TOWN OF LAKE COWICHAN

Public Works and Environmental Services Committee
Tuesday, October 15th, 2019 at 6:00 p.m. – Council Chambers

AGENDA

1. CALL TO ORDER **Page #**

INTRODUCTION OF LATE ITEMS (if applicable)

2. APPROVAL OF AGENDA

3. BUSINESS ARISING AND UNFINISHED BUSINESS

(a) Superintendent, Public Works and Engineering Services re: WTP Update **3**

(b) Ongoing Items Still Being Addressed:

(i) CLEC Water System-Update.
(ii) Updating of Signage – river, Legion, etc.
(iii) In vessel composting system

4. DELEGATIONS AND REPRESENTATIONS

None.

5. CORRESPONDENCE

None.

6. VERBAL COMMENT FROM THE PUBLIC ON A SUBSEQUENT ITEM ON THE AGENDA–
(maximum 3 minutes per speaker and maximum time allotted 15 minutes)

7. REPORTS

(a)	Superintendent, Public Works and Engineering Services re: Summary report.	**5**
(b)	Superintendent, Public Works and Engineering Services re: Hydraulic capacity and Modelling Analysis.	**7**
(c)	Superintendent, Public Works and Engineering Services re: Water Siphon at the North Shore Pump Station.	**9**
(d)	Superintendent, Public Works and Engineering Services re: Ministry of Environment and Client Change Strategy – Warning Letter.	**11**
(e)	Superintendent, Public Works and Engineering Services re: Town Water Reservoir.	**13**

8. NEW BUSINESS

(a) Installation of Soda Ash system.
(b) Crosswalk on Cowichan Ave. W for school crossing and no parking across on South Shore Road.

9. NOTICES OF MOTION

10. PUBLIC RELATIONS ITEMS

11. <u>QUESTION PERIOD</u> (maximum 3 minutes per speaker and maximum time allotted 15 minutes)
- Limited to items on the agenda

12. ADJOURNMENT

Please note: Should this meeting end sooner than 7:00 p.m., the next meeting may start no later than 10 minutes after adjournment of this meeting.

Memo

TO: Chief Administrative Officer

SUBJECT: WTP update

DATE: October 11, 2019

FROM: Superintendent, Public Works and Engineering Services

Background

In the morning of Sept 19th 2019, Mayor Peters, the Superintendent, other Town personnel met with consulting engineer Shaun Swarbrick and Bartek Puchajda from Stantec. The purpose of the meeting was to commission the filters for the backwash camber and provide a walk through to for Archie Johnstone Plumbing to provide a quote for installation of the Soda Ash system.

In the afternoon, members from Island Health was given a tour to view the progress of the WTP and to inspect the commissioning of the filters.

Backwash Chamber and Turbidly

To reduce the concentrations of water turbidity, filters in the WTP are used to remove sand and other particulates from the water. To maintain the filters, backwashing needs to occur which consists of pumping water backwards through the filters to be cleaned. The backwashing is triggered after a set time interval or when the filter effluent turbidity is greater than the treatment guidelines.

The check values on the backwash chamber have been installed and the Process Engineer Bartek Puchajda from Stantec was working with the town water operators to commission the filters. Unfortunately the check valves exhibited a leak and the filters could not be commissioned.

Tritech is continuing to work with the supplier, Stantec and Town operations to resolve this issue. Testing of the check valves were conducted on 10th and 11th of Oct. The issue has not yet been resolved.

As of today, the average turbidity level is under 0.5 NTUs. The acceptable standard is 3.0 NTU for a boil water advisory. The commissioning of the filters is not an issue at the moment.

Soda Ash System:

pH is an indicator of the acid or alkaline condition of water. The pH scale ranges from 0-14; 7 indicates the neutral point. The normal pH range of drinking water is 6 – 8.5. The pH is mostly a result of natural geological conditions at the site and the type of minerals found in the local rock.

Soda ash will be introduced into the water systems to raise the pH of acidic water to near neutral. Soda is ash to be introduced to the water system by injection.

During the walk through with members from Archie Johnstone Plumbing, the WTP drawings of the Soda Ash System were reviewed with the contractor.

The contractor will be providing a quote for the supply and installation of the system. We are expecting the quote to be half of what was originally quoted by Tritech.

Paving

Duncan paving completed their compaction testing on the Oct 2nd. Due to the weather, a number of projects have been delayed for Duncan Paving. The paving is now scheduled to be completed by Oct 20th.

Other Deficiencies

There are 8 other deficiencies listed on the 8-Oct-19 field report. Those deficiencies involve minor works such as a counter installment or an eye wash station. These deficiencies would not affect the overall commissioning of the WTP.

Kam So, P.Eng
Superintendent, Public Works and Engineering Services

Memo

TO: Chief Administrative Officer

SUBJECT: Summary Report for PWS - Oct

DATE: October 11, 2019

FROM: Superintendent, Public Works and Engineering Services

Summary Report for PWS - Oct

Reviewed reports

- Wastewater Treatment Plant Upgrade – Dayton & Knight (2008)
- 2018 Town of Lake Cowichan Sewage Lagoon Effluent Discharge – SLR
- 2013 Sewer CCTV Inspection and Smoke Testing Program - OPUS
- 2015 Sewer CCTV Inspection and Smoke Testing Program – OPUS
- 2013 Infiltration and Inflow Assessment Review – OPUS
- Integrated Rainwater Management Plan – 2014
- Lake Cowichan – Fire Service Study -2011
- Pump Stations – Operational Analysis and Upgrading
- Water Treatment Plant Tender
- Defining Levels of Service Report – CVRD
- Strathcona Regional District AMP –
- 2019 Hydraulic Capacity and Modeling Analysis – GeoAdvice 2019
- Lake Cowichan First Nation Water Modeling and Service Analysis - 2019

Asset Management Plan

- Compiled inventory for Roads, Stormwater, Water Network, Sewage, Parks
- Still to come, Fleet inventory and lighting.
- Compiled Conditions of Asset Portfolios.
- Developed Level of Service
- Developed Risk Assessment
- Proposed Work Plans.
- Attended AM conference with CVRD

Ongoing Capital Projects

- River Road Boaster Station Upgrade – BCBid – Competition closes on 18-Oct.
- Sewage Lagoon Slope Stability – BCBid – Competition closes on 1-Nov.
- Asset Management RFP – Competition closes on 18-Oct.
- North Shore Water Intake – Genset – Stantec
- Working on deficiency requirements for the WTP with Stantec.

Ongoing Maintenance

- Lawn care rehabilitation for the Centennial Park Upgrade
- Reservoir Cleaning Planning – Remote
- Works to rehabilitate Sahtlan Park hockey rink
- Repair 2-4 water leaks a week.
- Light rehabilitation requests to BC Hydro
- Site rehabilitation for property on Cottonwood St.
- Christmas lights going up.
- Winterization of fleet preparation.
- Winterization of valves and water network.

Subdivision

- Review and analysis of infrastructure requirements for Block 200, Lot 48, Point Ideal and Winter Road.

Kam So, P.Eng
Superintendent, Public Works and Engineering Services

Memo

TO: Chief Administrative Officer

SUBJECT: Hydraulic Capacity and Modeling Analysis – Town of Lake Cowichan – Final Report – GeoAdvice – 6 Sep-19

DATE: October 11, 2019

FROM: Superintendent, Public Works and Engineering Services

Background

GeoAdvice Engineering Inc. (GeoAdvice) was retained by the town to update the hydraulic model of the Town's water distribution system. The date of their final report was 6th-Sep-19.

The objective of this study was to understand the current water system under existing and future demand requirements. The following tasks were completed:

- Update the water model
- Calibrate the model.
- Analyze the capacity of the water distribution network
- Analyze pumping capacity
- Analyze reservoir storage capacity
- Recommended system improvements to eliminate capacity deficiencies

Summary

Items Meeting Standard

- The water storage capacity and hydraulic pressure requirements are sufficient for current and the future growth of the town. Future population was calculated to be 4,498 in 2035 for the model.
- Based on the Hydraulic Model, the town's pump station and capacities under existing and future demands met the Master Municipal Construction Document (MMCD)'s design guide manual criteria.

Not Meeting Standard

- Sufficient fire flow is required for the operation of fire hydrants and firefighting. Low fire flow water pressure would result in reduce water pressure when using a fire hose and non-existent household water usage in the surround area.
- The required fire flow pressure at fire hydrants is 22 psi or greater.
- Based on the model, 48% of existing and 52% future scenarios had fire flow nodes with pressure less than 22 psi.
- A range of +/- 10% can be considered within "model accuracy" and would not act as a trigger for system upgrades. A range of 48% and 52% is a cause for concern.

- The Fire Flow Requirements are **deficient** in the River Road Pressure Zone, Slopes Pressure Zone and Neva Pressure Zone.
- The recommendations to improve the water distribution are as follows:

Improvement Type	Description
New Storage Zone 3	Storage of 0.91 ML 1.6 km of new pipes (supply/distribution main)
Pump Upgrades	2 new Domestic Pumps • Winter Drive Boaster Pump 2 additional fire Pumps: • Neva Road Boaster Station • River Road Boaster Station
Hydraulic Upgrades	1 km of Pipe Upsizing
Fire Flow Upgrades	6.4 km of Pipe Upsizing

- The study only identified pressure and water capacity of the water distribution and did not mention the condition of water system.

Kam So, P.Eng
Superintendent, Public Works and Engineering Services

Memo

TO: Chief Administrative Officer

SUBJECT: Water Siphon at the North Shore Pump Station

DATE: October 11, 2019

FROM: Superintendent, Public Works and Engineering Services

Background

Due to climate change, the summers are becoming longer and drier resulting in the water levels of Lake Cowichan to reach historical lows. This summer the lake's water storage hit 'zero' for the second time since the weir was built, and Catalyst began pumping water out of the lake to maintain water flow in the river resulting in even lower water levels.

The Town of Lake Cowichan's water supply is taken from an intake pipe at the North Shore Pump Station. With the lower levels of water levels, receiving water through the intake pipe becomes more difficult. To alleviate the water intake problem, a water siphon was installed. The siphon would allow water to move more efficiently up through water intake pipe.

Issue

The original siphon had air bubbles forming within the siphon which resulted in air leaks. Air bubbles do not allow for a proper seal in a siphon and the suction of water will not be as strong. The air leaks were resolved but there were continued formation of bubbles which may have been related to the drop leg length of the intake pipe. Some bubbles were also formed due to the very negative vacuum at the top of the siphon.

The engineer at Catalyst was looking at using a small vacuum pump that could pull out the air bubbles from the siphon. The use of a vacuum truck was scheduled.

Resolution

The use of the siphon to receive water ended up not being necessary this year because lake's water level returned to higher levels due to this month's rain.

It is not expected that the siphon would be needed this fall unless the water pumps are turned on again to the aid the river flowing.

The siphon will be available for water intake in the future if needed.

Kam So, P.Eng
Superintendent, Public Works and Engineering Services

Memo

TO: Chief Administrative Officer

SUBJECT: Ministry of Environment and Client Change Strategy – Warning Letter

DATE: October 9, 2019

FROM: Superintendent, Public Works and Engineering Services

Recommendation

The recommendation is to target the replacement of the highest priority sewage lines for rehabilitation.

Background

On February 13, 2019, Ministry of Environment and Client Change Strategy staff conducted an inspection of the Lake Cowichan Sewage Treatment Plant (STP) under the *Environmental Management Act (EMA)*, Permit 247. The inspection determined that the STP was out of compliance and a Warning Letter was issued.

The failure to comply with the Permit could result in a fine of $1,000,000, imprisonment for 6 months, or both.

The violations were as follows:

	Standard	Violation	Remedy
1.1	Authorized Discharges – the maximum rate of discharge is 4500 cubic metres per day.	10 violations in 2017 8 violations in 2018	Conduct sewage rehabilitation program.
1.1	Authorized Discharges - Characteristics of the discharge must be equivalent or better than BOD, TSS, TCR maximums.	1 violation in 2017 0 violations in 2018	Conduct sewage rehabilitation program.
2.12	Infiltration and Inflow Reduction	Did not provide plans to reduce I&I.	Follow through on CCTV Inspection Program.
4.3	Outfall inspection	2017 SLR report does not mention outfall inspection. 2018 SLR report does mention outfall inspection, but was reported after 30 days.	2018 SLR report contains information on outfall inspection.
5.1	Maintain data of analyses and flow measurements	Data was being recorded. Was reported beyond the 30 day requirement.	Data is being recorded.

5.3	Annual Report Evaluation	No evaluation of the performance of the treatment works or identify and necessary changes.	2018 Report contains an evaluation of the performance and identifies necessary changes.

Issue

In response to the letter from MOECCS, a technical memorandum was prepared by WSP to address the non-compliances of Permit No. 247.

The memo gives a history of past reports and studies for the I&I including describing the results of the 2016 CCTV Inspection and Smoke Testing Review and Rehabilitation Recommendations.

The memo examines the dates of the maximum daily flows exceed. The findings were that there was a major precipitation event two days before every event. The fact the sewage did not exceed the maximum daily flow during the precipitation event was lead to believe that it was the infiltration of storm water into the sewer system that lead to the increase in maximum daily flow.

Recommendation

The recommendation is to target the replacement of the highest priority sewage lines for rehabilitation.

The repair of sewage lines will address items 1.1 and 2.2. The 2018 SLR report has already addressed items 4.3, 5.1 and 5.3.

Kam So, P.Eng
Superintendent, Public Works and Engineering Services

Memo

TO: Chief Administrative Officer

SUBJECT: Town Water Reservoir

DATE: October 9, 2019

FROM: Superintendent, Public Works and Engineering Services

Recommendation:
Use a Remotely Operated Vehicle (ROV) to clean the Town Reservoir.

Background

The town's reservoir needs to be cleaned on a regular basis to ensure clean drinking water is delivered to households in Lake Cowichan.

Overtime sediment, waste and plant material find their way to the bottom of the reservoir. This material turns into a layer of sludge that acts as a breeding ground for harmful bacteria, dangerous to the quality of water and harmful to the capacity of the tank. Although the WTP removes a lot of the sludge, it is still important to monitor and clean the reservoir.

The town's current procedure is to shut off the valves to the reservoir, empty the reservoir and manually clean the lining. Water would be taken straight from the intake pump, chlorine would be added and water distributed to the town. The process would take 3 days to clean the reservoir and 6 more days to fill the reservoir and allow the new water to allow the appropriate amount of contact time with the WTP to allow further distribution of clean water. This process would use PWS crew for several days and exposes them to a confined spaces hazard that is above their regular duties.

Issue

Using professional SUBA divers to enter the reservoir is the industry standard methods of cleaning a reservoir. Divers would use specialized equipment to avoid contamination with the water and enter the confined space. Although, this method of cleaning is an industry standard, it is expensive. As new safety regulations may require a rescue team to be available. Contravention of the confined spaces could be subject to a fines of $25,000 to $500,000 are not uncommon.

The use of remotely operated vehicles (ROV) are becoming more popular and is a low risk technology that should be explored.

A ROV allows:

a) Cleaning the reservoir without removing water or emptying the reservoir.
b) No physical entry into the reservoir and no confined space violations.

The ROV can be equipped with vacuum head and camera to allow for internal tank inspections and cleaning. The benefits of using the vacuum head means that there is minimal loss of water during the project, depending on the size and amount of material to clean, and it can be done at any time during the year.

Kam So, P.Eng
Superintendent, Public Works and Engineering Services