



JUNE 2019 MONTHLY REPORT
City of Thompson
Wastewater Treatment Plant Upgrades & Associated Works
MWSB 1265
Construction Phase

Prepared By:

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111214442



The information provided in the document titled "City of Thompson Wastewater Treatment Plant Upgrades & Associated Works - Monthly Report for June, 2019" has been prepared by Stantec Consulting Ltd. ("Stantec") for the exclusive use of Manitoba Water Services Board (MWSB), Manitoba Sustainable Development and the City of Thompson (the "Client"). The information contained within is not to be reproduced, copied, or distributed in part or whole by a third party without written authorization from Stantec Consulting Ltd.

1 Progress for the Month of June and Forward Look to July

Monthly progress:

The following presents a key summary of the construction activities for this reporting period:

- Introduction of sewage into the new WWTP occurred on June 14, 2019. Raw wastewater from CNR, Nelson and Riverside lift stations are now flowing into the new WWTP for processing influent.
- The following process systems related to the IOS were completed, checked, tested, and are in operation, including associated system control panels, electrical, and instrumentation monitoring equipment:
 - Headworks screening system.
 - Grit dewatering system.
 - Blower units and fine bubble air diffusers in SBR and Digester tanks.
 - SBR decanting system.
 - Equalization pump system and UV disinfection system.
 - Flushing water system.
 - TWRS discharge pump system.
- Razar worked on the following:
 - Completed installation of process mechanical systems, including the odor control biofilter system.
 - Completed time and material work for PCN's 36R2 and 39R2; additional drain piping from pre-selected Vendor's equipment and drain piping revisions in TWRS tank, respectively.
 - Completed installation of all plumbing and sanitary equipment, including plumbing fixtures.

- Engaged Nothart to complete pump performance testing of the flushing water pumps, equalization pumps, WAS pumps, dewatering pumps, and potable water booster pumps
- East Side Ventilation worked on the following:
 - Completed all outstanding ductwork associated with ERV-2, including vent pipes to Aerobic Digesters, TWRS and Headworks influent channel.
- Thermo Insulators worked on the following:
 - Completed pipe insulation c/w PVC jacket on interior domestic water piping, except in Biofilter Mech Room.
 - Completed insulation on interior HVAC ductwork.
 - Completed insulation c/w metal jacket on ERV-1 exterior ductwork.
 - Most of the insulation c/w metal jacket is complete on ERV-2 exterior ductwork.
- CES worked on the following:
 - Completed electrical work and energized systems related to IOS as mentioned at beginning of this report.
 - Completed installation and energized interior light fixtures throughout, except in Corridor, Headworks, Entrance Foyer and stairs.
 - Power receptacles are in progress throughout; approx. 75% complete.
 - Fire alarm system is in progress throughout; approx. 75% complete. Heat detector loops are installed, but not terminated.
 - Security system is in progress; approx. 20% complete. Intrusion alarms are installed at roof access hatches.
 - Electrical instrumentation equipment is in progress; approx. 80% complete.
 - Heat trace panels are installed in Biofilter Mech Room.

- Conduit and junction boxes are roughed in for exterior parking receptacles.
- Celco continued to work on PLC and SCADA integration in preparation for introduction of sewage. Ran through I/O checks to vendor equipment panels, and WWTP systems. Programming is ongoing.
- Oakwood Roofing completed replacement of the non-conforming roofing system on UV Building. Finished installing cap sheet on the flat roof portions, including on entrance canopy. Parapet cap flashing is done, except some outstanding on UV Building. Approx. 90% of the black cap warning strip is installed. Parapet flashing, scuppers, and plumbing vent stack jack flashings are outstanding.
- Duperon's technician was on site, corrected deficiencies and completed wet startup of FlexRake bar screen system in Headworks and Biofilter Mech Room.
- Hydro International's technicians were on site, set up grit pumps, and completed wet startup test of its grit removal system.
- Trojan Technologies and EDA Environmental technicians were on site, ran through wet startup of UV disinfection system.
- Site work:
 - Concrete walls are poured for the exterior entrance stair and ramp. Formwork is in progress for the stairs and ramp slab.
 - Parking lot construction is in progress on south side of building. Smook completed subgrade excavation, placed 150 mm granular sub-base on geotextile and some 50 mm granular sub-base. Construction has not started on the west side.
 - Bird formed and placed the reinforced concrete apron pad along the Dewatering Building. Protection bollards are set in place adjacent the overhead doors.
- Buus continued to pressure test the new 400 mm FM. Found and repaired several leaks. Retesting of FM ongoing.

Work anticipated for next month:

- The non-compliant areas of the insulated roofing system will be replaced on the UV Building and 101800 Level Building.
- Work to complete all outstanding exterior building trims, flashings, louvers, caulking etc to be completed.
- Exterior guardrails and metal stair to be completed at the loading dock.
- Exterior concrete works will be ongoing for the barrier free access ramp and main entrance stair.
- Exterior concrete works will tentatively commence for the paving slab at south side of Dewatering Building.
- Work to complete millwork, furnishings, acoustic ceiling tiles, light fixtures, grilles, trims, etc in the Administration rooms.
- Finish installing ceiling fans, detectors, emergency exit devices, fire alarm system, security hardware in Corridor and Administration rooms.
- Razar is in process of engaging its supplier field reps to inspect and commission the installed equipment
- Continue installing light fixtures throughout the main and upper floor levels and in stairwells.
- Work to complete cable pulls and terminations for electrical, HVAC and process mechanical systems throughout.
- Finish pressure testing 400mm forcemain and place into service.
- Complete Cree Road LS pump performance testing in presence of Stantec. Commission LS controls and place into service.
- Continue WWTP siteworks including parking lot construction.

2 Contract Administration Services (Non-resident and Resident)

The designated Contract Administrator for Stantec is Robert De Koninck. Resident inspector is Perry Piwniuk. Ongoing Contract Administration services by Stantec for this reporting period include the following key tasks:

- Maintain daily logs and site photos using Procore, a construction management software program.
- Update RFI tracking log (see attached).
- Update Shop Drawing log (see attached).
- Update PCN and CO log (see attached).
- Update SI tracking log (see attached).
- Shop drawing submissions and reviews are ongoing.
- Perform daily walk arounds to review work in progress and assess for project conformance.
- Maintain regular and ongoing liaison with Bird Construction on project related issues.
- Biweekly construction & commissioning meetings with Bird, MWSB and the City are being held. Minutes are taken and issued by Stantec.

3 Areas of Concern

During the first week following introduction of sewage, Birds performance with diagnosing issues that were encountered was unsatisfactory. Bird did not appear to put much effort into diagnosing issues which allowed the issues to persist for longer periods of time. A brief description of the issues that occurred following introduction of sewage are as follows:

1. TWRS chopper pump low flows – Upon introduction of sewage the TWRS chopper pumps were not keeping pace with the incoming flows to the TWRS. Bird reacted by installing a temporary submersible pump in the TWRS to keep the operating level in check. Bird indicated onsite that there was a problem with the pumps but did not appear to investigate further to diagnose what the problem was. Since Bird did not appear to be working on diagnosing the issue, Stantec stepped in and aided Razar to figure out the cause. Stantec diagnosed the issue as a partially closed

valve on the discharge of the pumps, which Razar found and opened. The TWRS chopper pumps were then able to perform as designed. Bird will need to review and advise if the TWRS chopper pumps have been negatively impacted by operating under low flow conditions for several days.

2. Flushing water excess unidentified demands – Upon introduction of sewage the flushing water flows were observed to be around 15 L/s with all 3 pumps running when the expected flow should have been 1.6 L/s up to 3.5 L/s with only 1 pump running. Bird reacted by turning off one pump to reduce the amount of flushing water flow. Stantec advised Bird that the flows and pressures appeared to point to unidentified flushing water demands and reminded Bird of their responsibility to review the installation and find them. Bird found one source of extra flushing water demands, open valves on the suction side of the grit pumps where the actuator and valve were not clocked to each other. Bird reported the finding via email noting they resolved the issue and reviewed the remainder of the system and found no other valves open. Stantec noted the flushing water flows were still around 8 L/s and advised Bird that additional unidentified flushing water demands persisted. Razar later traced the issue to a solenoid valve on the flushing water line to the grit system Teacup, closing off the valve brought the flushing water demands down to the expected flowrates.
3. Bird have shown improvement in their operation and in their ability to diagnose issues with the facility.

Bird has not provided a remedial plan for correcting the damage they caused to the dewatered sludge conveyor. Bird had mentioned that Andritz will review the conveyor when they return to site for the centrifuge commissioning. That will occur several weeks from now once the process has developed to the point where there is sufficient sludge for wasting.

Nothart indicated to Bird that the flushing water pumps are currently running at an undesirable duty point. Bird passed this onto Stantec during the last commissioning meeting. Stantec reviewed the current operation against the operation sequence described and suspect that the programming for operation of the flushing water pumps may be incomplete. Stantec will be reviewing the sequence of operation in more detail during the next site review. Stantec is also reviewing the option to incorporate the flushing water pressure tank into the system during periods of lower flow which will adjust the duty point of the pumps due to the increase in flow when refilling the tank. Once the tank is full, the pumps would shut off until the tank has emptied and pressure in the system drops

to the point where the pumps turn back on. It appears only minor programming changes should be required to achieve this functionality as the inlet valve on the pressure tank will need to be reprogrammed to be normally open, and the pump start/stop setpoints should already be setup to be user adjustable.

Bird has not submitted a complete overall training plan. Bird has submitted the individual training plans for the SBR package, Grit system and UV system. Bird has been reminded several times of the requirement to submit a complete training plan.

Bird has not submitted all the O&M Manuals for the WWTP. The manuals for the SBR package, UV system, grit system, dewatering centrifuge, biofilter and the Xylem lift station control panels have been submitted. Bird has been reminded several times of the requirement to submit the complete O&M Manuals in compliance with the specifications.

4 Review of Incidents

Bird did not report any safety related incidents in June.

5 Schedule

Bird has not provided an updated schedule for the project since the introduction of sewage. Based on the sewage introduction date of June 14th, Stantec anticipates the acceptance testing to occur in August 2019. Bird is not ready to begin the 14-day mechanical performance verification testing. It is uncertain when Bird will be ready to conduct the performance verification testing as the chemical feed systems and HVAC have not been started up.

The pressure testing of the new 400mm FM has been in progress since the end of May. Buus continues to encounter leaking fittings and couplers. The completion of FM pressure testing is impacting the timeline for introducing sewage from Cree Road lift station to the WWTP. Without the sewage from Cree RD LS the biological process will take longer to develop due to lower incoming flows and sewage loading. The lagoon will remain in use until the FM testing is complete and accepted. The contractor indicates the FM pressure testing should be complete in early July and can be put into service shortly afterwards.

6 Summary of Process Development

Sewage was introduced into the WWTP on June 14, 2019. Sewage flow to the old sewage treatment plant from Nelson Road lift station and Riverside lift station has been diverted to the new WWTP. The City's existing lagoon remains in service as the pressure testing of the new forcemain from Cree Road lift station to the new WWTP remains in progress. It is anticipated that sewage from Cree Road lift station will be transferred to the new WWTP by mid-July. Daily influent and effluent flows through the new WWTP are being monitored and tracked.

	Total Daily Flow (m ³ /day)	
	Influent	Effluent
14-Jun-19	654.4	18.0*
15-Jun-19	3866.7	970.11*
16-Jun-19	3828.8	167.1*
17-Jun-19	4066.6	1339.5*
18-Jun-19**	3946.6	3747.3
19-Jun-19	3952.3	3719.4
20-Jun-19	4102.7	3929.3
21-Jun-19	4462.7	3783.3
22-Jun-19	4195.8	4131.8
23-Jun-19	4497.8	3972.6
24-Jun-19	4775.4	4033.8
25-Jun-19	4289.5	4114.9
26-Jun-19	4387.2	4146.7
27-Jun-19	4248.7	4416.1
28-Jun-19	4329.0	4118.3
29-Jun-19	3950.8	4122.7
30-Jun-19	4045.8	3911.4
1-Jul-19	3979.7	3855.2
2-Jul-19	4454.6	3804.7
3-Jul-19	4369.9	4141.3
4-Jul-19	4212.6	4161.6
5-Jul-19	4289.9	4005.6
6-Jul-19	4090.4	3281.4
7-Jul-19	4090.3	4429.9

8-Jul-19	4150.3	3857.8
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* Equalization tank prefilled with clean water for flushing water system

** Start of decant cycles

Bird has started sampling to monitor the development of the process and in conformance with the agreed upon monitoring requirements for the facility until acceptance testing is complete. The results from one (1) sampling set have been received thus far and a copy is attached for reference. Sample result summary as follows:

Sample Date: June 19, 2019

Parameter:	Influent	Effluent	unit
Alkalinity, Bicarbonate	377	221	mg/L
Total Alkalinity	309	181	mg/L
Total Ammonia	18.5	0.51	mg/L
BOD	460	25.5	mg/L
Total Phosphorus	4.84	2.13	mg/L
Total Kjeldahl Nitrogen	34.7	27.3	mg/L
Total Suspended Solids	1120	6.8	mg/L
pH	7.21	7.46	

7 Construction Pictures (See Attached)

The attached image report was generated from the Procore management software program.

Forcemain 2019

Description

Taken Date
2019/06/26 16:15:02

Upload Date
2019/07/03 23:14:25

Uploaded By
Perry Piwniuk

File Name
[P6262621.JPG](#)

Location
Forcemain



Forcemain 2019

Description

Taken Date
2019/06/25 16:26:52

Upload Date
2019/07/03 22:52:04

Uploaded By
Perry Piwniuk

File Name
[P6252487.JPG](#)

Location
Forcemain



Forcemain 2019

Description

Taken Date
2019/06/14 07:47:46

Upload Date
2019/06/14 23:26:50

Uploaded By
Perry Piwniuk

File Name
[P6140858.JPG](#)

Location
Forcemain



Forcemain 2019

Description

Forcemain repair on
Burntwood at Oak St. -
Electro-fusion coupling
removed and replaced w/
x2 Robar couplings.

Taken Date
2019/06/12 13:03:10

Upload Date
2019/06/15 11:39:41

Uploaded By
Perry Piwniuk

File Name
[IMG_0952.JPG](#)

Location
Forcemain



Sitework WWTP June 2019

Description

Taken Date
2019/06/26 10:42:10

Upload Date
2019/07/03 22:11:48

Uploaded By
Perry Piwniuk

File Name
[P6262562.JPG](#)

Location
Site work



Sitework WWTP June 2019

Description

Taken Date
2019/06/25 09:50:33

Upload Date
2019/06/25 23:42:27

Uploaded By
Perry Piwniuk

File Name
[P6252309.JPG](#)

Location
Site work



Sitework WWTP June 2019

Description

Taken Date
2019/06/20 12:27:56

Upload Date
2019/06/20 13:35:35

Uploaded By
Perry Piwniuk

File Name
[P6202186.JPG](#)

Location
Site work



Sitework WWTP June 2019

Description

Taken Date
2019/06/20 12:25:29

Upload Date
2019/06/20 13:36:03

Uploaded By
Perry Piwniuk

File Name
[P6202179.JPG](#)

Location
Site work



Sitework WWTP June 2019

Description

Taken Date
2019/06/18 17:00:15

Upload Date
2019/06/18 17:56:51

Uploaded By
Perry Piwniuk

File Name
[P6181846.JPG](#)

Location
Site work



Sitework WWTP June 2019

Description

Taken Date
2019/06/16 11:44:43

Upload Date
2019/06/16 17:01:30

Uploaded By
Perry Piwniuk

File Name
[P6161134.JPG](#)

Location
Site work



Sitework WWTP June 2019

Description

Taken Date
2019/06/15 16:16:35

Upload Date
2019/06/16 00:02:35

Uploaded By
Perry Piwniuk

File Name
[P6151027.JPG](#)

Location
Site work



Sitework WWTP June 2019

Description

Taken Date
2019/06/11 12:23:23

Upload Date
2019/06/11 23:20:48

Uploaded By
Perry Piwniuk

File Name
[P6110606.JPG](#)

Location
Site work



Sitework WWTP June 2019

Description

Taken Date
2019/06/04 10:20:13

Upload Date
2019/06/04 22:17:24

Uploaded By
Perry Piwniuk

File Name
[P6049950.JPG](#)

Location
Site work



Sitework WWTP June 2019

Description

Taken Date
2019/06/04 09:56:27

Upload Date
2019/06/04 22:16:49

Uploaded By
Perry Piwniuk

File Name
[P6049945.JPG](#)

Location
Site work



Construction WWTP June 2019

Description

Taken Date
2019/06/26 10:48:58

Upload Date
2019/07/03 18:41:57

Uploaded By
Perry Piwniuk

File Name
[P6262570.JPG](#)

Location
Building



Construction WWTP June 2019

Description

Taken Date
2019/06/25 17:29:26

Upload Date
2019/07/03 17:44:10

Uploaded By
Perry Piwniuk

File Name
[P6252532.JPG](#)

Location
Building



Construction WWTP June 2019

Description

Taken Date
2019/06/25 17:23:38

Upload Date
2019/07/03 17:25:05

Uploaded By
Perry Piwniuk

File Name
[P6252526.JPG](#)

Location
Building



Construction WWTP June 2019

Description

Taken Date
2019/06/25 17:21:45

Upload Date
2019/07/03 17:34:06

Uploaded By
Perry Piwniuk

File Name
[P6252514.JPG](#)

Location
Building



Construction WWTP June 2019

Description

Taken Date
 2019/06/25 10:41:55

Upload Date
 2019/07/03 12:17:55

Uploaded By
 Perry Piwniuk

File Name
[P6252407.JPG](#)

Location
 Building



Construction WWTP June 2019

Description

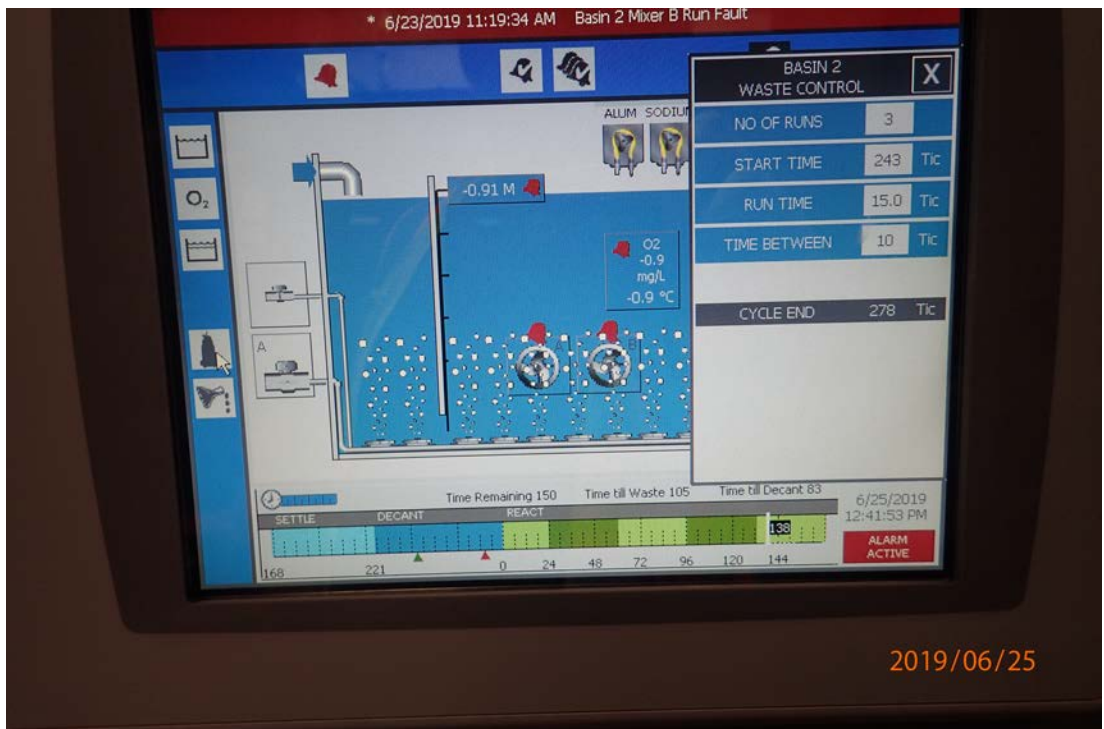
Taken Date
 2019/06/25 10:36:19

Upload Date
 2019/06/26 08:36:28

Uploaded By
 Perry Piwniuk

File Name
[P6252370.JPG](#)

Location
 Building



Construction WWTP June 2019

Description

Taken Date
2019/06/20 12:35:30

Upload Date
2019/06/20 14:03:28

Uploaded By
Perry Piwniuk

File Name
[P6202216.JPG](#)

Location
Building



Construction WWTP June 2019

Description

Taken Date
2019/06/20 12:34:41

Upload Date
2019/06/20 14:02:48

Uploaded By
Perry Piwniuk

File Name
[P6202212.JPG](#)

Location
Building



Construction WWTP June 2019

Description

Taken Date
2019/06/20 12:17:30

Upload Date
2019/06/20 13:58:40

Uploaded By
Perry Piwniuk

File Name
[P6202159.JPG](#)

Location
Building



Construction WWTP June 2019

Description

Taken Date
2019/06/14 10:28:18

Upload Date
2019/06/14 23:33:17

Uploaded By
Perry Piwniuk

File Name
[P6140878.JPG](#)

Location
Building






Bird Construction
ATTN: Matthew Hoyt
Bird Construction
17007 - 107 Avenue
Edmonton AB T3S 1G3

Date Received: 25-JUN-19
Report Date: 05-JUL-19 10:06 (MT)
Version: FINAL

Client Phone: 780-660-6254

Certificate of Analysis

Lab Work Order #: L2297757
Project P.O. #: NOT SUBMITTED
Job Reference: CITY OF THOMPSON MB WWTP
C of C Numbers:
Legal Site Desc:


Quinn Gurdibaniuk
Account Manager

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ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2297757-1 EFFLUENT 1 Sampled By: CLIENT on 06-JUN-19 @ 21:41 Matrix: EFFLUENT Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate Bicarbonate (HCO3)	221		1.2	mg/L		26-JUN-19	
Alkalinity, Carbonate Carbonate (CO3)	<0.60		0.60	mg/L		26-JUN-19	
Alkalinity, Hydroxide Hydroxide (OH)	<0.34		0.34	mg/L		26-JUN-19	
Alkalinity, Total (as CaCO3) Alkalinity, Total (as CaCO3)	181		1.0	mg/L		25-JUN-19	R4687366
Miscellaneous Parameters							
Ammonia, Total (as N)	0.51		0.10	mg/L		26-JUN-19	R4689468
BOD Carbonaceous	25.5		6.0	mg/L		26-JUN-19	R4691691
Phosphorus (P)-Total	2.13		0.030	mg/L		02-JUL-19	R4692451
Total Kjeldahl Nitrogen	27.3		2.0	mg/L	28-JUN-19	02-JUL-19	R4692235
Total Suspended Solids	6.8		2.0	mg/L		02-JUL-19	R4692638
pH	7.46		0.10	pH units		25-JUN-19	R4687366
L2297757-2 INFLUENT 1 Sampled By: CLIENT on 06-JUN-19 @ 21:50 Matrix: EFFLUENT Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate Bicarbonate (HCO3)	377		1.2	mg/L		26-JUN-19	
Alkalinity, Carbonate Carbonate (CO3)	<0.60		0.60	mg/L		26-JUN-19	
Alkalinity, Hydroxide Hydroxide (OH)	<0.34		0.34	mg/L		26-JUN-19	
Alkalinity, Total (as CaCO3) Alkalinity, Total (as CaCO3)	309		1.0	mg/L		25-JUN-19	R4687366
Miscellaneous Parameters							
Ammonia, Total (as N)	18.5		1.0	mg/L		26-JUN-19	R4689468
BOD Carbonaceous	460		100	mg/L		26-JUN-19	R4691691
Phosphorus (P)-Total	4.84		0.030	mg/L		02-JUL-19	R4692451
Total Kjeldahl Nitrogen	34.7		2.0	mg/L	28-JUN-19	02-JUL-19	R4692235
Total Suspended Solids	1120		30	mg/L		02-JUL-19	R4692638
pH	7.21		0.10	pH units		25-JUN-19	R4687366

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO ₃ ²⁻ /L.			
ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO ₃ ⁻ /L.			
ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH ⁻ /L.			
ALK-TITR-WP	Water	Alkalinity, Total (as CaCO ₃)	APHA 2320B
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO ₃ ⁻ and H ₂ CO ₃ endpoints indicated electrometrically.			
BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B
Samples are diluted and seeded, have TCMP added to inhibit nitrogenous demands, and then are incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
N-TOTKJ-WP	Water	Total Kjeldahl Nitrogen	APHA 4500 NorgD (modified)
Aqueous samples are digested in a block digester with sulfuric acid and copper sulfate as a catalyst. Total Kjeldahl Nitrogen is then analyzed using a discrete analyzer with colorimetric detection.			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L
This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aqueous matrices is determined gravimetrically after drying the residue at 103 105°C.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2297757

Report Date: 05-JUL-19

Page 1 of 4

Client: Bird Construction
 Bird Construction 17007 - 107 Avenue
 Edmonton AB T3S 1G3

Contact: Matthew Hoyt

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP								
	Water							
Batch	R4687366							
WG3088529-19	LCS							
Alkalinity, Total (as CaCO3)			104.0		%		85-115	25-JUN-19
WG3088529-16	MB							
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	25-JUN-19
BOD-CBOD-WP								
	Water							
Batch	R4691691							
WG3088442-4	DUP	L2297757-1						
BOD Carbonaceous		25.5	26.3		mg/L	3.1	20	26-JUN-19
WG3088442-2	LCS							
BOD Carbonaceous			98.2		%		85-115	26-JUN-19
WG3088442-1	MB							
BOD Carbonaceous			<2.0		mg/L		2	26-JUN-19
N-TOTKJ-WP								
	Water							
Batch	R4692235							
WG3091070-10	LCS							
Total Kjeldahl Nitrogen			101.0		%		75-125	02-JUL-19
WG3091070-6	LCS							
Total Kjeldahl Nitrogen			101.8		%		75-125	02-JUL-19
WG3091070-5	MB							
Total Kjeldahl Nitrogen			<0.20		mg/L		0.2	02-JUL-19
WG3091070-9	MB							
Total Kjeldahl Nitrogen			<0.20		mg/L		0.2	02-JUL-19
NH3-COL-WP								
	Water							
Batch	R4689468							
WG3090325-32	LCS							
Ammonia, Total (as N)			97.6		%		85-115	26-JUN-19
WG3090325-31	MB							
Ammonia, Total (as N)			<0.010		mg/L		0.01	26-JUN-19
P-T-COL-WP								
	Water							
Batch	R4692451							
WG3092355-2	LCS							
Phosphorus (P)-Total			98.6		%		80-120	02-JUL-19
WG3092355-1	MB							
Phosphorus (P)-Total			<0.0030		mg/L		0.003	02-JUL-19
PH-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-WP	Water							
Batch	R4687366							
WG3088529-17 LCS								
pH			7.38		pH units		7.3-7.5	25-JUN-19
SOLIDS-TOTSUS-WP	Water							
Batch	R4692638							
WG3091740-3 DUP		L2297757-1						
Total Suspended Solids		6.8	7.1		mg/L	3.8	20	02-JUL-19
WG3091740-2 LCS								
Total Suspended Solids			100.9		%		85-115	02-JUL-19
WG3091740-1 MB								
Total Suspended Solids			<2.0		mg/L		2	02-JUL-19

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Quality Control Report

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Total Suspended Solids	1	06-JUN-19 21:41	02-JUL-19 08:00	7	25	days	EHTR
	2	06-JUN-19 21:50	02-JUL-19 08:00	7	25	days	EHTR
pH	1	06-JUN-19 21:41	25-JUN-19 12:00	0.25	446	hours	EHTR-FM
	2	06-JUN-19 21:50	25-JUN-19 12:00	0.25	446	hours	EHTR-FM
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	1	06-JUN-19 21:41	25-JUN-19 12:00	14	19	days	EHTR
	2	06-JUN-19 21:50	25-JUN-19 12:00	14	19	days	EHTR
Aggregate Organics							
Carbonaceous BOD	1	06-JUN-19 21:41	26-JUN-19 07:00	48	465	hours	EHTR
	2	06-JUN-19 21:50	26-JUN-19 07:00	48	465	hours	EHTR

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2297757 were received on 25-JUN-19 08:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affidavit



L2297757-COFC

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Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																																																									
Company: Bird Construction		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																																																									
Contact: Matthew Hoyt		Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Day)		EMERGENCY																																																							
Phone: 780-660-6254		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			4 day [P4-20%] <input type="checkbox"/>		1 Business day [E - 100%] <input type="checkbox"/>																																																							
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Street: 17007 - 107 Avenue		Email 1 or Fax janice.overend@bird.ca			Date and Time Required for all E&P TATs:					dd-mmm-yy hh:mm																																																				
City/Province: Edmonton, AB		Email 2 eric.hinse@bird.ca; matthew.hoyt@bird.ca			For tests that can not be performed according to the service level selected, you will be contacted.																																																									
Postal Code: T5S 1G3		Email 3 devon.macpherson@bird.ca			Analysis Request																																																									
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Project Information		Oil and Gas Required Fields (client use)			SUSPECTED HAZARD (see Special Instructions)																																																									
ALS Account # / Quote #: W8234		AFE/Cost Center: PO#																																																												
Job #: City of Thompson MB WWTP		Major/Minor Code: Routing Code:			<table border="1"> <tr> <th></th> <th>COBOD5</th> <th>SOLIDS-TOTSUS</th> <th>pH</th> <th>Ammonia-N</th> <th>TKN</th> <th>TP</th> <th>Alkalinity</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>											COBOD5	SOLIDS-TOTSUS	pH	Ammonia-N	TKN	TP	Alkalinity																																								
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ALS Lab Work Order # (lab use only):		ALS Contact:			Sampler:			<table border="1"> <tr> <th></th> <th>COBOD5</th> <th>SOLIDS-TOTSUS</th> <th>pH</th> <th>Ammonia-N</th> <th>TKN</th> <th>TP</th> <th>Alkalinity</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>											COBOD5	SOLIDS-TOTSUS	pH	Ammonia-N	TKN	TP	Alkalinity																																					
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	X	X	X	X	X	X	X																																																							
Drinking Water (DW) Samples ¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																																																									
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																																									
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																																									
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SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)																																																						
Released by: ERIC HOYT		Date: 06-24-19		Time: 09:00		Received by: Jone		Date: 25/19		Time: 8:30		Received by: CEL		Date: "		Time: 9:49																																														

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NOV 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.