



**DISTRICT OF SOOKE
WASTEWATER TREATMENT PLANT
AND COLLECTION SYSTEM**

**OPERATED BY
EPCOR WATER SERVICES INC.**



**OPERATIONS REPORT
JULY 2015
REGISTRATION NUMBER 17300**



INTRODUCTION

The Sooke wastewater collection system and treatment plant are owned by the District of Sooke and operated by EPCOR Water Services Inc. The system services the core area of Sooke.

The system consists of:

- 54 km of collection system piping
- 522 manholes
- 7 pump lift stations (Sooke Road, West Coast Road, Helgesen Road, Sunriver, Prestige Hotel, Mariner's Village and Treatment Plant)
- A secondary treatment wastewater plant with disinfection
- A marine discharge through a 1.7 km long, 30m deep outfall

The treatment plant uses a Sequencing Batch Reactor (SBR) treatment process with UV disinfection to provide secondary wastewater treatment. Plant treatment removes over 95% of the total suspended solids and high levels of other contaminants, providing significant environmental benefits to the District of Sooke and the receiving waters.

The treatment plant has a design capacity of 3,000 m³/day (annual average daily flow), and a peak wet weather flow capacity of 6,900 m³/day. The plant is expandable by an additional 3,000 m³/day (average daily flow).

Construction of the Sooke collection system and wastewater treatment plant began in 2004 and the system was commissioned in December 2005. Individual domestic and commercial connections began in May 2006 and continued throughout 2006 and 2007, with the majority completed by December 2006. Additional connections have continued since that time for new construction in the specified sewer area.



OPERATIONS

Wastewater Treatment Plant

In July, the effluent quality was good with the TSS (total suspended solids) averaging 11 mg/L and CBOD averaging 5 mg/L. (MWR limit is ≤ 45 mg/L and WSER limit is ≤ 25 mg/L quarterly average). The results, as detailed in this report, are obtained from samples tested at an independent ISO/IEC 17025 accredited lab.

- July 1 On call operator responded to wastewater treatment plant alarm. Found DeviceNet communication fault. Communication had been lost to all SBR devices stopping all SBR treatment process. Back-up operator called in, troubleshooting procedures were unsuccessful and an electrical contractor was called in. Contractor determined DeviceNet power source location and rebooted. All SBR devices reset and were put back in service, with the exception of SBR blower #1.
- July 7 Oil topped up in centrifuge gearbox.
- July 8 Aeration valve #2 failed to open. This has been an ongoing issue for some time and the cause very hard to pinpoint as many different mechanical/electrical factors dictate valve operations.
- July 9 More “aeration valve #2 fail to open” alarms. Troubleshooting continuing. Operators at treatment plant working with EPCOR programmers in Edmonton to troubleshoot SBR blower #1 faulted condition, which resulted from DeviceNet communication failure of July 1. Programmer determined problem to be local and electrical drawings were forwarded to electrical contractor.
- July 10 Aeration valves #2 fail to open alarms continuing, as is troubleshooting. Local contractor unable to resolve SBR blower #1 fault condition. Contractor working with VFD manufacturer to troubleshoot issue.
- July 14 Changed oil in centrifuge gearbox. Replaced with special synthetic oil as per manufacturer. Some metal filings noticed in previous oil. Electrical contractor replaced failed circuit board in bank A of UV disinfection system. Monthly safety meeting held.
- July 15 Removed aeration valve #2. Replaced with spare rebuilt valve. Local electrical contractor working with EPCOR programmers/technologists to resolve SBR blower #1 fault condition that occurred July 1. These joint efforts concluded that



the SBR blower device had inadvertently changed its network address. A plan to return device to original address was developed and executed with success, putting SBR blower #1 back in service.

- July 16 Problems continuing with aeration valve #2, operators swapped valve positions.
- July 17 Operators discussed aeration valve problems with valve manufacturer and troubleshooting continued.
- July 21 Operators spoke with field service troubleshooting technician with valve manufacturer. Flat steel gaskets installed in valve did not prove successful.
- July 22 Obtained quotes on replacement aeration valves.
- July 27 Operators reset aeration valve #2 actuator limit switches.
- July 29 Lab analyses of effluent from SBR #2 showed substantial increase in ammonia. This is a direct result of inefficient aeration process, which had been caused by aeration valve #2 failures.
- July 30 Both banks of UV lamps cleaned and UV channel cleaned of all debris. Bottom three brushes of auger screen replaced. Some wear noticed on auger near bottom as brushes were worn down too far.

Wastewater Collection System

Lift Stations

The lift stations operated well throughout the month of July.

On July 3, 7, 13, 17, 21, 23, 24, 29 routine lift station checks were completed including LIT cleanings and alarm dial-out function tests.

- July 13 TELUS having communication problems at Mariner's Village and Helgesen Rd. lift stations. Operators worked with remote TELUS technicians to troubleshoot communication devices at both lift stations. TELUS advised later that this was a more widespread disruption in the Sooke area.
- July 14 TELUS monitoring technician confirmed that Sooke lift stations communication network were back up and running.



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- July 17 Operators checked Sooke Rd. lift station valve chamber. Earlier lift station check discovered “sloshing/clunking” sound in floor drain. Operators investigated and found the floor drain between valve chamber and wet well to contain water and confirmed that the noise is normal.
- July 20 EPCOR operator and contractor did annual pump inspections at Sunriver and on-site lift station.
- July 21 Annual pump inspections completed at West Coast Rd. lift station. Found low level float tangled in influent tray. Power cable was broken as the float was untangled. Replacement low level float was installed and tested.
- July 23 Annual pump inspections completed at Helgesen and Sooke Rd. lift stations. Follow up inspection at West Coast Rd. lift station found pump #1 in fault. Operator reset fault and returned pump to “auto”. Operator re-checked West Coast Rd. lift station and again found pump #1 in fault. Operator cleared fault and rotated pump selector switch enabling pump# 2 and pump# 3.
- July 24 EPCOR operator and contractor pulled pump #1 from West Coat Rd. lift station wet well. A length of the broken float power cable was obstructing the pump impeller. Obstruction cleared and pump returned to service.
- July 28 Received odour concern from resident near Sooke Rd. lift station.
- July 29 Operators checked Sooke Rd. lift station for odours. Found none. There is odour control equipment at Sooke Rd. lift station which was also checked and found to be in perfect condition. Inspection of grounds conducted and human waste was found near a fan exhaust.
- July 31 Operated force main isolation valve at Sooke Rd. lift station as part of preventative maintenance measure.



Plant and Operator Classification

The Wastewater Treatment Plant is a Class III plant, classified under EOCP # 1358 and is operated under MOE Guidelines. The Sooke WWT plant is operated in compliance with the MWR and meets the certification requirements.

The collection system is a Class II Wastewater Collection System, classified under EOCP # 1827 in accordance with the Environmental Operators Certification Program. Previously, the collection system was determined to be a Class III facility. The collection system classification is reviewable every five years and was recently reviewed. Discrepancies were noted in a previous classification application and most recent application information has resulted in a change to the collection system classification.

Table 1– Operator Certification

Name	Position	Qualifications
Shawn Pearson	Lead Operator	BC EOCP Certified: Level III Wastewater Treatment & Level I Wastewater Collection System
Corey Hodgson	Operator	Alberta Environment Level III Collection System
Jesse Forcier	Operator	BC EOCP OIT (Operator in Training)

QUALITY

The District of Sooke Liquid Waste Management Plan was approved by the Ministry of Environment in June 2011. Contained in the approved plan is a proposed Operational Certificate (OC). The OC provides more extensive standards and guidelines for the operation of the wastewater treatment plant than is contained in the plant registration that was submitted by the District to the Ministry in 2002 or in the general guidelines provided in the Municipal Waste Regulations (MWR). The Operational Certificate will be finalized in the future and will become the standard for the plant operation.

The Wastewater Systems Effluent Regulations (WSER), under the Federal Fisheries Act, was gazetted on July 18, 2012. The Government of Canada worked with the provinces and engaged municipalities and others to establish the country’s first national standards for wastewater treatment. It establishes limits for deleterious substances in the wastewater plant effluent that can be released into the natural environment.

Table 2 contains the WSER, MWR and the proposed OC requirements for information.

Table 2 – Summary of Regulatory Requirements

Parameters or Description	WSER		MWR		Proposed OC	
	Limits	Frequency	Limits	Frequency	Limits	Frequency
Ammonia-Nitrogen			NA	Quarterly (Grab)	NA	Quarterly (grab)
Ammonia (un-ionized) as N at 15°C (WSER)	<1.25 mg/L	Monthly (until June 30, 2014)	NA	NA	NA	NA
CBOD	≤25 mg/L (Quarterly Average)	Monthly (Grab)	≤45 mg/L	Monthly (Grab)	≤45 mg/L	Monthly (Grab)
Fecal Coliforms	NA		<200 CFU/100 ml * Geometric Mean	5 samples GM/30 days	NA	6 x / year
<i>Enterococci</i>	NA		NA	NA	NA	6 x / year
pH			6.0 - 9.0		6.0 - 9.0	Monthly (Grab)
Receiving Environment Testing			Required	Annually	As per Receiving Environment Monitoring Plan	1/year
Operator Certification			Required notification to regulator when there is a change in operator with the highest certification level in the plant	NA	Required notification to regulator when there is a change in operator with the highest certification level in the plant	NA
Reports, Annual			As requested by Director	As requested by Director	1/year	Within 120 days of calendar Year
Reports, General	Quarterly	Within 45 days after the end of the quarter	Data submission 2 times per year		Quarterly	Within 31 days of quarter ends
Flow Measurement		Daily Total			NA	Daily Total
Flow, Average			To be determined	2/week	3,000 m ³ /day	2/week
Flow, Maximum			To be determined	2/week	6,900 m ³ /day	2/week
Total Phosphorus			NA	Quarterly (Grab)	Not Required	NA
Effluent TSS	≤25 mg/L (Quarterly Average)	Monthly (Grab)	≤ 45 mg/L	Monthly (Grab)	≤ 45 mg/L	Monthly (Grab)
Post of Outfall Sign			Required		Erect sign above high water mark.	NA
Out fall Inspection			Required	Every 5 years	Required	Every 5 years. Next Due 2018
Biosolids Management			NA		Shall be transported to an approved receiving facility	NA

*<200 CFU/100 mL on a geometric mean on the last 5 samples in 30 days at the edge of the dilution zone for recreational water use and <14 CFU/100 mL for shellfish bearing waters. ** All regulated tests are conducted by an ISO/IEC 17025 accredited laboratory. "Grab" refers to a grab sample, which is a single sample that represents the composition of the water at that specific time and place.

Table 3 – Performance Measures – District of Sooke O&M Key Performance Indicators

Water Quality & Environmental Performance Measures			
Activity	Actual Values	Actual Values	Target Values
	July	YTD	Annual
Effluent Quality & Violations to Operational Certificates	0	0	0
Laboratory QA/QC Activities	30	257	200
Proactive Environmental/Quality Initiatives	0	3	5
Completion of Required Regulatory Reporting	100%	100%	100%
Activity	Actual Value	Actual Value	Acceptable Value
	July	YTD	Annual
Releases **	0	0	2
People & Safety Performance Measures			
Activity	Actual Values	Actual Values	Target Values
	July	YTD	Annual
Lost Time Accidents	0	0	0
Staff Training (hours)	0	130	40 hrs/ employee
Safety Preventative Activities	12	64	30
Customer Service Performance Measures			
Activity	Actual Values	Actual Values	Target Values
	July	YTD	Annual
Service Outages < 24 hours	100%	100%	90% Complete
Community Related Activities	2	6	4

* Uncontrolled discharges of wastewater that are reportable to Provincial Emergency Plan under legislation, excluding abnormal circumstances



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Table 4 – Monthly Quality Summary

	Influent				Effluent																			Biosolids Shipped				
	CBOD mg/L	TSS mg/L	NH3-N mg/L	TP	Flow m ³ /day			CBOD mg/L			TSS mg/L			NH3-N mg/L			Un-ionized NH3-N mg/L			TP			FC CFU/100mL			Kg	# of Loads	
	Ave	Ave	Ave	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Geo Mean			
Regulatory Limit						14400	3000		≤45**	≤25 *		≤45**	≤25 *					<1.25							<200			
January	152	168	28	5.2	1931	5443	2613	<4	5	5	5	6	5	1.14	2.50	1.68	<0.05	<0.05	<0.05	2.18	3.28	2.72	10	64	29	72990	8	
February	70	86	37	7.8	1767	3543	2313	<4	<4	<4	5	6	6	0.17	2.19	1.00	<0.05	<0.05	<0.05	2.33	4.35	3.25	4	96	19	41270	4	
March	163	156	39	7.01	1574	3305	2220	<4	<4	<4	3	4	4	0.17	1.69	0.72	0.00021	<0.05	0.025	2.57	3.64	3.19	22	68	38	50410	5	
April	214	239	43	8.30	1718	2485	1973	<4	5	4	<5	11	7	0.13	0.61	0.37	<0.05	<0.05	<0.05	3.25	4.37	3.89	6	76	19	68000	7	
May	138	230	43	13.7	1516	1800	1643	<4	6	5	<5	8	7	0.08	0.51	0.28	<0.05	<0.05	<0.05	3.54	4.52	4.07	16	160	37	68830	7	
June	340	195	45	14.0	1439	1709	1559	<4	6	5	<3	14	9	0.10	0.46	0.27	<0.05	<0.05	<0.05	3.52	6.80	4.54	18	72	33	40090	4	
July	269	346	63	10.7	1387	1644	1514	<4	7	5	7	17	11	0.26	0.35	0.21	nr	nr	nr	2.35	8.40	4.75	8	260	43	29860	3	
August																												
September																												
October																												
November																												
December																												
Total																										371450	38	
Annual	192	203	42	9.5	1387	5443	1976	<4	7	5	<3	17	7	0.08	2.50	0.65	0.00021	<0.05	<0.05	2.18	8.40	3.77	4	260	29			

* WSER- Quarterly average, **MWR and proposed OC



Table 5 – Influent Water Quality

		INFLUENT								
		IN HOUSE				EXTERNAL				
	Effluent flows	pH	TSS	COD	NH ₃ -N	COD	CBOD	TSS	NH ₃	TP
July	m ³ /d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	1573									
2	1573	7.6	455	1360	>55					
3	1477	7.8	535	974	>55					
4	1519									
5	1551									
6	1528	7.8	305	1037	>55					
7	1644									
8	1528	7.9	295	990	>55	719	356	394	54.0	11.0
9	1458									
10	1487	7.6	280	1188	>55					
11	1521									
12	1612									
13	1497	7.6	275	1081	>55					
14	1524									
15	1504	7.8	360	1147	>55					
16	1387									
17	1473	7.9	285	985	>55					
18	1459									
19	1547									
20	1500	7.6	420	1018	45					
21	1446									
22	1564	7.9	270	862	>55	803	181	298	71.0	10.4
23	1486									
24	1509	7.6	290	1371	>55					
25	1491									
26	1583									
27	1541	7.7	275	1073	>55					
28	1591									
29	1440	7.8	280	1028	>55					
30	1466									
31	1459	7.6	290	1060	>55					
Min	1387	7.6	270	862	45	719	181	298	54.0	10.4
Max	1644	7.9	535	1371	>55	803	356	394	71.0	11.0
AVG	1514	7.7	330	1084	54	761	269	346	62.5	10.7



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Table 6 – Daily Water Quality of Effluent

	SBR 1 EFFLUENT											SBR 2 EFFLUENT											
	IN HOUSE				EXTERNAL							IN HOUSE				EXTERNAL							
	pH	TSS	COD	NH3-N	COD	TSS	CBOD	NH3-N	pH	TP	FC	pH	TSS	COD	NH3-N	COD	TSS	CBOD	NH3-N	pH	TP	FC	
July	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/ 100mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/ 100mL	
1																							
2	6.6	10	74	<0.4							6.6	13	63	<0.4									
3	6.5	8		<0.4							6.6	10		<0.4									
4																							
5																							
6	6.5	12		<0.4							6.6	14		<0.4									
7																							
8	6.6	12	71	0.6	72	11	5	0.35	6.59	2.35	24	6.6	17	72	0.6	71	17	7	0.14	6.51	8.40	102	
9																							
10	6.5	12		<0.4								6.6	14		<0.4								
11																							
12																							
13	6.5	8		0.7								6.5	12		<0.4								
14																							
15	6.6	11	56	<0.4							8	6.6	12	68	<0.4								10
16																							
17	6.6	9		<0.4								6.7	8										
18																							
19																							
20	6.6	10		0.4								6.7	9		<0.4								
21																							
22	6.7	8	62	0.6	66	7	4	0.26	6.57	2.76	84	6.6	9	69	0.4	71	8	<4	0.10	6.49	5.50	16	
23																							
24	6.6	9		<0.4								6.6	8		<0.4								
25																							
26																							
27	6.6	11		1.0								6.8	11		2.7								
28																							
29	6.6	11	76	<0.4							170	6.6	10	66	<0.4								260
30																							
31	6.6	12		<0.4								6.7	15		<0.4								
Min	6.5	8	56	<0.4	66	7	4	0.26	6.57	2.35	8	6.5	8	63	<0.4	71	8	<4	0.10	6.49	5.50	10	
Max	6.7	12	76	1.0	72	11	5	0.35	6.59	2.76	170	6.8	17	72	2.7	71	17	7	0.14	6.51	8.40	260	
AVG	6.6	10	68	0.5	69	9	5	0.31	6.58	2.56	41	6.6	12	68	0.6	71	13	6	0.12	6.50	6.95	45	

Note: Monthly average reported for fecal coliforms is a geometric mean. WSER limit is ≤25 mg/L quarterly average TSS/CBOD. MDL = Method Detection Limit. External testing done by an ISO/IEC 17025 accredited Labs, EXOVA, Surrey, BC.,



Table 8: Acronyms

Acronyms /Abbreviations	Description
ATS	Automatic Transfer Switch
AVE or AVG	Average
BC EOCP	British Columbia Environmental Operators Certification Program
BOD	Biochemical Oxygen Demand
BO/PO	Blow off /pump out
CBOD	Carbonaceous Biochemical Oxygen Demand
CFU/100mL	Colony Forming Units Per 100 milliliters
COD	Chemical Oxygen Demand
FC	Fecal Coliforms
F/M ratio	Food-to-microorganism ratio
HMI	Human Machine Interface
IC	Inspection Chamber
I/I	Inflow & Infiltration
LIT	Level Indicator Transmitter
LPS	Low pressure system
m ³ /day	Cubic meters per day (flow)
mg/L	Milligram per liter
MDL	Method detection limit
MSR	Municipal Sewage Regulation
MWR	Municipal Wastewater Regulation
NH ₃	Ammonia
OC	Operational Certificate
PLC	Programmable Logic Controller
Q	Yearly Quarter
SBR	Sequencing Batch Reactor
SCADA	Supervisory Control And Data Acquisition (system)
SSA	Specified Sewer Area
TP	Total Phosphorus
TSS	Total Suspended Solids
VFD	Variable Frequency Drive
WWC	Wastewater Collection System
WSER	Wastewater Systems Effluent Regulations
WWTP	Wastewater Treatment Plant
YTD	Year to Date