November 2019 MONTHLY REPORT

City of Thompson

Wastewater Treatment Plant Upgrades & Associated Works

MWSB 1265

Startup & Commissioning Phase

Prepared By:

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Stantec

1 Progress for the Month of November

Monthly progress:

The following presents a key summary of the startup & commissioning activities for this reporting period:

- 14-day Trouble Free mechanical operation testing was completed.
- Multirake Bar screen acceptance testing completed. Supplier to provide acceptance testing report.
- Grit system acceptance testing occurred. Samples were taken and sent to the lab for analysis and are expected by 2nd week of December. Supplier to provide acceptance testing report.
- Biofilter odor control acceptance testing occurred. Sample were taken and sent to the lab for analysis. Results have been received by the Supplier who will provide along with their acceptance testing report.
- SBR Basin #2 mixers have been fixed and reinstalled.

2 Areas of Concern

The biological process in both SBR Basins was found to be on the decline as TSS and phosphorus levels in the treated effluent were rising. The MLSS levels in both basins started rising and continued to rise even with increased sludge wasting. Xylem travelled to site to diagnose the issue and found that digested sludge was recirculating back into the front of the plant and back into the SBR basins. The sludge dewatering system had not been brought online yet and both digesters had reached capacity. The sludge dewatering manufacturer was not scheduled to be onsite for startup of the dewatering equipment until December. To allow for sludge wasting, SBR Basin #2 was converted into a temporary digester/sludge storage and all incoming raw wastewater flow was directed to SBR Basin 1. Since switching to this temporary means of operation TSS and phosphorus removal have reduced and are within the guidelines, however denitrification has gone backwards and effluent ammonia levels are above the guidelines. The thought was that due to the amount of sludge wasting that needed to occur to bring the basin MLSS into check, too much of the nitrifying bacteria was lost in the wasted sludge. The current plan to restore normal operation will commence once sludge

dewatering has started. SBR 2 will be emptied of sludge, a portion of SBR Basin 1 will be transferred to SBR Basin 2 and then raw wastewater will be reintroduced to Basin 2. Both basins will then be seeded with nitrifying bacteria culture to restore the process.

SBR Basin 2 had degraded to the point where sludge was passing the decanting weir, entering the equalization tank before being discharged to the Burntwood River. Bird prepared a report summarizing the occurrence which has been appended to this report.

3 Schedule

Acceptance testing of the sludge dewatering centrifuge is scheduled for early December. Acceptance testing of the SBR and Digesters likely won't occur until early 2020, once the process has re-established.

It is anticipated that the facility will reach Interim Substantial Completion by Mid-December at which point the City will take over operation of the facility.

4 Summary of Process Development

Sewage was introduced into the WWTP on June 14, 2019. All sewage including piped and trucked has been diverted to the new WWTP. Daily influent and effluent flows through the new WWTP are being monitored and tracked however Bird has not provided the flow reports since mid-November. A copy of flow reporting to Mid-November is attached for reference.

Bird continues sampling the effluent to monitor the development of the process. The summary of testing results provided by Bird is attached for reference.

DateTime	01_FIT_101.Flo	01_FIT_10	01_FIT_10	01_FIT_10	Total Daily
1-Aug	1109.276245	3600.662	1575.862	0	6285.8
2-Aug	1038.193604	3583.645	1554.667	0	6176.506
3-Aug	1009.600525	3419.185	1486.684	0	5915.469
4-Aug	957.6132202	3167.74	1439.396	0	5564.748
5-Aug	246.7058563	742.7657	338.1114	0	1327.583
6-Aug	1073.884888	3012.188	1433.497	303.5093	5823.079
7-Aug	129.8987274	477.2199	181.8019	148.0998	937.0204
8-Aug	1079.383545	2985.862	1363.314	1221.549	6650.109
9-Aug	385.714325	1037.194	424.0167	617.8962	2464.821
10-Aug	900.1272583	2751.033	1294.531	852.139	5797.83
11-Aug	1.700000286	2614.9	1212.851	1151.366	4980.817
12-Aug	1164.462769	2492.781	1233.146	1187.457	6077.847
13-Aug	1157.264526	2808.689	1291.832	1125.272	6383.058
14-Aug	1118.873901	2722.906	1233.246	1265.938	6340.963
15-Aug	1091.180664	2691.475	1200.254	1263.039	6245.948
16-Aug	1060.788086	2583.87	1184.058	1261.939	6090.655
17-Aug	1058.688599	2532.32	1231.646	1263.938	6086.593
18-Aug	1295.730713	2922.901	1333.721	1270.437	6822.79
19-Aug	1212.850952	2740.523	1332.722	1245.243	6531.338
20-Aug	1138.968994	3148.22	1384.809	1251.042	6923.04
21-Aug	1117.674194	3419.585	1436.996	1235.645	7209.901
22-Aug	1038.993408	3271.14	1388.908	1004.002	6703.044
23-Aug	1057.888794	3228.999	1380.01	345.8119	6012.71
24-Aug	1011.899963	3088.963	1417.801	1315.226	6833.889
25-Aug	875.333313	3022.298	1363.714	1264.838	6526.183
26-Aug	1284.93335	3664.824	1536.872	1311.627	7798.256
27-Aug	1854.594238	5218.24	1836.799	1298.73	10208.36
28-Aug	1550.868408	4518.557	1692.734	1302.929	9065.088
29-Aug	1357.315674	3896.05	1621.351	1329.622	8204.339
30-Aug	1276.135498	3589.251	1536.372	1323.424	7725.182
31-Aug	1088.281372	3282.451	1529.774	1227.847	7128.354
1-Sep	883.6312866	3009.185	1441.095	1275.436	6609.347
2-Sep	848.4398804	2904.383	1459.191	1276.835	6488.849
3-Sep	855.1382446	2891.27	1457.191	1242.744	6446.343
4-Sep	861.9365845	3028.103	1466.489	1252.341	6608.87
5-Sep	1015.199158	2952.429	1447.494	1204.353	6619.475
6-Sep	1053.689819	2929.107	1447.194	1146.967	6576.957
7-Sep	1117.674194	2886.065	1389.608	1177.66	6571.006
8-Sep	1114.474976	2778.059	1338.12	1261.339	6491.994
9-Sep	1177.859497	2706.79	1354.216	1194.955	6433.821
10-Sep	1236.645142	2754.236	1427.698	1217.95	6636.529
11-Sep	1353.716553	2705.889	1436.896	1132.371	6628.872
12-Sep	1272.036499	2750.432	1432.897	1058.689	6514.055
13-Sep	1171.361084	2673.057	1382.809	1171.361	6398.589
14-Sep	1141.568359	2709.492	1370.912	963.8117	6185.785
15-Sep	1119.773682	2657.041	1367.413	1282.334	6426.562

Sept

Cree:	33113.33	m3
Riverside:	84452.86	m3
Nelson:	41653.04	m3

16-Sep	1203.453247	2856.936	1371.112	1204.753	6636.255
17-Sep	1110.375977	2893.572	1430.598	1245.543	6680.089
18-Sep	1025.196777	2881.76	1383.609	1246.443	6537.009
19-Sep	1313.726318	3362.53	1467.389	1317.125	7460.77
20-Sep	1155.964844	3139.412	1488.884	765.5601	6549.82
21-Sep	1138.069214	2980.457	1415.801	718.8715	6253.199
22-Sep	1186.757324	2509.798	1440.295	441.0177	5577.868
23-Sep	1212.351074	1724.626	1413.902	1315.826	5666.705
24-Sep	1189.056763	2901.68	1446.194	1008.401	6545.331
25-Sep	1147.866821	2960.637	1397.006	1354.116	6859.627
26-Sep	1172.260864	2838.018	1286.233	1345.419	6641.93
27-Sep	1128.471558	2840.42	1298.23	1310.827	6577.949
28-Sep	1106.476929	2826.907	1238.245	1364.114	6535.743
29-Sep	911.5244751	2712.996	1218.65	1338.62	6181.79
30-Sep	888.6300659	2687.571	1137.669	1335.521	6049.391
1-Oct	917.9229126	2751.734	1181.759	1335.421	6186.836
2-Oct	1029.995605	2789.671	1206.852	1294.031	6320.55
3-Oct	1052.190186	2738.421	1134.07	1319.625	6244.306
4-Oct	1037.093872	2666.551	1164.563	1318.625	6186.832
5-Oct	1027.296265	2701.885	1105.077	541.8148	5376.073
6-Oct	1029.995605	2673.357	1093.28	252.6062	5049.239
7-Oct	1088.481323	2729.412	1116.874	348.7121	5283.48
8-Oct	1044.092163	2896.475	1078.884	591.4026	5610.853
9-Oct	988.3057251	2888.067	1100.878	1155.865	6133.116
10-Oct	1009.500549	2815.095	1191.356	1122.773	6138.725
11-Oct	1044.692017	2784.165	1157.365	921.522	5907.744
12-Oct	1249.841919	2838.618	1064.987	1353.117	6506.564
13-Oct	1194.755371	2775.056	1163.763	1343.219	6476.794
14-Oct	1269.837036	2800.581	1087.981	1247.243	6405.642
15-Oct	1322.424194	2810.491	1102.878	1181.958	6417.751
16-Oct	1270.836792	2883.863	1126.172	1322.624	6603.496
17-Oct	1249.741943	2962.74	1115.675	1289.632	6617.788
18-Oct	1245.642944	2926.204	1131.271	1307.528	6610.646
19-Oct	1177.459595	2794.375	1191.256	1086.982	6250.073
20-Oct	1275.735596	2761.443	1178.359	1251.442	6466.98
21-Oct	1312.226685	2801.782	1195.255	1293.631	6602.896
22-Oct	1204.053101	2754.636	1132.471	1244.943	6336.103
23-Oct	1196.454956	2663.448	1166.662	1301.929	6328.494
24-Oct	1247.342529	2619.004	1085.782	1257.04	6209.169
25-Oct	1162.563232	2900.379	1060.488	1270.237	6393.667
26-Oct	1243.443481	2894.773	1105.277	1175.16	6418.654
27-Oct	1285.233276	2951.729	1101.878	1309.327	6648.167
28-Oct	1217.849731	3081.555	1136.87	1111.676	6547.95
29-Oct	1100.378418	2916.094	1132.571	1176.66	6325.703
30-Oct	1041.492798	2937.014	1149.266	1311.327	6439.101
31-Oct	1137.269409	2867.947	1117.774	1341.32	6464.31
1-Nov	952.0145874	2790.071	1083.982	1360.015	6186.083

2-Nov	960.2125854	2787.368	1119.774	1386.708	6254.063
3-Nov	933.1192017	2757.639	1157.564	1357.416	6205.739
4-Nov	933.1192017	2757.639	1157.564	1357.416	6205.739
5-Nov	942.5169067	2828.909	1176.16	1306.828	6254.414
6-Nov	928.6203003	2806.587	1075.385	1384.709	6195.301
7-Nov	921.2221069	2789.37	1082.283	1415.002	6207.877
8-Nov	937.4181519	2765.547	1080.683	1311.827	6095.475
9-Nov	891.5293579	2801.382	1069.286	1429.498	6191.695
10-Nov	850.93927	2599.785	1042.792	1411.802	5905.32
11-Nov	1107.57666	2575.161	1034.794	1388.308	6105.841
12-Nov	1111.075806	2601.287	1043.092	1161.264	5916.719
13-Nov	1109.476196	2728.811	1076.884	1335.321	6250.493
14-Nov	1198.85437	2707.791	1080.683	1360.215	6347.543
15-Nov	1201.253784	2701.685	1062.388	868.6349	5833.961
16-Nov	1201.453735	2622.007	1028.696	1406.604	6258.76
17-Nov	1186.257446	2627.412	1020.798	962.2121	5796.68
18-Nov	1215.950195	2641.126	1026.696	413.316	5297.088
19-Nov	1224.748047	2735.017	1040.593	499.5213	5499.88
					0
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Daily WWTP Testing Results

Date	Comments	Effluent Sample													SBR Basin 1										SBR Basin 2								
		Time	Effluent Temp (˚C)	pH	NH3-N Ammonia (mg/L)	TSS	Nitrate (mg/L)	Phosphate (mg/L)	Total Nitrogen (mg/L)	TKN (mg/L)	Alkalinity	COD (mg/L)	UVT	Flow (L/s)	Time	Temp	Settling Test	TSS Probe	TSS Field Lab	MLVSS Field Lab	Sludge Judge	WAS TSS	Digester TSS	Digester Settling	Time	Temp	Settling Test	TSS Probe	TSS Field Lab	MLVSS Field Lab	Sludge Judge	WAS TSS	Digester TSS
		D	D	D	D	D	W	D	W	W	W	W	D	D	D	D	D	D	D	W	D	D	W	D	D	D	D	D	D	W	D	D	W
				> 6.8	At 16C ≤ 3 mg/L	< 25	≤ 15 mg/L	≤ 1.0 mg/L		≤ 15 mg/L	> 70		> 55	> 16 L/s																			
18-Sep				7	11																												
20-Sep				6.96	3.18																												
20-Sep				7.76	6.92																												
21-Sep				6.97	7.43																												
23-Sep				6.74	2.82																												
24-Sep				7.04	5.28																												
26-Sep				6.98	5.49																												
1-Oct			14.0	7.00	No Pipette								67.3	43	9:10	14.5	378	1890							9:40	14.4	300	1820					
2-Oct			13.4	7.01	Too Low Readings								63.3	62	9:07	14.4									9:30	14.2							
3-Oct			13.5	7.04	1.39								61.1	41	9:00	14.4	365																
4-Oct		13:40	13.5	7.1	4.69								58.3	47																			
5-Oct		9:55		7.02	4.29																												
5-Oct		14:15		7																													
6-Oct		10:00		6.99	4.83																												
8-Oct		9:40	11.8	6.84	2.68								55.9	64																			
9-Oct		11:20		6.86	0.52																												
10-Oct		16:15		6.85	Too Low Readings																												
11-Oct		15:43		6.98	1.19								98.7	65	16:45	14									16:45	13.8							
12-Oct	robe Calib	8:05	14.8	6.98	0.56								65.7	38	8:24	14	300	2820							10:18	13.7	250	3180					
14-Oct		16:00	14.4	6.98	0.483								60.9	48	16:30	13.6	270	4420															
16-Oct		10:40	10.9	6.8	0.41										10:30		290																
17-Oct															11:00			4360							10:00			4370					
20-Oct		13:10	10.5	6.88	0.58								55.8	47																			
21-Oct		11:15	10.8	6.92	0.29								55.3	41																			
22-Oct		10:18	9.1	7	0.2								55.8	54	10:45	13.4	387	5950							9:55	13.4	255	4150					
24-Oct		8:30	11.0	7	0.41								55.2	55	8:00	13.5	380	5230							8:40	13.3	390	3720					
27-Oct		10:00	13.4	7.06	7.23								34.7	40	10:16	12.9	320	3010							10:50	12.6	240	2680					
29-Oct		14:00	12.6	7.09	3.45								60	40	15:00	12.9		4540							14:30	12.7	307	4250					
30-Oct		9:45	12.8	7.07	3.24								62.6	54	9:30	12.9	430	4670							10:45	12.7	300	4240					
31-Oct		14:30	12.6	7.03	1.18																												
1-Nov		9:30	12.5	7.04	0.327								62.1	40	5:20	12.9	420	3860							9:45	12.7	310	3860					
2-Nov		9:45	12.7	7.07	0.112								68.8	41	12:35	12.9	440	3910							9:51	12.6	390	3840					
3-Nov		17:00			0.317																				11:35	12.6	340	3370					
4-Nov		9:33	12.1	7.17	0.041								62.1	68	9:27	12.4	450	3880							11:30	12.3	350	3300					
5-Nov		9:40	12.4	7.15	0.42								63.7	40	9:30	12.4	390	3910							11:25	12.3	400	3590					
6-Nov		10:00	11.7	7.26	0.69								58.3	66	9:20	12.4	490	3890							11:20	12.3	415	3570					
7-Nov		9:40	13.1		0.518								63.7	61	2:37	12.2	450	5610							11:29	12	400	4930					
8-Nov		9:31	10.4	7.32	0.348			4.08					59.5	85											11:50	11.9	370	5860					
10-Nov		9:37	8.4	7.34	0.261								62	46	9:46		490	5950							11:35		480	5360					
11-Nov		2:35	11.6	7.24	0.248								63.7	40	3:06		340	5560							4:40		445	5160					
12-Nov		1:36	13.2	7.22	0.438			2.67					65.7	41	1:26	11.5	600	6003							1:26	11.2	440	6740	6710				
13-Nov		9:30	12.0	7.35	0.411	63		2.7					63.3	40	10:15	11.5	480	6102	6040				12:00		11:15	11.4	470	6360	5650				
14-Nov		10:01	11.3	7.58	0.499	3.2						28.5	62.4	40	9:30	11.4	440	6500	6350						11:30	11.3	600	6820	6410				
15-Nov		10:00	11.3		0.014								62.2	40	9:30	11.4	570	6790															
17-Nov		9:44	11.0	7.13	0.319								60.2	40	9:55	11.2	680	6440							11:30	11.1	730	7260					
18-Nov		9:04	13.8	7.28	1.05	7.2		2.21					63.9	41	10:20	11.8	650	7000			11'				12:00	11.3	850	8200	7530				
19-Nov		8:25	13.1	7.3	0.546	11.6		1.61					58.1	44	9:34	11.4	850	7790			12'				11:30	12.4	765	6060	9240		15'		
20-Nov		8:30	10.5	7.13	1.03	1123		6.32					-	71	10:05	10.5	840	5920	8380	5830	15'												
21-Nov		9:30	10.4	7.1	10.9	186		1.05					64	43	9:30	10.1	540	6280	6080	-	11'	6150											
22-Nov		8:05	10.7	7.58	1.42	36.6		2.23					53.7	32	9:54	10.6	550	6230	4940		14'	12460											
23-Nov		11:10	10.8	7.08	10.2								55.3	28	10:50	10.1	400	3420			13'												
24-Nov		10:20	9.9	7.26	10.8								58.2	55	10:20	10.4	515	3980			13'												
25-Nov		7:50	11.3	7.02	11	15		0.649				37.8	24.2	62	10:30	10.7	540	3920	5820		15'	8060											
26-Nov		8:10	11.1	7.03	10.1	14.2		0.782					55.1	27	10:30	10.7	600	3940	5800		14'	10660											
27-Nov			10.6		10.4			0.95										3820			14'												
28-Nov																																	
29-Nov																																	
30-Nov																																	
1-Dec																																	
2-Dec			13.4	7.14	15.6	34	0.99	0.5				42.7	56.6				250	2400	2880			4810											

Out of Spec Discharge from Thompson Waste Water Treatment Plant

Occurrence Date: Started Wednesday, November 20th, 2019 at approximately 8:21am

Action date: Wednesday, November 20th, around 8:45am

Reporting date: December 4th, 2019

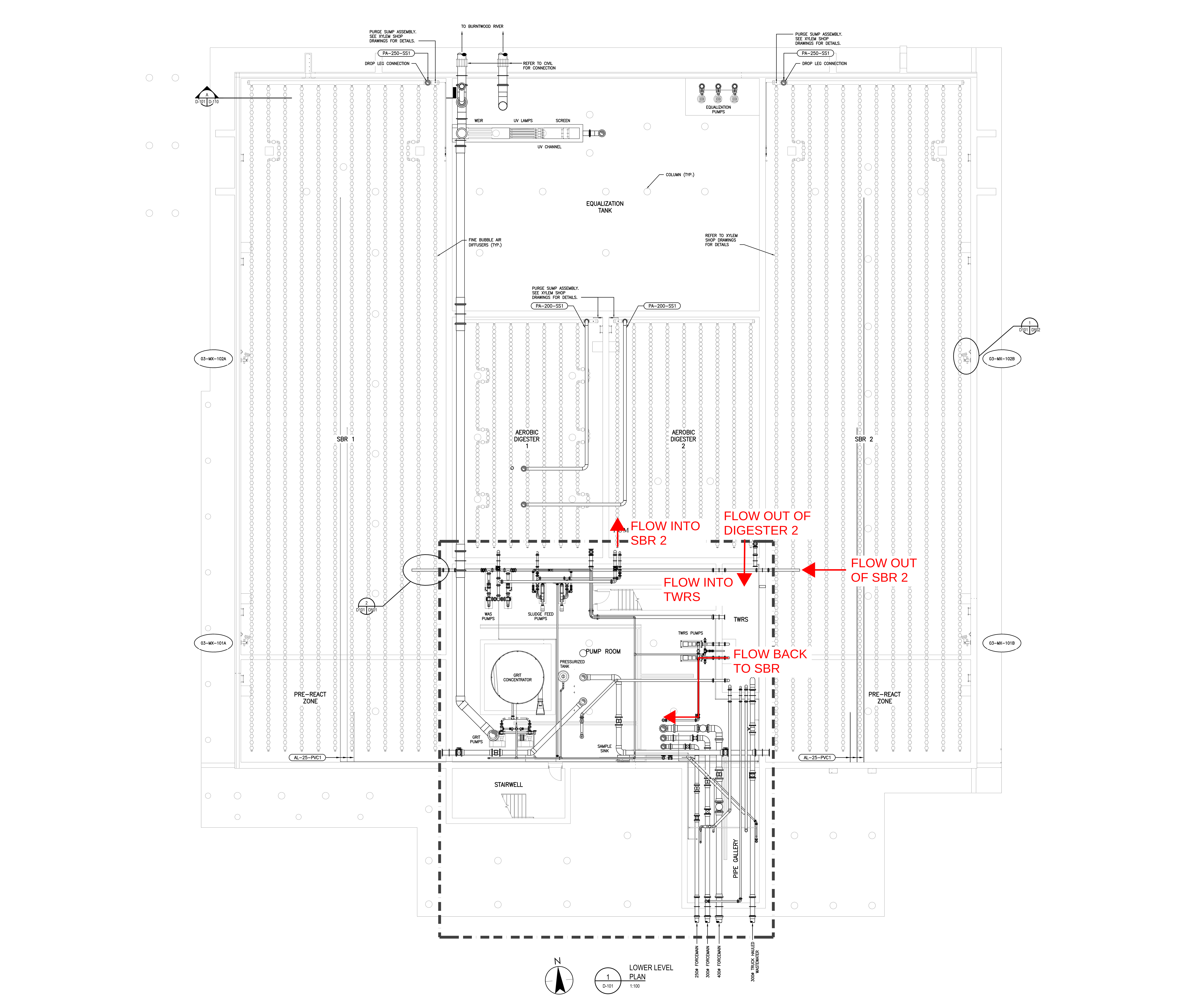
Cause: It was discovered onsite that the sludge blanket in Sequence Batch Reactor (SBR) 2 had reached the height of the decanter arm, causing the top of the sludge blanket to be drawn into the decanter arm, and subsequently sent through the UV lamps. Thus sending high TSS effluent discharge to the river. Once this was witnessed, decanting in SBR 2 was stopped immediately.

Future Plans: It was discovered that the cause of the excessive sludge build up was due to cycling of sludge throughout the plant because the centrifuge was not yet operational (sludge did not meet suspended solids requirements for start up at time of last test). The waste activated sludge from SBR 2 was being pumped to Aerobic Digester 2 as per design, but Aerobic Digester 2 was decanting sludge into the Trucked Water Receiving Station (TWRS) tank, instead of water. This caused sludge to get sent back into the SBRs, allowing a buildup of sludge to occur in SBR 2. Bird turned SBR 2 into a sludge holding tank, will start the centrifuge to remove the digested sludge from the Aerobic Digesters and dewater it as per the design. Digested sludge samples were taken on November 18, and results received on November 20 showed that the sludge concentrations were adequate for centrifuge started up. Bird will also truck out sludge from SBR 2 to the lagoon, until the centrifuge is running (scheduled for December 3, 2019 due to vendor availability) and the sludge levels are back to suitable conditions.

Flow amount: Discharge flowmeter reading at the time of discovery was 71 L/s, but 20 minutes before that, it was 17 L/s. This shows that the water had just begun decanting from SBR 2, as the Equalization pumps had recently started pumping more to keep up with the decanting process. Flow is not constant through the discharge, but using the average flows between 71 L/s and 17 L/s over the 30 minute period, it can be determined that approximately 97.2 m3 of high TSS effluent was discharged.

Solution: Centrifuge was started up on December 3, 2019 and will run continuously during working hours, in conjunction with septic trucks, until the sludge has been reduced to operable conditions and SBR 2 is no longer being used a sludge holding tank

Attachments: Thompson WWTP Lower Level Plan



Stantec

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Legend

Notes

1. USE OF MECHANICAL COUPLINGS ARE ACCEPTABLE ON LARGE DIAMETER PIPIPNG (<450mm DIAMETER) TO FACILITATE INSTALLATION.

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD
D ISSUED FOR CONSTRUCTION	JB	SKB	17.05.24
C ISSUED FOR TENDER	JB	SKB	17.03.03
B ISSUED FOR 95% REVIEW	JB	SKB	16.02.05
A ISSUED FOR 66% REVIEW	JB	SKB	15.12.04

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	FO	SKB	JB	15.11.30

Permit-Seal

ORIGINAL SEALED BY S.K. BASU P. ENG. 17/03/03

APEGM
Certificate of Authorization
Stantec Consulting Ltd.
No. 1301

Client/Project

CITY OF THOMPSON
WASTEWATER TREATMENT PLANT UPGRADES
AND ASSOCIATED WORKS
MWSB 1265

Thompson, MB Canada

Title

LOWER LEVEL PLAN

Project No. 111214442

Scale 1:100 (0 1000 3000 5000)

Drawing No. D-101

Sheet 1 of 15

Revision 0