Stantec

Field Report

Project:	City of Wasilla WWTP Pilot Study	Field Crew:	Jake Alward, Riley Bronga, John Marshall
File:	204700415	Date:	March 14, 2018 to March 15, 2018 and March 27, 2018

Subsurface☒ Surface☒ Vegetation Plot☐ Lagoon ☒

Reference: March Water Sampling Event

1.1 BACKGROUND

Shannon & Wilson installed 8 new monitoring wells in the first weeks of March. With the new wells there are now 16 monitoring wells/borings and 18 surface sites to sample.

The march sampling event was conducted in two separate events. During the first event, 3/14 to 3/15, the monitoring wells were checked and sampled where possible. The second event, 3/27, included sampling the lagoon water, and sampling the stream.

There was substantially more snow on the site than there has been in the past. The temperatures remained below freezing on all sampling days. Although many of the monitoring wells were recently drilled, most them were already frozen.

1.2 SAMPLING EVENT HIGHLIGHTS

SUBSURFACE
During the first event only MW10, MW15, MW2b, B4, and B11 were able to be sampled. The remaining wells were frozen at or above ground surface (see photos 1 &2). The wells that were able to be sampled were unfrozen due to artesian pressure or the water level being substantially below ground surface. The new wells installed the week prior had not been developed, therefore some of the samples were silty. The peristaltic pump or bailer was used to purge all thawed wells. The peristaltic pump was used to collect all water samples.

The two wells on the west bluff were not sampled. MW14 was not able to be fixed due to frozen ground. When things begin to thaw, the drilling contractor will go back to the site and attempt to fix the well again. MW20 had a locked casing cover and it was not able to be opened.

SURFACE
The only two surface water sites that were sampled were SW17 and SW18. All other locations were frozen over, including the two pond locations that were previously sampled in the winter. The two sites that were sampled had little to no ice. The stream was gaged only at one location as SW18 was still frozen (see photo 4).

LAGOON
The lagoon was sampled in 8 different locations, twice per cell. Samples were taken at the exit of each cell and at a possibly stagnant location in each cell. Cells 1 and 2 were completely thawed and required a boat to sample the water (see photos 3 & 4). Cell 3 was partially frozen and cell 4

was completely frozen (see photo 5). The sampling crew was able to walk on the ice to sample cells 3 and 4. A bomb shell sampler was used to collect water samples in all four cells. This sampling method was consistent and simple and will be used again in the summer when all cells are thawed. Where the lagoon was frozen, a 6-inch auger was used to drill through the ice.

IMPROVEMENTS FOR FUTURE SAMPLING:

All wells not under artesian pressure will need to be properly developed in the summer when the ground has thawed as the water was silty. Either Shannon and Willson or Stantec will develop the wells according to state standards. A key and tool set will be brought next sampling event to access MW20. The paddle bit used to drill through the ice for surface water sampling proved to be problematic and a spiral bit will need to be used next event to drill through ice with ease.

1.3 OTHER ACTIVITIES

WEIR 1 (SW17)

Width: 2.21 -ft
Water depth: 0.70 -ft
Velocity: 0.41-ft/sec
Calculated flow: 0.63 -CF/sec

WEIR 2 (SW18)

Width: NA -ft
Water depth: NA -ft
Velocity: NA -ft/sec
Calculated flow: NA -CF/sec

1.4 SAMPLE RESULTS

The attached table summaries detected analytes. All other were below detectable limits. Complete results can be found in the SGS reports.

1.5 DATA QUALITY

Duplicates were not sampled this sampling event.

Attachment: Photo Log

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March Photo Log

Photo 1:
Ice frozen to top of casing, MW6

Photo 4:
Sampling L2B from boat

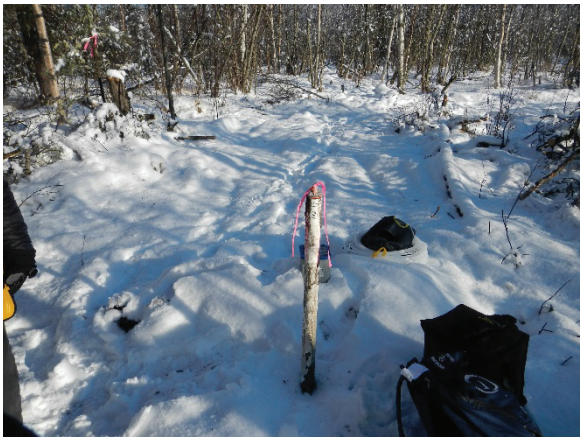

Photo 2:
MW17, frozen at ground surface

Photo 4:
Sampling L4B through 6" hole

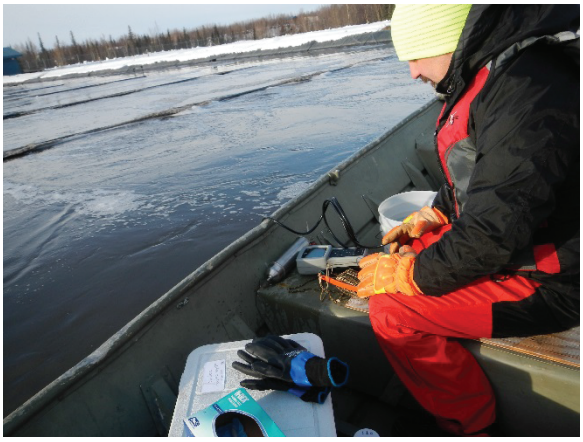

Photo 3:
Sampling L1A from boat

Photo 4:
Creek at SW18 frozen

Attachment: Results Summary Table

Detectable Results Summary Table

March-2018

Site ID	B4	B11	MW2b	MW10	MW15	SW17	SW18
Date Collected	3/14/2018	3/15/2018	3/14/2018	3/14/2018	3/14/2018	3/27/2018	3/27/2018
Time	14:51	11:36	11:35	10:26	13:41	13:30	13:00
Sample Type	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Surface	Surface
Water Temperature (°C)	3.5	2.92	2.78	3.34	2.11	2.32	1.48
Conductivity	423	356	216	366	335	622	757
pH	6.37	6.06	6.75	6.63	6.55	6.43	6.38
DO	13.8	2.07	11.35	1.75	2.76	8.38	7.64
Nitrate	1.43	ND(0.0500)	0.11	0.162	ND(0.0500)	2.4	1.51
Nitrite	ND	ND	ND	ND	ND	ND(0.0500)	ND(0.0250)
Total Nitrate/Nitrite	1.43	ND(0.0500)	0.11	0.162	ND(0.0500)	2.4	1.51
TSS						46.8	ND(0.525)
TKN	ND(0.500)	ND(0.500)	1.66	ND(0.500)	1.14	ND(0.500)	1.25
Ammonia	ND(0.0500)	0.16	ND(0.0500)	ND(0.0500)	0.224	0.423	0.766
TC						46	37
Arsenic	ND(2.50)	ND(2.50)	114	8.68	297		
Barium	17.5	48.5	218	199	3240		
Chromium	ND(2.00)	ND(2.00)	15.4	39.1	1090		
Copper	ND(3.00)	6.63	43.1	49.8	1640		
Lead	ND(0.500)	ND(0.500)	6.95	7.59	201		
Mercury	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	3.79		
Zinc	ND(12.5)	ND(12.5)	54.1	64	1820		

Site ID	L1A	L1B	L2A	L2B
Sample Event	March, 2018	March, 2018	March, 2018	March, 2018
Date Collected	0:00	0:00	0:00	0:00
Time	0.395833333	0.409722222	0.453472222	0.4625
Sample Type	Lagoon	Lagoon	Lagoon	Lagoon
Water Temperature (°C)	2.24	2.23	1.44	1.41
Conductivity	1064	1065	1512	1085
pH	6.26	6.51	5.96	6.56
DO	4.73	4.05	1.8	3.27
TSS	156	158	124	525
TKN	50.8	59.1	57	55.4
Ammonia	28.3	30.6	30.4	31.2
BOD	85.5	128	228	72.9

Site ID	L3A	L3B	L4A	L4B
Sample Event	March, 2018	March, 2018	March, 2018	March, 2018
Date Collected	0:00	0:00	0:00	0:00
Time	0.430555556	0.4375	0.480555556	0.489583333
Sample Type	Lagoon	Lagoon	Lagoon	Lagoon
Water Temperature (°C)	0.23	-0.02	0.25	0.21
Conductivity	1040	949	1133	1134
pH	6.5	6.38	6.46	6.53
DO	3.44	4.2	4.33	1.93
TSS	80	890	68	67.1
TKN	51.8	87.6	50.4	49.5
Ammonia	31.1	39.8	34	34.8
BOD	58.4	56.6	53.6	50.4