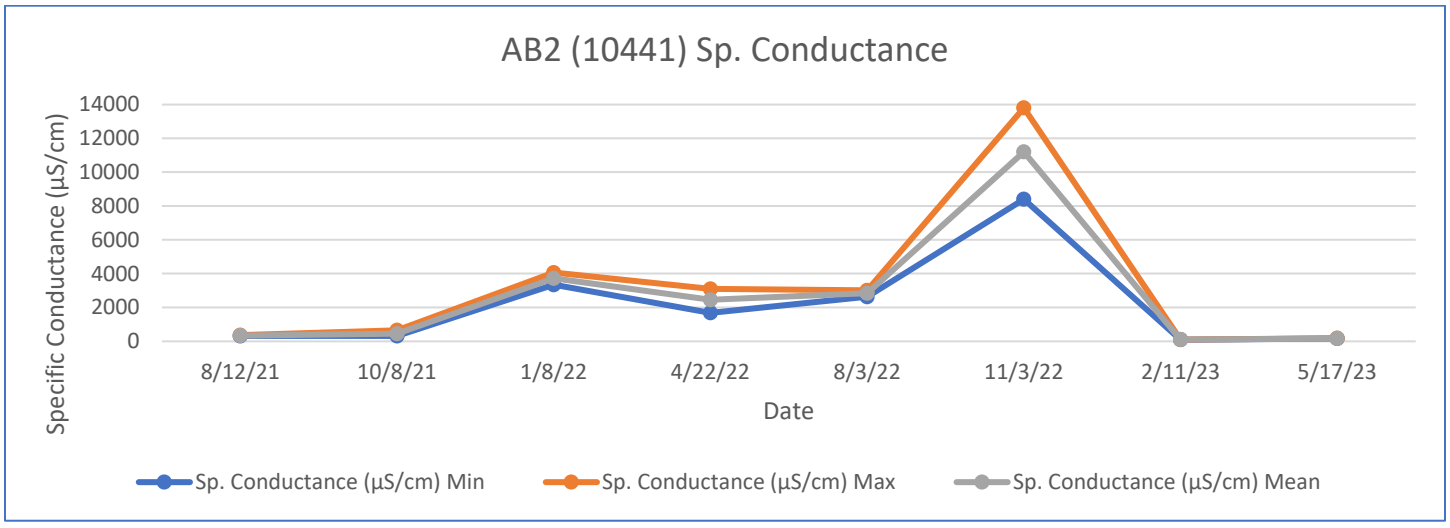

Figure 19. Site AB2 (10441) Specific Conductance over time.

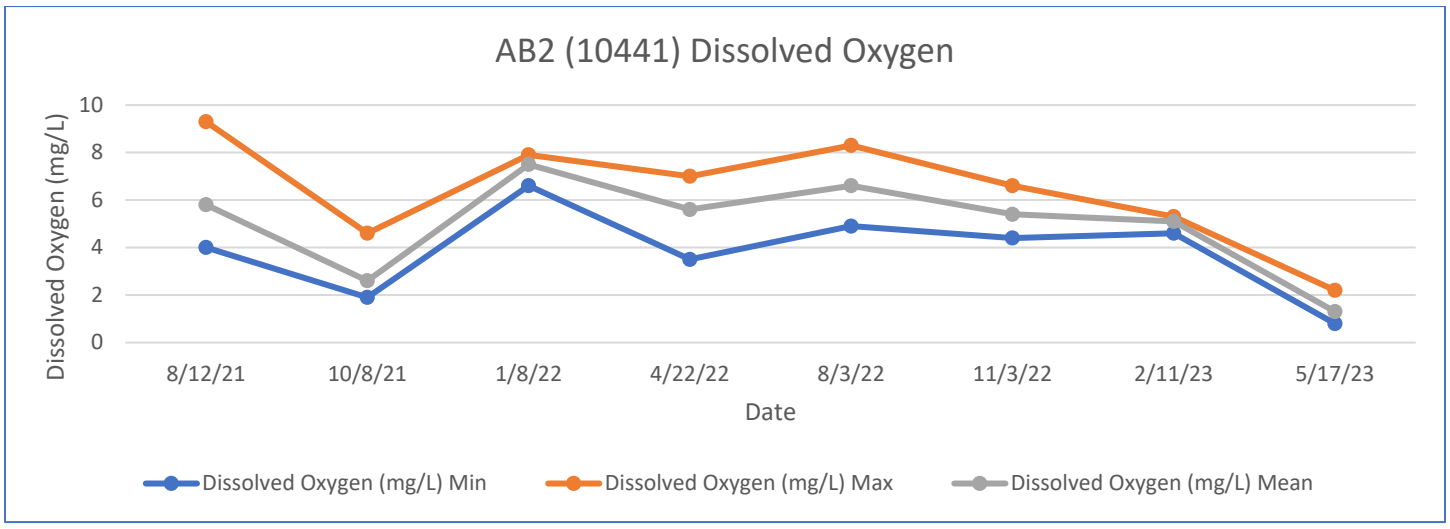

Figure 20. Site AB2 (10441) Dissolved Oxygen over time.

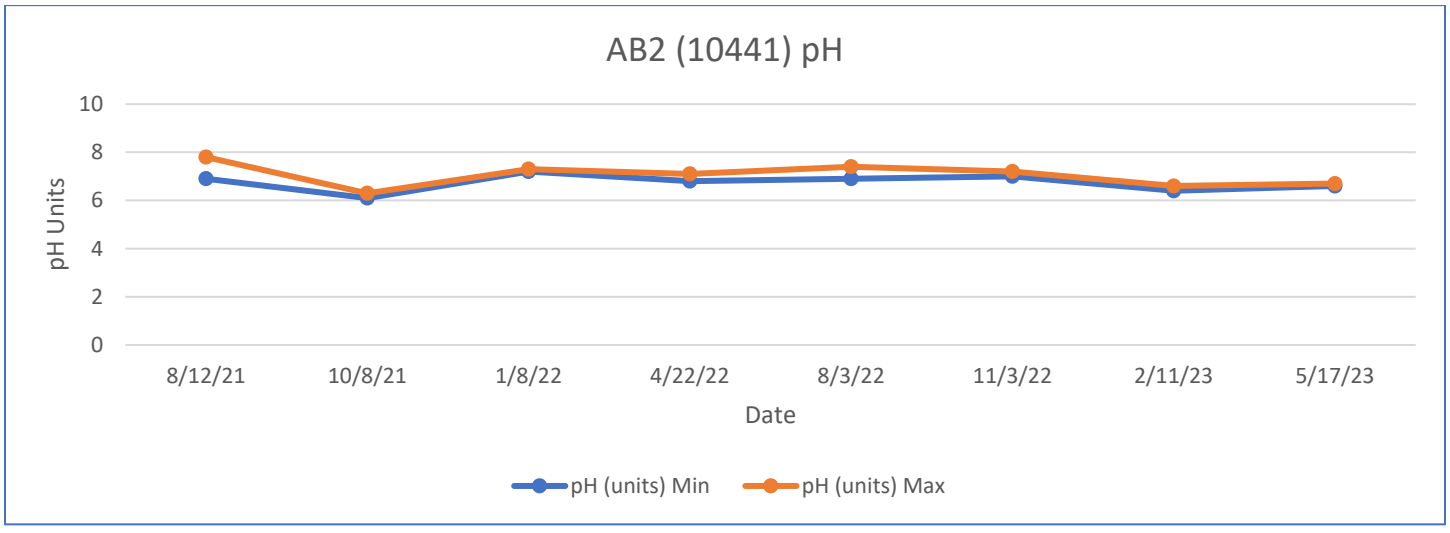

Figure 21. Site AB2 (10441) pH over time.

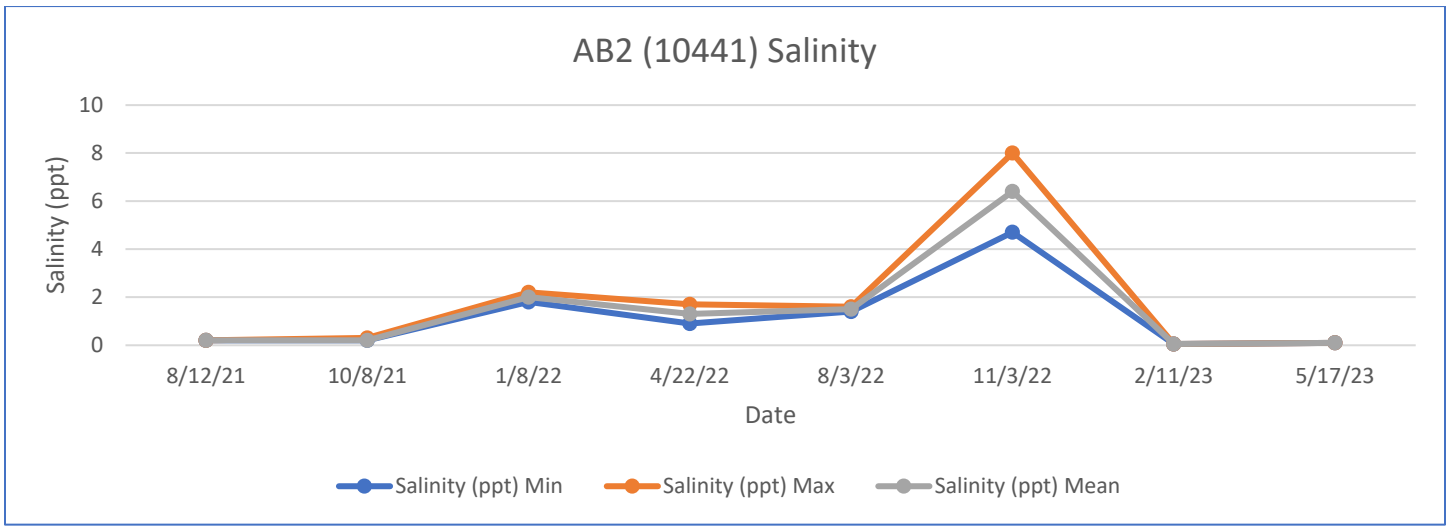

Figure 22. Site AB2 (10441) Salinity over time.

Table 10. Station 10442 (AB3) 24-hour results.

Date	Water temp (°C)			Sp. Conductance (µS/cm)			DO (mg/L)			pH (units)		Salinity (ppt)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Min	Max	Mean
8/12/21	31.2	32.7	31.6	232	244	238	1.2	6.6	3.6	6.7	7.2	0.1	0.1	0.1
10/7/21	25.1	27.2	25.6	156	216	181	0.7	1.7	1.1	6.5	6.6	0.1	0.1	0.1
1/5/22	15.1	16.6	15.6	2,240	3,540	3,010	4.3	6.6	5.5	6.8	6.9	1.2	1.9	1.6
4/6/22	22.8	24.6	23.2	622	817	713	1.4	3.4	2.2	6.8	6.8	0.3	0.4	0.4
8/3/22	30.4	31.5	30.9	1,230	1,840	1,510	0.9	3.2	1.9	6.7	6.8	0.7	1.0	0.8
11/3/22	20.2	21.3	20.8	5,420	13,100	9,890	2.1	3.5	2.8	6.7	6.8	3.0	7.5	5.6
2/11/23	14.8	16.7	15.6	107	154	120	5.0	5.7	5.5	6.6	6.7	<0.1	0.1	0.1
5/17/23	27.3	29.3	27.9	132	147	135	<0.1	2.4	0.7	6.5	6.6	0.1	0.1	0.1

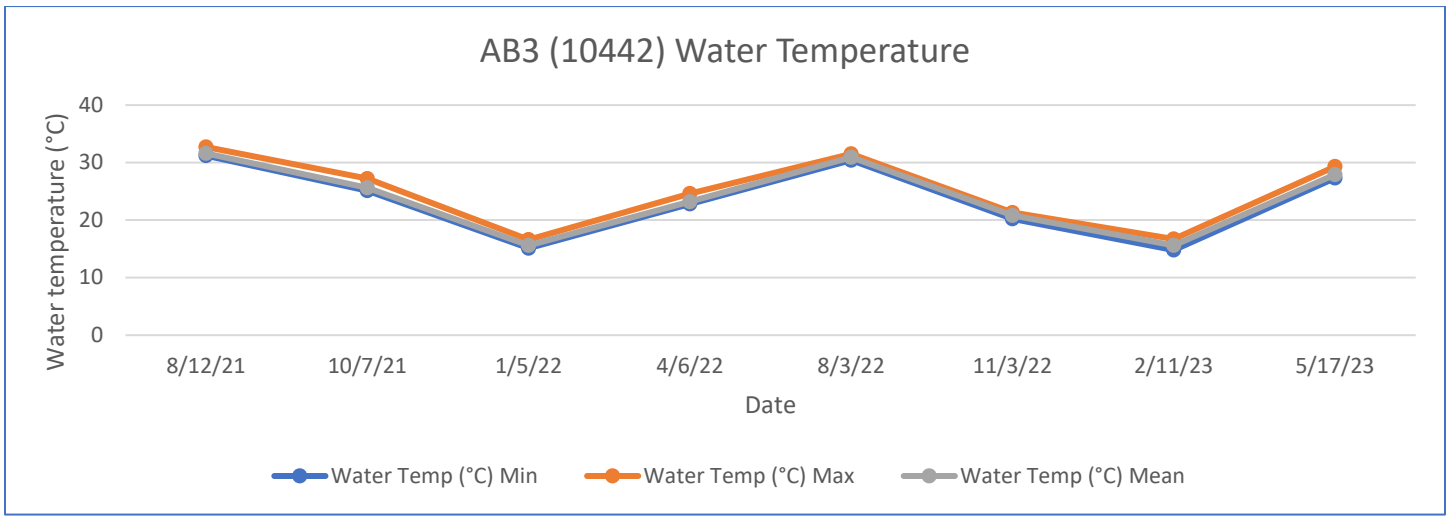

Figure 23. Site AB3 (10442) Water Temperature over time.

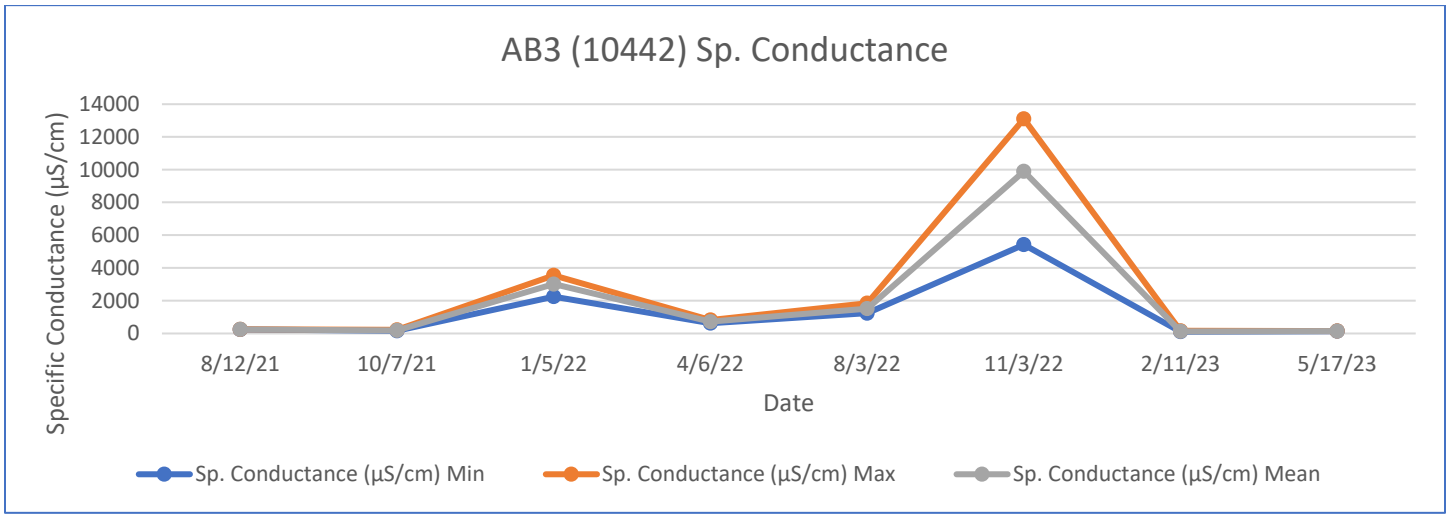

Figure 24. Site AB3 (10442) Specific Conductance over time.

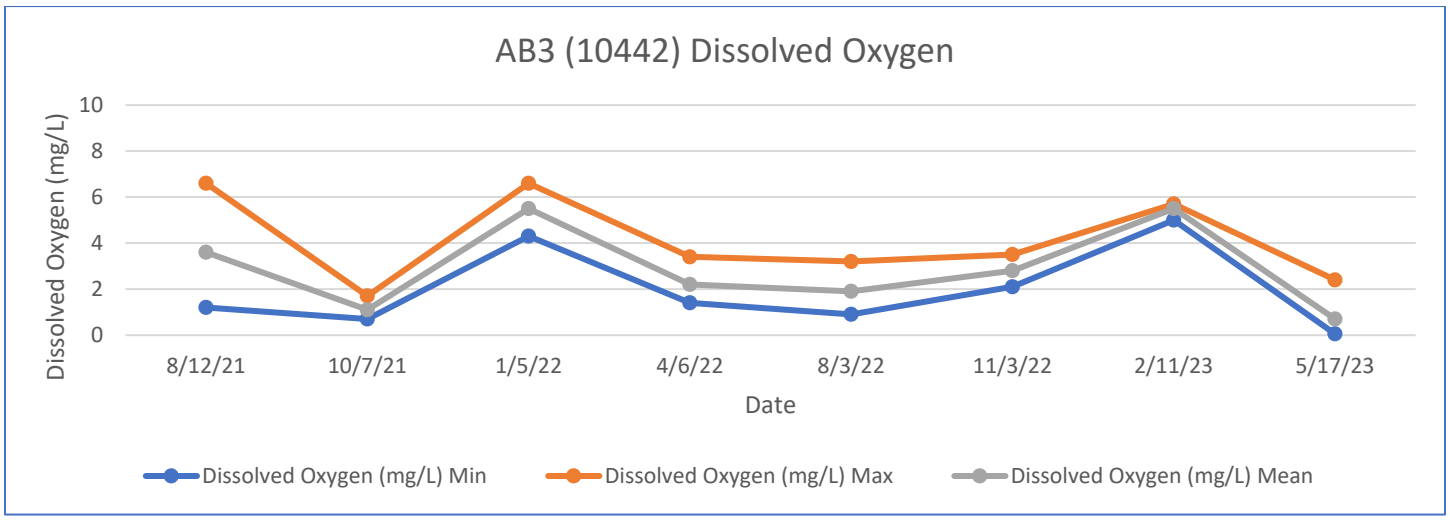

Figure 25. Site AB3 (10442) Dissolved Oxygen over time.

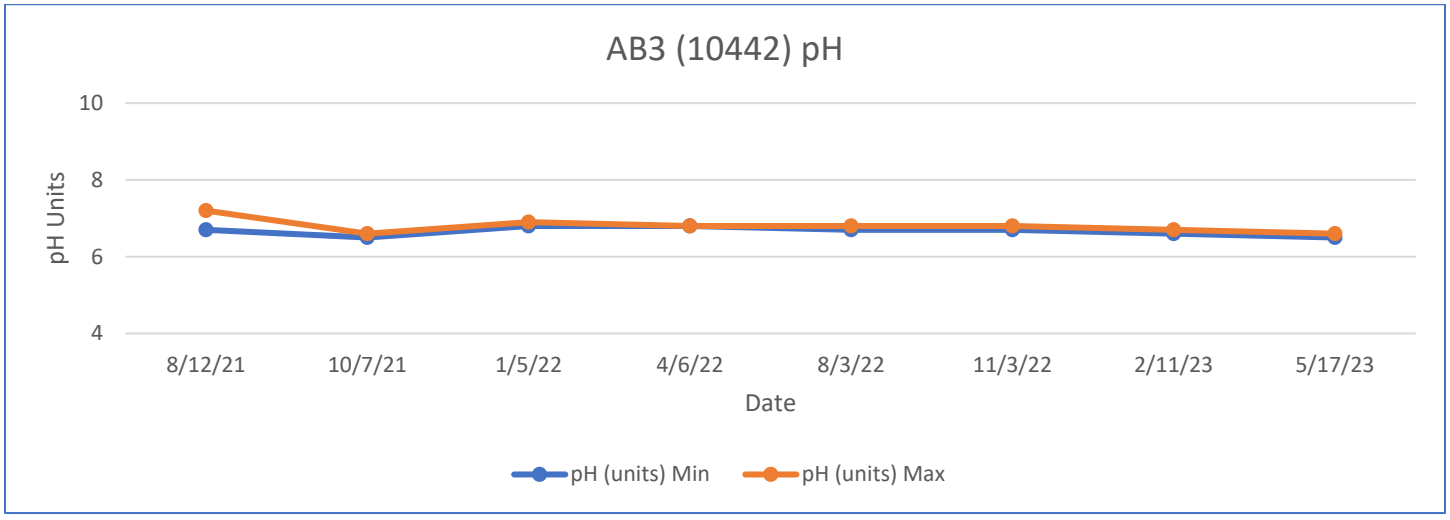

Figure 26. Site AB3 (10442) pH over time.

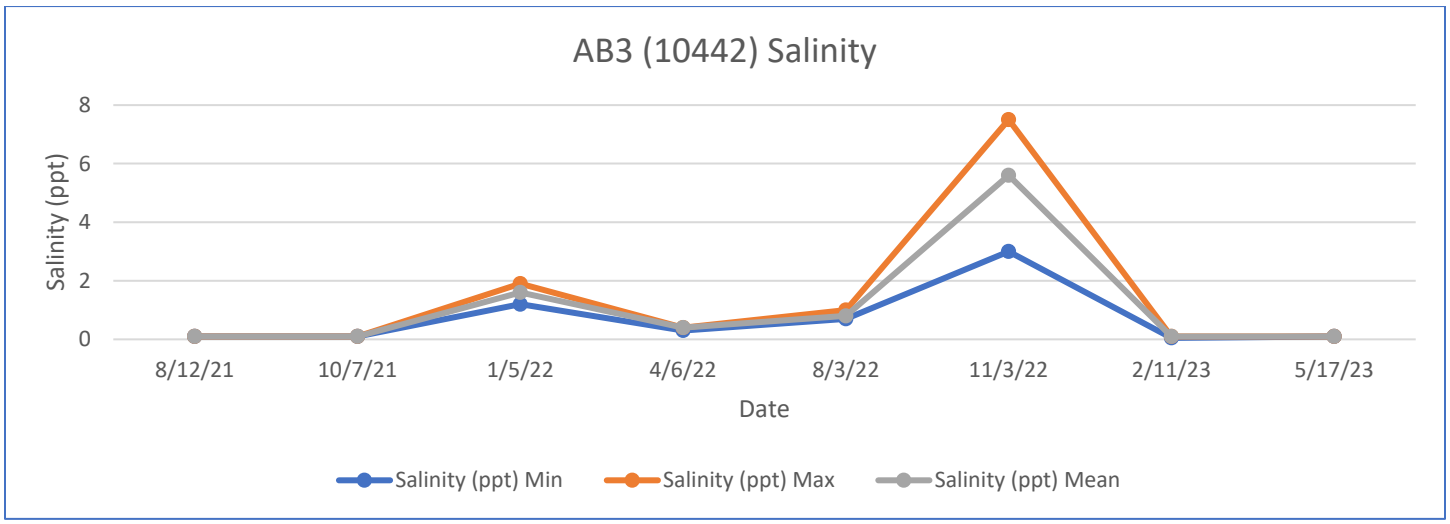

Figure 27. Site AB3 (10442) Salinity over time.

Figure 28. Adams Bayou at Western Ave.

Table 11. Station 16059 (AB4) 24-hour results.

Date	Water temp (°C)			Sp. Conductance (µS/cm)			DO (mg/L)			pH (units)		Salinity (ppt)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Min	Max	Mean
9/9/21	29.4	30.6	29.9	353	430	381	1.6	3.2	2.2	6.7	6.8	0.2	0.2	0.2
12/2/21	16.9	17.8	17.4	4,050	8,480	5,680	4.5	5.7	5.2	6.6	6.7	2.2	4.8	3.1
3/23/22	18.6	20.4	19.3	219	485	294	4.2	5.1	4.7	6.7	7.1	0.1	0.2	0.1
6/7/22	28.9	30.4	29.5	814	991	891	1.8	3.2	2.3	7.0	7.1	0.4	0.5	0.5
9/9/22	25.6	26.8	26.2	124	140	135	0.4	2.0	1.3	6.5	6.6	0.1	0.1	0.1
12/7/22	19.2	20.1	19.6	1,370	2,320	1,840	1.7	2.8	2.3	6.7	6.8	0.7	1.3	1.0
3/23/23	16.6	18.7	17.8	539	552	544	2.7	4.3	3.6	7.0	7.1	0.3	0.3	0.3
6/8/23	25.9	28.0	26.8	215	359	305	0.7	2.8	1.2	6.8	6.9	0.1	0.2	0.1

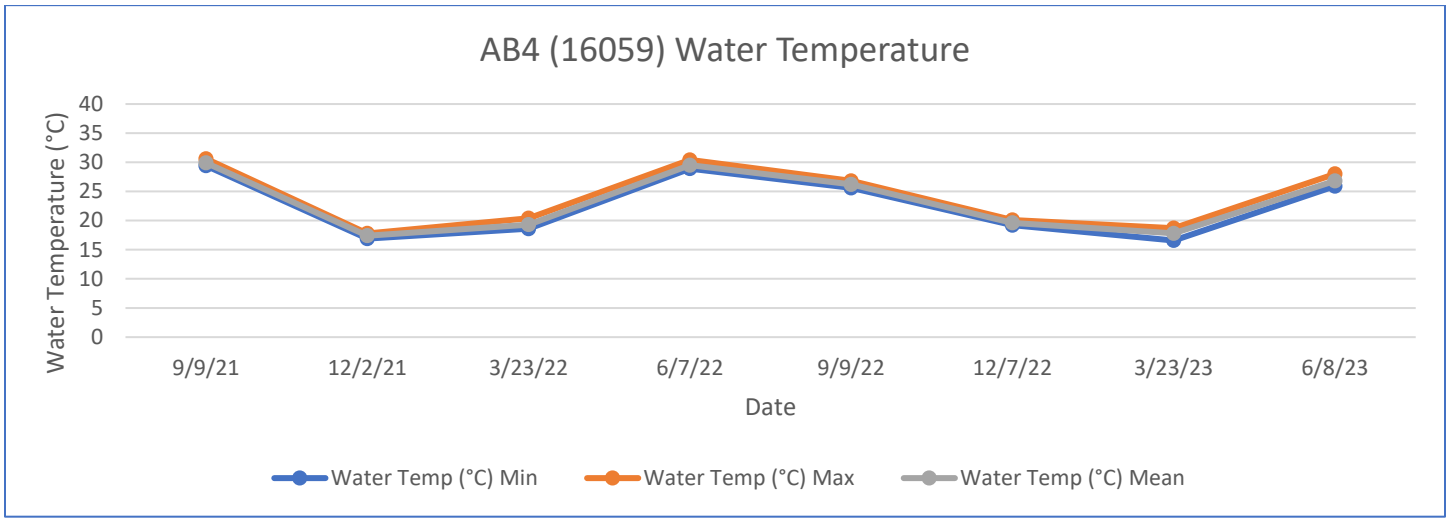

Figure 29. Site AB4 (16059) Water Temperature over time.

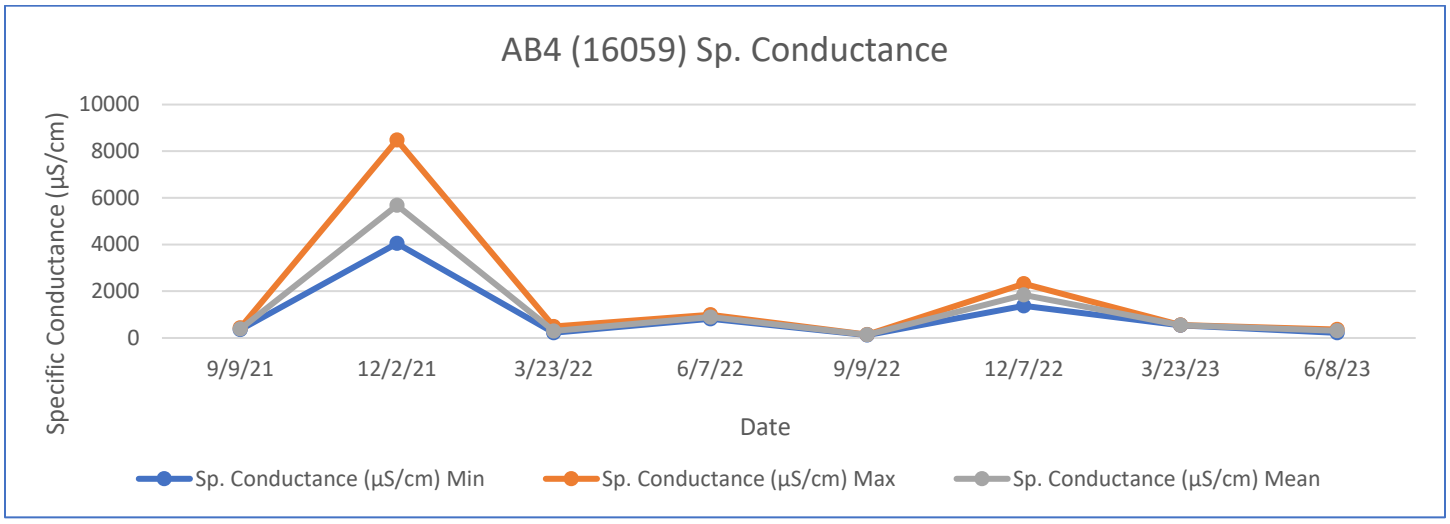

Figure 30. Site AB4 (16059) Specific Conductance over time.

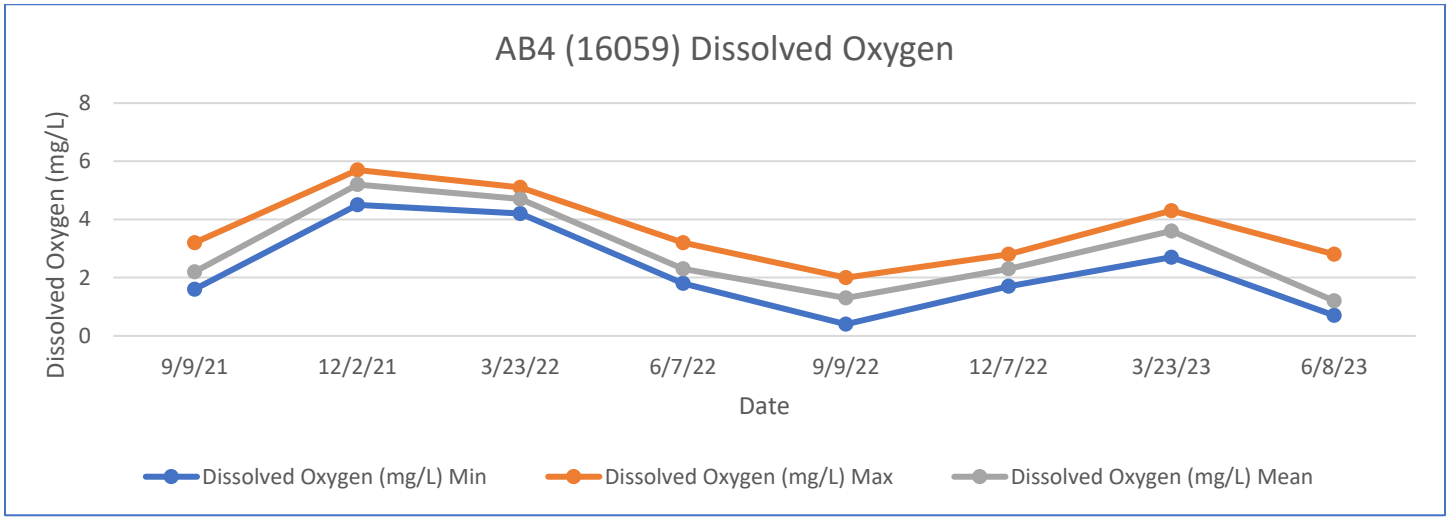

Figure 31. Site AB4 (16059) Dissolved Oxygen over time.

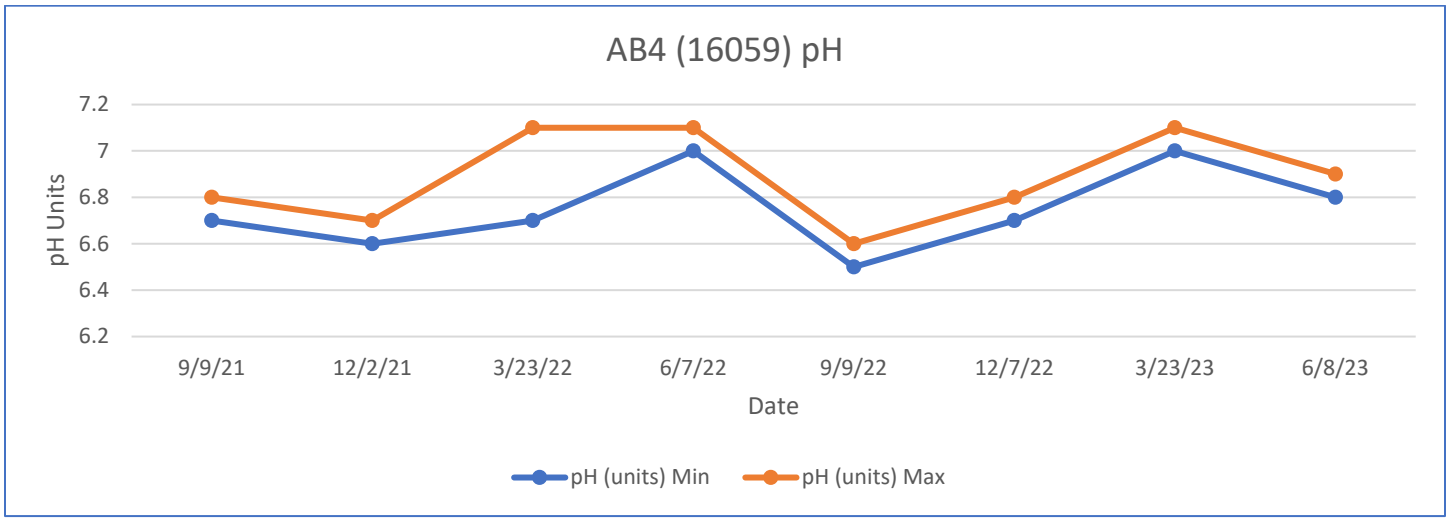

Figure 32. Site AB4 (16059) pH over time.

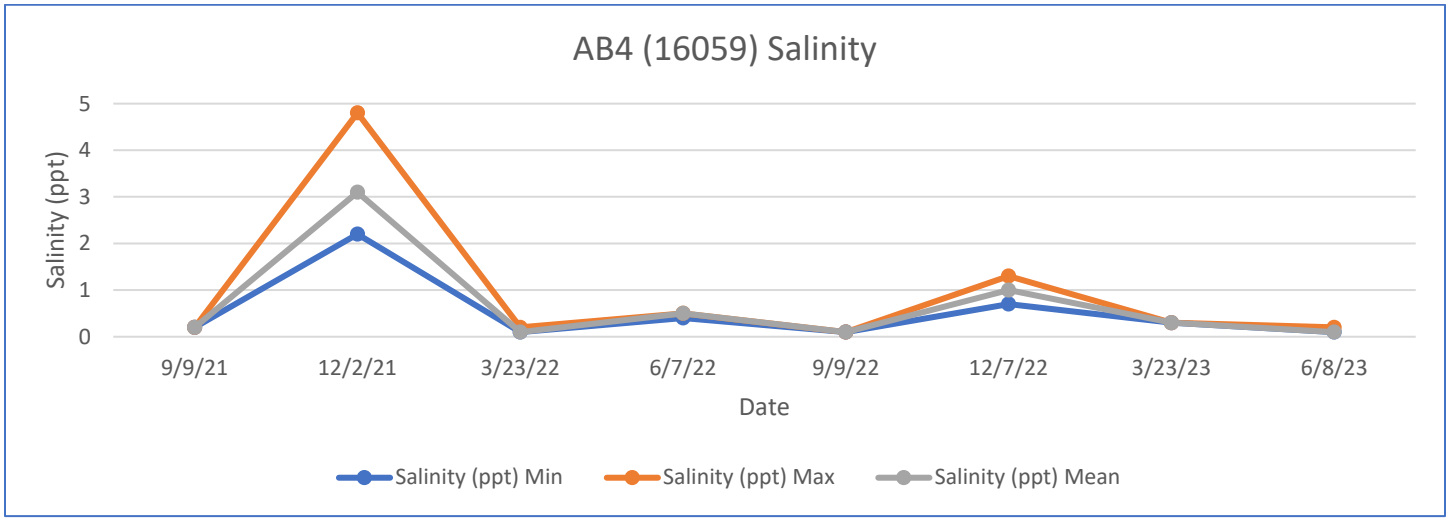

Figure 33. Site AB4 (16059) Salinity over time.

24-hour monitoring sites within the Cow Bayou watershed.

Station 10453 (CB3) – Cow Bayou at FM 105 East of Orange, TX.
Station 13781 (CB4) – Cow Bayou at FM 1442/North crossing between FM 105 and IH10.
Station 10457 (CB5) – Cow Bayou immediately upstream of IH10 west service road west of Orange, TX.

Table 12. Station 10453 (CB3) 24-hour results.

Date	Water temp (°C)			Sp. Conductance (µS/cm)			DO (mg/L)			pH (units)		Salinity (ppt)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Min	Max	Mean
9/9/21	29.4	31.0	30.1	264	364	314	3.1	5.5	4.2	6.6	6.8	0.1	0.2	0.2
12/2/21	16.5	18.8	16.5	4,130	5,360	4,540	4.5	8.0	6.1	6.7	6.9	2.3	3.0	2.5
3/23/22	18.3	19.9	19.1	83	200	120	5.1	5.6	5.5	6.3	6.6	<0.1	0.1	<0.1
6/7/22	29.9	31.1	30.4	1,380	1,585	1,487	5.1	7.5	6.4	7.0	7.3	0.7	0.8	0.8
9/9/22	26.6	27.8	27.1	184	211	204	1.0	1.8	1.4	6.1	6.2	0.1	0.1	0.1
12/7/22	18.9	20.0	19.4	420	661	564	2.6	4.4	3.7	6.2	6.3	0.2	0.3	0.3
3/23/23	16.8	18.8	18.0	513	568	532	4.6	6.6	5.7	6.9	7.0	0.3	0.3	0.3
6/8/23	27.3	28.5	27.8	220	314	266	1.0	3.9	2.1	6.4	6.6	0.1	0.2	0.1

Figure 34. Cow Bayou at FM 1442.

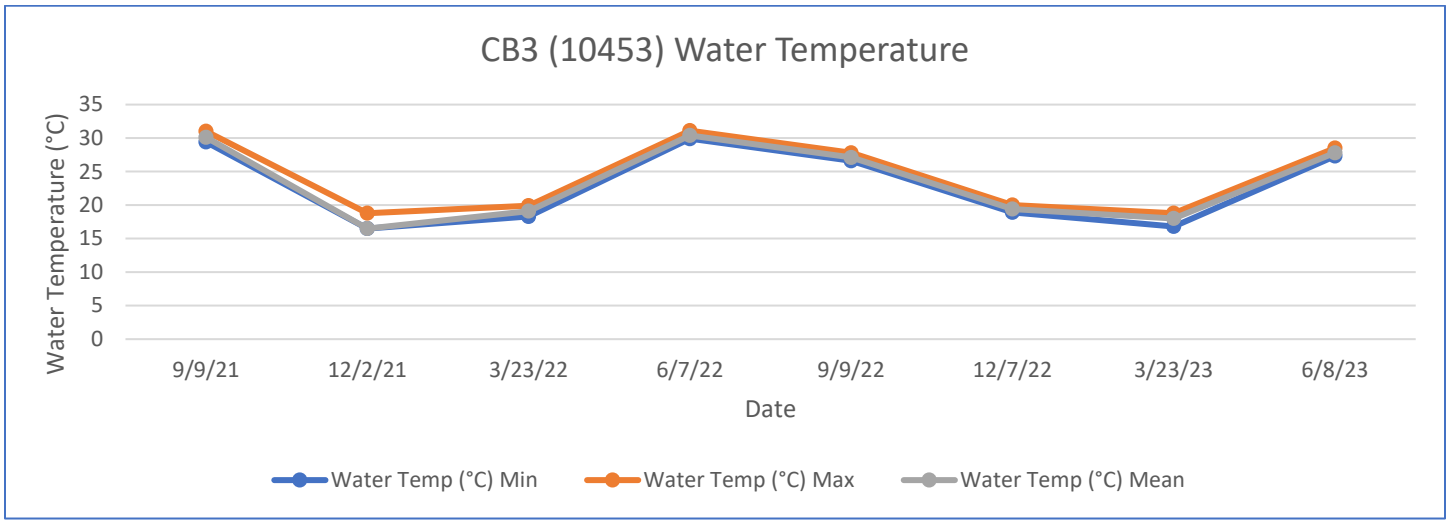

Figure 35. Site CB3 (10453) Water temperature over time.

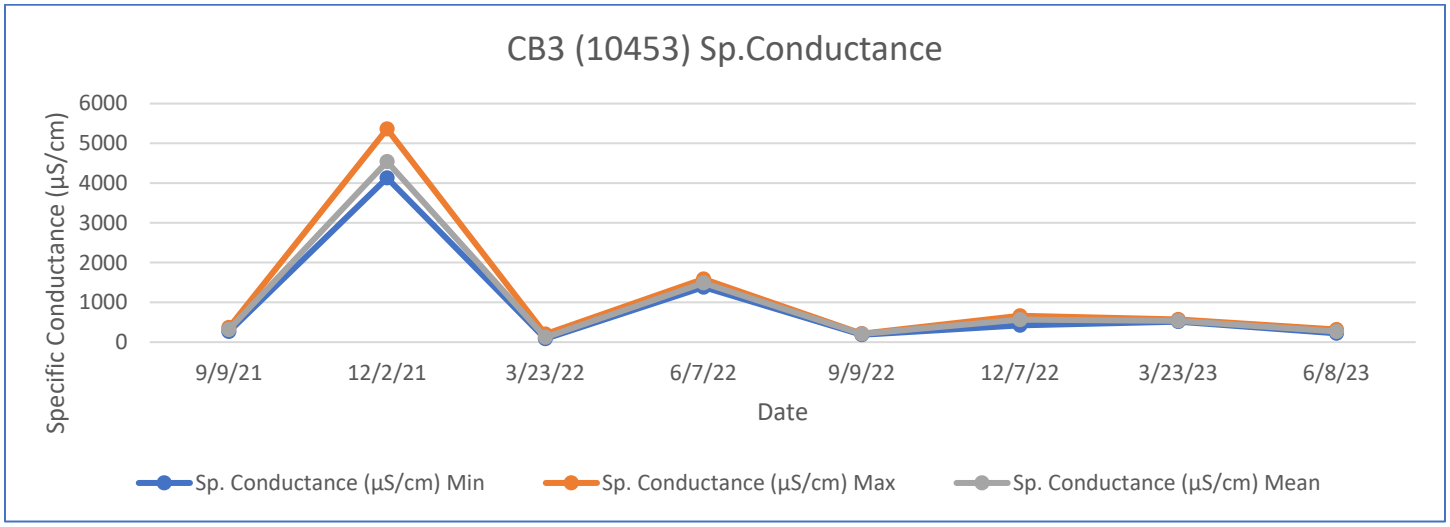

Figure 36. Site CB3 (10453) Specific Conductance over time.

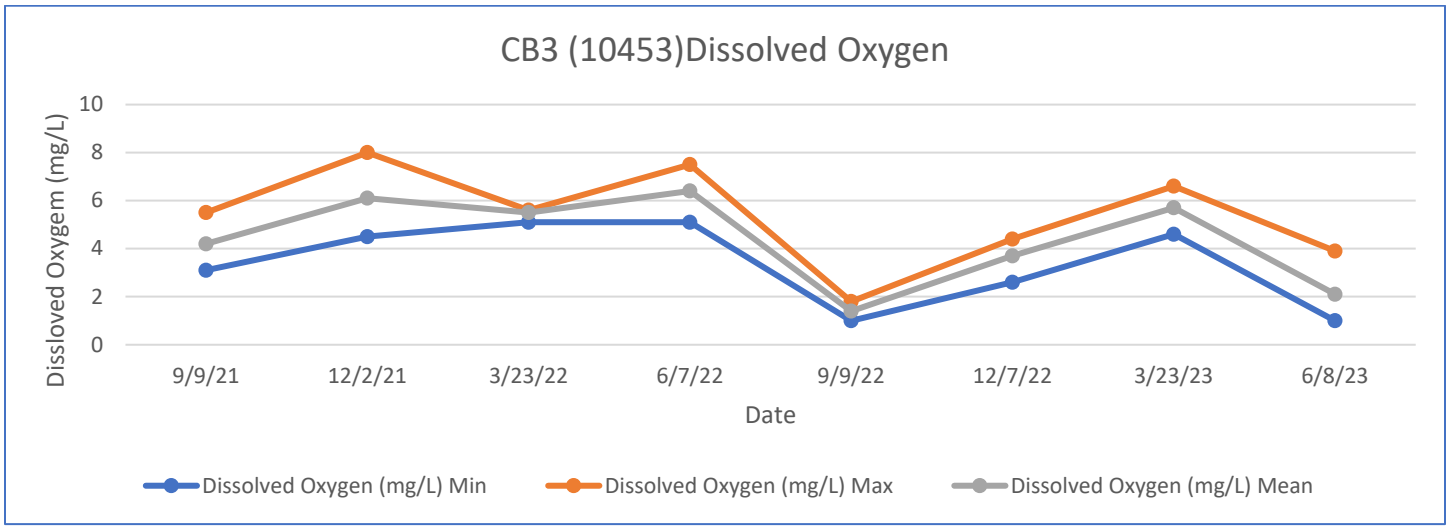

Figure 37. Site CB3 (10453) Dissolved Oxygen over time.

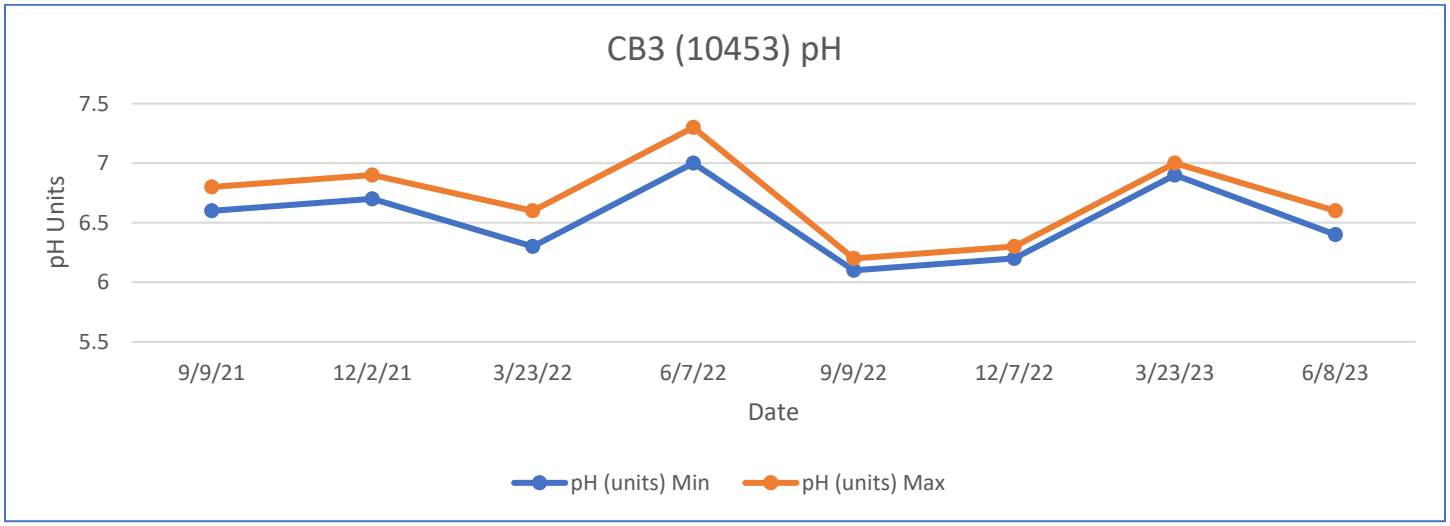

Figure 38. Site CB3 (10453) pH over time.

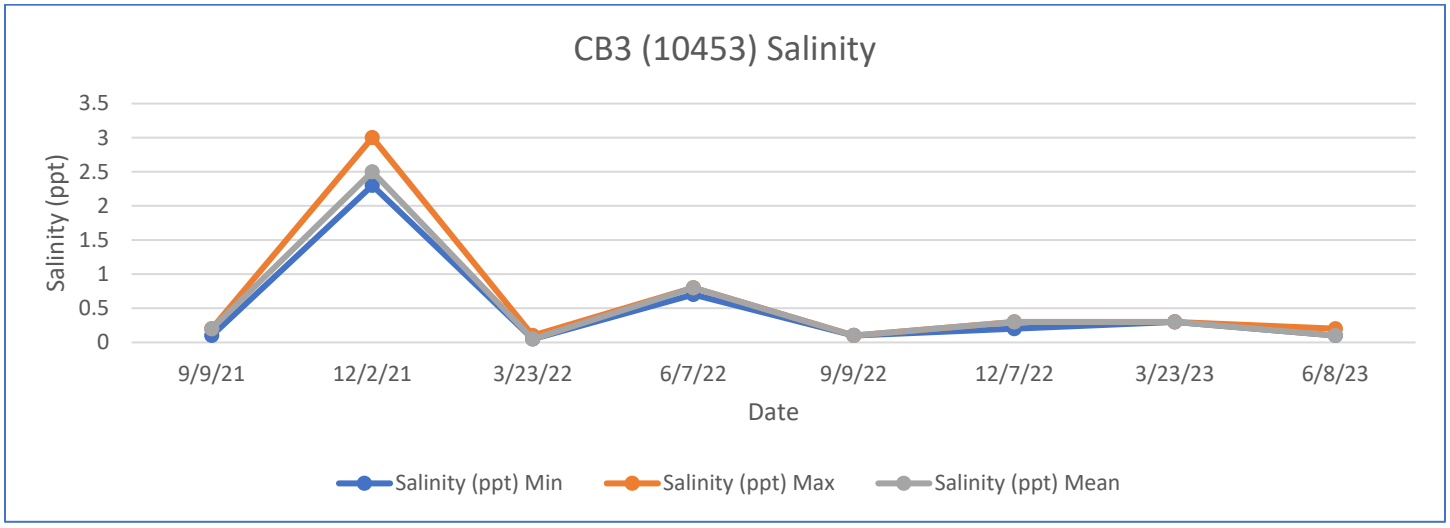

Figure 39. Site CB3 (10453) Salinity over time.

Figure 40. Cow Bayou at FM 105

Table 13. Station 13781 (CB4) 24-hour results.

Date	Water temp (°C)			Sp. Conductance (µS/cm)			DO (mg/L)			pH (units)		Salinity (ppt)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Min	Max	Mean
7/7/21	27.0	27.2	27.1	38	45	42	4.7	5.2	4.9	5.7	5.8	<0.1	<0.1	<0.1
11/3/21	17.0	17.3	17.2	33	38	36	7.4	7.5	7.4	5.2	5.3	<0.1	<0.1	<0.1
2/17/22	13.9	16.7	14.6	145	169	155	7.9	8.8	8.2	6.6	6.7	0.1	0.1	0.1
5/5/22	24.6	26.6	25.7	297	307	302	0.9	3.0	2.0	6.4	6.6	0.1	0.2	0.2
7/6/22	28.3	30.4	29.3	132	141	136	0.6	3.0	1.7	5.7	5.9	0.1	0.1	0.1
1/19/23	14.9	17.1	16.3	76	88	83	5.7	7.0	6.5	5.0	6.0	<0.1	<0.1	<0.1
4/6/23	22.4	23.4	22.8	280	284	282	1.5	3.3	2.1	6.7	6.8	0.1	0.1	0.1

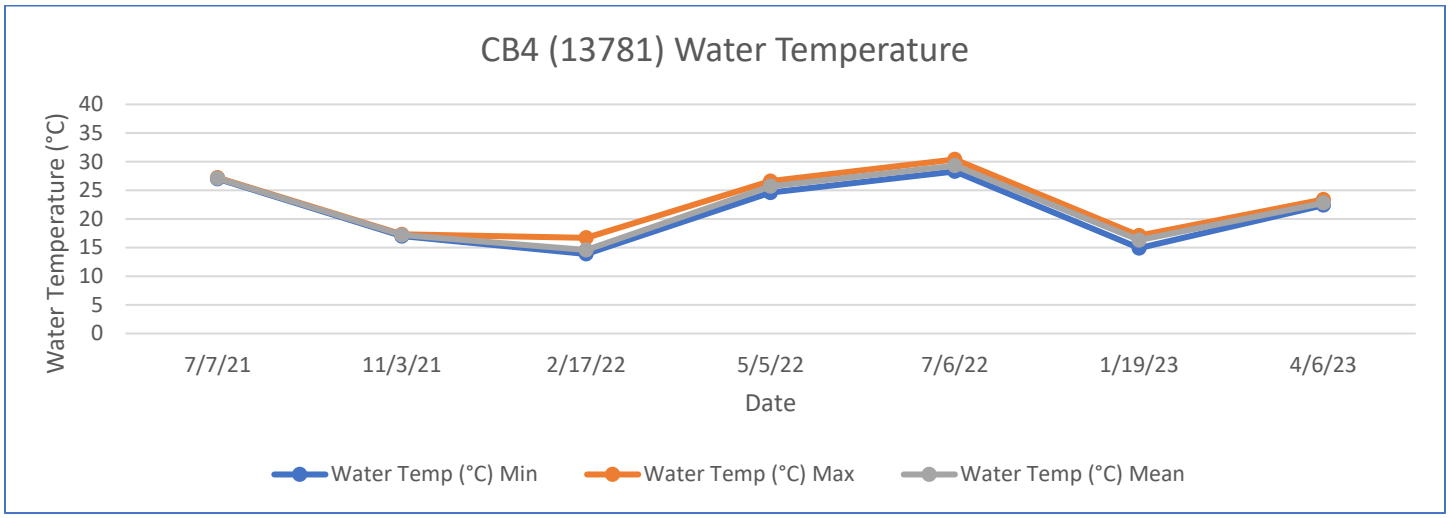

Figure 41. Site CB4 (13781) Water temperature over time.

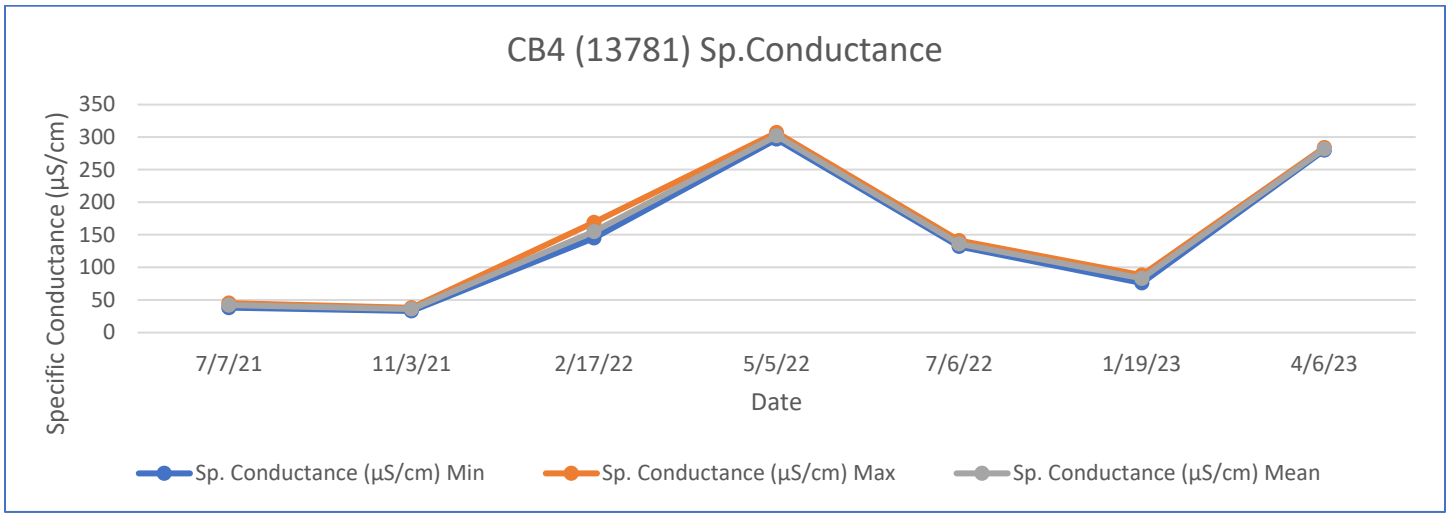

Figure 42. Site CB4 (13781) Specific Conductance over time.

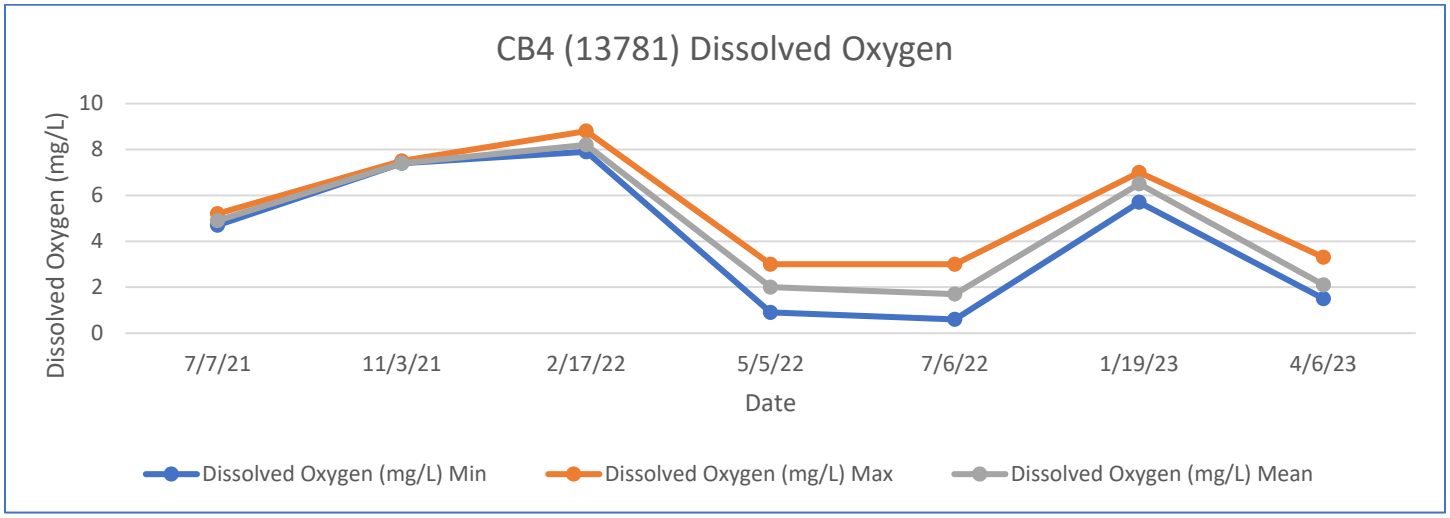

Figure 43. Site CB4 (13781) Dissolved Oxygen over time.

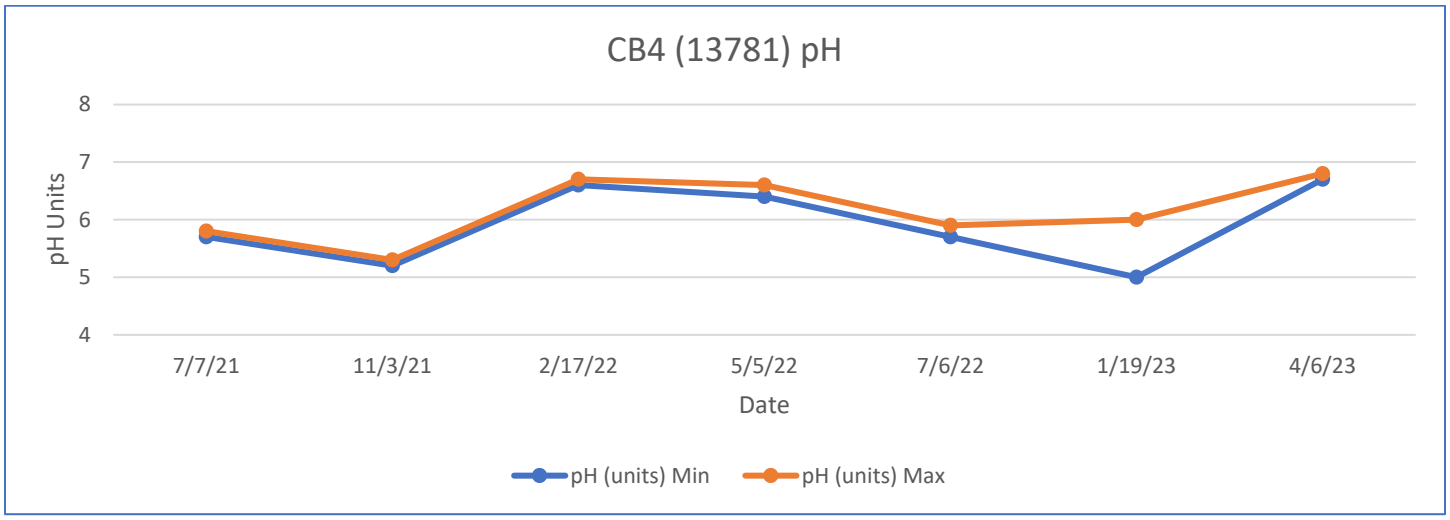

Figure 44. Site CB4 (13781) pH over time.

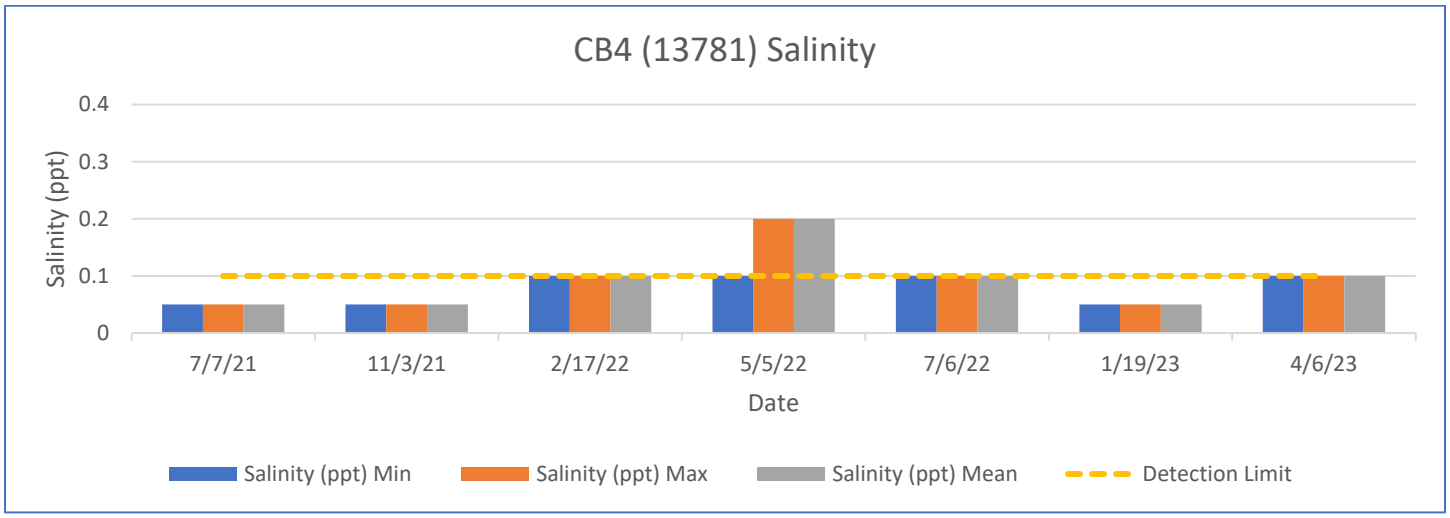

Figure 45. Site CB4 (13781) Salinity over time.

Table 14. Station 10457 (CB5) 24-hour results.

Date	Water temp (°C)			Sp. Conductance (µS/cm)			DO (mg/L)			pH (units)		Salinity (ppt)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Min	Max	Mean
7/7/21	26.8	27.3	27.1	24	28	27	4.9	5.3	5.1	5.4	5.6	<0.1	<0.1	<0.1
11/3/21	16.7	17.3	17.1	36	40	38	7.4	7.6	7.5	5.4	5.6	<0.1	<0.1	<0.1
2/25/22	16.3	17.1	16.7	193	221	209	6.2	6.8	6.4	6.6	6.7	0.1	0.1	0.1
5/5/22	25.6	26.9	26.3	319	343	328	3.3	5.5	4.2	6.8	6.9	0.2	0.2	0.2
7/7/22	28.4	30.1	29.0	142	152	147	1.5	4.1	2.5	6.4	6.5	0.1	0.1	0.1
10/26/22	19.4	21.1	20.2	411	525	489	2.7	4.2	3.6	6.9	7.1	0.2	0.3	0.2
1/19/23	16.7	18.8	17.9	74	87	81	6.3	7.2	6.7	6.0	6.1	<0.1	<0.1	<0.1
4/6/23	22.6	23.1	22.9	359	403	374	1.8	3.3	2.3	6.6	6.7	0.2	0.2	0.2

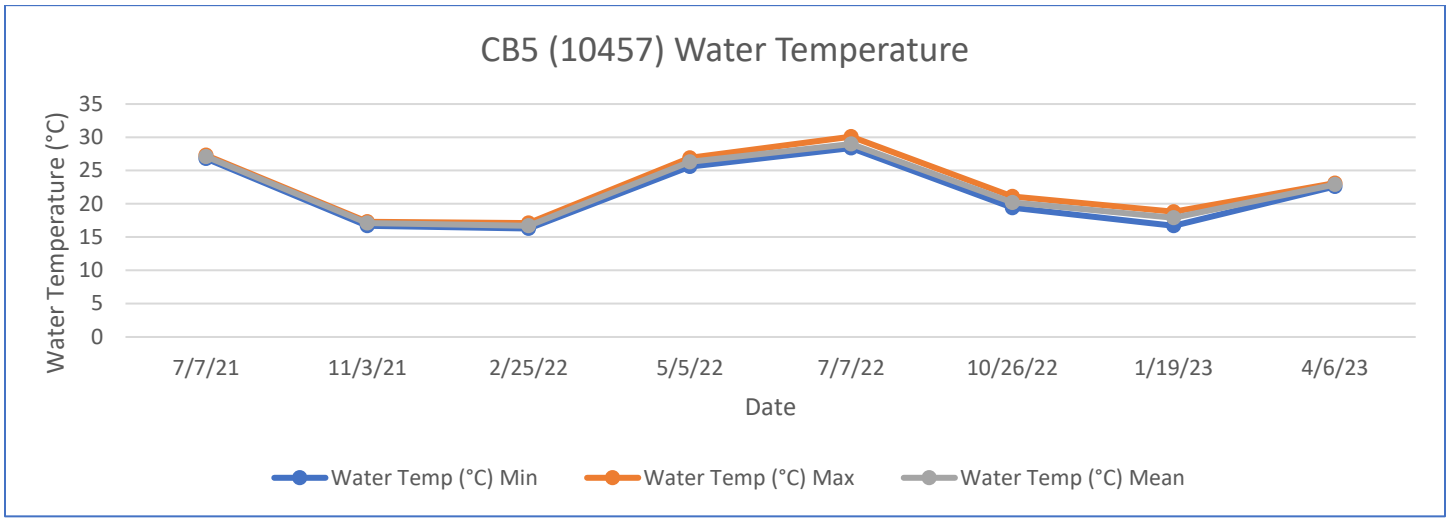

Figure 46. Site CB5 (104567) Water temperature over time.

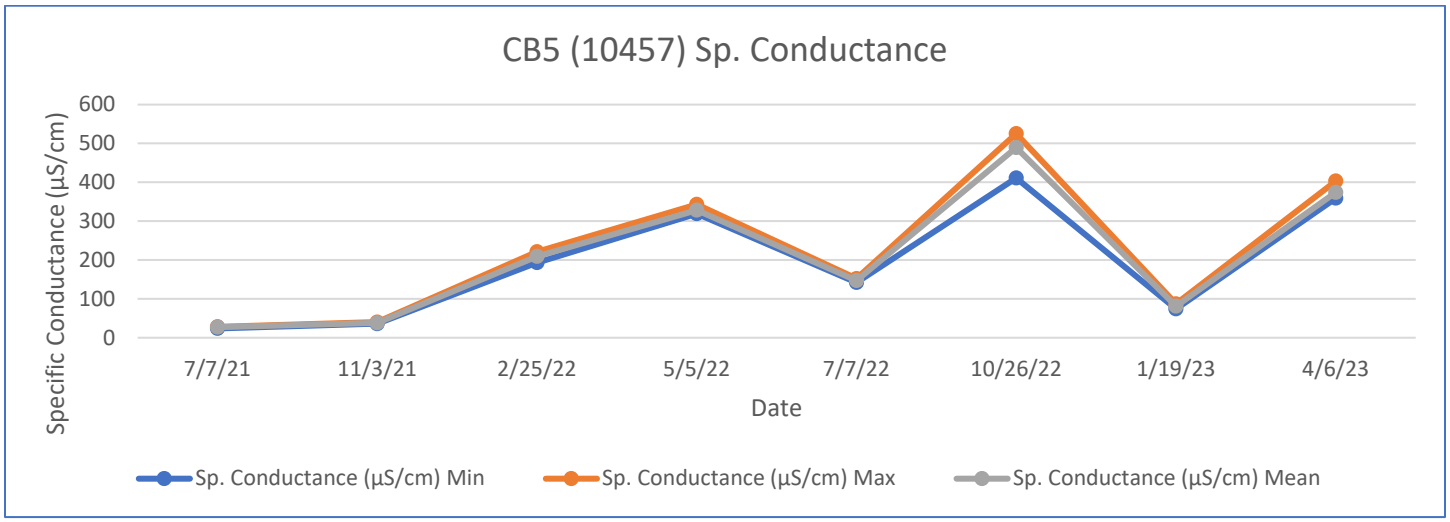

Figure 47. Site CB5 (10457) Specific Conductance over time.

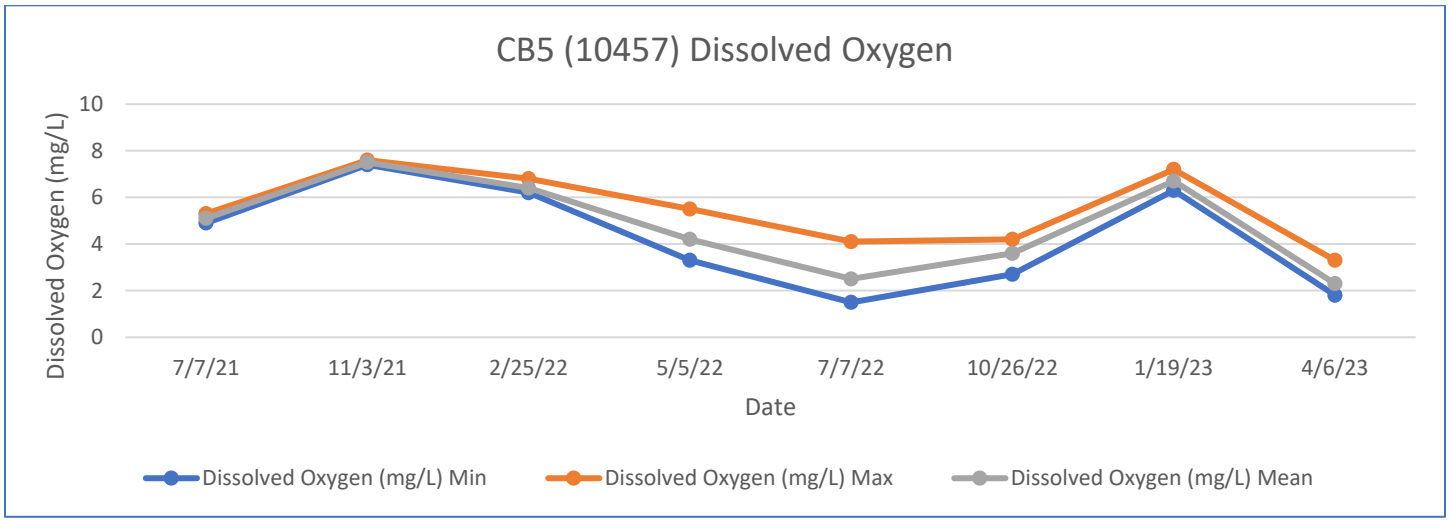

Figure 48. Site CB5 (10457) Dissolved Oxygen over time.

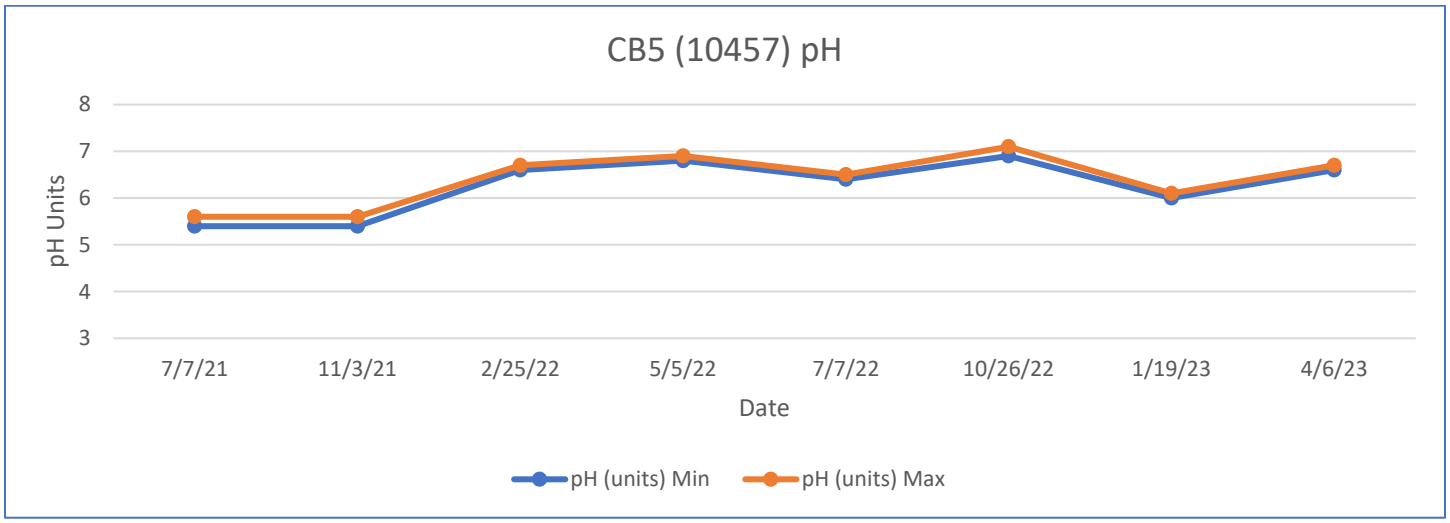

Figure 49. Site CB5 (10457) pH over time.

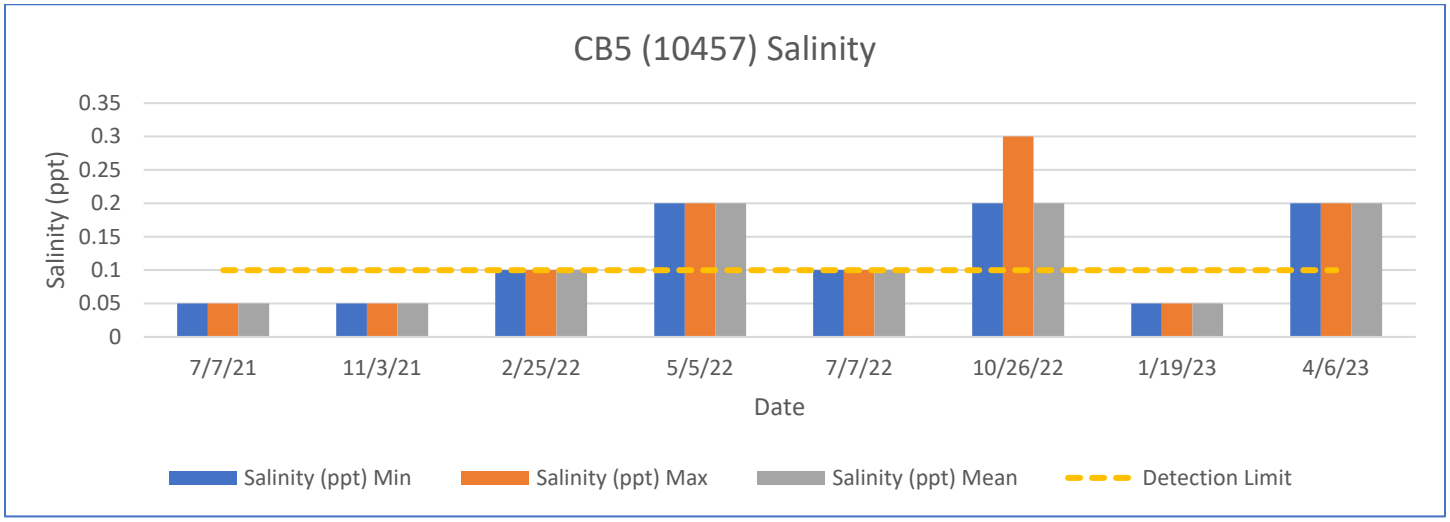

Figure 50. Site CB5 (10457) Salinity over time.

24-Hour Sampling Results

Since sampling began in July 2021 eight sampling events were conducted at each 24hr station, except for site 13781, which was unable to be sampled in October 2022 due to water level fluctuations. Each of the six sites have had two events during the critical period and at least two in both the index and non-index periods.

Results have been very similar between the minimum, maximum and mean values at most sites. The larger differences in results have occurred for specific conductance and dissolved oxygen.

Tidal Determination

Tidal determination sites within the Adams Bayou watershed.

Station 16049 (GG) – Gum Gully at Haliburton Rd. upstream of the confluence with Adams Bayou.
Station 15107 (AB7) – Adams Bayou at FM 3247 NW of Orange, TX.
Station 14964 (AB8) – Adams Bayou at FM 1078 NW of Orange, TX.

Figure 51. Adams Bayou at FM 3247

Table 15. Station 16049 (GG) tidal results

Date	Surface Water Temp (°C)	Bottom Water Temp (°C)	Surface Sp. Cond. (µS/cm)	Bottom Sp. Cond. (µS/cm)	Surface Salinity (ppt)	Bottom Salinity (ppt)	% Pool Coverage	Flow Severity
7/15/21	27.8	NA	351	NA	0.2	NA	100	3
8/25/21	29.2	NA	1,190	NA	0.6	NA	100	3
9/23/21	22.0	21.8	763	767	0.4	0.4	100	3
10/14/21	26.0	25.8	303	315	0.2	0.2	100	3
11/9/21	14.2	13.9	1,340	1,340	0.7	0.7	100	3
12/9/21	16.1	16.0	523	531	0.3	0.3	100	3
1/20/22	13.2	13.2	82	82	<0.1	<0.1	100	3
2/23/22	18.6	NA	1,595	NA	0.8	NA	100	2
3/23/22	15.6	NA	203	NA	0.1	NA	100	3
4/6/22	22.3	22.2	1,023	1,027	0.5	0.5	100	3
5/19/22	27.6	27.4	1,700	1,710	0.9	0.9	100	3
6/23/22	30.5	29.0	1206	1221	0.6	0.6	100	3
7/21/22	30.5	NA	1,580	NA	0.8	NA	100	2
8/18/22	28.6	NA	580	NA	0.3	NA	100	2

NA = not applicable

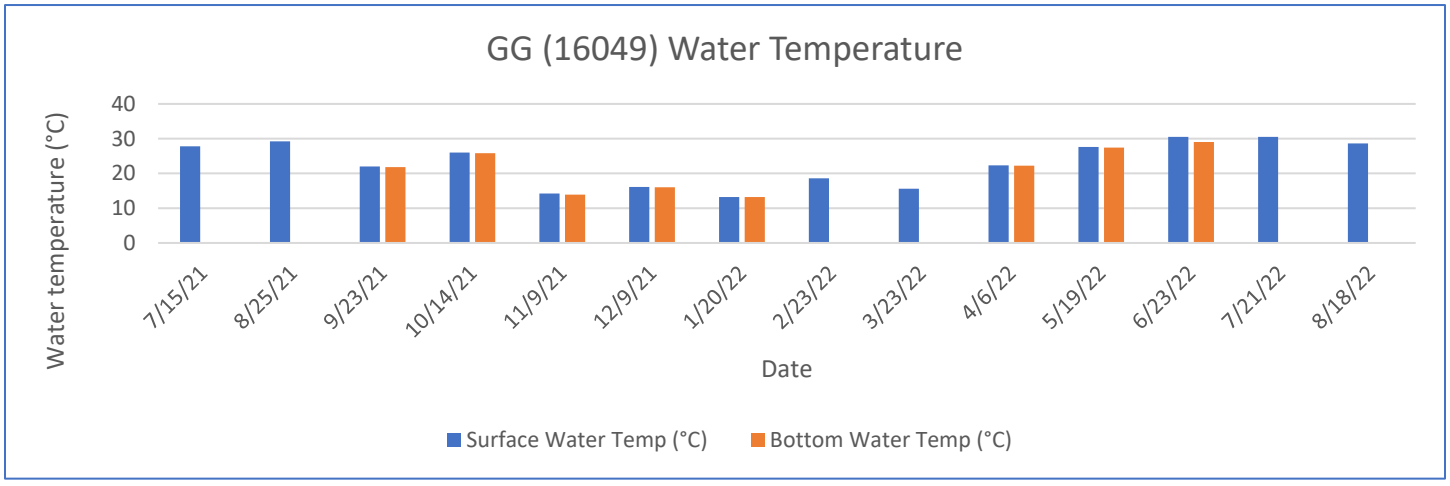

Figure 52. Site GG (16049) Surface and Bottom Water Temperature over time.

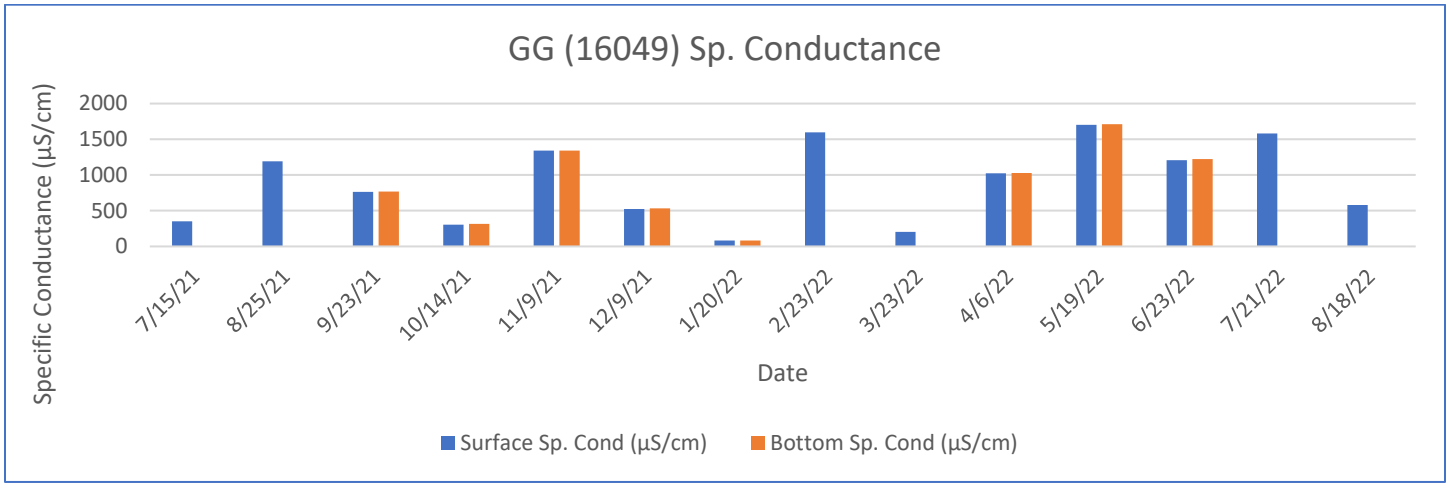

Figure 53. Site GG (16049) Surface and Bottom Specific Conductance over time.

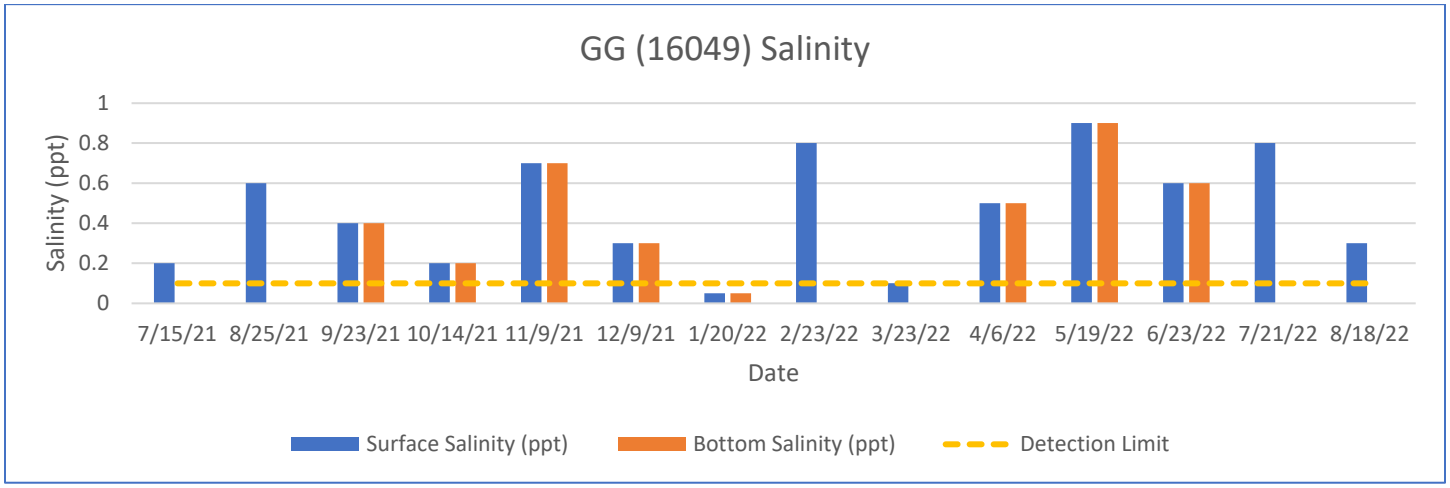

Figure 54. Site GG (16049) Surface and Bottom Salinity over time.

Figure 55. Gum Gully at Halliburton Road.

Table 16. Station 15107 (AB7) tidal results

Date	Surface Water Temp (°C)	Bottom Water Temp (°C)	Surface Sp. Cond. (µS/cm)	Bottom Sp. Cond. (µS/cm)	Surface Salinity (ppt)	Bottom Salinity (ppt)	% Pool Coverage	Flow Severity
12/9/21	16.8	16.7	509	508	0.3	0.3	100	3
1/20/22	14.9	15.0	63	64	<0.1	<0.1	100	5
2/23/22	16.9	17.0	617	622	0.3	0.3	100	3
3/23/22	17.1	16.9	125	136	0.1	0.1	100	3
4/6/22	22.0	21.4	349	348	0.2	0.2	100	3
5/19/22	28.6	28.2	717	722	0.4	0.4	100	3
6/23/22	30.2	30.2	483	483	0.2	0.2	100	3
7/21/22	31.1	30.8	354	359	0.2	0.2	100	3
8/18/22	29.2	29.1	146	145	0.1	0.1	100	3

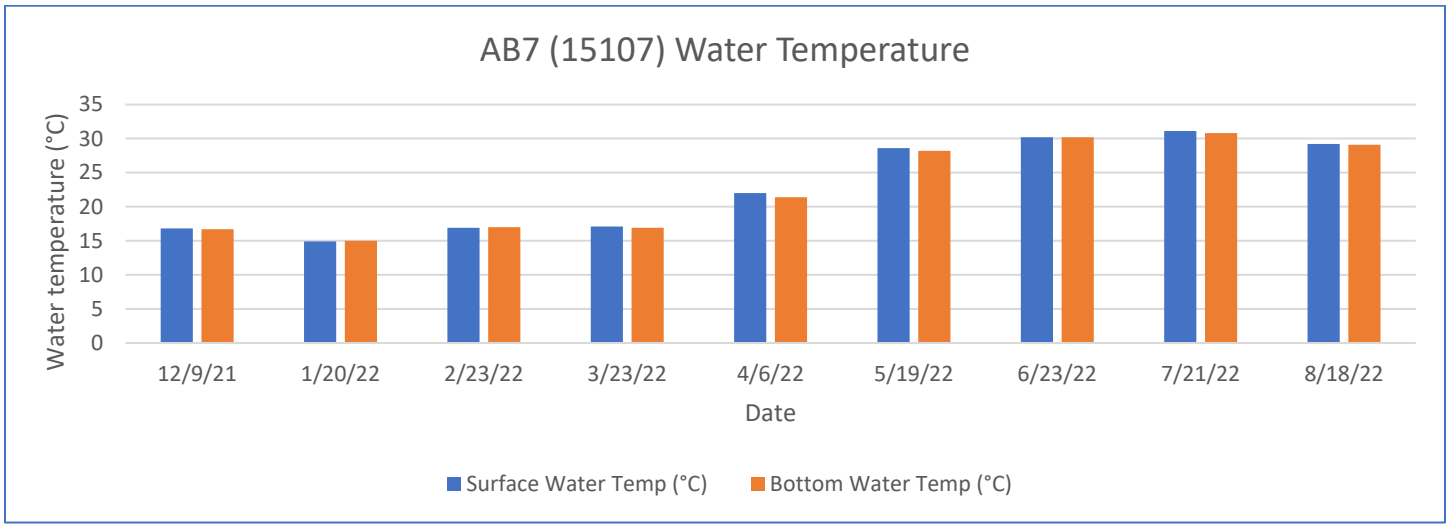

Figure 56. Site AB7 (15107) Surface and Bottom Water temperature over time.

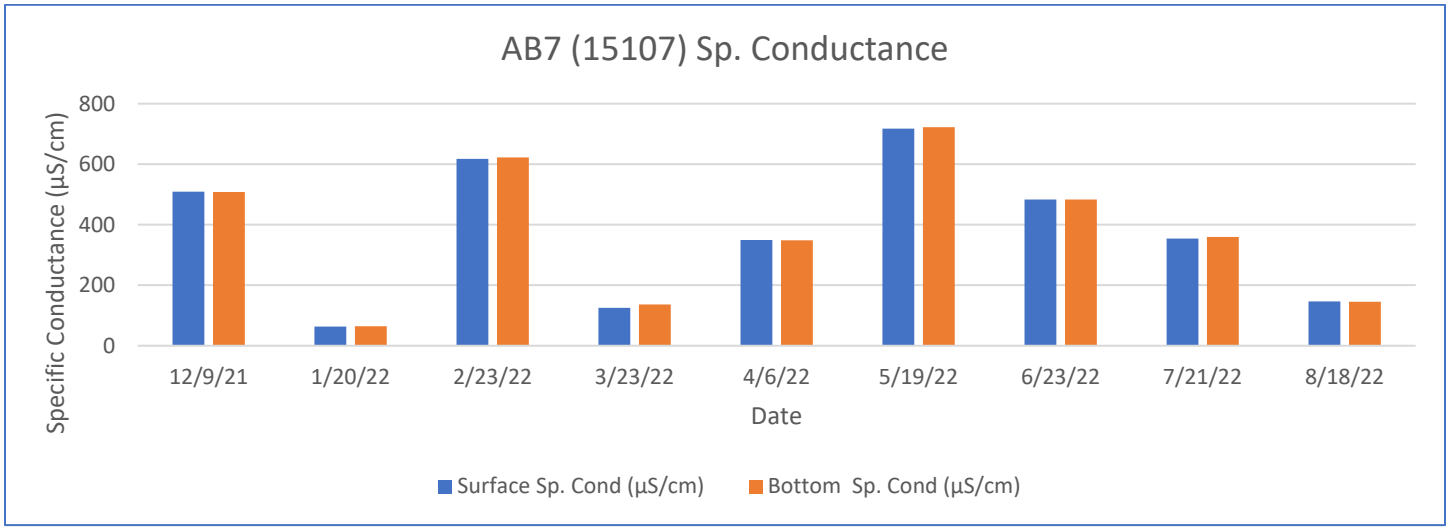

Figure 57. Site AB7 (15107) Surface and Bottom Specific Conductance over time.

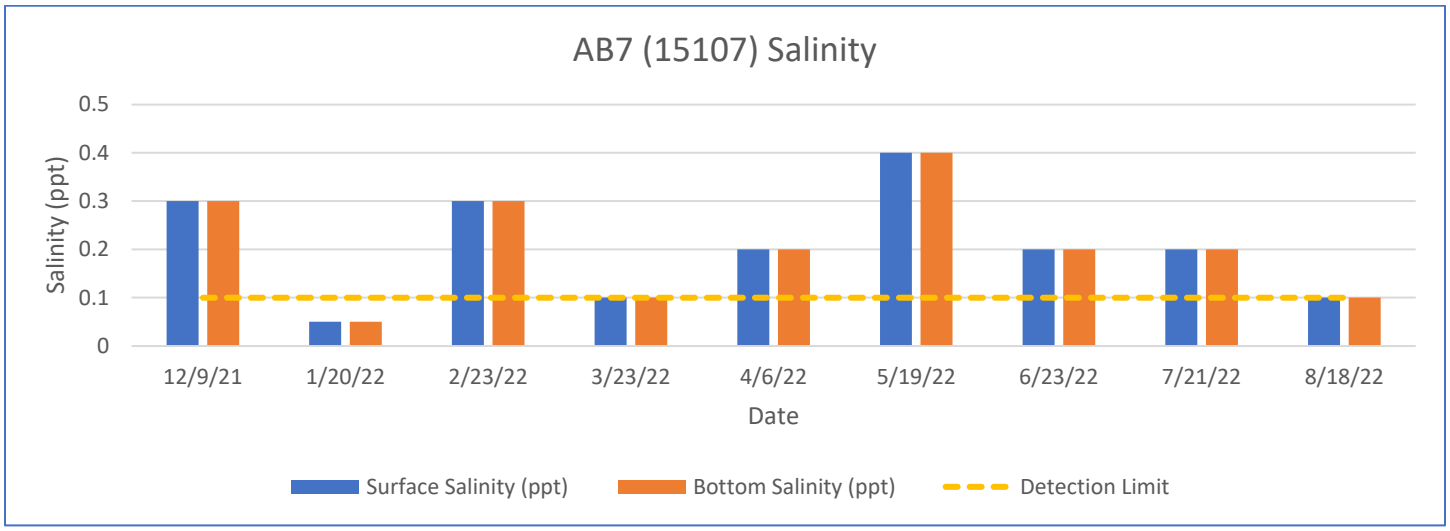

Figure 58. Site AB7 (15107) Surface and Bottom Salinity over time.

Table 17. Station 14964 (AB8) tidal results

Date	Surface Water Temp (°C)	Bottom Water Temp (°C)	Surface Sp. Cond. (µS/cm)	Bottom Sp. Cond. (µS/cm)	Surface Salinity (ppt)	Bottom Salinity (ppt)	% Pool Coverage	Flow Severity
12/9/21	16.3	16.1	179	179	0.1	0.1	100	3
1/20/22	15.2	15.2	56	55	<0.1	<0.1	100	3
2/23/22	16.3	16.3	597	597	0.3	0.3	100	3
3/23/22	16.7	16.7	95	95	<0.1	<0.1	100	3
4/6/22	20.3	20.2	317	317	0.2	0.2	100	3
5/19/22	25.9	25.9	616	616	0.3	0.3	100	3
6/23/22	28.3	28.3	550	550	0.3	0.3	100	3
7/21/22	28.6	28.6	521	520	0.3	0.3	100	3
8/18/22	28.1	28.1	183	182	0.1	0.1	100	3

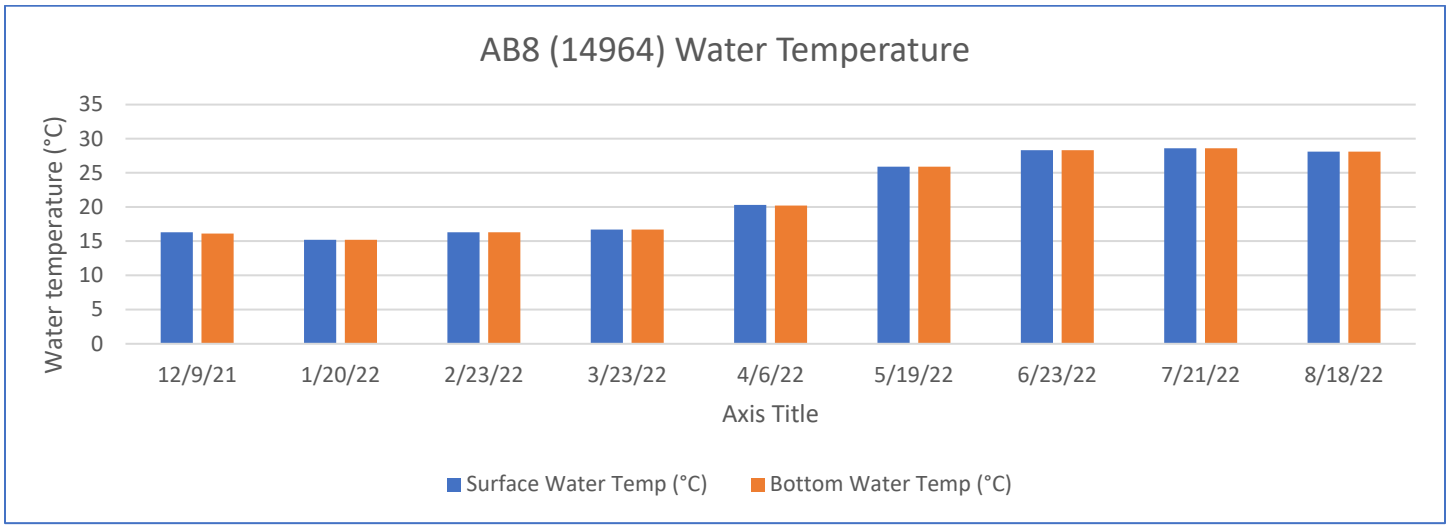

Figure 59. Site AB8 (14964) Surface and Bottom Water Temperature over time.

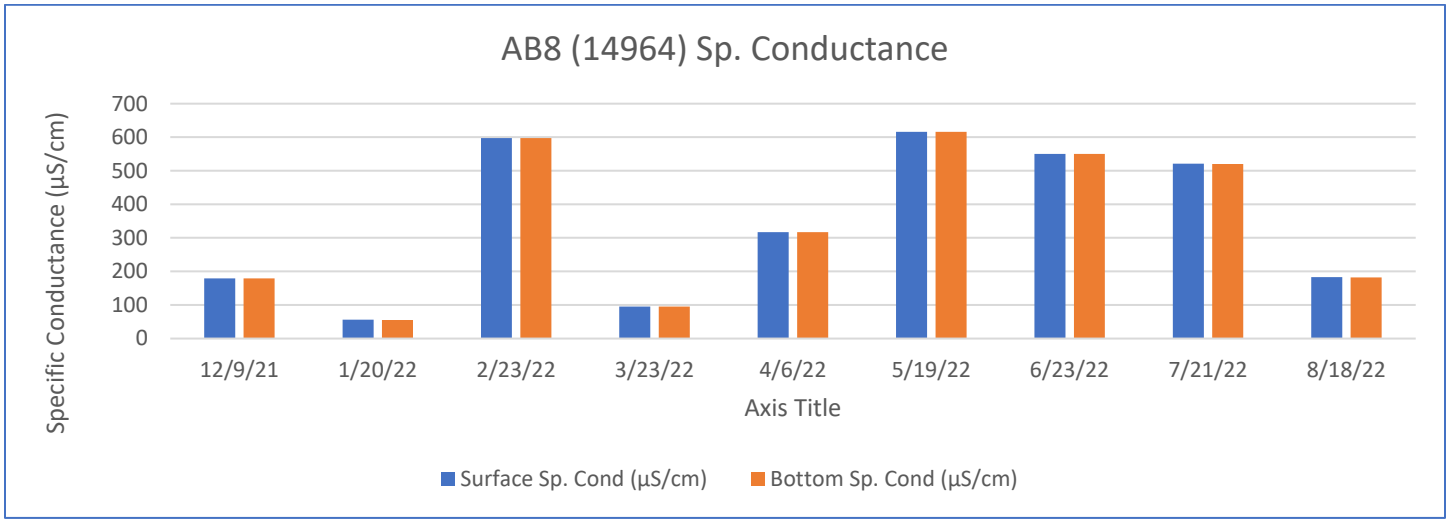

Figure 60. Site AB8 (14964) Surface and Bottom Specific Conductance over time.

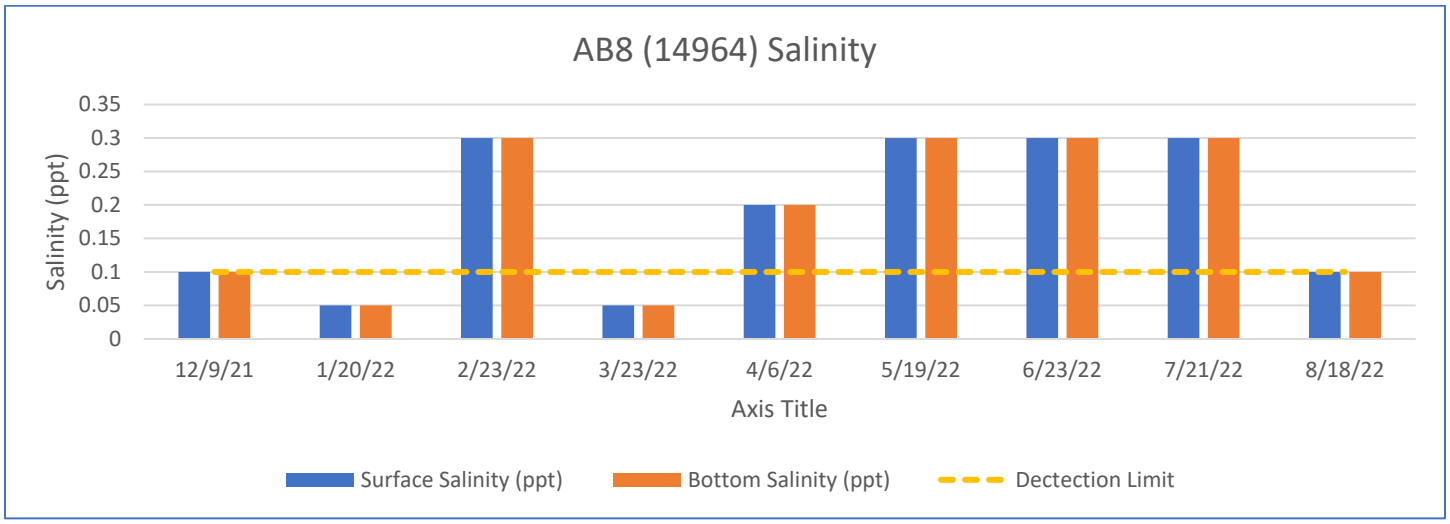

Figure 61. Site AB8 (14964) Surface and Bottom Salinity over time.

Tidal Determination Results

Monthly grab samples for specific conductance, temperature and salinity were taken at two sites in Adams Bayou Above Tidal (0508A_01) and one site in Gum Gully (0508B_01) to determine tidal influence in these areas. Parameters were collected at the surface and bottom at each site.

The recorded surface and bottom values at each site were very similar. All the salinity measurements taken were less than 1.0 ppt. Salinity values of less than the detection limit of 0.1 ppt were recorded once at Site 15107 and 16049 and twice at Site 14964.

The percent pool coverage was recorded as 100% at all sites for each sampling event.

This component of the project concluded at the end of August 2022.