

Chemical Reduction Experiment at Qualcomm

Interim update

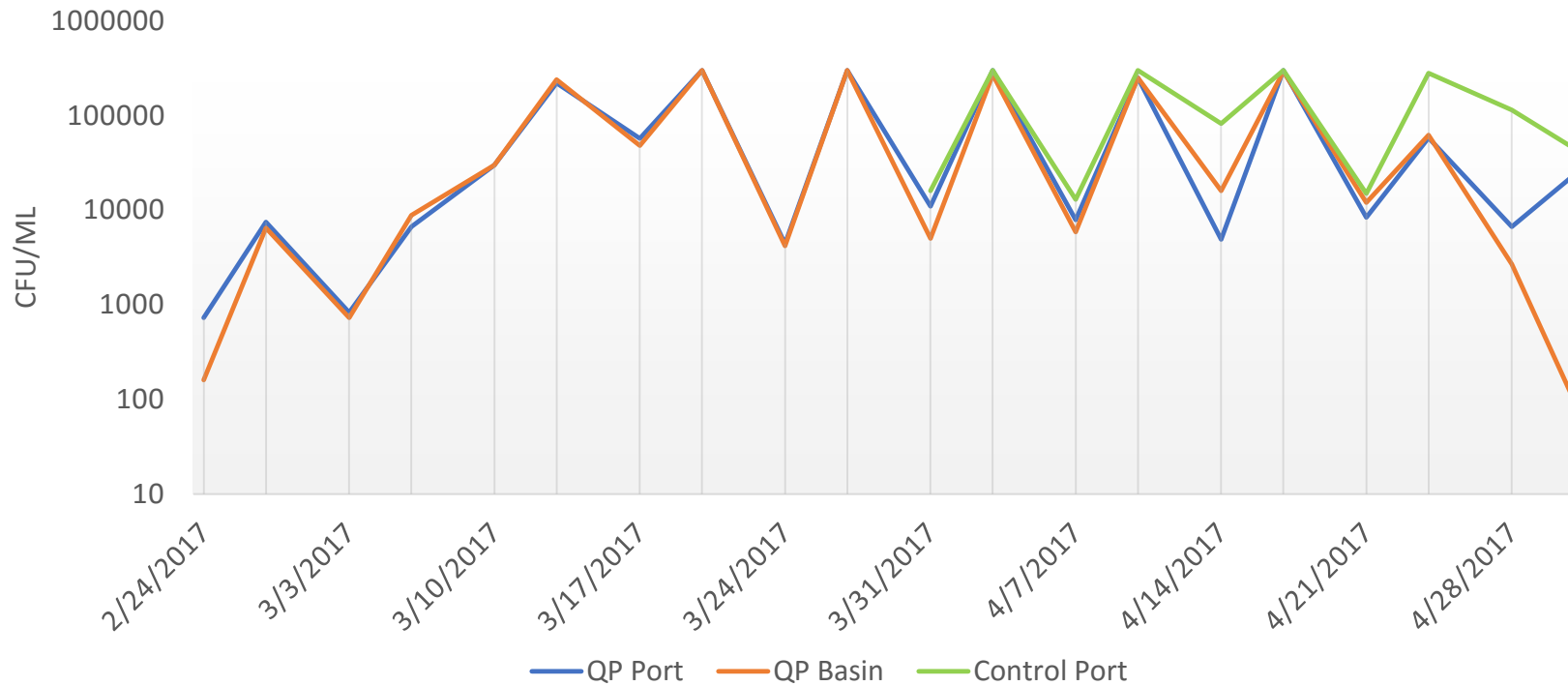
May 11, 2017

Molecular Express, Inc.

General Notes:

- Samples collection started on February 24th, 2017.
- Qualcomm agreed to shut off the maintenance chemicals at the bracelet-installed cooling tower, except for glutaraldehyde. The shut off happened on March 21st.
- A water sample each from the sampling port and the basin (of the bracelet-installed cooling tower) is taken every Mondays and Fridays for chemical and bacteria count analyses.
 - Starting on March 31, 2017, a water sample from the sampling port of the “control” tower (with no HydroFlux bracelet) is taken every Mondays and Fridays for bacteria count analysis only.
- For the anions, metals and other parameter plots presented here, the relative change compare to the initial measurements (February 24th) is presented. For plotting purposes, measurements below the detection limit is represented as “0%”.
- Reports for samples received after April 24th have not been received.

Bacteria Count Summary



Notes:

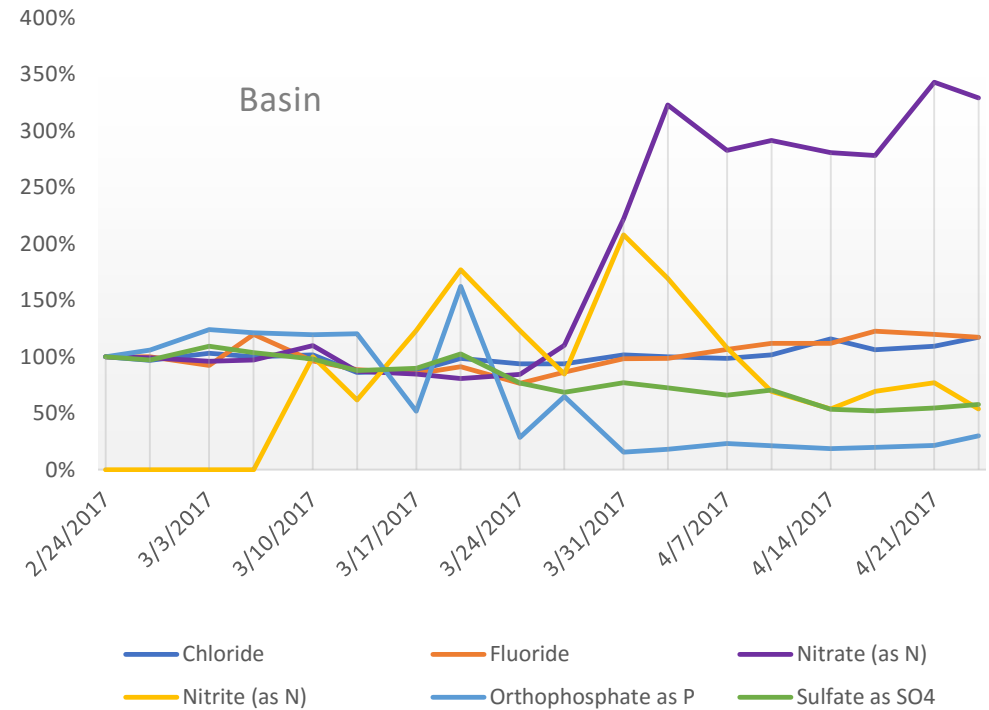
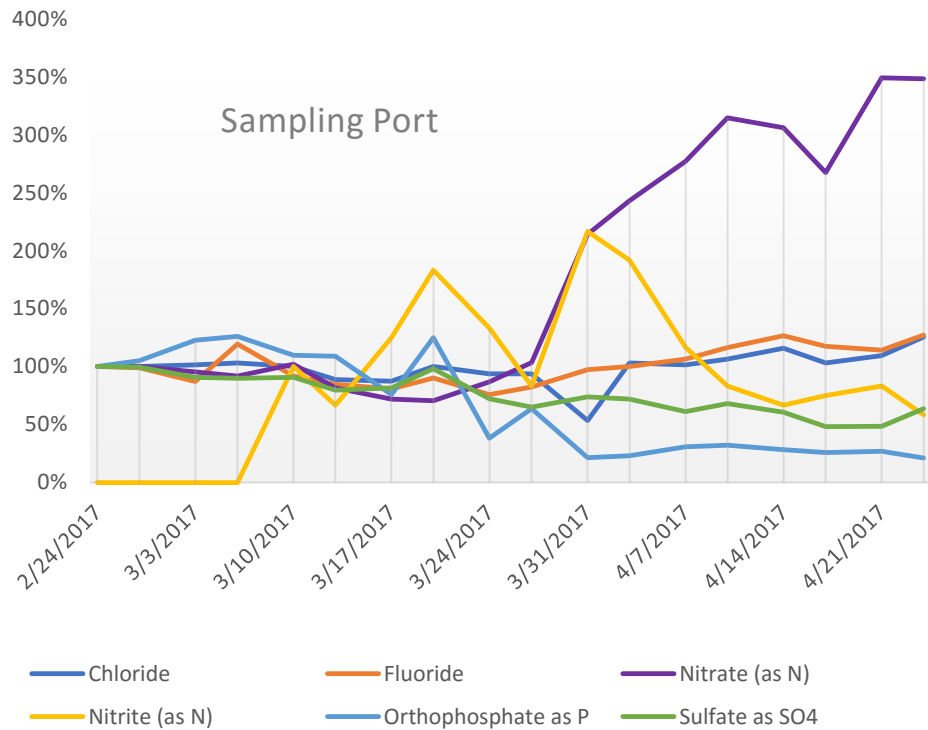
- Starting on March 13th, the bacteria counts has been alternating between high (Mondays) and low (Fridays), this trend applies to all 3 samples.
 - This trend ended with the latest sample (collected May 1st, Monday) where the basin sample and the control tower sample decreased compared to the previous Friday (April 28th) sample.
- In general, the bacteria count of the bracelet-installed cooling tower maintained at pre-chemical shut-off levels.

Bacteria Count Summary

Date		Heterotrophic Plate Count (CFU/mL)		
		HydroFlux Port sample	HydroFlux Basin sample	Control Tower Port Sample
2/24/2017	F	730	160	-
2/27/2017	M	7500	6500	-
3/3/2017	F	830	730	-
3/6/2017	M	6700	8800	-
3/10/2017	F	>30000	>30000	-
3/13/2017	M	220000	240000	-
3/17/2017	F	57000	48000	-
3/20/2017	M	>300000	>300000	-
3/24/2017	F	4400	4200	-
3/27/2017	M	>300000	>300000	-
3/31/2017	F	11000	5000	16000
4/3/2017	M	>300000	270000	>300000
4/7/2017	F	7900	5900	13000
4/10/2017	M	250000	250000	>300000
4/14/2017	F	4900	16000	82000
4/17/2017	M	300000	290000	>300000
4/21/2017	F	8400	12000	15000
4/24/2017	M	58000	62000	280000
4/28/2017	F	6700	2700	110000
5/1/2017	M	24000	98	45000

NOTE: Samples in green are unofficial results.

Anions Concentrations Summary



Notes:

- There is a significant increase of nitrate around the end of March.
- There is a slight increasing trend in fluoride and chloride levels, and a decreasing trend for orthophosphate and sulfate levels since the end of March.

Anions Concentrations Summary

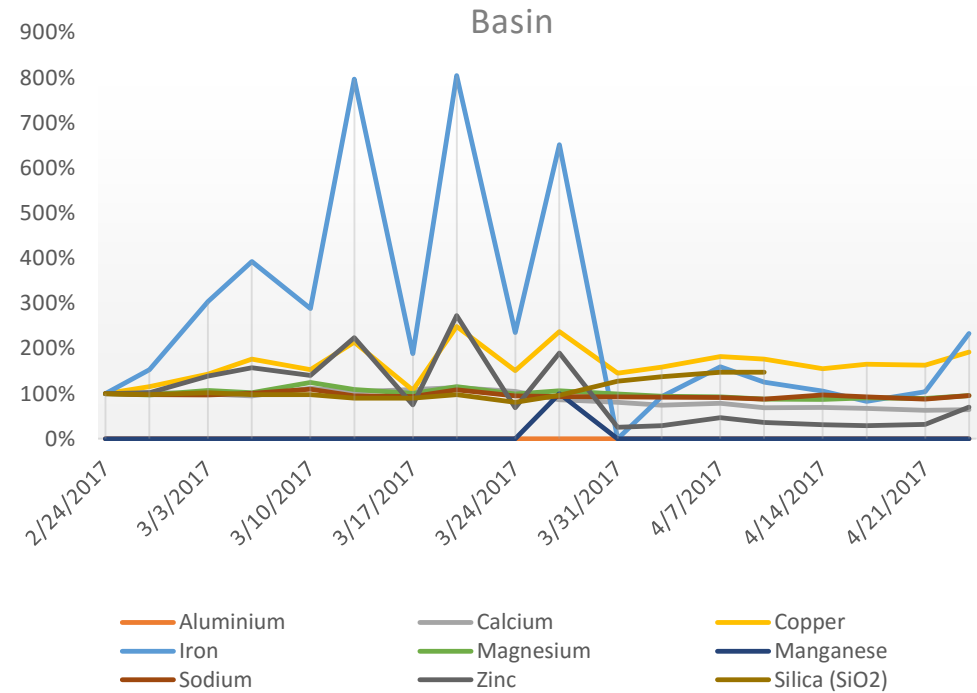
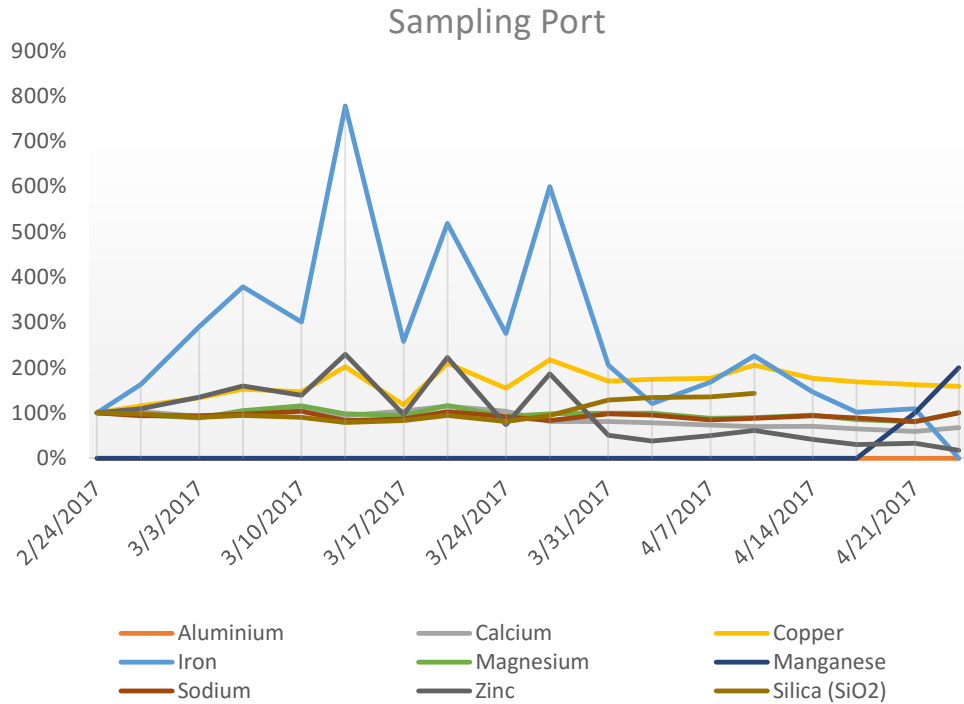
Date		Chloride (mg/L)		Fluoride (mg/L)		Nitrate as N (mg/L)		Nitrite as N (mg/L)		Orthophosphate as P (mg/L)		Sulfate as SO4 (mg/L)	
Reporting limit		0.05		0.200		0.25		0.05		0.10		250	
2/24/2017	F	630	640	4.12	4.07	1.97	1.96	ND	ND	2.37	2.38	2060	1960
2/27/2017	M	630	620	4.08	4.06	1.97	1.94	ND	ND	2.49	2.52	2050	1900
3/3/2017	F	640	660	3.59	3.75	1.88	1.88	ND	ND	2.91	2.95	1870	2140
3/6/2017	M	650	640	4.92	4.87	1.81	1.9	ND	ND	2.99	2.88	1850	2030
3/10/2017	F	630	650	3.78	3.92	2.01	2.15	0.12	0.13	2.6	2.84	1870	1920
3/13/2017	M	560	550	3.49	3.6	1.61	1.71	0.08	0.08	2.58	2.86	1640	1720
3/17/2017	F	550	560	3.33	3.46	1.42	1.66	0.15	0.16	1.8	1.23	1680	1760
3/20/2017	M	630	630	3.71	3.71	1.39	1.58	0.22	0.23	2.96	3.86	2020	2010
3/24/2017	F	590	600	3.12	3.11	1.71	1.65	0.16	0.16	0.91	0.68	1490	1500
3/27/2017	M	590	600	3.4	3.51	2.04	2.16	0.1	0.11	1.51	1.54	1340	1340
3/31/2017	F	337	650	4.01	4	4.22	4.35	0.26	0.27	0.51	0.37	1520	1510
4/3/2017	M	650	640	4.13	4.01	4.79	6.33	0.23	0.22	0.55	0.43	1480	1420
4/7/2017	F	640	630	4.39	4.33	5.46	5.54	0.14	0.14	0.73	0.55	1260	1290
4/10/2017	M	670	650	4.8	4.55	6.2	5.71	0.1	0.09	0.76	0.5	1400	1380
4/14/2017	F	730	740	5.22	4.55	6.03	5.5	0.08	0.07	0.67	0.44	1250	1050
4/17/2017	M	650	680	4.84	4.99	5.27	5.45	0.09	0.09	0.61	0.47	994	1020
4/21/2017	F	690	700	4.7	4.87	6.88	6.72	0.1	0.1	0.64	0.51	1000	1070
4/24/2017	M	790	750	5.24	4.77	6.86	6.45	0.07	0.07	0.5	0.71	1310	1130

NOTE:

Numbers in black represent results for the port samples. Numbers in red represent results for the basin samples.

“ND” = Not Detected, at or above the reporting limit indicated.

Metals Concentrations Summary



Notes:

- From March 10th to March 31st, the trend of high and low iron, copper and zinc levels corresponds to the high and low trend of the bacteria count level during those times, but these metals have low fluctuations after March 31st.

Metals Concentrations Summary

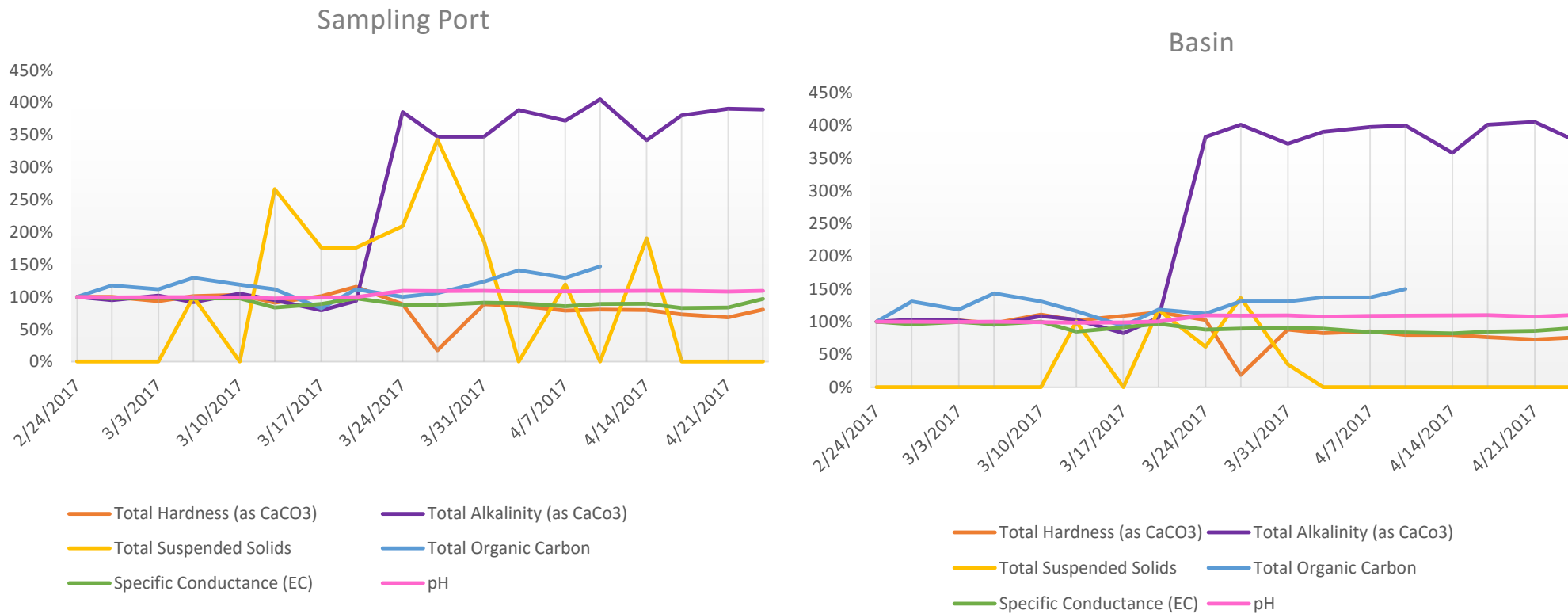
Date		Aluminium (mg/L)		Calcium (mg/L)		Copper (mg/L)		Iron (mg/L)		Magnesium (mg/L)		Manganese (mg/L)		Sodium (mg/L)		Zinc (mg/L)		Silica (mg/L)	
Reporting limit		1.00		2.50		0.050		0.100		2.50		0.030		12.5		0.050		1.0	
2/24/2017	F	ND	ND	351	345	0.051	0.051	0.126	0.128	146	141	ND	ND	620	600	0.933	0.975	53	51
2/27/2017	M	ND	ND	363	354	0.059	0.059	0.206	0.196	140	137	ND	ND	582	586	1.02	0.994	52	50
3/3/2017	F	ND	ND	325	342	0.068	0.073	0.366	0.389	130	151	ND	ND	583	580	1.26	1.35	48	52
3/6/2017	M	ND	ND	346	327	0.078	0.09	0.477	0.503	154	144	ND	ND	606	604	1.49	1.53	50	50
3/10/2017	F	ND	ND	376	385	0.075	0.078	0.379	0.369	169	176	ND	ND	643	657	1.3	1.37	48	50
3/13/2017	M	ND	ND	329	358	0.103	0.109	0.98	1.02	143	154	ND	ND	518	568	2.14	2.18	42	46
3/17/2017	F	ND	ND	366	377	0.06	0.055	0.325	0.241	138	142	ND	ND	538	560	0.901	0.728	44	46
3/20/2017	M	ND	ND	403	392	0.107	0.127	0.654	1.03	170	163	ND	ND	638	648	2.08	2.66	50	50
3/24/2017	F	ND	ND	365	361	0.079	0.077	0.347	0.301	135	140	ND	ND	570	568	0.69	0.671	43	41
3/27/2017	M	ND	ND	284	298	0.111	0.121	0.756	0.834	143	150	ND	0.037	517	560	1.74	1.85	50	49
3/31/2017	F	ND	ND	286	278	0.087	0.074	0.259	ND	145	140	ND	ND	608	556	0.475	0.245	68	65
4/3/2017	M	ND	ND	274	256	0.089	0.081	0.152	0.12	145	133	ND	ND	590	554	0.358	0.28	71	70
4/7/2017	F	ND	ND	258	272	0.09	0.093	0.212	0.204	129	131	ND	ND	526	549	0.469	0.457	72	75
4/10/2017	M	ND	ND	245	236	0.105	0.09	0.285	0.16	131	124	ND	ND	547	528	0.572	0.35	76	75
4/14/2017	F	ND	ND	247	240	0.09	0.079	0.184	0.135	139	123	ND	ND	582	582	0.387	0.302	85	75
4/17/2017	M	ND	ND	229	232	0.086	0.084	0.128	0.106	125	128	ND	ND	554	558	0.284	0.279	78	85
4/21/2017	F	ND	ND	209	217	0.083	0.083	0.138	0.133	118	126	ND	ND	504	528	0.307	0.309		
4/24/2017	M	ND	ND	239	222	0.081	0.098	ND	0.298	148	135	ND	ND	622	572	0.163	0.686		

NOTE:

Numbers in black represent results for the port samples. Numbers in red represent results for the basin samples.

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Other Parameters Summary



Notes:

- The Total Alkalinity jumped since March 24th. Although less apparent from the graph, the pH of the samples also jumped on March 24th (see Table on the next slide), and has remained leveled around 8.7 since then.
- The change in Total Suspended Solids level during the period of March 10th to 31st correspond to the trends observed in the iron, copper and zinc levels observed in the previous slide.

Other Parameters Summary

Date		Total Hardness (mg CaCO ₃ /L)		Total Alkalinity (mg CaCO ₃ /L)		Total Suspended Solids (mg/L)		Total Organic Carbon (mg/L)		Specific Conductance (µmhos/cm)		pH	
Reporting limit		10		5		20.0		3.0		1.00		0.10	
2/24/2017	F	1480	1440	97	93	ND	ND	17	16	4680	4690	7.99	7.97
2/27/2017	M	1480	1450	92	96	ND	ND	20	21	4580	4520	7.94	7.99
3/3/2017	F	1380	1470	99	95	ND	ND	19	19	4600	4680	7.97	7.95
3/6/2017	M	1500	1410	89	89	21	ND	22	23	4570	4520	7.96	7.98
3/10/2017	F	1530	1600	102	101	ND	ND	20	21	4570	4690	7.9	7.93
3/13/2017	M	1350	1470	92	96	56	60	19	18	3910	3980	7.82	7.86
3/17/2017	F	1500	1570	77	77	37	ND	14	15	4160	4300	7.91	7.9
3/20/2017	M	1710	1650	91	99	37	71	19	19	4580	4560	7.95	8
3/24/2017	F	1310	1480	374	356	44	37	17	18	4120	4130	8.75	8.77
3/27/2017	M	260	272	337	373	72	82	18	21	4090	4200	8.71	8.72
3/31/2017	F	1310	1270	337	346	39	21	21	21	4260	4270	8.73	8.76
4/3/2017	M	1280	1190	377	363	ND	ND	24	22	4230	4200	8.67	8.61
4/7/2017	F	1170	1230	361	370	25	ND	22	22	4010	3950	8.68	8.69
4/10/2017	M	1190	1150	393	372	ND	ND	25	24	4170	3940	8.7	8.72
4/14/2017	F	1180	1150	332	333	40	ND	26	22	4190	3870	8.76	8.75
4/17/2017	M	1080	1100	369	373	ND	ND	26	25	3870	3980	8.73	8.8
4/21/2017	F	1010	1050	379	377	ND	ND			3920	4050	8.64	8.61
4/24/2017	M	1190	1090	378	354	ND	ND			4530	4220	8.76	8.8

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