Stantec

Field Report

Project:	City of Wasilla WWTP Pilot Study	Field Crew:	Jake Alward, John Marshall, Ryan Cooper
File:	204700415	Date:	September 25-27, 2018

Subsurface☒ Surface☒ Vegetation Plot☐ Lagoon ☐

Reference: September Water Sampling Event

1.1 BACKGROUND

The September sampling event was a large subsurface and surface sampling event right at the end of the growing season. Temperatures were still above freezing, dipping to ~35 °F during the early morning, and biotic activity was senescing.

Work was aided by having three field crew members, which allowed longer transects and much quicker sampling times, reducing field time by 1-2 days. This also avoided the need to re-visit wells on subsequent visits, as one crew member was able to advance and develop a well while the rest of the team finished work on surface samples. This allowed the subsurface well to recharge for sampling.

All surface water and sub-surface water locations were sampled, including Mr. Shaw's property. This sampling event included developing the wells with a peristaltic pump, or bailer (when required).

1.2 SAMPLING EVENT HIGHLIGHTS

SURFACE
All 18 surface water locations and Mr. Shaw's property were sampled with a peristaltic pump, expect for a few locations where a bottle was dipped (SW3 and SW6). SW13 and SW18 were duplicated. The sites had higher than normal flows. Mr. Shaw's property appeared to be flowing in the east to north direction. Both stream sites were overflowing their banks. It continues to be difficult to move through the site, with almost all time spent in water to the knee or waist.

SUB-SURFACE
All sub-surface water locations were sampled. All wells were developed with a peristaltic pump (when possible) or a bailer. Approximately 3 well volumes were purged. In general, the water bailed from wells was very silty. Some wells were to dry after sampling to perform in-situ tests (MW14b and MW2b).

IMPROVEMENTS FOR FUTURE SAMPLING:

Three staff members are a large cost savings to the project. It shortens the time spent at an individual site and removes the need to revisit sites after well development.

Reference: September Water Sampling Event

1.3 OTHER ACTIVITIES

WEIR 1 (SW17)

Width: 2.21 -ft
Water depth: 0.95 -ft
Velocity: 0.26-ft/sec
Calculated flow: 0.54 -CF/sec

WEIR 2 (SW18)

Width: 3.22 -ft
Water depth: 0.90 -ft
Velocity: 0.22 -ft/sec
Calculated flow: 0.64 -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

There were two duplicates taken during the September sampling event for both surface water and sub-surface water. TC looks alarming for SW13, however TC result just both indicate bacteria.

Site ID	Nitrate	Nitrite	TSS	TKN	Ammonia	Total P	BOD	FC	E. Coli	TC
B11	ND	ND		ND	0.185	-	-	ND	-	-
B11.1	ND	ND		ND	0.18	-	-	ND	-	-
% Diff	**0.0%**	**0.0%**	**-**	**0.0%**	**-2.7%**	-	-	**0.0%**	-	-
MW13	ND	ND		ND	0.465	-	-	ND	-	-
MW13.1	ND	ND		ND	0.655	-	-	ND	-	-
% Diff	**0.0%**	**0.0%**	**-**	**0.0%**	**33.9%**	-	-	**0.0%**	-	-
SW13	ND	ND	ND	ND	ND	0.0285	ND	ND	ND	1203
SW13.1	ND	ND	ND	ND	ND	ND	ND	2	1	13000
% Diff	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**NA**	**0.0%**	**NA**	**NA**	**166.1%**
SW18	5.21	ND	6.12	ND	0.112	0.807	ND	8	11	2420
SW18.1	5.09	ND	3.88	ND	0.115	0.81	ND	5	5	2420
% Diff	**-2.3%**	**0.0%**	**-44.8%**	**0.0%**	**2.6%**	**0.4%**	**0.0%**	**-46.2%**	**-75.0%**	**0.0%**

Attachment: Photo Log

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September Photo Log

Photo 1:
SW-6

Photo 4:
SW-10

Photo 2:
SW-11

Photo 4:
SW-12

Photo 3:
SW-16

Photo 4:
B-4

Attachment: Results Summary Table

Detectable Results Summary Table

September-2018

Site ID	B1	B3	B4	B11	B11.1	MW2b	MW6	MW8	MW10	MW12	MW13	MW13.1	MW14a	MW14b
Date Collected	9/25/18	9/25/18	9/25/18	9/26/18	9/26/18	9/25/18	9/25/18	9/26/18	9/25/18	9/26/18	9/27/18	9/27/18	9/26/18	9/26/18
Time	12:50	13:20	10:08	15:15	15:15	10:18	13:47	12:58	12:10	14:00	10:13	10:13	10:55	11:11
Sample Type	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface
Water Temperature (°C)	3.5	6.35	5.44	4.89	4.89	0:00	3.13	3.9	3.24	3.92	3.89	3.89	4.24	0
Conductivity	264	206	447	406	406	0:00	202	254	371	321	218	218	188	0
pH	5.96	5.86	5.61	5.39	5.39	0:00	6.68	5.71	6.39	5.47	6.92	6.92	5	0
DO	1.01	-	-	2.53	2.53	0:00	1.7	3.2	1.45	0	5.07	5.07	0	0
Nitrate	ND(0.0500)	ND(0.0500)	1.47	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	0.101	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)
Total Nitrate/Nitrite	ND	ND	1.47	ND	ND	ND	ND	ND	0.101	ND	ND	ND	ND	ND
TKN	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	2.06	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
Ammonia	0.119	0.112	ND(0.0500)	0.185	1/0/1900	ND(0.0500)	ND(0.0500)	0.208	ND(0.0500)	0.264	0.465	0.655	ND(0.0500)	0.406
FC	ND(1)	1	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(2)	ND(1)	ND(2)	ND(10)	ND(10)	ND(1)	ND(20)

Site ID	MW15	MW16	MW17	MW20
Date Collected	9/25/18	9/26/18	9/26/18	9/26/18
Time	12:31	14:37	12:15	10:20
Sample Type	Sub-surface	Sub-surface	Sub-surface	Sub-surface
Water Temperature (°C)	3.97	4.09	3.43	3.78
Conductivity	324	280	287	338
pH	5.71	5.3	5.98	4.97
DO	1.46	3.98	2.2	0
Nitrate	ND(0.0500)	ND(0.0500)	ND(0.0500)	0.248
Total Nitrate/Nitrite	ND	ND	ND	0.248
TKN	ND(0.500)	ND(0.500)	9.73	ND(0.500)
Ammonia	0.241	0.114	1.36	ND(0.0500)
FC	ND(1)	1	ND(20)	ND(1)

Detectable Results Summary Table

September-2018

Site ID	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	SW11	SW12	SW13	SW13.1
Date Collected	9/25/18	9/25/18	9/25/18	9/25/18	9/25/18	9/25/18	9/25/18	9/26/18	9/26/18	9/26/18	9/26/18	9/26/18	9/26/18	9/26/18
Time	10:18	11:02	13:33	15:15	13:35	14:45	15:00	12:51	12:30	12:05	15:00	14:20	13:55	13:55
Sample Type	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Water Temperature (°C)	8.74	8.76	10.03	10.32	9.32	12.32	11.25	8.51	9.98	9	9.58	9.7	8.99	8.99
Conductivity	266	169	262	400	349	396	245	332	457	227	333	461	286	286
pH	5.43	4.85	5.82	5.77	5.88	6.09	5.56	5.52	5.88	5.44	6.05	5.87	5.86	5.86
DO	0.41	1.13	0.72	1.53	1.28	4.25	2.98	1.48	0.95	1.2	1.7	3.4	0.84	0.84
TSS	4	5.88	14.5	2.9	6.93	90.8	1.73	2.06	3.43	ND(0.500)	15.8	10.5	ND(0.500)	ND(0.500)
TKN	ND(0.500)	1.06	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
Ammonia	0.141	0.149	0.106	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)
Total P	0.054	0.0891	0.106	ND(0.0100)	ND(0.0100)	ND(0.0100)	ND(0.0100)	0.0451	ND(0.0100)	ND(0.0100)	0.249	0.058	0.0285	ND(0.0100)
BOD	28.5	3.47	2.67	ND(2.00)	ND(2.00)	2.57	ND(2.00)	2.02	29.7	ND(2.00)	ND(2.00)	ND(2.00)	ND(2.00)	ND(2.00)
FC	2	1	9	11	26	10	51	ND(1)	1	10	14	86	ND(1)	2
E. Coli	8	ND(1)	2	18	41	14	46	ND(1)	ND(1)	10.348	4	36	ND(1)	1
TC	2421	5170	517	24200	7700	345	461	488	238	227.656	24200	24200	1203	13000

Site ID	SW14	SW15	SW16	SW17	SW18	SW18.1	Shaw
Date Collected	9/27/18	9/27/18	9/27/18	9/27/18	9/27/18	9/27/18	9/26/18
Time	10:02	9:42	9:30	10:33	10:52	10:52	9:44
Sample Type	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Water Temperature (°C)	6.58	8.03	8.13	6.2	7.72	7.72	6.14
Conductivity	398	295	282	522	633	633	194
pH	6.11	5.97	5.47	6.35	6.22	6.22	5.75
DO	1.24	0.43	1.67	4.48	5.3	5.3	5.49
Nitrate	ND(0.0500)	ND(0.0500)	ND(0.0500)	2.23	5.21	5.09	ND(0.0500)
Total Nitrate/Nitrite	ND	ND	ND	2.23	5.21	5.09	ND
TSS	ND(0.490)	32.2	1.9	4.27	6.12	3.88	4.16
Ammonia	ND(0.0500)	0.113	0.111	ND(0.0500)	0.112	0.115	ND(0.0500)
Total P	0.0258	0.0904	0.0299	0.121	0.807	0.81	0.0599
BOD	ND(2.00)	5.73	4.63	ND(2.00)	ND(2.00)	ND(2.00)	ND(2.00)
FC	ND(1)	2	ND(1)	17	8	5	12
E. Coli	ND(1)	1	ND(1)	25	11	5	10
TC	113	579	248	613	2420	2420	770