



# **2020 Corporate Strategic Asset Management Plan**

## **Appendix E Condition Assessment Framework Part 5 - Water Systems**

**APPENDICES C:**  
Utilities Assessment Reports





MORRISON HERSHFIELD

July 20, 2018

Cowichan Valley Regional District  
175 Ingram Street  
Duncan, BC V9L 1N8

Dear Austin Tokarek:

**Re: CVRD Infrastructure Condition Assessments  
Final Deliverable Overview**

Morrison Hershfield Limited (MH) is pleased to present the updated infrastructure condition assessment (ICA) submissions for the 36 water and wastewater systems managed by the CVRD on the accompanying USB drive. If you have any issues downloading the files, please let us know.

A summary of the documents included in the submission are as follows:

1) 36 Infrastructure Condition Assessments

Each submission has been organized in the following folder structure:

- a. ICA excel spreadsheet that may be used by CVRD for ongoing system management and planning
- b. Summary report presenting a summary of the system information, including a draft 10 Year Capital Plan and a 10 Year Operations & Maintenance Plan based on the findings of the assessments.
- c. Reference folder containing:
  - Catalogued map – summarizes the portions of each system that were catalogued using record drawings. The areas that are not catalogued using record drawings relied on the CVRD's GIS database.
  - Record Drawings – all record drawings used in the assessment.
  - Site Inspection Forms – notes recorded during the project start-up call and field inspection.

Please note that the condition assessments for all buildings have been completed in independent assessments. The building condition assessments will be provided as a separate deliverable.

A water and sewer summary of the system costs of each system is attached to this letter. These system costs provide an overview of the current system costs and future system costs to help the CVRD plan for system expenditures. These costs are by no means definitive costs but provide an indication of the costs to maintain the system. As more information related to the changing condition of the system becomes available,

these costs should be revisited and refined to support necessary system rehabilitation and/or upgrades.

2) Instructions and Definitions Documents

The instructions and definitions documents provide an overview of the ICA and provides instructions on how the ICA's can be updated. As discussed during the March 27, 2018 review meeting, the CVRD should update the instructions to ensure they tie into the CVRD's internal processes. For example, identifying how the information will be communicated between departments and the process and frequency of inter-department communication related to the ICA updates.

3) CVRD GIS Geodatabase Excel Files

Excel files of the CVRD's GIS geodatabase are provided which outline how the infrastructure quantities included in the ICAs were calculated. Furthermore, install dates that were provided by the CVRD are summarized in the catalogued mapping included in the corresponding reference folders.

Please note that when the GIS system listed an unknown pipe diameter, we assumed the pipe diameter was consistent with the pipe diameter of the largest quantity in the area of the pipe.

4) Site Photos

The site photos referenced in the ICAs from the site visit on November 20-24, 2017 are compiled.

As discussed previously, the intent of these condition assessments are to act as a tool that assists the CVRD to manage these systems. The condition assessments have been developed to provide a central location to document the condition of the various components of the systems and also identify subsequent actions required to maintain the appropriate level of service for the system users.

5) Replacement Costs

The document outlines the unit rate replacement costs used in the condition assessments for each diameter of pipe or component in the system. The Excel file is provided so CVRD can update the replacement cost unit rates as necessary.

In the preparation of these documents, particularly in the development of the inventory lists for the various systems, we relied on various sources of information. Some of these sources of information were incomplete and therefore we had to make a number of assumptions on how best to prepare the inventories. These assumptions are captured in the condition assessments. A summary of the tasks that may be completed to improve the quality of the information presented in the condition assessment include the following:



1. The costs listed in this assessment are order of magnitude estimates and should be updated/refined to ensure accurate project costs. Further review of replacements costs are recommended to forecast future replacement costs.
2. Missing and incomplete record drawings should be compiled and the system inventories updated.
3. Various assumptions were made using the information in the GIS database (listed above). This information should be checked and, when appropriate, the GIS database should be updated to ensure there is consistency between the two systems.

We hope the infrastructure condition assessments meet your needs. Please contact the undersigned if you require any further support.

We look forward to the opportunity to continue to work with the CVRD.

Sincerely,  
Morrison Hershfield Limited



Kieran Bertsch, EIT  
Project Engineer



Adam Greenwood, P.Eng.  
Water Engineer



**Infrastructure Condition Assessment and Capital Planning Summary**

Date

July 19, 2018

**Water Summary table**

Function Code	System	Number of Users	System Replacement Cost Estimate	Replacement Cost Per User	Annual Replacement Cost Forecast (40 Year)	Annual Replacement Cost Forecast (80 Year)	10 Year Capital Plan Total	10 Year Operations and Maintenance Plan Total
601	Satellite Park Water	77	\$2,538,666	\$32,970	\$31,342/year	\$55,151/year	\$10,000	\$38,000
603	Douglas Hill Water	135	\$3,037,665	\$22,501	\$40,188/year	\$37,502/year	\$0	\$63,000
604	Lambourne Estates Water	171	\$3,977,759	\$23,262	\$21,120/year	\$49,108/year	\$320,000	\$68,000
605	Arbutus Mountain Estates Water	124	\$3,644,280	\$29,389	\$20,000/year	\$44,991/year	\$30,000	\$15,000
608	Fern Ridge Water	32	\$824,883	\$25,778	\$5,853/year	\$10,184/year	\$50,000	\$10,000
611	Bald Mountain Water	45	\$4,710,785	\$104,684	\$15,280/year	\$58,158/year	\$0	\$20,000
613	Dogwood Ridge Water	33	\$1,247,454	\$37,802	\$13,211/year	\$15,401/year	\$15,000	\$40,000
615	Arbutus Ridge Water	646	\$9,207,651	\$14,253	\$72,828/year	\$113,675/year	\$10,000	\$145,000
616	Carlton Water	43	\$1,774,819	\$41,275	\$23,139/year	\$21,911/year	\$500,000	\$50,000
617	Shellwood Water	27	\$1,219,700	\$45,174	\$19,505/year	\$15,058/year	\$30,000	\$40,000
618	Woodley Range Water	26	\$4,678,550	\$179,944	\$16,561/year	\$57,760/year	\$80,000	\$55,000
619	Burnum Water	83	\$3,556,331	\$42,847	\$11,927/year	\$43,905/year	\$10,000	\$90,000
620	Mesachie Lake Water	78	\$2,037,542	\$26,122	\$49,696/year	\$25,154/year	\$80,000	\$70,000
640	Saltair Water	864	\$17,497,642	\$20,252	\$243,608/year	\$216,020/year	\$5,000	\$230,000
653	Youbou Water	530	\$11,423,403	\$21,554	\$40,171/year	\$141,030/year	\$300,000	\$125,000
660	Honeymoon Bay Water	497	\$5,303,818	\$10,672	\$80,366/year	\$65,479/year	\$0	\$30,000
670	Cherry Point Water	29	\$1,242,500	\$42,845	\$7,711/year	\$15,340/year	\$75,000	\$45,000
680	Shawnigan Lake Water System	680	\$9,469,434	\$13,926	\$209,146/year	\$116,907/year	\$238,000	\$185,000
681	Shawnigan Lake Weir	680	\$250,000	\$368	\$6,098/year	\$3,086/year	\$0	\$10,000
690	Kerry Village Water	89	\$2,409,464	\$27,073	\$12,061/year	\$29,746/year	\$40,000	\$50,000

**Sewer Summary table**

Function Code	System	Number of Users	System Replacement Cost Estimate	Replacement Cost Per User	Annual Replacement Cost Forecast (40 Year)	Annual Replacement Cost Forecast (80 Year)	10 Year Capital Plan Total	10 Year Operations and Maintenance Plan Total
800	Cowichan Bay Sewer	870	\$17,692,159	\$20,336	\$289,143/year	\$218,422/year	\$125,000	\$165,000
801	Brulette Place Sewer	56	\$2,853,530	\$50,956	\$45,927/year	\$35,229/year	\$290,000	\$26,000
802	Sentinal Ridge Sewer	95	\$7,970,841	\$83,904	\$93,659/year	\$98,405/year	\$230,000	\$80,000
803	Twin Cedars	74	\$6,285,197	\$84,935	\$65,865/year	\$77,595/year	\$150,000	\$120,000
804	Lambourne Estates Sewer	155	\$5,617,168	\$36,240	\$61,391/year	\$42,480/year	\$120,000	\$105,000
805	Arbutus Mountain Estates Sewer	121	\$4,794,942	\$39,628	\$56,293/year	\$59,197/year	\$100,000	\$85,000
809	Cobble Hill Sewer	84	\$1,492,455	\$17,767	\$14,732/year	\$18,425/year	\$400,000	\$15,000
810	Mesachie Lake Sewer	49	\$2,052,998	\$41,898	\$50,073/year	\$25,346/year	\$1,700,000	\$0
811	Bald Mountain Sewer	53	\$3,666,112	\$69,172	\$43,366/year	\$45,261/year	\$0	\$50,000
813	Mill Springs Sewer	210	\$8,227,184	\$39,177	\$77,668/year	\$101,570/year	\$0	\$85,000
815	Arbutus Ridge Sewer	646	\$12,939,002	\$20,029	\$142,805/year	\$159,741/year	\$3,150,000	\$156,000
820	Eagle Heights Sewer	760	\$8,779,457	\$11,552	\$212,130/year	\$108,388/year	\$130,000	\$100,000
830	Maple Hills Sewer	60	\$1,981,806	\$33,030	\$43,873/year	\$24,467/year	\$100,000	\$45,000
840	Shawnigan Beach Sewer	377	\$15,137,098	\$40,151	\$176,366/year	\$186,878/year	\$263,000	\$310,000
850	Kerry Village Sewer	93	\$3,920,429	\$42,155	\$46,463/year	\$48,400/year	\$50,000	\$120,000
860	Youbou Sewer	43	\$1,578,535	\$36,710	\$14,366/year	\$19,488/year	\$10,000	\$30,000

# Infrastructure Condition Assessment USER INSTRUCTIONS



Revised July 17, 2018

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## **Introduction**

The infrastructure condition assessments (ICA) are intended to act as a tool to assist the CVRD in managing their water and wastewater systems. The files are set up in Excel and require a basic understanding of Excel formulas and linking of cells to be utilized correctly and efficiently. The instructions below outline the steps for updating the inventories.

## **Conditions Required for Updating an ICA**

The following conditions will trigger an update to an ICA:

1. Renewal of infrastructure over \$xxxx threshold (monthly or yearly) – timing and amount to be confirmed by CVRD
2. GIS update (yearly)

## **Instructions for ICA**

### **Step 1 – Compile Information**

All information about the replacement or new component should be compiled before updating the inventory. Examples of some key information that should be compiled is listed below:

- Diameter of pipe
- Make, Model, Material of component
- Quantity of component
- Year of installation

### **Step 2 – File Management Versioning**

Save a new copy of the excel document with the update date. Move the old copy of the excel document to an “Old” folder. The reason for keeping the old spreadsheet is in case one requires to look up the assessment information from old items.

### **Step 3 – Create New Row**

- 3.1 Insert a new row below all existing item rows.
- 3.2 Find the street where the new/replacement item has been installed.
- 3.3 Find the existing item that has been replaced.
- 3.4 Copy the existing item row and paste it into the newly inserted row at the bottom of the spreadsheet.

### **Step 4 – Add Information to New Line Item**

Follow the table below for step-by-step instructions on updating each cell of the new item.



## USER INSTRUCTIONS

Revised July 17, 2018

Step 4 Table: Add Information to New Line Item			
Step	Column(s)	Categories	Action
4.1	A	Asset ID	Link the new Asset ID to equal the Asset ID of the same street. Items on the same street should have the same Asset ID.
4.2	E	DWG Ref	Update record drawing number or input "GIS".
4.3	I	Asset Code ID	Link the new Asset Code ID to equal the Asset Code ID from the row above plus one.
4.4	L	Description	Update the description info as required to ensure it matches the line item being added.
4.5	M, N, O	Make, Model, Material	Update the make, model, and material info as required to ensure it matches the line item being added.
4.6	P	Quantity	a) Input quantity of item added or replaced. b) If replacement, subtract the amount of the new line item from the existing item. c) If addition, DO NOT subtract the amount of the new line item from the existing item.
4.7	R	Year Installed	Input year item installed.
4.8	V	Unit Price	If new item has a different size / diameter than existing item, update the unit price of the item by referring to the Replacement Cost Estimates spreadsheet.
4.9	X, Y, Z	Condition Assessment	Update condition assessment for new item. (ex. New/good condition, Meets standard, able to meet capacity)
4.10	AA, AB	Probability and Severity of Failure	Update probability and severity of failure ratings based on the definitions stated on the Risk Assessment tab.
4.11	AD, AE, AF, AH	Description, Type of Work, Budget Estimate, Comments	Delete description, type of work, budget estimate, and comments from new line item.

# Infrastructure Condition Assessment

## DEFINITIONS



### Definitions of Assessment Sheets

Sheet	Description
Overview	Overview of the system developments, project team, and the 10 Year Capital Plan.
10 Year Capital and O&M Plan	Information regarding the improvements that are recommended in the next 10 years and the associated estimated costs.
ICA	The Infrastructure Condition Assessment (ICA) includes information of each component listed from design drawings, the site visit, or from GIS. Refer to the Instructions for steps on how to update this sheet.
Replacement Schedule	Graphs of the 40-Year and 80-Year replacement costs of the system.
Categories	The major, minor, and specific categories for the asset code of the water or sanitary component.
Risk Assessment	The probability and severity of failure rating scale is described, along with the calculations to determine the condition rating using these values. The timing and type of work for the recommended upgrades is also described.

### Definitions of ICA Categories

Category	Definition
Asset ID	Every component in the same area should have the same Asset ID (for example: everything within a water treatment plant, or all infrastructure within a development or street).
Function Code	The function code is the same as the system code, each spreadsheet should have a different function code.
Address	The address of the water / wastewater treatment plant in that system.
Location	The specific location of the component within the system.
DWG Ref	The drawing number of where that component's information was recorded from, or listed as "Site Visit / Photos" if the component's information is from the site visit.
Major	The Major category of the Asset Code. Choose either "W" for Water or "S" for Sewer by clicking on the cell to show the drop-down menu. To add an option, add it to the Major Category table in the Categories tab.
Minor	The Minor category of the Asset Code. Choose from the options listed by clicking on the cell to show the drop-down menu. To add an option, add it to the Minor or Sanitary Category table in the Categories tab.
Spec	The Specific category of the Asset Code. Choose from the options listed by clicking on the cell to show the drop-down menu. To add an option, add it to the Specific Water or Sanitary Category table in the Categories tab.
ID	Sequential numbering giving each component its own number.
Asset Code	The combination of the Major, Minor, and Specific Categories, and ID number.
Photo	The photo/video numbers of the pictures and videos showing that component.
Description	The description of the component including any supplementary information not included in other columns.
Make	The manufacturer of the component.
Model	The model number of the component.

## Infrastructure Condition Assessment DEFINITIONS



Material	The material the component is made out of.
Quantity	The quantity of the component.
Quantity Unit	The unit of the quantity. Either "m" for metres, "ea" for each, or "LS" for lump sum.
Year Installed	The year the component was installed.
Year Renewed	The year the component was renewed.
Service Life Expectancy	The service life expectancy of the component.
Est. Remaining Service Life	The estimated remaining service life of the component. Calculated using the current year, the installed year, and the service life expectancy.
Unit Price	The unit price of the replacement value of the component.
Replacement Value of Asset	The total replacement value of the component for planning purposes.
Physical Condition	Good - Component in good condition, no deterioration observed. Fair - Component in fair condition, exhibiting wear and minor deterioration. Poor - Component failing, significant deterioration observed.
Level of Service Condition	The level of service of the component either "Meets standard" or "Does not meet standard". Other comments describe specifics if necessary.
Demand Condition	Description of the demand capabilities of the component.
Probability of Failure	The component's probability of failure. The description of the Probability choices (1-5) are listed on the Risk Assessment tab of the assessment spreadsheet.
Severity of Failure	The component's severity of failure. The description of the Severity choices (1-5) are listed on the Risk Assessment tab of the assessment spreadsheet.
Condition	The condition of the component is calculated by using the Probability and Severity of Failure numbers. The calculations are shown on the Risk Assessment tab of the assessment spreadsheet.
Description	The description of the recommendations.
Type of Work	The type of work that is recommended for each component, either "Field Investigation", "Monitor Condition", "Replacement", or "Rehabilitation".
Budget Estimate	The budget estimate to include in the 10 Year Capital Plan.
Timing	The number of years of when the recommended upgrade to the component should occur. Details about each year range is included on the Risk Assessment tab of the assessment spreadsheet.
Comment/Question to be resolved	Comments or questions that need to be resolved for each component.



## 601 - Satellite Park Water

### Infrastructure Condition Assessment and Capital Plan

Satellite Park Road, Cobble Hill, BC

Date Prepared

July 19, 2018

#### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 2, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
April 13, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 601 - Satellite Park Water

Infrastructure Condition Assessment and Capital Plan

Satellite Park Road, Cobble Hill, BC

Date Prepared

July 19, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	1	W-WTP-PMP-7	Capital Renewal	Assess approach for replacing fire pump in WTP with suitable operating conditions	\$10,000	\$10,000
	11						
	12						
						Total	\$10,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4	2	W-WTP-WLL-12 and W-WTP-PMP-13	Operations	Inspect/assess well and well pump for deterioration to determine replacement timing/phasing.	\$5,000	\$5,000
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	3	W-RES-TNK-14	Operations	Inspect/assess condition of reservoir for deterioration to determine replacement timing/phasing.	\$5,000	\$33,000
	11	7	W-PP-PRV-22	Operations	Inspect/assess PRV chamber for deterioration to determine replacement timing/phasing.	\$3,000	
	12	8 - 16	ALL	Operations	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$25,000	
	13						
	14						
						Total	\$38,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Infrastructure Condition Assessment

Owner:	Cowichan Valley Regional District (CVRD)
System:	601 Satellite Park Water
Civic Address:	Satellite Park Rd.
Geographic Location:	Between Cowichan Bay and Mill Bay
Customers:	82
Users:	77

Current Year	2018	Total	\$2,538,666
		Value per	\$32,970

Asset ID	Function Code	Location	Address	Location	DWS Ref	Major	Minor	Spec	Asset Code		Photo	Description	Make	Model	Material	Asset Inventory		Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Condition Assessment					Recommendations / Action Items	Type of Work	10 Year Capital Plan	Budget Estimate	Timing	Comment/Question to be resolved	
									Quantity	Unit						Physical Condition	Level of Service Condition							Demand Condition	Probability of Failure	Severity of Failure	Condition								
1	601	Satellite Park Rd.	Water treatment plant	176-05-T	W	WTP	WTP	1	W-WTP-WTP-1	3 to 24		Water Treatment Plant and Pumping Station building				1	ea	2011		40	33	Refer to Satellite Park Water System Building	\$4,000	Good	Meets standard	able to meet capacity	1	3	4	Inspect/assess water treatment plant for deterioration to determine replacement timing/phasing.	Operations	Refer to Satellite Park Water System Building Condition Assessment.	\$-10 Year		Refer to Satellite Park Water System Building Condition Assessment.
1	601	Satellite Park Rd.	Water treatment plant	176-05-T	W	WTP	FM	2	W-WTP-FM-2	10		75mm Flow Meter, flanged c/w MAG 5100 Transmitter	Siemens	MAG 5100W		1	ea	2011		40	33	\$4,000	\$4,000	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
1	601	Satellite Park Rd.	Water treatment plant	176-05-T	W	WTP	CH	3	W-WTP-CH-3	20 to 23		Chlorine system c/w analyzer, dosing pump, tank	Severn Trent Services	T17XC4400A		1	ea	2011		40	33	\$13,000	\$13,000	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
1	601	Satellite Park Rd.	Water treatment plant	176-05-T	W	WTP	PM	4	W-WTP-PM-4	12		3 HP Booster Pump	A.V. McDonald	64300		3	ea	2011		20	13	\$3,000	\$9,000	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
1	601	Satellite Park Rd.	Water treatment plant	176-05-T	W	WTP	PM	7	W-WTP-PM-7	7 to 9, 13		Diesel powered Fire Pump package c/w pressure GAFF14 pump, factory tested, skid mounted (Assumed 60hp)	Chasco			1	ea	2011		20	13	\$60,000	\$60,000	Good	Meets standard	able to meet capacity	2	2	4	Assess approach for replacing fire pump in WTP with suitable operating conditions.	Capital Renewal	\$10,000	5-10 Year		
1	601	Satellite Park Rd.	Water treatment plant	176-05-T	W	WTP	PT	8	W-WTP-PT-8	7, 8, 11, 17		Pneumatic diaphragm pressure tank	Well Rise	WR360		2	ea	2011		20	13	\$8,000	\$16,000	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
1	601	Satellite Park Rd.	Water treatment plant	176-05-T	W	WTP	COM	10	W-WTP-COM-10	14 to 16		Communications (WTP)				1	LS	2011		20	13	\$9,000	\$9,000	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
1	601	Satellite Park Rd.	Water treatment plant	176-05-T	W	WTP	PP	11	W-WTP-PP-11	6 to 14, 17		Process piping c/w valves, pipes, tees				1	LS	2011		40	33	\$50,000	\$50,000	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
2	601	Satellite Park Rd.	Water treatment plant	176-05-T	W	WTP	WLL	12	W-WTP-WLL-12	18		Production well				1	ea	1978		40	0	\$10,000	\$10,000	Good - lots of capacity	Meets standard	able to meet capacity	4	3	2	Inspect/assess well and well pump for deterioration to determine replacement timing/phasing.	Operations	\$5,000	5-2 Year		
2	601	Satellite Park Rd.	Water treatment plant	176-05-T	W	WTP	PM	13	W-WTP-PM-13	18		Well pump, submersible Shp	Myers	SS 50-50		1	ea	2007		20	9	\$5,000	\$5,000	Good	Meets standard	able to meet capacity	3	2	3	Inspect/assess well pump for deterioration to determine replacement timing/phasing.	Operations	Included above	2-5 Year		
3	601	Satellite Park Rd.	Reservoir	176-05-T	W	RES	TK	14	W-RES-TK-14	2		570,000L Steel Bolted Reservoir				570	'000 L	2011		40	33	\$1,000	\$570,000	Good - great water quality	Meets standard	able to meet capacity	1	3	4	Inspect/assess condition of reservoir for deterioration to determine replacement timing/phasing.	Operations	\$5,000	5-10 Year		
4	601	Satellite Park Rd.	Leflan Rd	176-05-T	W	PP	PP	15	W-PP-PP-15			Supply Watermain, 100mm, depth 1.2m, boulevard, some asphalt		C900	PVC	40	m	2011		80	73	\$400	\$16,116	Good	Meets standard	able to meet capacity	1	2	1		Operations		\$-10 Year		
4	601	Satellite Park Rd.	Leflan Rd	176-05-T	W	PP	PP	16	W-PP-PP-16			Watermain, 200mm, depth 1.2m, boulevard, some asphalt		C900	PVC	34	m	2011		80	73	\$500	\$17,175	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
5	601	Satellite Park Rd.	Aros Rd	176-05-T	W	PP	PP	17	W-PP-PP-17			Supply Watermain, 100mm, depth 1.2m, boulevard, some asphalt		C900	PVC	49	m	2011		80	73	\$400	\$19,716	Good	Meets standard	able to meet capacity	1	2	1		Operations		\$-10 Year		
5	601	Satellite Park Rd.	Aros Rd	176-05-T	W	PP	PP	18	W-PP-PP-18			Watermain, 200mm, depth 1.2m, boulevard, some asphalt		C900	PVC	255	m	2011		80	73	\$500	\$127,260	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
5	601	Satellite Park Rd.	Aros rd / Peache rd	176-05-T	W	PP	CV	19	W-PP-PP-19			Check valve chamber c/w 150mm Valve mate No. 506 swing-flex check valve				1	ea	2011		40	33	\$4,000	\$4,000	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
6	601	Satellite Park Rd.	Granfield Place	176-05-T	W	PP	PP	20	W-PP-PP-20			Supply Watermain, 100mm, depth 1.2m, boulevard, some asphalt		C900	PVC	107	m	2011		80	73	\$400	\$42,744	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
6	601	Satellite Park Rd.	Granfield Place	176-05-T	W	PP	PP	21	W-PP-PP-21			Watermain, 200mm, depth 1.2m, boulevard, some asphalt		C900	PVC	109	m	2011		80	73	\$500	\$54,460	Good	Meets standard	able to meet capacity	1	2	5		Operations		\$-10 Year		
7	601	Satellite Park Rd.	Satellite park dr	176-05-T	W	PP	PRV	22	W-PP-PRV-22			Packaged buried PRV station chamber c/w 150mm Pressure Reducing Valve c/w process piping, isolation valves, pressure gauge	CLA-VAL	90-01		1	ea	2011		40	33	\$200,000	\$200,000	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess PRV chamber for deterioration to determine replacement timing/phasing.	Operations	\$3,000	5-10 Year		Update GIS system to only show One PRV station.
8	601	Satellite Park Rd.	Aros Rd	GIS	W	PP	PP	23	W-PP-PP-23			Watermain pipe, 150mm		AC	267	m	1973		60	15	\$450	\$120,150	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	\$25,000	5-10 Year			
8	601	Satellite Park Rd.	Aros Rd	GIS	W	PP	PP	24	W-PP-PP-24			Watermain pipe, 200mm, no material info (includes 208m of unknown diameter watermain) (GIS minus catalogued length from record drawings 176-05-T)			222	m	1973		60	15	\$500	\$111,240	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
9	601	Satellite Park Rd.	Champagne Dr	GIS	W	PP	PP	25	W-PP-PP-25			Watermain pipe, unknown diameter/material (Assume 200mm for replacement costing)			236	m	1973		60	15	\$500	\$118,000	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
10	601	Satellite Park Rd.	Granfield Pl	GIS	W	PP	PP	26	W-PP-PP-26			Watermain pipe, 100mm, no material info (GIS minus catalogued length from record drawings 176-05-T)			48	m	1973		60	15	\$400	\$19,256	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
10	601	Satellite Park Rd.	Granfield Pl	GIS	W	PP	PP	27	W-PP-PP-27			Watermain pipe, 200mm, no material info (GIS minus catalogued length from record drawings 176-05-T)			1	m	1973		60	15	\$500	\$540	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
11	601	Satellite Park Rd.	Leflan Rd	GIS	W	PP	PP	28	W-PP-PP-28			Watermain pipe, 75mm, no material info		PVC	475	m	1973		80	35	\$400	\$190,000	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
11	601	Satellite Park Rd.	Leflan Rd	GIS	W	PP	PP	29	W-PP-PP-29			Watermain pipe, 100mm, no material info (GIS minus catalogued length from record drawings 176-05-T)			22	m	1973		60	15	\$400	\$8,684	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
11	601	Satellite Park Rd.	Leflan Rd	GIS	W	PP	PP	30	W-PP-PP-30			Watermain pipe, 150mm, no material info		AC	100	m	1973		60	15	\$450	\$45,000	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
11	601	Satellite Park Rd.	Leflan Rd	GIS	W	PP	PP	31	W-PP-PP-31			Watermain pipe, 200mm, no material info (includes 140m of unknown diameter watermain) (GIS minus catalogued length from record drawings 176-05-T)			154	m	1973		60	15	\$500	\$76,825	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
12	601	Satellite Park Rd.	Peache Dr	GIS	W	PP	PP	32	W-PP-PP-32			Watermain pipe, unknown diameter/material (Assume 200mm for replacement costing)			148	m	1973		60	15	\$500	\$74,000	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
13	601	Satellite Park Rd.	Red Baron Pl	GIS	W	PP	PP	33	W-PP-PP-33			Watermain pipe, unknown diameter/material (Assume 200mm for replacement costing)			99	m	1973		60	15	\$500	\$49,500	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
14	601	Satellite Park Rd.	Red Oak Drive	GIS	W	PP	PP	34	W-PP-PP-34			Watermain pipe, unknown diameter/material (Assume 200mm for replacement costing)			119	m	1973		60	15	\$500	\$59,500	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
15	601	Satellite Park Rd.	Satellite Park Drive	GIS	W	PP	PP	35	W-PP-PP-35			Watermain pipe, unknown diameter/material (Assume 200mm for replacement costing)			638	m	1973		60	15	\$500	\$319,500	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			
16	601	Satellite Park Rd.	White Cap Rd	GIS	W	PP	PP	36	W-PP-PP-36			Watermain pipe, unknown diameter/material (Assume 200mm for replacement costing)			238	m	1973		60	15	\$500	\$119,000	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year			

601 - Satellite Park Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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601 - Satellite Park Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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601 - Satellite Park Water - See Infrastructure Condition Assessment table with corresponding photo ID's

**CVRD**

**Old Reservoir and Treatment Building**

**New Steel-Bolted Reservoir**

- Manufactured by Columbian Tec Tank
- Completed March 2009
- Capacity: 570 mc (126,000 l Gal)
- Height: 11.78 m
- Diameter: 5.51 m
- Tie-in reservoir into treatment building and existing piping network completed on January 19, 2010
  - 600 m of 100 mm & 200 mm pipe
  - PRV chamber and check valve chamber

**Supply Well on LeFran Road**

Treatment: Hypochlorination with provisions for UV  
Online September 2010  
Flows: 51,825 m<sup>3</sup>/year  
Equipment: booster pumps  
pressure tanks  
fire Pump (ITT), diesel, 55 hp, 1000 gpm  
Controls: reservoir levels, pumps, chlorine, telemetry control and HMI (human machine interface for trending & data recording)  
Total project cost: \$671,600.

**New Treatment Building**

**New PRV Chamber**

6" PRV is set to open when downstream psi drops to 57 psi; usually 62 psi which is head psi out of the reservoir.  
Opens to supply during high demands from the upper pressure zone.  
1" bypass installed so that a continuous flow goes through the valve to assist in water quality on satellite Park Drive by eliminating a dead end in the system.

Developed in 1978  
Depth: 96 ft  
Yield (2007): 6.3L/s (100 US gpm)  
Well pump: Myers 55 50-50 submersible 5hp  
Size: 6 inches  
Pump Intake: 84 feet, 1978.

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601 - Satellite Park Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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601 - Satellite Park Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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601 - Satellite Park Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Satellite Park - Water Treatment Building - Functional Code 601

BLOG Name	BLOG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	Description & History	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	OPINION OF PROBABLE COST								
						ID	Location / Type			Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Yr to Next U/R Check or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type					Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Satellite Park - Water Treatment Building	Water Treatment Building	601	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2011	21-Nov-17	MH	7	50	43	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$20	SF	\$12,000	0%	10%	5%	\$14,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2011	21-Nov-17	MH	7	50	43	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$10	SF	\$6,000	0%	10%	5%	\$7,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2011	21-Nov-17	MH	7	10	3	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2011	21-Nov-17	MH	7	50	43	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2011	21-Nov-17	MH	7	50	43	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$40	SF	\$24,000	0%	10%	5%	\$28,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2011	21-Nov-17	MH	7	12	5	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	800	\$8	SF	\$6,400	0%	15%	5%	\$8,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2011	21-Nov-17	MH	7	50	43	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	800	\$35	SF	\$28,000	0%	5%	5%	\$31,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	5	5	2011	21-Nov-17	MH	7	50	43	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	180	\$20	SF	\$3,600	0%	10%	5%	\$5,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201005 Exterior Louvers and Screens	Exterior Walls/Vent Louver	1	A metal louver vent is present on the exterior wall.	5	5	2011	21-Nov-17	MH	7	30	23	Replace the louver vent at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	EA	\$200	0%	10%	5%	\$1,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	5	5	2011	21-Nov-17	MH	7	30	23	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2011	21-Nov-17	MH	7	40	33	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	650	\$30	SF	\$19,500	0%	5%	5%	\$22,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2011	21-Nov-17	MH	7	25	18	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	10%	5%	\$1,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	5	5	2011	21-Nov-17	MH	7	20	13	Repaint interiors as required.  Note: a long service life has been included to reflect building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000
Satellite Park - Water Treatment Building	Water Treatment Building	601	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment	2	An exterior light is present on the building near the entrance.	5	5	2011	21-Nov-17	MH	7	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Satellite Park - Water Treatment Building - Functional Code 601

BUDG Name	BUDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST							10-YEAR CAPITAL PLAN																			
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age to 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total to 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027					
																																	\$0	\$0	\$1,000	\$0	\$8,000	\$0	\$0	\$0	\$0	\$0	\$0				
Satellite Park - Water Treatment Building	Water Treatment Building	601	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some above-grade foundation wall on some elevations.	5	5	2011	21-Nov-17	MH	7	50	43	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$20	SF	\$12,000	0%	10%	5%	\$14,000														
Satellite Park - Water Treatment Building	Water Treatment Building	601	A Substructure	A10 Foundations	A1010 Slab on Grade	A101001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2011	21-Nov-17	MH	7	50	43	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$10	SF	\$6,000	0%	10%	5%	\$7,000														
Satellite Park - Water Treatment Building	Water Treatment Building	601	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains		1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2011	21-Nov-17	MH	7	10	3	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000			\$1,000											
Satellite Park - Water Treatment Building	Water Treatment Building	601	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains		1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2011	21-Nov-17	MH	7	50	43	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No																						
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2011	21-Nov-17	MH	7	50	43	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$40	SF	\$24,000	0%	10%	5%	\$28,000														
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2011	21-Nov-17	MH	7	12	5	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	800	\$8	SF	\$6,400	0%	15%	5%	\$8,000					\$8,000									
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2011	21-Nov-17	MH	7	50	43	The cementitious siding is expected to last the life of the building.  Note: Isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	800	\$35	SF	\$28,000	0%	5%	5%	\$31,000														
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit		1	Perforated metal soffit is present at the roof overhangs.	5	5	2011	21-Nov-17	MH	7	50	43	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	180	\$30	SF	\$3,600	0%	10%	5%	\$5,000														
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201005 Exterior Louvers and Screens	Exterior Walls/Vent Louver		1	A metal louver vent is present on the exterior wall.	5	5	2011	21-Nov-17	MH	7	30	23	Replace the louver vent at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$300	EA	\$200	0%	10%	5%	\$1,000														
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	B20 Enclosure	B2010 Exterior Doors	B201001 Solid Doors	Exterior Walls/ Door		1	Two painted metal doors are present on the building.	5	5	2011	21-Nov-17	MH	7	30	23	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000														
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2011	21-Nov-17	MH	7	40	33	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	650	\$30	SF	\$19,500	0%	5%	5%	\$22,000														
Satellite Park - Water Treatment Building	Water Treatment Building	601	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2011	21-Nov-17	MH	7	25	18	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	10%	5%	\$1,000														
Satellite Park - Water Treatment Building	Water Treatment Building	601	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes		2	The interior gypsum and plywood walls and ceilings are painted.	5	5	2011	21-Nov-17	MH	7	20	13	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000														
Satellite Park - Water Treatment Building	Water Treatment Building	601	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		2	An exterior light is present on the building near the entrance.	5	5	2011	21-Nov-17	MH	7	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000														

Cowichan Valley Regional District

Satellite Park - Water Treatment Building - Functional Code 601



Photo 1



Photo 2



## 603 - Douglas Hill Water

### Infrastructure Condition Assessment and Capital Plan

4108 St Catherines Dr., Duncan, BC

Date Prepared

July 18, 2018

#### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 3, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 19, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management seperately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create seperate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 603 - Douglas Hill Water

Infrastructure Condition Assessment and Capital Plan  
4108 St Catherines Dr., Duncan, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$0

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	W-WTP-GEN-11	Operations	Inspect/assess generator for deterioration to determine replacement timing/phasing.	\$3,000	\$48,000
	8	2	W-WTP-WLL-12 and W-WTP-PMP-13	Operations	Inspect/assess well and well pump for deterioration to determine replacement timing/phasing.	\$5,000	
	9	3	W-WTP-WLL-14 and W-WTP-PMP-15	Operations	Inspect/assess well and well pump for deterioration to determine replacement timing/phasing.	\$5,000	
	10	6 to 17	ALL	Operations	Inspect/assess watermains, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$35,000	
Medium Term (5 - 10 Year)	11	1	W-WTP-PMP-2	Operations	Inspect/assess condition of WTP and the process piping for deterioration to determine replacement timing/phasing.	\$5,000	\$15,000
	12	4	W-RES-RES-16	Operations	Inspect/assess condition of reservoir for deterioration to determine replacement timing/phasing.	\$10,000	
	13						
	14						
	15						
						Total	\$63,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Infrastructure Condition Assessment

Owner:	Kalbar Regional District (VRD)
System:	603 Douglas Hill Water
City Address:	408 St. Catharines Dr.
Geographic Location:	South of Cowichan Bay
Customers:	118
Users:	135

Current Year	2018	Total Replacement Value	\$3,077,605
		Value per user	\$22,501

Asset ID	Location			Asset Code			Asset Inventory										Condition Assessment					Recommendations / Action Items			10 Year Capital Plan									
	Function Code	Address	Location	DWG Ref	Major	Minor	Spec	ID	Asset Code	Photo	Description	Make	Model	Material	Quantity	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Demand Condition	Probability of Failure	Severity of Failure	Conditon	Description	Type of Work	Budget Estimate	Timing	Comments/Question to be resolved		
1	603	4308 St. Catharines Dr.	WTP / Pump Station	Site Visit / Photos	W	WTP	WTP	1	W-WTP-WTP-1		Water treatment building				1	ea	2014		40	36													Refer to Douglas Hill Water System Building Condition Assessment.	
1	603	4308 St. Catharines Dr.	WTP / Pump Station	111-14038-00	W	WTP	PMP	2	W-WTP-PMP-2		Duty pump, 20 HP, 600V/3PH/60Hz (17.1 L/s at 61.5 m TDH)	Grundfos	CR45-3-2		2	ea	2014		20	16	\$10,000	\$40,000	Good	Meets standard	able to meet capacity	2	2	4	Inspect/assess condition of WTP and the process piping for deterioration to determine replacement timing/phasing.	Operations	\$5,000	5-10 Year		
1	603	4308 St. Catharines Dr.	WTP / Pump Station	111-14038-00	W	WTP	PMP	4	W-WTP-PMP-4		Duty pump, 1HP, 600V/3PH/60Hz (1.75 L/s at 61.5 m TDH)	Grundfos	CR5-8		2	ea	2014		20	16	\$3,000	\$6,000	Good	Meets standard	able to meet capacity	1	2	4		Operations	\$1,000	10 Year		
1	603	4308 St. Catharines Dr.	WTP / Pump Station	111-14038-00	W	WTP	PMP	6	W-WTP-PMP-6		Duty pump, 1/2 HP, 600V/3PH/60Hz (0.875 L/s at 61.5 m TDH)	Grundfos	CR5-8		1	ea	2014		20	16	\$4,000	\$4,000	Good	Meets standard	able to meet capacity	1	2	4		Operations	\$1,000	10 Year		
1	603	4308 St. Catharines Dr.	WTP / Pump Station	111-14038-00	W	WTP	CK	7	W-WTP-CK-7		Chlorination system w/ analyzer, dosing pump, tank	Severn-Treat	T12P24800A		1	ea	2014		20	16	\$11,000	\$11,000	Good	Meets standard	able to meet capacity	1	2	4		Operations	\$1,000	10 Year		
1	603	4308 St. Catharines Dr.	WTP / Pump Station	Site Visit / Photos	W	WTP	COM	8	W-WTP-COM-8		Communications (WTP)				1	LS	2014		20	16	\$9,000	\$9,000	Good	Meets standard	able to meet capacity	1	2	4		Operations	\$1,000	10 Year		
1	603	4308 St. Catharines Dr.	WTP / Pump Station	Site Visit / Photos	W	WTP	PP	9	W-WTP-PP-9		Process piping (w/ valves, pipes, tees)				1	LS	2014		20	36	\$10,000	\$10,000	Good	Meets standard	able to meet capacity	1	2	4		Operations	\$1,000	10 Year		
1	603	4308 St. Catharines Dr.	WTP / Pump Station	Site Visit / Photos	W	WTP	GER	10	W-WTP-GER-10		Generator building (WTP)				1	LS	1982		40	4												Refer to Douglas Hill Water System Building Condition Assessment.		
1	603	4308 St. Catharines Dr.	WTP / Pump Station	Site Visit / Photos	W	WTP	GEN	11	W-WTP-GEN-11		Generator (WTP) (Assumed 20 kW for replacement value)				1	LS	1982		40	4	\$16,000	\$16,000	Genset in good condition, but roof of building is old	Meets standard	able to meet capacity	3	2	3	Inspect/assess generator for deterioration to determine replacement timing/phasing.	Operations	\$13,000	2-5 Year		
2	603	4308 St. Catharines Dr.	WTP / Pump Station	Site Visit / Photos	W	WTP	VEL	12	W-WTP-VEL-12		Well 1				1	ea	1982		40	4	\$1,000	\$1,000	Good - upgraded with proper wellhead	Meets standard		4	2	1	Inspect/assess well and well pump for deterioration to determine replacement timing/phasing.	Operations	\$5,000	2-5 Year		
2	603	4308 St. Catharines Dr.	WTP / Pump Station	Site Visit / Photos	W	WTP	PMP	13	W-WTP-PMP-13		Well 1 pump (Assumed 5 hp for replacement value)				1	ea	1982		20	0	\$5,000	\$5,000				4	2	1	Inspect/assess well and well pump for deterioration to determine replacement timing/phasing.	Operations	included above	2-5 Year		
3	603	4308 St. Catharines Dr.	WTP / Pump Station	Site Visit / Photos	W	WTP	WLL	14	W-WTP-WLL-14		Well 2				1	ea	1982		40	4	\$10,000	\$10,000	Good - upgraded with proper wellhead	Meets standard		4	2	1	Inspect/assess well and well pump for deterioration to determine replacement timing/phasing.	Operations	\$5,000	2-5 Year		
3	603	4308 St. Catharines Dr.	WTP / Pump Station	Site Visit / Photos	W	WTP	PMP	15	W-WTP-PMP-15		Well 2 pump (Assumed 5 hp for replacement value)				1	ea	1982		20	0	\$5,000	\$5,000				4	2	1	Inspect/assess well and well pump for deterioration to determine replacement timing/phasing.	Operations	included above	2-5 Year		
4	603	4308 St. Catharines Dr.	Outside pump station	111-14038-00	W	RES	RES	16	W-RES-RES-16		Concrete reservoir, 450,000L				400	'000L	1982		80	44	\$2,000	\$900,000	Good - fenced and gated	Meets standard	able to meet capacity - good circulation (inlet and outlet placed in proper locations)	2	2	4	Inspect/assess condition of reservoir for deterioration to determine replacement timing/phasing.	Operations	\$10,000	5-10 Year		
5	603	4308 St. Catharines Dr.	Outside pump station	111-14038-00	W	PP	PP	17	W-PP-PP-17		100mm Watermain pipe				12	m	2011		80	73	\$400	\$4,800				4	2	1		Operations	included above	2-5 Year		
5	603	4308 St. Catharines Dr.	Outside pump station	111-14038-00	W	PP	PP	18	W-PP-PP-18		150mm Watermain pipe				4	m	2011		80	73	\$450	\$1,800				4	2	1		Operations	included above	2-5 Year		
5	603	4308 St. Catharines Dr.	Outside pump station	111-14038-00	W	PP	PP	19	W-PP-PP-19		150mm Watermain pipe				AC	2	m	2011		80	53	\$450	\$900				4	2	1		Operations	included above	2-5 Year	
5	603	4308 St. Catharines Dr.	Outside pump station	111-14038-00	W	PP	PP	20	W-PP-PP-20		Drywell				1	ea	2011		40	33	\$40,000	\$40,000				4	2	1		Operations	included above	2-5 Year		
6	603	4308 St. Catharines Dr.	CANTERBURY PLACE	GIS	W	PP	PP	21	W-PP-PP-21		Watermain pipe, 150mm				129	m	1982		60	24	\$450	\$58,040				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	\$35,000	2-5 Year		
7	603	4308 St. Catharines Dr.	CHELSEA PLACE	GIS	W	PP	PP	22	W-PP-PP-22		Watermain pipe, 150mm				71	m	1982		60	24	\$450	\$32,070				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year		
8	603	4308 St. Catharines Dr.	COWICHAN BAY ROAD	GIS	W	PP	PP	23	W-PP-PP-23		Watermain pipe, 150mm				AC	310	m	1982		60	24	\$450	\$139,567				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	
8	603	4308 St. Catharines Dr.	COWICHAN BAY ROAD	GIS	W	PP	PP	24	W-PP-PP-24		Watermain pipe, 150mm				PVC	924	m	1982		80	44	\$450	\$415,800				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	
9	603	4308 St. Catharines Dr.	DOUGLAS VALE PLACE	GIS	W	PP	PP	24	W-PP-PP-24		Watermain pipe, 100mm				99	m	1982		60	24	\$400	\$39,441				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year		
9	603	4308 St. Catharines Dr.	DOUGLAS VALE PLACE	GIS	W	PP	PP	25	W-PP-PP-25		Watermain pipe, 150mm				37	m	1982		60	24	\$450	\$16,792				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year		
10	603	4308 St. Catharines Dr.	ELLSBORN PLACE	GIS	W	PP	PP	26	W-PP-PP-26		Watermain pipe, 150mm				AC	175	m	1982		60	24	\$450	\$78,751				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	
11	603	4308 St. Catharines Dr.	HIGHLAND PLACE	GIS	W	PP	PP	27	W-PP-PP-27		Watermain pipe, 150mm				PVC	102	m	1982		80	44	\$450	\$45,991				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	
11	603	4308 St. Catharines Dr.	HIGHLAND PLACE	GIS	W	PP	PP	28	W-PP-PP-28		Watermain pipe, 150mm (includes 86m of unknown diameter watermain)				200	m	1982		60	24	\$450	\$90,000				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year		
12	603	4308 St. Catharines Dr.	IVERNESS PLACE	GIS	W	PP	PP	29	W-PP-PP-29		Watermain pipe, 100mm				AC	66	m	1982		60	24	\$400	\$26,365				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	
13	603	4308 St. Catharines Dr.	JIM'S CRESCENT	GIS	W	PP	PP	30	W-PP-PP-30		Watermain pipe, 100mm				AC	472	m	1982		60	24	\$400	\$188,777				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	
13	603	4308 St. Catharines Dr.	JIM'S CRESCENT	GIS	W	PP	PP	31	W-PP-PP-31		Watermain pipe, 150mm				AC	15	m	1982		60	24	\$450	\$6,782				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	
14	603	4308 St. Catharines Dr.	JUDGE DRIVE	GIS	W	PP	PP	32	W-PP-PP-32		Watermain pipe, 150mm				AC	540	m	1982		60	24	\$450	\$242,398				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	
14	603	4308 St. Catharines Dr.	JUDGE DRIVE	GIS	W	PP	PP	33	W-PP-PP-33		Watermain pipe, 150mm				397	m	1982		60	24	\$450	\$178,650				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year		
15	603	4308 St. Catharines Dr.	KANA ROAD	GIS	W	PP	PP	33	W-PP-PP-33		Watermain pipe, 150mm				AC	24	m	1982		60	24	\$450	\$11,018				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	
16	603	4308 St. Catharines Dr.	SHEARING ROAD	GIS	W	PP	PP	34	W-PP-PP-34		Watermain pipe, 150mm				180	m	1982		60	24	\$450	\$81,093				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year		
17	603	4308 St. Catharines Dr.	ST. CATHERINES DRIVE	GIS	W	PP	PP	35	W-PP-PP-35		Watermain pipe, 100mm				PVC	52	m	1982		80	44	\$400	\$20,779				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	
17	603	4308 St. Catharines Dr.	ST. CATHERINES DRIVE	GIS	W	PP	PP	36	W-PP-PP-36		Watermain pipe, 150mm (includes 25m of unknown diameter watermain)				AC	574	m	1982		60	24	\$450	\$258,326				2	3	3	Inspect/assess watermain, fire hydrants, air release valves and line valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	included above	2-5 Year	

603 -Douglas Hill Water - See Infrastructure Condition Assessment table with corresponding photo ID's

**WTP TREATMENT PLANT  
FIELD INSPECTION**

**MH MORRISON HERSHFIELD**

SYSTEM: Douglas Hill Water DATE: Nov. 24/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 603 PROJECT No.: 5170700

INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Type of Treatment System (Schematic)

Two Wells → 4" AC → Distribution → AC & good PVC } is no breaks

2) Site Conditions/Security

Visible deterioration of structure:

Visible deterioration of structure:

Handwritten notes on form:  
- "limited to paper with heads."  
- "some main breaks (tree roots)"  
- "next to residential ed."

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603 (2)  
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603 -Douglas Hill Water - See Infrastructure Condition Assessment table with corresponding photo ID's



603 (3)



603 (4)  
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603 -Douglas Hill Water - See Infrastructure Condition Assessment table with corresponding photo ID's



603 (5)



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603 -Douglas Hill Water - See Infrastructure Condition Assessment table with corresponding photo ID's



603 (7)



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603 -Douglas Hill Water - See Infrastructure Condition Assessment table with corresponding photo ID's



603 (9)



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603 -Douglas Hill Water - See Infrastructure Condition Assessment table with corresponding photo ID's



603 (11)



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603 -Douglas Hill Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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603 -Douglas Hill Water - See Infrastructure Condition Assessment table with corresponding photo ID's



603 (31)

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Douglas Hill - Generator Building - Functional Code 603**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST														
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Expectancy or Action Interval	Est. Time Remaining to EOJ or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars		
Douglas Hill - Water Treatment Building	Water Treatment Building	603	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1 & 2		The generator building appears to be cinder block masonry units installed on a slab on grade. It is assumed that no foundation is present.	5	5	2011	21-Nov-17	MH	7	50	43	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	25	\$60	SF	\$1,500	0%	5%	5%	\$2,000
Douglas Hill - Water Treatment Building	Water Treatment Building	603	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1 & 2		The superstructure is comprised of cinder block walls and a wood framed (sloped) roof. Some of the flashing and screening for the roof had been removed. The wood trim is cupping in some areas and is in need of replacement.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2011	21-Nov-17	MH	7	50	2	Interior protected structural components are expected to last the life of the building.  Complete isolated repairs to the wood framing closures at the roof. The cost of this has been included in the painting budget.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	1	\$250	LS	\$250	0%	15%	5%	\$1,000
Douglas Hill - Water Treatment Building	Water Treatment Building	603	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cinder Block		1 & 2		The superstructure is comprised of cinder block walls and a wood framed (sloped) roof. Some of the flashing and screening for the roof had been removed.  The wood trim at the roof has been painted. Service holes in the cinder block has been abandoned and sealed with spray foam.	2	2	2011	21-Nov-17	MH	7	9	2	Repair siding and trim. Consideration may be given to replacing the wood trim with a more durable material.  At the time of painting, replace wood trim as required. Install flashing over service holes that are no longer required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$250	LS	\$250	0%	15%	5%	\$1,000
Douglas Hill - Water Treatment Building	Water Treatment Building	603	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		1 & 2		The access door of the structure is a wood framed assembly. Vegetation was covering the majority of the door.	5	5	2011	21-Nov-17	MH	7	30	23	Replace doors at the end of their service life.  Complete general maintenance to remove vegetation from the door.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Douglas Hill - Water Treatment Building	Water Treatment Building	603	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1 & 2		The roof is low sloped assembly which has been waterproofed with 2-ply SBS membrane. The perimeter of the roof has flashing installed. The roof is sloped to drain at the back. In some areas the flashings are damaged due to the vegetation growing over the roof.	3	3	2011	21-Nov-17	MH	7	25	5	Replace the 2-ply SBS membrane at the end of its service life.  Complete general maintenance to remove vegetation from the roof assembly and prevent further damage to the flashings (and potentially the SBS membrane).	Replacement	3 - Future Renewal	No	Yes	No	No	25	\$50	SF	\$1,250	0%	5%	5%	\$2,000



Cowichan Valley Regional District

Douglas Hill - Generator Building - Functional Code 603



Photo 1



Photo 2

**June to 2018** Cowichan Valley Regional District  
**Facility Condition Assessment and Capital Plan**  
 Douglas Hill - Water Treatment Building - Functional Code 603

Row	BUD Name	BUD Year	Analysis Data	Asset Category	Asset Sub-Category	Asset ID	Asset Name	Asset Type	Photo	Description & History	CONDITION ASSESSMENT				LIFECYCLE DATA				RECOMMENDATION				OPINION OF PROBABLE COST											
											Condition	Performance	Value/Investment	Replacement Date	Asset Age	Age to 2018	Age to 2028	Age to 2038	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended, will system be replaced over its life cycle?	Will a failure in this system lead to a loss of life or safety?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Material/Replacement Cost	Conting.	Contig. only	OT	OT Tax	Total to 2037 Dollars
1	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	A Substructure	A10 Foundations	A10100 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is covered from exterior, with the exception of some above grade foundation wall on some elevations.	5	5	2011	21-Nov-17	MM	7	50	43	The foundations are expected to remain in service for the life of this building. No capital expense associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	800	\$10	SF	\$10,000	0%	0%	0%	0%	\$10,000
2	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	A Substructure	A10 Foundations	A10100 Sub on Grade	A101001 Standard Sub on Grade	Interior of Building/ Sub on-Grade		The floor is concrete sub-on-grade (finished concrete throughout). Isolated traction cracking was observed. The evidence of major settlement or heaving was reported or observed.	5	5	2011	21-Nov-17	MM	7	50	43	The concrete sub-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expense associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$10	SF	\$6,000	0%	0%	0%	0%	\$7,000
3	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	A Substructure	A10 Foundations	A10100 Sub on Grade	A101000 Foundation Drainage	Underground/ Perimeter Drains		Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2011	21-Nov-17	MM	7	30	3	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	0%	0%	\$1,000
4	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	A Substructure	A10 Foundations	A10100 Sub on Grade	A101000 Foundation Drainage	Underground/ Perimeter Drains		Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2011	21-Nov-17	MM	7	50	43	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage issue recommended in A101000 (Foundation Drainage below).	Contingency	3 - Future Renewal	N/A	N/A	No	No									
5	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ Ceiling Superstructure		The superstructure is comprised of wood framing on 40 floor walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long term leakage that would apply to concealed structural damage.	5	5	2011	21-Nov-17	MM	7	50	43	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$40	SF	\$24,000	0%	0%	0%	0%	\$27,000
6	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	B Shell	B10 Exterior Enclosure	B10100 Exterior Walls	B101001 Exterior Enclosure	Exterior Wall/ Cementitious Siding		Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2011	21-Nov-17	MM	7	11	5	Repair siding and trim.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	700	\$8	SF	\$5,600	0%	0%	0%	0%	\$10,000
7	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	B Shell	B10 Exterior Enclosure	B10100 Exterior Walls	B101001 Exterior Enclosure	Exterior Wall/ Cementitious Siding		Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2011	21-Nov-17	MM	7	50	43	The cementitious siding is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: isolated siding and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	500	\$35	SF	\$17,500	0%	0%	0%	0%	\$28,000
8	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	B Shell	B10 Exterior Enclosure	B10100 Exterior Walls	B101001 Exterior Enclosure	Exterior Wall/ Cementitious Siding		Perforated metal soffits is present at the roof overhangs.	5	5	2011	21-Nov-17	MM	7	50	43	The perforated metal soffits is expected to last the life of the building. No major capital expenditures associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	120	\$40	SF	\$4,800	0%	0%	0%	0%	\$5,000
9	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	B Shell	B10 Exterior Enclosure	B10200 Exterior Windows	B102001 Windows	Exterior Wall/Window		A vinyl framed window assembly is present adjacent to the main doors.	5	5	2011	21-Nov-17	MM	7	23	23	Replace the window assembly at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	0%	0%	0%	\$1,000
10	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	B Shell	B10 Exterior Enclosure	B10200 Exterior Doors	B102001 Solid Doors	Exterior Wall/Door		Two painted metal doors are present on the building.	5	5	2011	21-Nov-17	MM	7	30	23	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	0%	0%	0%	\$4,000
11	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	B Shell	B10 Roofing	B10100 Roof Coverings	B101001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2011	21-Nov-17	MM	7	40	33	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all support fasteners and reworking of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	650	\$30	SF	\$19,500	0%	0%	0%	0%	\$22,000
12	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	B Shell	B10 Roofing	B10100 Roof Coverings	B101001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2011	21-Nov-17	MM	7	25	18	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	0%	0%	0%	\$1,000
13	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	C Interiors	C10 Interior Finishes	C10100 Wall Finishes	C101001 Gypsum Wallboard Finishes	Interior/Interior Finishes		The interior gypsum and plywood walls and ceilings are painted.	5	5	2011	21-Nov-17	MM	7	30	13	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	0%	0%	\$3,000
14	Douglas Hill Water Treatment Building	Water Treatment Bldg	003	C Interiors	C10 Electrical	C10100 Lighting and Branch Wiring	C101001 Gypsum Wallboard Finishes	C101001 Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2011	21-Nov-17	MM	7	20	13	Replace light at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	0%	0%	\$1,000

This report should be reviewed in conjunction with the Objectives, Terms of Reference, Limitations, and Methodology included with the full report.  
 CWRD-BCA - Douglas Hill - Water Treatment Building - Functional Code 603 - Exec in Chart, 01/30/2018



Cowichan Valley Regional District

Douglas Hill - Water Treatment Plant - Functional Code 603



Photo 1



Photo 2

## 604 - Lambourne Estates Water

### Infrastructure Condition Assessment and Capital Plan

5433 Hurtin Road, Cowichan Bay, BC

Date Prepared

July 18, 2018

#### PROPERTY STATISTICS AND REPORT SUMMARY

System Replacement Cost Estimate	\$3,977,759	
Number of Users	171	
Replacement Cost Per User	\$23,262	
Annual Replacement Cost (40 Years)	\$21,120	per year
Annual Replacement Cost (80 Years)	\$49,108	per year
10 Year Capital Plan Total	\$320,000	
10 Year Operations & Maintenance Plan Total	\$68,000	

#### PROPERTY DESCRIPTION

The Lambourne Estates Water System started construction in 1983 and includes the phases outlined in the table below.

Development	Year Installed	Source
Distribution System	1983	Innova Report
Reservoir	1993	Innova Report
Pump Station	1993	Innova Report
Lambourne Dr	1993	Record Drawings (8619)
Hurtin Rd Upgrades	2008	Record Drawings (010788-20-01-ASB)
Polo Field Pl/Royal Island Terrace	2009	Record Drawings (010745-20-01-ASB)
Water Treatment Plant	2010	Record Drawings (10-007-00)
Mobile park	2011	Record Drawings (C1-02-LAM)
Lanes Rd/Greenbrier Rd	2013	Record Drawings (112311109)
Sutherland Rd	2015	Record Drawings (2014-02647)

#### PROJECT TEAM

Austin Tokarek, Asset Coordinator  
 Todd Etherington, Utility Operations Superintendent  
 David Parker, Engineering Technologist III  
 Rob Grant, GIS Supervisor  
 Andrea Kross, GIS Technician I  
 Adam Greenwood, Project Engineer  
 Kieran Bertsch, E.I.T.  
 Caleb Light, GIS

#### CONTACT INFORMATION

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## 604 - Lambourne Estates Water

Infrastructure Condition Assessment and Capital Plan

5433 Hurtin Road, Cowichan Bay, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 3, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 19, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New



## 604 - Lambourne Estates Water

Infrastructure Condition Assessment and Capital Plan

5433 Hurtin Road, Cowichan Bay, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4	6	W-RES-RES-19	Capital Renewal	Replace reservoir	\$300,000	\$300,000
	5						
	6						
Short Term (2 - 5 Year)	7	7	W-PS-PP-31	Capital Upgrade/New	Replace process piping in the pump station.	\$20,000	\$20,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$320,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	W-WTP-GEN-9	Maintenance	Monitor condition of rebuilt and aging generator parts	\$3,000	\$53,000
	8	2	W-WTP-WLL-12 and W-WTP-PMP-13	Operations	Inspect/assess well #3 and well pump for deterioration to determine replacement timing/phasing.	\$5,000	
	9	3	W-WTP-WLL-14 and W-WTP-PMP-15	Operations	Inspect/assess well #4 and well pump for deterioration to determine replacement timing/phasing.	\$5,000	
	10	7	W-PS-COM-21 to W-PS-GEN-30	Operations	Inspect/assess condition of pump station, communications, pumps, pressure tanks, and generator for deterioration to determine replacement timing/phasing.	\$10,000	
	11	12, 15, 17 to 21	ALL	Operations	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$30,000	
	12						
Medium Term (5 - 10 Year)	13	1	ALL	Operations	Inspect/assess condition of WTP for deterioration to determine replacement timing/phasing.	\$10,000	\$15,000
	14	1	W-WTP-FTR-10	Maintenance	Take greensand filter offline if polyphosphate treatment is successful	\$5,000	
	15						
	16						
	17						
						Total	\$68,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Infrastructure Condition Assessment

Owner: Cowichan Valley Regional District (CVRD)
System: Lambourn Estates Water
Site Address: 5433 Huron Rd
Location: South of Strathmore Lake
Parcels: 165
Users: 275

Current Year: 2018
Total Replacement Value: \$3,077,750
Value per user: \$11,192

Main data table with columns: Asset ID, Location, Function Code, Address, Location, DWG Ref, Major, Minor, Asset Code, Photo, Description, Make, Model, Material, Quantity, Year Installed, Year Renewed, Service Life Expectancy, Est. Remaining Service Life, Unit price, Replacement Value of Asset, Physical Condition, Level of Service Condition, Condition Assessment, Probability of Failure, Severity of Failure, Condition, Recommendations / Action Items, Budget Estimate, Timing, Comments/Question to be resolved.

604 Lambourn Estates Waterr-See Infrastructure Condition Assessment table with corresponding photo ID's

**WTP TREATMENT PLANT  
FIELD INSPECTION**

**MORRISON HERSHFIELD**

SYSTEM: Lambourn Estates Water DATE: Nov. 24/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 604 PROJECT No.: 5170700

INSPECTED BY: Adorn CVRD STAFF PRESENT: Todd

1) Type of Treatment System (Schematic)

2) Site Conditions/Security

3) Condition of Structure:  
Visible details:

604 (1)



604 (2)  
1 of 26

604 Lambourn Estates Waterr-See Infrastructure Condition Assessment table with corresponding photo ID's



604 (3)



604 (4)  
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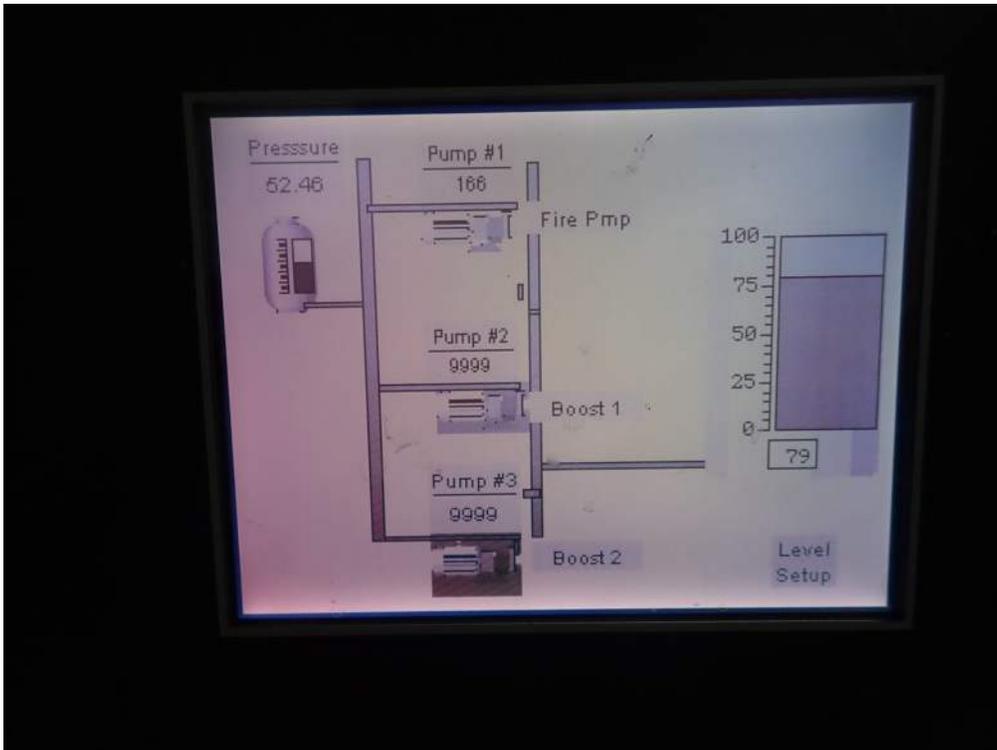


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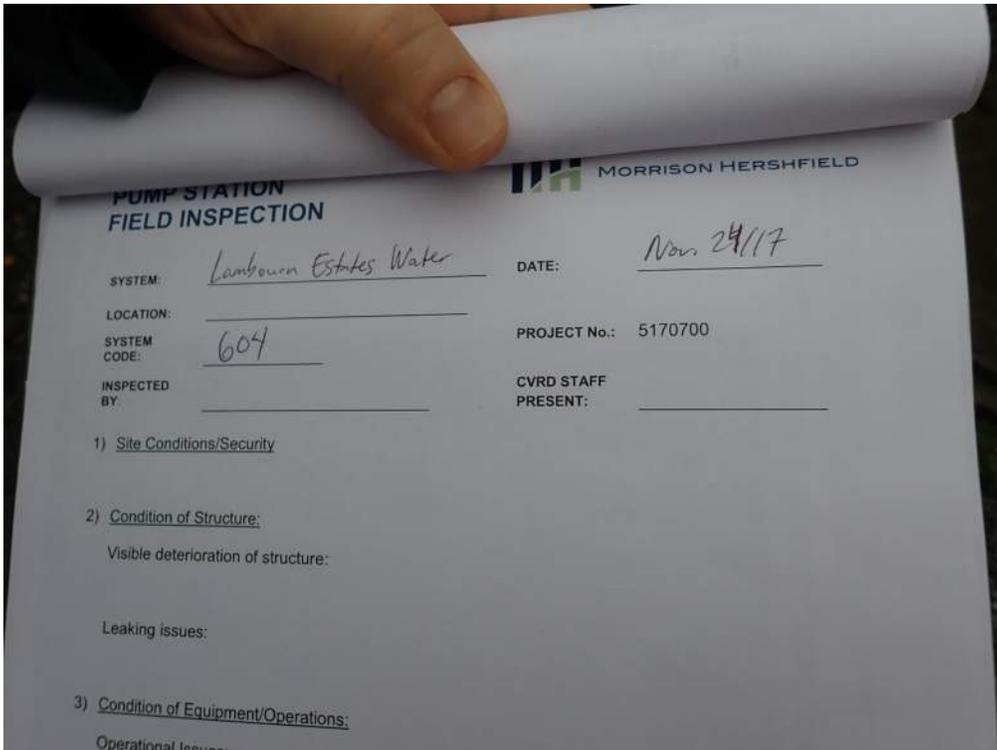


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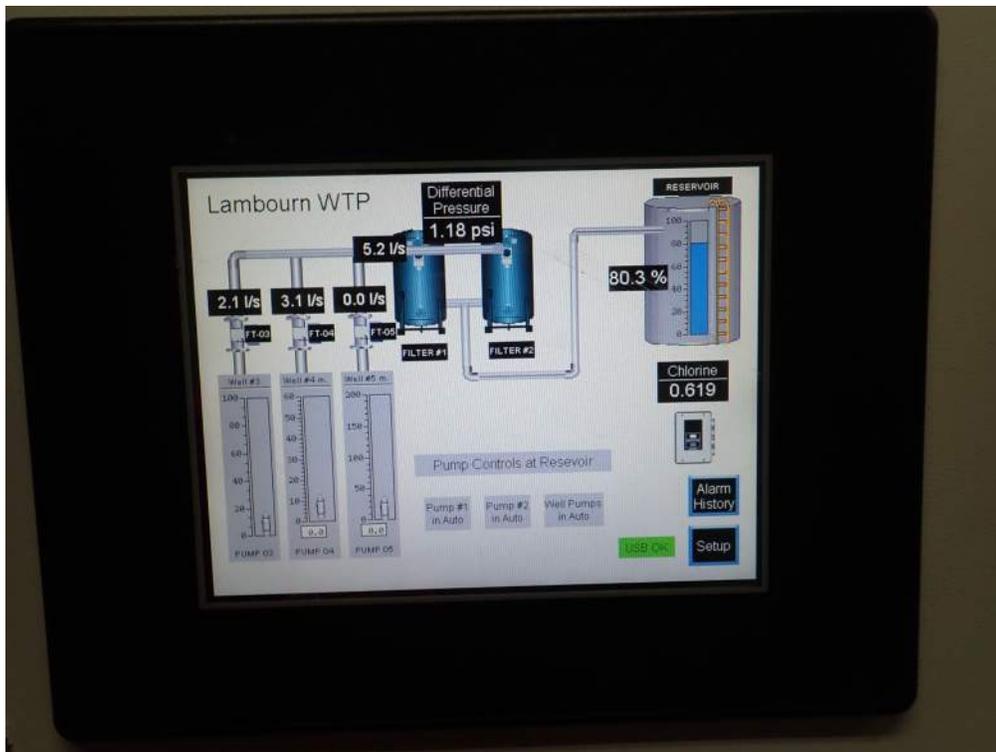


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## 604 Lambourn Estates Waterr-See Infrastructure Condition Assessment table with corresponding photo ID's



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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Lambourn Estates - Pump Station Building - Functional Code 604**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Yr to Next U/R Check or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Lambourn Estates - Pump Station Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some interior areas.	4	4	1993	21-Nov-17	MH	25	50	25	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$20	SF	\$12,000	0%	5%	5%	\$14,000
Satellite Park - Water Treatment Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	1993	21-Nov-17	MH	25	50	25	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$10	SF	\$6,000	0%	5%	5%	\$7,000
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1993	21-Nov-17	MH	25	50	25	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$40	SF	\$24,000	0%	5%	5%	\$27,000
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted wood siding and wood trim are present on the exterior walls. Some isolated areas of deterioration were observed.	4	4	1993	21-Nov-17	MH	25	12	3	Repaint siding and trim.  At the time of painting, replace sealant joints and wood elements as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	800	\$4	SF	\$3,200	0%	15%	5%	\$4,000
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted wood siding and wood trim are present on the exterior walls. Wood siding is also present on some soffit areas. Some isolated areas of deterioration were observed.	4	4	1993	21-Nov-17	MH	25	50	43	Given the use of the building the wood siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	800	\$35	SF	\$28,000	0%	5%	5%	\$31,000
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201005 Exterior Louvers and Screens	Exterior Walls/Vent Louver	1	A metal louver vent is present on the exterior wall.	4	4	1993	21-Nov-17	MH	25	30	23	Replace the louver vent at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	EA	\$200	0%	10%	5%	\$1,000
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	4	4	1993	21-Nov-17	MH	25	30	23	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	D30 Roofing	B3010 Roof Coverings	B301002 Low Slope Roof	Main Roof/Sloped Roof	1	The roof is sloped metal roof assembly. A hydro pole penetration is present on the roof.  The roof is edge drained.	3	3	1993	21-Nov-17	MH	25	30	5	Replace the metal roof at the end of its service life. At the time of the roof replacement the hydro pole should be relocated to avoid the roof penetration.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	650	\$20	SF	\$13,000	0%	5%	5%	\$15,000
Satellite Park - Water Treatment Building	Water Treatment Building	604	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment	1	An exterior light is present on the building near the entrance.	5	5	1993	21-Nov-17	MH	25	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Lambourn Estates - Pump Station Building - Functional Code 604

BLDD Name	BLDD Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT							LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST							10-YEAR CAPITAL PLAN															
						ID	Location / Type	Photo	Description & History	Condition	Performance	V. New or Last Major Action	Assessment Date	Assessed By	Age to 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total to 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
Lambourn Estates - Pump Station Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some interior areas.	4	4	1993	21-Nov-17	MH	25	50	25	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$20	SF	\$12,000	0%	5%	5%	\$14,000											
Satellite Park - Water Treatment Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1010 Slab on Grade	A101001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	1993	21-Nov-17	MH	25	50	25	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$10	SF	\$6,000	0%	5%	5%	\$7,000											
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence of long-term leakage that would allude to concealed structural damage.	4	4	1993	21-Nov-17	MH	25	50	25	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$40	SF	\$24,000	0%	5%	5%	\$27,000											
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted wood siding and wood trim are present on the exterior walls. Some isolated areas of deterioration were observed.	4	4	1993	21-Nov-17	MH	25	12	3	Repaint siding and trim. At the time of painting, replace sealant joints and wood elements as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	800	\$4	SF	\$3,200	0%	15%	5%	\$4,000				\$4,000							
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted wood siding and wood trim are present on the exterior walls. Wood siding is also present on some soffit areas. Some isolated areas of deterioration were observed.	4	4	1993	21-Nov-17	MH	25	50	43	Given the use of the building the wood siding is expected to last the life of the building. Note: Isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	800	\$35	SF	\$28,000	0%	5%	5%	\$31,000											
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201005 Exterior Louvers and Screens	Exterior Walls/Vent Louver	1	A metal louver vent is present on the exterior wall.	4	4	1993	21-Nov-17	MH	25	30	23	Replace the louver vent at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	EA	\$200	0%	10%	5%	\$1,000											
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	4	4	1993	21-Nov-17	MH	25	30	23	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000											
Satellite Park - Water Treatment Building	Water Treatment Building	604	B Shell	B30 Roofing	B3010 Roof Coverings	B301002 Low Slope Roof	Main Roof/Sloped Roof	1	The roof is sloped metal roof assembly. A hydro pole penetration is present on the roof. The roof is edge drained.	3	3	1993	21-Nov-17	MH	25	30	5	Replace the metal roof at the end of its service life. At the time of the roof replacement the hydro pole should be relocated to avoid the roof penetration. Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	650	\$20	SF	\$13,000	0%	5%	5%	\$15,000				\$15,000							
Satellite Park - Water Treatment Building	Water Treatment Building	604	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment	1	An exterior light is present on the building near the entrance.	5	5	1993	21-Nov-17	MH	25	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000											

Cowichan Valley Regional District

Lambourn Estates - Pump Station Building - Functional Code 604



Photo 1

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Lambourn Estates - Water Treatment Building - Functional Code 604

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr Review or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOQ or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2015	21-Nov-17	MH	3	50	47	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	750	\$10	SF	\$7,500	0%	5%	5%	\$9,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2015	21-Nov-17	MH	3	50	47	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	750	\$20	SF	\$15,000	0%	5%	5%	\$17,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2015	21-Nov-17	MH	3	10	7	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No information was available regarding the scoping of the system to review for continuity.	5	5	2015	21-Nov-17	MH	3	50	47	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2015	21-Nov-17	MH	3	50	47	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	750	\$40	SF	\$30,000	0%	5%	5%	\$34,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2015	21-Nov-17	MH	3	12	9	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	900	\$8	SF	\$7,200	0%	15%	5%	\$9,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2015	21-Nov-17	MH	3	50	47	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	900	\$35	SF	\$31,500	0%	5%	5%	\$35,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	5	5	2015	21-Nov-17	MH	3	50	47	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	180	\$20	SF	\$3,600	0%	10%	5%	\$5,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	CB20 Exterior Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/Window	1	A vinyl framed window assembly is present in the building.	5	5	2015	21-Nov-17	MH	3	25	22	Replace window at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	10%	5%	\$1,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Four painted metal doors are present on the building.	5	5	2015	21-Nov-17	MH	3	30	23	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	4	\$1,500	EA	\$6,000	0%	5%	5%	\$7,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Enclosure	E2030 Exterior Doors	B203004 Overhead and Roll-up Doors	Exterior Walls/ Overhead Door	1	One overhead metal door is present on the building.	5	5	2015	21-Nov-17	MH	3	20	17	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$2,000	EA	\$2,000	0%	5%	5%	\$3,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2015	21-Nov-17	MH	3	40	33	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	800	\$30	SF	\$24,000	0%	5%	5%	\$27,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2015	21-Nov-17	MH	3	25	18	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$10	SF	\$1,000	0%	10%	5%	\$2,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum walls and ceilings are painted.	5	5	2015	21-Nov-17	MH	3	20	13	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2015	21-Nov-17	MH	3	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

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 Facility Condition Assessment and Capital Plan  
 Lambourn Estates - Water Treatment Building - Functional Code 604

BUDG Name	BUDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT							LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST										10-YEAR CAPITAL PLAN															
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age to 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total \$2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027				
																																	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,000	\$0	\$9,000	\$0			
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some above-grade foundation wall on some elevations.	5	5	2015	21-Nov-17	MH	3	50	47	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	750	\$10	SF	\$7,500	0%	5%	5%	\$9,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1010 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2015	21-Nov-17	MH	3	50	47	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	750	\$20	SF	\$15,000	0%	5%	5%	\$17,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains		1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2015	21-Nov-17	MH	3	10	7	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains		1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2015	21-Nov-17	MH	3	50	47	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No																					
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2015	21-Nov-17	MH	3	50	47	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	750	\$40	SF	\$30,000	0%	5%	5%	\$34,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2015	21-Nov-17	MH	3	12	9	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	900	\$8	SF	\$7,200	0%	15%	5%	\$9,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2015	21-Nov-17	MH	3	50	47	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	900	\$35	SF	\$31,500	0%	5%	5%	\$35,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit		1	Perforated metal soffit is present at the roof overhangs.	5	5	2015	21-Nov-17	MH	3	50	47	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	180	\$20	SF	\$3,600	0%	10%	5%	\$5,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Exterior Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/Window		1	A vinyl framed window assembly is present in the building.	5	5	2015	21-Nov-17	MH	3	25	22	Replace window at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	10%	5%	\$1,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Enclosure	E2030 Exterior Doors	E203001 Solid Doors	Exterior Walls/ Door		1	Four painted metal doors are present on the building.	5	5	2015	21-Nov-17	MH	3	30	23	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	4	\$1,500	EA	\$6,000	0%	5%	5%	\$7,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	B20 Enclosure	E2030 Exterior Doors	E203004 Overhead and Roll-up Doors	Exterior Walls/ Overhead Door		1	One overhead metal door is present on the building.	5	5	2015	21-Nov-17	MH	3	20	17	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$2,000	EA	\$2,000	0%	5%	5%	\$3,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2015	21-Nov-17	MH	3	40	33	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	800	\$30	SF	\$24,000	0%	5%	5%	\$27,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2015	21-Nov-17	MH	3	25	18	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$10	SF	\$1,000	0%	10%	5%	\$2,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301001 Gypsum Wallboard Finishes	Interior/Interior Finishes		2	The interior gypsum walls and ceilings are painted.	5	5	2015	21-Nov-17	MH	3	20	13	Repair interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000													
Lambourn Estates - Water Treatment Building	Water Treatment Building	604	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Lighting Equipment			An exterior light is present on the building near the entrance.	5	5	2015	21-Nov-17	MH	3	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000													

Cowichan Valley Regional District

Lambourn Estates - Water Treatment Building - Functional Code 604



Photo 1



Photo 2



## 605 - Arbutus Mountain Estates Water

Infrastructure Condition Assessment and Capital Plan

1003 Easton Place, Cobble Hill, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 4, 2018	Adam Greenwood and Kieran Bertsch	The watermain, fire hydrant, and pressure reducing valve chamber that were installed to be included for fire service were added to the assessment listed as Asset ID 8.
March 4, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 19, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 605 - Arbutus Mountain Estates Water

Infrastructure Condition Assessment and Capital Plan

1003 Easton Place, Cobble Hill, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	1	W-WTP-PMP-11	Capital Upgrade/New	Replace existing fire pump with a smaller pump that operates at the appropriate operating conditions.	\$30,000	\$30,000
	11						
	12						
						Total	\$30,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	1	ALL	Operations	Inspect/assess condition of WTP, pumps, chlorine system, and communications for deterioration to determine replacement timing/phasing.	\$5,000	\$15,000
	11	4	W-RES-TNK-15	Operations	Inspect/assess condition of reservoir for deterioration to determine replacement timing/phasing.	\$10,000	
	12						
	13						
	14						
						Total	\$15,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Infrastructure Condition Assessment

Owner:	Cowichan Valley Regional District (CVRD)
System:	GIS
City Address:	1003 Easton Place
Geographic Location:	South of Shawangian Lake
Customers:	Parrets 123
Users:	124

Current Year:	2018	Total Replacement Value:	\$1,644,383
		Value per year:	\$25,000

Asset ID	Function Code	Address	Location	Location	DWG Ref	Asset Code		Photo	Description	Make	Model	Material	Asset Inventory			Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Condition Assessment				Recommendations / Action Items	Type of Work	10 Year Capital Plan	Timing	Comment/Question to be resolved					
						Major	Minor						Spec	ID	Asset Code						Quantity	Unit	Year Installed	Physical Condition						Functional Condition	Demand Condition	Probability of Failure	Severity of Failure	Condition
1	605	1003 Easton Place	Water treatment plant / Pumphouse	Site Visit / Photos		W	WTP	1	W-WTP-1	3 to 21, 23, 26, 27, 29, MOV 1			1	ea	2007	40	29		\$0	Refer to Archival Mountain Eastern Water System Building Condition Assessment														
1	605	1003 Easton Place	Water treatment plant / Pumphouse	1500-01-01		W	WTP	2	W-WTP-2	15			2	ea	2007	40	29	\$4,800	\$8,000	Good	Meets standard			1	2	3								
1	605	1003 Easton Place	Water treatment plant / Pumphouse	1500-01-01		W	WTP	4	W-WTP-PMP-4	8 to 11		Myers	2	ea	2007	20	9	\$5,000	\$10,000	Good	Meets standard			2	2	4	Inspect/assess condition of WTP, pumps, chlorine system, and communications for deterioration to determine replacement timing/sharing	Operations	\$5,000	5-10 Year				
1	605	1003 Easton Place	Water treatment plant / Pumphouse	1500-01-01		W	WTP	6	W-WTP-CH-6	18 to 21		Severn Trent	2	ea	2007	20	9	\$13,000	\$26,000	Good	Meets standard			2	2	4	Inspect/assess chlorine system for deterioration to determine replacement timing/sharing	Operations	Included above	5-10 Year				
1	605	1003 Easton Place	Water treatment plant / Pumphouse	1500-01-01		W	WTP	8	W-WTP-PP-8	7 to 11, 14, 15, 17			1	LS	2007	40	29	\$50,000	\$50,000	Good - some surface corrosion on valves	Meets standard	At risk to handle flows	1	2	3									
1	605	1003 Easton Place	Water treatment plant / Pumphouse	Site Visit / Photos		W	WTP	9	W-WTP-COM-9	12, 13, 16			1	LS	2007	20	9	\$8,000	\$8,000	Good - intrusion alarm	Meets standard			2	2	4	Inspect/assess condition of communications	Operations	Included above	5-10 Year				
1	605	1003 Easton Place	Water treatment plant / Pumphouse	Site Visit / Photos		W	WTP	10	W-WTP-GEN-10	28		Kohler	1	ea	2007	40	29	\$100,000	\$100,000	Good - oversized	Meets standard	Able to meet capacity	1	2	3	Replace existing fire pump with a smaller pump that operates at the appropriate operating conditions	Capital Upgrade/New	\$30,000	5-10 Year					
1	605	1003 Easton Place	Water treatment plant / Pumphouse	1500-01-01		W	WTP	11	W-WTP-PMP-11	7, 9 to 11, 17		Chenco	1	ea	2007	20	9	\$25,000	\$25,000	Good	Meets standard	Does not turn on due to capacity of other pumps	2	2	4									
2	605	1003 Easton Place	Entrance to Pumphouse	1500-01-01/WTP Site Plan		W	WTP	12	W-WTP-WL-12	5			1	ea	2007	40	29	\$10,000	\$10,000	Good - good quality water	Meets standard			1	2	3								
2	605	1003 Easton Place	Entrance to Pumphouse	1500-01-01/WTP Site Plan		W	WTP	13	W-WTP-PMP-13	5			1	ea	2007	20	9	\$7,000	\$7,000	Good	Meets standard			1	2	3								
3	605	1003 Easton Place	Entrance to Pumphouse	1500-01-01/WTP Site Plan		W	WTP	14	W-WTP-WL-14	25			1	ea	2007	40	29	\$10,000	\$10,000	Good - good quality water	Meets standard			1	2	3								
3	605	1003 Easton Place	Entrance to Pumphouse	1500-01-01/WTP Site Plan		W	WTP	15	W-WTP-PMP-15	25			1	ea	2007	20	9	\$7,000	\$7,000	Good	Meets standard			1	2	3								
4	605	1003 Easton Place	Reservoir	197		W	RES	15	W-RES-TM-15	2, 3, 5, 6, 22 to 24			1	LS	2007	80	69	\$750,000	\$750,000	Good	Meets standard			1	3	4	Inspect/assess condition of reservoir for deterioration to determine replacement timing/sharing	Operations	\$10,000	5-10 Year				
5	605	1003 Easton Place	Shyler Circle	197		W	PP	16	W-PP-PP-16				130	m	2011	80	73	\$450	\$148,500					1	2	3								
5	605	1003 Easton Place	Shyler Circle	197		W	PP	17	W-PP-PP-17		PVC		130	m	2011	80	73	\$100	\$65,000					1	2	3								
5	605	1003 Easton Place	Shyler Circle	197		W	PP	18	W-PP-PP-18				79	m	2011	80	73	\$450	\$148,500					1	2	3								
5	605	1003 Easton Place	Shyler Circle/Easton Place	197		W	PP	19	W-PP-S-19				49	ea	2011	60	53	\$1,800	\$147,000					1	2	3								
6	605	1003 Easton Place	Fitzgerald rd	197		W	PP	20	W-PP-PP-20		PVC		75	m	2011	80	73	\$450	\$133,500					1	2	3								
6	605	1003 Easton Place	Wright Rd	197		W	PP	21	W-PP-PP-21		PVC		64	m	2011	80	73	\$450	\$126,000					1	2	3								
6	605	1003 Easton Place	Fitzgerald/Highway	197		W	PP	22	W-PP-S-22				8	ea	2011	60	53	\$1,800	\$147,000					1	2	3								
7	605	1003 Easton Place	Shawangian Rd	197		W	PP	23	W-PP-PP-23		PVC		63	m	2008	80	70	\$450	\$126,000					1	2	3								
8	605	1003 Easton Place	Entrance to Pumphouse	1500-01-01/WTP Site Plan		W	PP	24	W-PP-PP-24				20	m	2008	80	70	\$500	\$10,000					1	2	3								
8	605	1003 Easton Place	Entrance to Pumphouse	1500-01-01/WTP Site Plan		W	PP	25	W-PP-PP-25				7	m	2008	80	70	\$450	\$126,000					1	2	3								
8	605	1003 Easton Place	Entrance to Pumphouse	1500-01-01/WTP Site Plan		W	PP	26	W-PP-PP-26				20	m	2008	80	70	\$450	\$126,000					1	2	3								
9	605	1003 Easton Place	Shawangian Lake rd to Sookle Lake Rd	Site Visit / Photos		W	PP	27	W-PP-PP-27				1,100	m	2008	80	70	\$100	\$100,000					1	2	3								
9	605	1003 Easton Place	Shawangian Lake rd to Sookle Lake Rd	Site Visit / Photos		W	PP	28	W-PP-PP-28				1	ea	2008	40	30	\$200,000	\$200,000					1	2	3								
10	605	1003 Easton Place	EASTON PLACE	GIS		W	PP	29	W-PP-PP-29				0	m	2008	60	50	\$400	\$0					1	2	3								
10	605	1003 Easton Place	EASTON PLACE	GIS		W	PP	30	W-PP-PP-30				14	m	2008	60	50	\$500	\$5,000					1	2	3								
10	605	1003 Easton Place	EASTON PLACE	GIS		W	PP	31	W-PP-PP-31				124	m	2008	60	50	\$550	\$68,100					1	2	3								
11	605	1003 Easton Place	FITZGERALD ROAD	GIS		W	PP	32	W-PP-PP-32				392	m	2008	60	50	\$450	\$176,400					1	2	3								
12	605	1003 Easton Place	WRIGHT WAY	GIS		W	PP	33	W-PP-PP-33				75	m	2008	60	50	\$450	\$133,500					1	2	3								
13	605	1003 Easton Place	USA CLOSE	GIS		W	PP	34	W-PP-PP-34				189	m	2008	60	50	\$450	\$84,900					1	2	3								
14	605	1003 Easton Place	SHAWANGIAN LAKE ROAD	GIS		W	PP	35	W-PP-PP-35				0	m	2008	60	50	\$450	\$0					1	2	3								
14	605	1003 Easton Place	SHAWANGIAN LAKE ROAD	GIS		W	PP	36	W-PP-PP-36				1419	m	2008	60	50	\$550	\$780,600					1	2	3								
15	605	1003 Easton Place	SHAWANGIAN LAKE ROAD	GIS		W	PP	37	W-PP-PP-37				1	m	2011	60	53	\$450	\$507					1	2	3								
15	605	1003 Easton Place	SHAWANGIAN LAKE ROAD	GIS		W	PP	38	W-PP-PP-38				0	m	2011	60	53	\$450	\$0					1	2	3								
15	605	1003 Easton Place	SHAWANGIAN LAKE ROAD	GIS		W	PP	39	W-PP-PP-39				12	m	2011	60	53	\$500	\$6,000					1	2	3								
16	605	1003 Easton Place	WRIGHT ROAD	GIS		W	PP	40	W-PP-PP-40				0	m	2008	60	50	\$450	\$0					1	2	3								
17	605	1003 Easton Place	Shire system	GIS		W	PP	41	W-PP-PP-41				119	ea	2008	40	30	\$1,800	\$214,200					1	2	3								

605 -Arbutus Mtn Estates Water - See Infrastructure Condition Assessment table with corresponding photo ID's



605 (1)



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605 (3)



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605 (5)



605 (6)  
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605 -Arbutus Mtn Estates Water - See Infrastructure Condition Assessment table with corresponding photo ID's



605 (7)

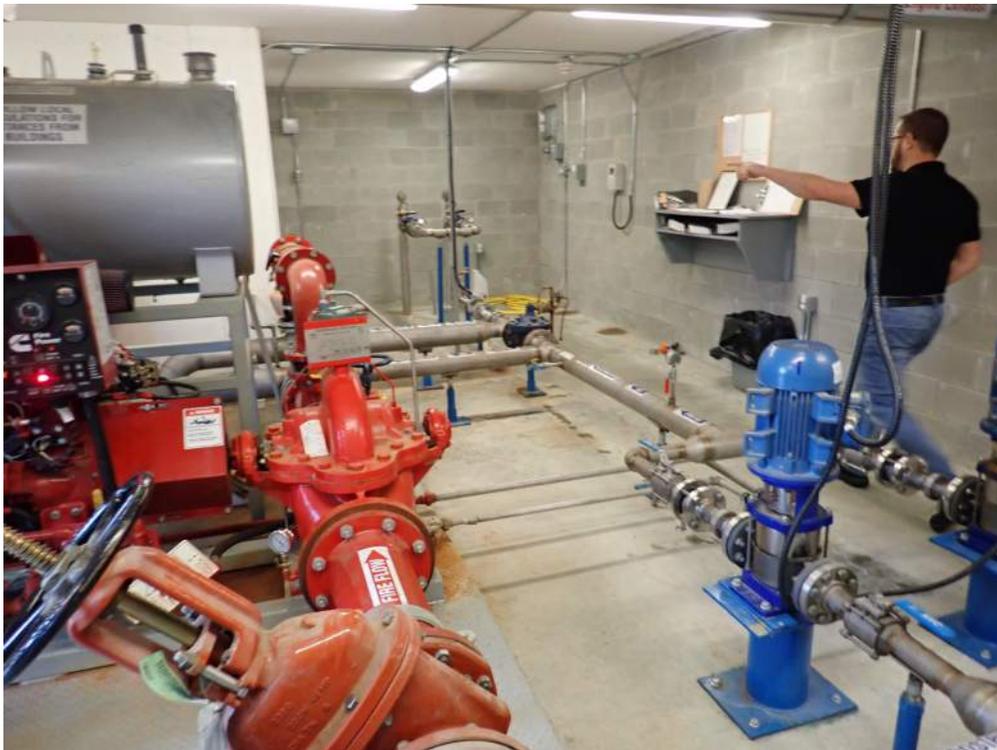


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605 -Arbutus Mtn Estates Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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605 (13)

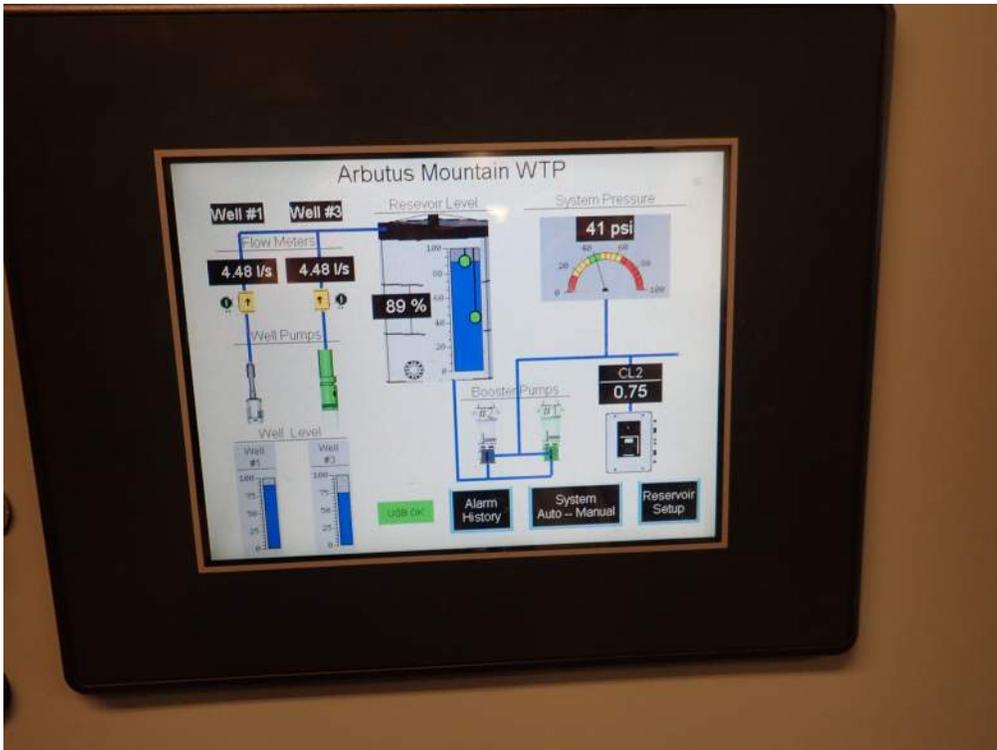


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605 (29)

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Arbutus Mountain Estates Water - Water Treatment Building - Functional Code 605**

BLOG Name	BLOG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION				OPINION OF PROBABLE COST												
						ID	Location / Type		Condition	Performance	Yr Review or Last Major Action	Assessment Date	Assessed By	Age in 2018	Type of Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars	
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2008	21-Nov-17	MH	10	50	40	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	250	\$20	SF	\$5,000	0%	5%	5%	\$6,000
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2008	21-Nov-17	MH	10	50	40	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	250	\$10	SF	\$2,500	0%	5%	5%	\$3,000
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of split faced masonry blocks. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2008	21-Nov-17	MH	10	30	20	Masonry structural components are expected to last the life of the building. A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Soffits	1	Perforated metal soffit is present at the roof overhangs.	5	5	2008	21-Nov-17	MH	10	50	40	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	50	\$20	SF	\$1,000	0%	10%	5%	\$2,000
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201005 Exterior Louvers and Screens	Exterior Walls/Vent Louver	1	A metal louver vent is present on the exterior wall.	5	5	2008	21-Nov-17	MH	10	30	20	Replace the louver vent at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	EA	\$200	0%	10%	5%	\$1,000
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	B Shell	B20 Enclosure	F2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	5	5	2008	21-Nov-17	MH	10	30	20	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Asphalt Single Roof Assembly	1	The roof is sloped assembly which has been waterproofed with asphalt shingles. The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2008	21-Nov-17	MH	10	30	20	Replace asphalt shingles at the end of its service life. Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	300	\$20	SF	\$6,000	0%	5%	5%	\$7,000
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Asphalt Single Roof Assembly	1	The roof is sloped assembly which has been waterproofed with asphalt shingles. The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2008	21-Nov-17	MH	10	30	20	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	50	\$10	LF	\$500	0%	10%	5%	\$1,000
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Asphalt Single Roof Assembly	1	The roof is sloped assembly which has been waterproofed with asphalt shingles. Fascia board are painted wood assemblies.	4	4	2008	21-Nov-17	MH	10	15	5	Repair and repaint wood fascia boards.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	Sections of the building have been finished with gypsum wall board.	5	5	2008	21-Nov-17	MH	10	20	10	Repaint interiors as required. Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Arbutus Mountain Estates Water - Water Treatment Building	Water Treatment Building	605	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2008	21-Nov-17	MH	10	20	10	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Arbutus Mountain Estates Water --Water Treatment Building - Functional Code 605



Photo 1



Photo 2



## 608 - Fern Ridge Water

### Infrastructure Condition Assessment and Capital Plan

1058 Fern Ridge Drive, Mill Bay, BC

Date Prepared

July 18, 2018

#### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 4, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 608 - Fern Ridge Water

Infrastructure Condition Assessment and Capital Plan  
1058 Fern Ridge Drive, Mill Bay, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	W-RES-TNK-13	Capital Upgrade/New	Inspect/assess condition of reservoir and rehabilitate the sections that are deteriorating.	\$50,000	\$50,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$50,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	ALL	Operations	Inspect/assess condition of access road, WTP, pumps, communications, process piping, pressure tank, generator and chlorine system for deterioration to determine replacement timing/phasing.	\$10,000	\$10,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
	13						
	14						
						Total	\$10,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.



608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's

**WTP TREATMENT PLANT  
FIELD INSPECTION**

**MH MORRISON HERSHFIELD**

SYSTEM: Fern Ridge Water DATE: Nov. 22/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 608 PROJECT No.: 5170700

INSPECTED BY: Adam CVRD STAFF PRESENT: Todd

1) Type of Treatment System (Schematic)  
Well  
Logane  
Quality  
Two  
Archie Arnie State.

2) Site Conditions/Security

3) Condition of Structure:  
Visible deterioration of structure:  
  
Leaking issues:

608 (1)



608 (2)  
1 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (3)



608 (4)  
2 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (5)



608 (6)  
3 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (7)



608 (8)  
4 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (9)



608 (10)  
5 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (11)



608 (12)  
6 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (13)



608 (14)  
7 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (15)



608 (16)  
8 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (17)



608 (18)  
9 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (19)



608 (20)  
10 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (21)



608 (22)  
11 of 12

608 -Fern Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



608 (23)



608 (24)  
12 of 12

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Fern Ridge - Water Treatment Building - Functional Code 608**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr. Since Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOQ or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Fern Ridge - Water Treatment Building	Water Treatment Building	608	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	1995	21-Nov-17	MH	23	50	27	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	450	\$10	SF	\$4,500	0%	5%	5%	\$5,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	1995	21-Nov-17	MH	23	50	27	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No major capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	450	\$20	SF	\$9,000	0%	5%	5%	\$10,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	1995	21-Nov-17	MH	23	10	3	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	1995	21-Nov-17	MH	23	50	27	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Fern Ridge - Water Treatment Building	Water Treatment Building	608	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	1995	21-Nov-17	MH	23	50	27	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	450	\$40	SF	\$18,000	0%	5%	5%	\$20,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted wood siding (board and batten configuration) and wood trim are present on the exterior walls. Isolated sections of unpainted cladding were present on the rear of the building under the overhang structure.  The timeline of the last repainting was not known and has been assumed.	5	5	2015	21-Nov-17	MH	3	12	9	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	800	\$5	SF	\$4,000	0%	5%	5%	\$5,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	1995	21-Nov-17	MH	23	50	27	The wood siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	800	\$35	SF	\$28,000	0%	5%	5%	\$31,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Soffits	1	Perforated metal soffit is present at the roof overhangs.	5	5	1995	21-Nov-17	MH	23	50	43	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	80	\$20	SF	\$1,600	0%	10%	5%	\$2,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	B Shell	CB20 Exterior Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/Vent Louver	1	A vinyl framed window is present at the main entrance.	4	4	1995	21-Nov-17	MH	23	35	12	Replace the louver vent at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	EA	\$200	0%	10%	5%	\$1,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	A metal door is present at the buildings main entrance.	4	4	1995	21-Nov-17	MH	23	30	7	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped roof assembly with asphalt shingles installed.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	1995	21-Nov-17	MH	23	30	7	Replace asphalt shingle at the end of their service life.	Replacement	3 - Future Renewal	No	Yes	No	No	500	\$10	SF	\$5,000	0%	5%	5%	\$6,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped roof assembly with asphalt shingles installed.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	1995	21-Nov-17	MH	23	25	18	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	80	\$10	SF	\$800	0%	10%	5%	\$1,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301099 Other Wall Finishes	Interior Walls/Plywood Finishes	2	The interior walls are finished with painted plywood.	5	5	1995	21-Nov-17	MH	23	20	7	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	0%	5%	\$2,000
Fern Ridge - Water Treatment Building	Water Treatment Building	608	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	1995	21-Nov-17	MH	23	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Fern Ridge - Water Treatment Building - Functional Code 608







# 611 - Bald Mountain Water

Infrastructure Condition Assessment and Capital Plan

9455 Marble Bay Road, Honeymoon Bay, BC

Date Prepared

July 18, 2018

**REPORT NOTES**

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 5, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management seperately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create seperate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 611 - Bald Mountain Water

Infrastructure Condition Assessment and Capital Plan  
9455 Marble Bay Road, Honeymoon Bay, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$0

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	1	ALL	Operations	Inspect/assess the condition of the WTP, UV treatment, chlorine system, process piping, and communications for deterioration to determine replacement timing/phasing.	\$10,000	\$20,000
	11	2	W-WTP-WLL-8 and W-WTP-PMP-9	Operations	Inspect/assess the condition of the well and well pump for deterioration to determine replacement timing/phasing.	\$5,000	
	12	3	W-RES-RES-10	Operations	Inspect/assess the condition of the reservoir for deterioration to determine replacement timing/phasing.	\$5,000	
	13						
	14						
						Total	\$20,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.



611 -Bald Mtn.Water - See Infrastructure Condition Assessment table with corresponding photo ID's

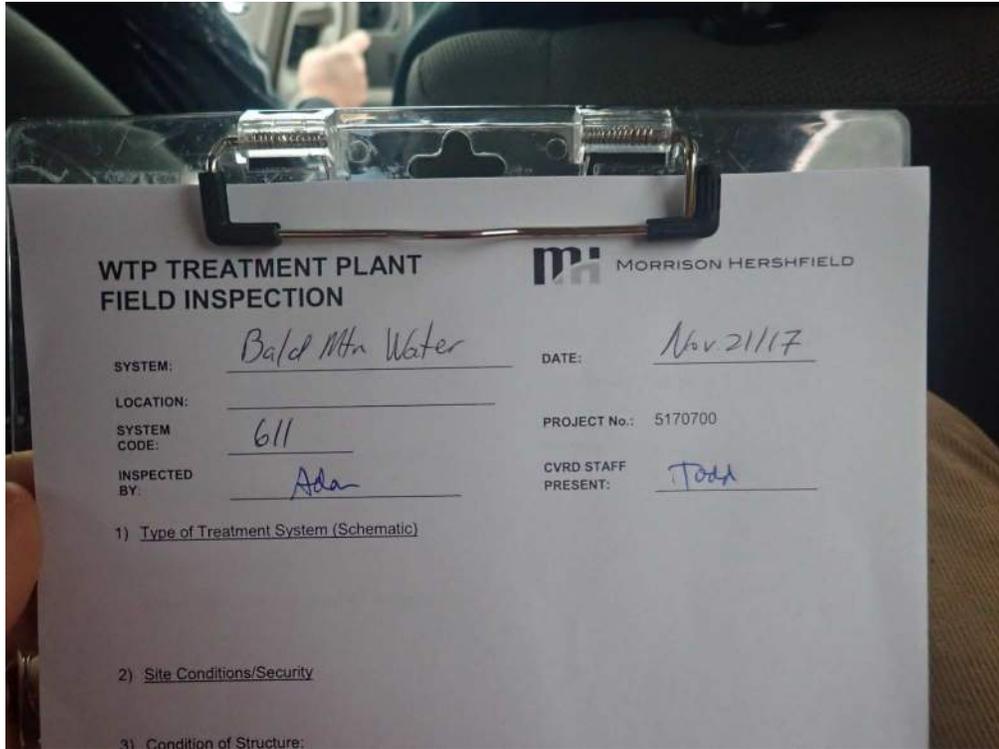


611 (1)



611 (2)  
1 of 9

611 -Bald Mtn.Water - See Infrastructure Condition Assessment table with corresponding photo ID's



611 (3)



611 (4)  
2 of 9

611 -Bald Mtn. Water - See Infrastructure Condition Assessment table with corresponding photo ID's



611 (5)



611 (6)  
3 of 9

611 -Bald Mtn.Water - See Infrastructure Condition Assessment table with corresponding photo ID's



611 (7)



611 (8)  
4 of 9

611 -Bald Mtn.Water - See Infrastructure Condition Assessment table with corresponding photo ID's



611 (9)



611 (10)  
5 of 9

611 -Bald Mtn.Water - See Infrastructure Condition Assessment table with corresponding photo ID's



611 (11)



611 (12)  
6 of 9

611 -Bald Mtn.Water - See Infrastructure Condition Assessment table with corresponding photo ID's



611 (13)



611 (14)  
7 of 9

611 -Bald Mtn.Water - See Infrastructure Condition Assessment table with corresponding photo ID's



611 (15)



611 (16)  
8 of 9

611 -Bald Mtn.Water - See Infrastructure Condition Assessment table with corresponding photo ID's



611 (17)

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Bald Mountain - Water Treatment Building - Functional Code 611

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr Review or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Bald Mountain - Water Treatment Building	Water Treatment Building	611	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2010	21-Nov-17	MH	8	50	42	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	650	\$20	SF	\$13,000	0%	5%	5%	\$15,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2010	21-Nov-17	MH	8	50	42	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	650	\$10	SF	\$6,500	0%	5%	5%	\$8,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2010	21-Nov-17	MH	8	10	2	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No information was available regarding the scoping of the system to review for continuity.	5	5	2010	21-Nov-17	MH	8	50	42	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Bald Mountain - Water Treatment Building	Water Treatment Building	611	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2010	21-Nov-17	MH	8	50	42	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	650	\$40	SF	\$26,000	0%	5%	5%	\$29,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted wood siding and wood trim are present on the exterior walls. Isolated sections of unpainted cladding were present on the rear of the building under the overhang structure.  The timeline of the last repainting was not known and has been assumed.	4	4	2010	21-Nov-17	MH	8	12	4	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	700	\$5	SF	\$3,500	0%	5%	5%	\$4,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2010	21-Nov-17	MH	8	50	42	The wood siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	700	\$35	SF	\$24,500	0%	5%	5%	\$28,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Soffits	1	Perforated metal soffit is present at the roof overhangs.	5	5	2010	21-Nov-17	MH	8	50	42	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	80	\$20	SF	\$1,600	0%	10%	5%	\$2,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two metal doors are present at the buildings main entrance.	5	5	2010	21-Nov-17	MH	8	30	22	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped with a metal roof installed. Snowguard area present at the base of the roof.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2010	21-Nov-17	MH	8	40	32	Replace asphalt shingle at the end of their service life.	Replacement	3 - Future Renewal	No	Yes	No	No	700	\$10	SF	\$7,000	0%	5%	5%	\$8,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped with a metal roof installed. Snowguard area present at the base of the roof.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2010	21-Nov-17	MH	8	25	17	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	40	\$10	SF	\$400	0%	10%	5%	\$1,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301099 Other Wall Finishes	Interior Walls/Plywood Finishes	2	The interior walls are finished with painted plywood.	5	5	2010	21-Nov-17	MH	8	20	12	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	0%	5%	\$2,000
Bald Mountain - Water Treatment Building	Water Treatment Building	611	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2010	21-Nov-17	MH	8	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Bald Mountain - Water Treatment Building - Functional Code 611





## 613 - Dogwood Ridge Water

Infrastructure Condition Assessment and Capital Plan

4922 Wilson Road, Duncan, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 5, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

**613 - Dogwood Ridge Water**  
**Infrastructure Condition Assessment and Capital Plan**  
**4922 Wilson Road, Duncan, BC**

Date Prepared July 18, 2018

**10 Year Capital Plan and Operations and Maintenance Plan**

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	3	ALL	Capital Upgrade/New	Rehabilitate well #2 and install level sensors.	\$15,000	\$15,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						<b>Total</b>	<b>\$15,000</b>

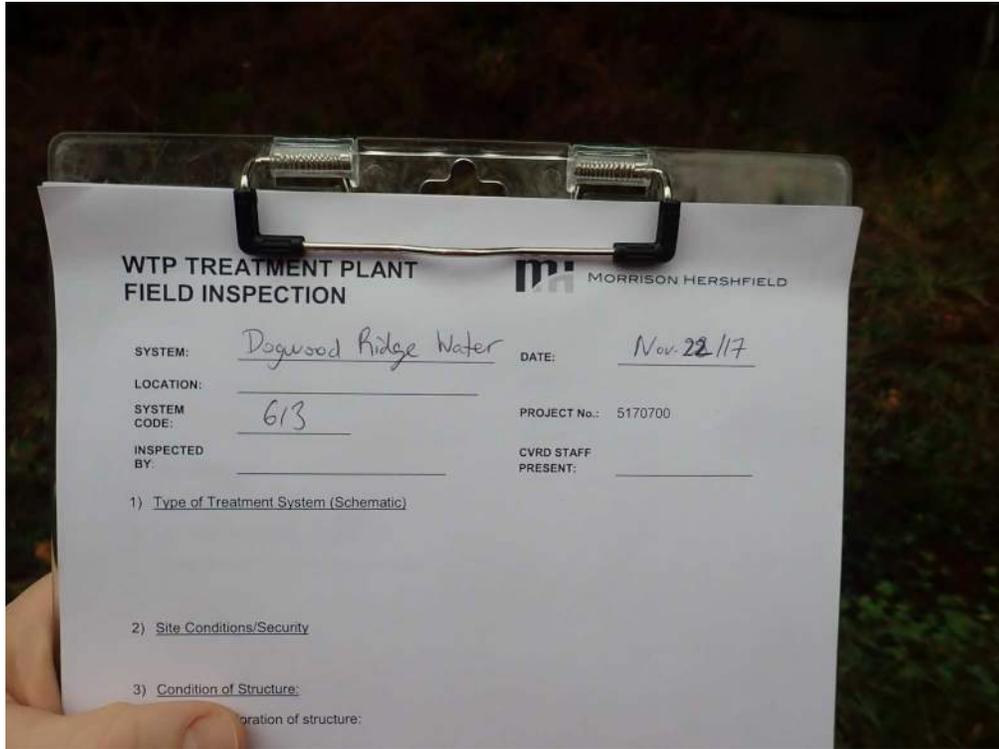
**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	3	W-WTP-PMP-12 and W-WTP-COM-13	Operations	Inspect/assess the condition of well #2 pump and communications.	\$5,000	\$15,000
	8	9	W-PP-PP-28 and W-PP-PP-29	Operations	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$10,000	
	9						
Medium Term (5 - 10 Year)	10	1	ALL	Operations	Inspect/assess the condition of the WTP, pumps, and communications for deterioration to determine replacement timing/phasing.	\$10,000	\$25,000
	11	2	W-WTP-WLL-10 and W-WTP-PMP-11	Operations	Inspect/assess the condition of well #1 and well pump.	\$5,000	
	12	4	W-RES-TNK-14	Operations	Inspect/assess the condition of the reservoir for deterioration to determine replacement timing/phasing.	\$10,000	
	13						
	14						
						<b>Total</b>	<b>\$40,000</b>

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.



613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



613 (1)



613 (2)  
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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



613 (3)



613 (4)  
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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



613 (5)



613 (6)  
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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



613 (7)



613 (8)  
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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



613 (9)



613 (10)  
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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



613 (11)



613 (12)  
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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



613 (13)



613 (14)  
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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



613 (17)

**Water Treatment Plant \$240,000**  
 Treatment: Hypochlorination with sodium hypochlorite solution  
 Equipment: 7.5 Tgp Biostar Pumps  
 Automated monitoring and controls  
 New submersible well pump for well # 1

**Well #1 Rehabilitation and Tie-in \$10,000**  
 - Well 1: depth: 178 ft (54.3m), flow rate: 19.3l/min (4.2 lgal/min)  
 - Well 2: depth: 189.5 ft (57.8m), flow rate: 80.9l/min (17.8 lgal/min)  
 - Well protection plan

**Reservoir \$180,000**  
 50,000 l gallons steel bolted

**DOGWOOD RIDGE UPGRADES TOTAL COST: \$ 520,000**

**SOURCES OF FUNDING:**  
 29% Borrowed; 19% Gas Tax; 52% Canada -BC Municipal Rural

**Watermain Upgrades \$90,000**  
 - Total length: 370 m of PVC pipe  
 - To tie-in well # 1  
 - To loop Hughes Rd to Bruce Rd via Wilson Rd

**C.V.R.D.**

613 (18)  
 9 of 15

613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's

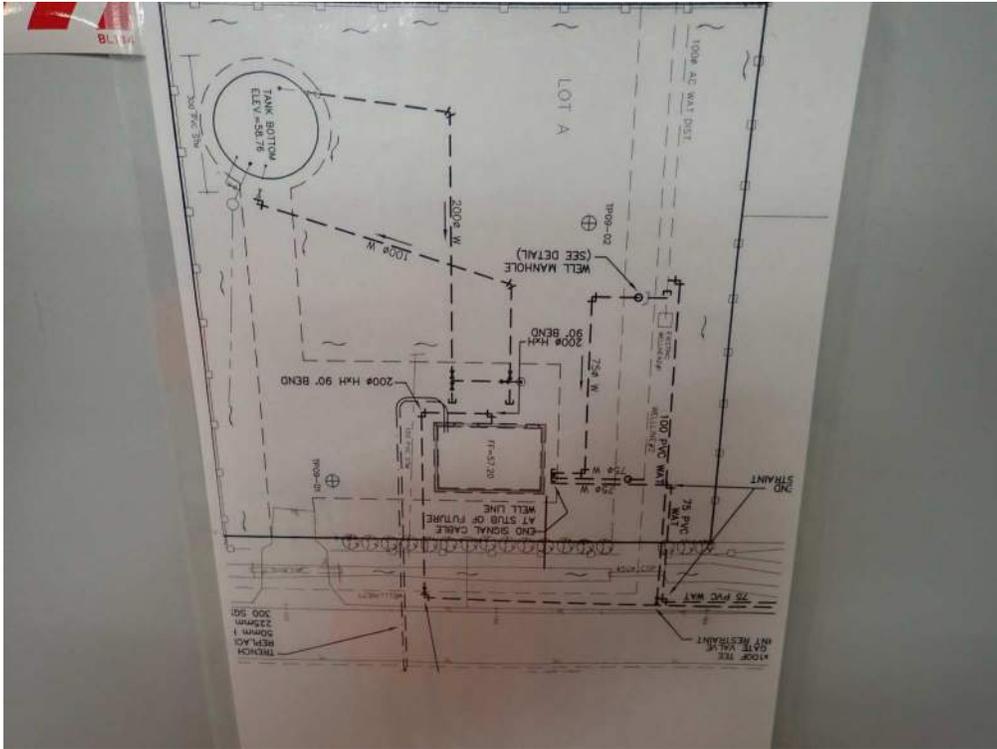


613 (19)



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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



613 (21)

Reservoir Volume List		CVRD
Location	Volume (Liters)	Volume (M <sup>3</sup> )
Arbutus Mountain Estates Water	757100	757.1
Arbutus Ridge Water	1295635	1295.6
Bald Mountain Water	1118214	1118.2
Barnum Water	326520	326.5
Carlton Water Systems	271500	271.5
Cherry Point Water	204574	204.6
Dogwood Ridge Water	227000	227.0
Douglas Hill Water	454609	454.6
Fenridge Water	199768	199.8
Honeycreek Bay Water	454609	454.6
Kerry Village Water	318226	318.2
Lambourn Estates Water (Sand)	190000	190.0
Lambourn Estates Water (Concrete)	251000	251.0
Manahie Lake Water	240548	240.5
Saltair Water Systems	819000	819.0
Satolite Park Water	572807	572.8
Shawigan Lake North Water (Concrete)	750105	750.1
Shawigan Lake North Water (Steel)	454609	454.6
Shelwood Water	420618	420.6
Woolley Range Water	327318	327.3
Yinkon Water	1148000	1148.0
Creekside Water (Reservoir 1)	307006	307.0
Creekside Water (Reservoir 2)	161370	161.4

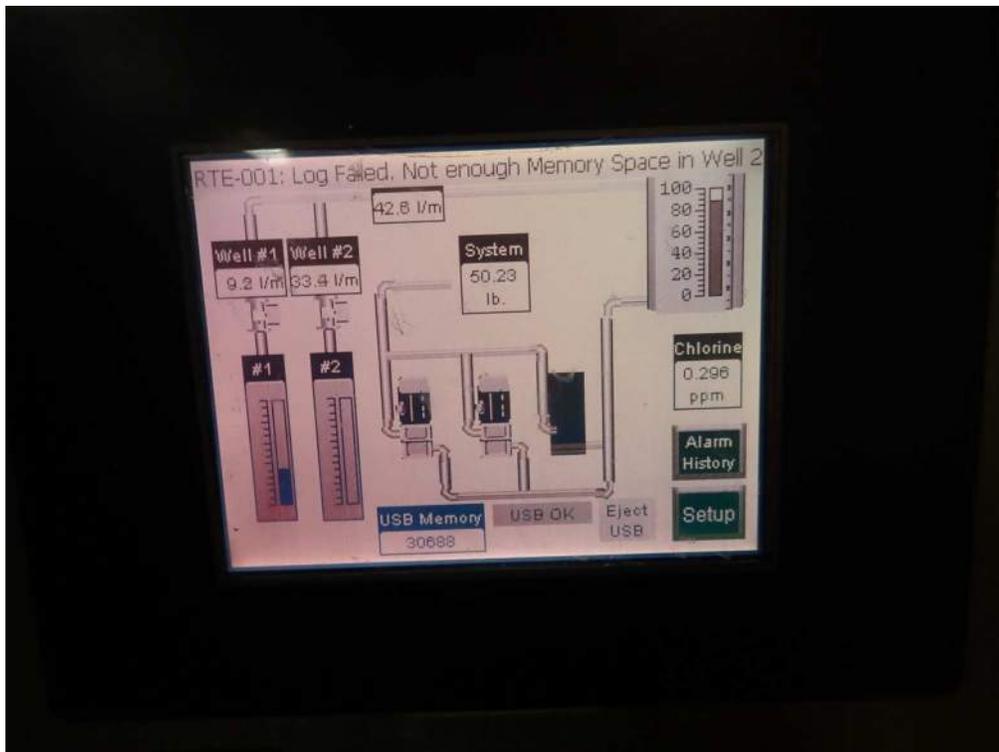
\* 80ml of 12% in 100,000L = 0.1mg/L

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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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613 -Dogwood Ridge Water - See Infrastructure Condition Assessment table with corresponding photo ID's



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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Dogwood Ridge - Water Treatment Building - Functional Code 613**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST													
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL on Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal (Price or Replacement Cost)	Consult	Contingency	5% Tax	Total in 2017 Dollars
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2010	21-Nov-17	MH	8	50	42	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	350	\$20	SF	\$7,000	0%	5%	5%	\$8,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2010	21-Nov-17	MH	8	50	42	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	350	\$10	SF	\$3,500	0%	5%	5%	\$4,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2010	21-Nov-17	MH	8	10	2	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No information was available regarding the scoping of the system to review for continuity.	5	5	2010	21-Nov-17	MH	8	50	42	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2010	21-Nov-17	MH	8	50	42	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	350	\$40	SF	\$14,000	0%	5%	5%	\$16,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding/cedar shakes (gable ends) and wood trim are present on the exterior walls.	4	4	2010	21-Nov-17	MH	8	12	4	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	650	\$8	SF	\$5,200	0%	15%	5%	\$7,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2010	21-Nov-17	MH	8	50	42	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	650	\$35	SF	\$22,750	0%	5%	5%	\$26,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	5	5	2010	21-Nov-17	MH	8	50	42	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$20	SF	\$2,000	0%	10%	5%	\$3,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201005 Exterior Louvers and Screens	Exterior Walls/Vent Louver	1	A metal louver vent is present on the exterior wall.	5	5	2010	21-Nov-17	MH	8	30	22	Replace the louver vent at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	EA	\$200	0%	10%	5%	\$1,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	5	5	2010	21-Nov-17	MH	8	30	22	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2010	21-Nov-17	MH	8	40	32	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	400	\$30	SF	\$12,000	0%	5%	5%	\$14,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2010	21-Nov-17	MH	8	25	17	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	40	\$10	SF	\$400	0%	10%	5%	\$1,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301099 Other Wall Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	5	5	2010	21-Nov-17	MH	8	20	12	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	LS	\$1,500	0%	0%	5%	\$2,000
Dogwood Ridge - Water Treatment Building	Water Treatment Building	613	D SERVICES	D50 Electrical	D5020 Lighting and Branch Wiring	D502099 Other Lighting and Branch Wiring	Lighting/Exterior Lighting		An exterior light is present on the building near the entrance.	5	5	2010	21-Nov-17	MH	8	20	12	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Dogwood Ridge - Water Treatment Building - Functional Code 613



Photo 1



Photo 2



## 615 - Arbutus Ridge Water

Infrastructure Condition Assessment and Capital Plan

3717 Arbutus Drive North, Cobble Hill, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
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June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 615 - Arbutus Ridge Water

Infrastructure Condition Assessment and Capital Plan  
3717 Arbutus Drive North, Cobble Hill, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	1	W-WTP-PP-8	Capital Upgrade/New	Replace aging pipe headers. Inspect/assess the condition of the rest of the process piping for deterioration.	\$10,000	\$10,000
	11						
	12						
						Total	\$10,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	W-WTP-PMP-2 to W-WTP-COM-7	Operations	Inspect/assess the condition of the WTP, pumps, chlorine system, generator, and communications for deterioration to determine replacement timing/phasing.	\$10,000	\$20,000
	8	4	W-PP-PRV-13	Operations	Inspect/assess the condition of the pressure reducing valve chamber for deterioration to determine replacement timing/phasing.	\$5,000	
	9	5	W-PP-PRV-14	Operations	Inspect/assess the condition of the pressure reducing valve chamber for deterioration to determine replacement timing/phasing.	\$5,000	
	10						
Medium Term (5 - 10 Year)	11	2	W-RES-RES-9	Operations	Inspect/assess the condition of the reservoir for deterioration to determine replacement timing/phasing.	\$5,000	\$125,000
	12	3	W-PS-BLD-10 and W-PS-PMP-11	Operations	Inspect/assess the condition of the pump station and pumps for deterioration to determine replacement timing/phasing.	\$5,000	
	13	12	W-WTP-WLL-25	Operations	Inspect/assess the condition of the well and well pumps.	\$5,000	
	14	13	W-WTP-WLL-26	Operations	Inspect/assess the condition of the well and well pumps.	\$5,000	
	15	14	W-WTP-WLL-27	Operations	Inspect/assess the condition of the well and well pumps.	\$5,000	
	16	15 to 45	ALL	Operations	Inspect/assess watermain, fire hydrant and valves for deterioration to determine replacement timing/phasing. This may include visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$100,000	
	17						
						Total	\$145,000

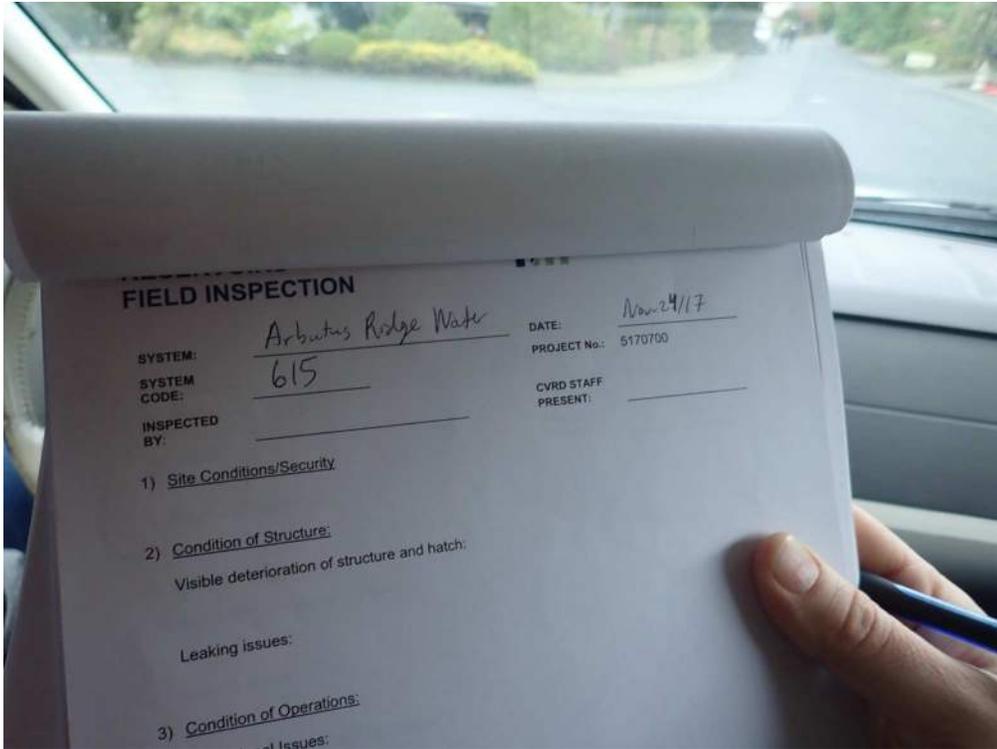
**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Courban Valley Regional District (CVRD)
System:	Abutus Ridge Water
Site Address:	1517 Abutus Drive North
Geographic Location:	Near Cobble Hill
Coordinates:	49°05' N 124°05' W

Infrastructure Condition Assessment

Asset ID	Function Code	BORIS	Address	Location	DWG Ref	Major Asset	Asset Type	Asset Code	Photo	Description	Make	Model	Material	Asset Inventory		Year Installed	Year Retired	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Functional Condition	Condition Assessment	Demand Condition	Probability of Failure	Severity of Failure	Condition	Recommendations / Action Items	Description	Type of Work	10 Year Capital Plan Budget Estimate	Timing	Comments/Questions to be resolved		
														Quantity	Unit Cost																					
1	615	3717 Abutus Drive North	Water treatment plant	Site Visit / Photos	W WTP	WTP	WTP-1	9 to 31	Water treatment plant building (in RW/Boat storage compound)					1	ea	1987		40	0																	
2	615	3717 Abutus Drive North	Water treatment plant	Site Visit / Photos	W WTP	WTP-2	WTP-2	11, 14 to 17, 20	Booster pumps, assumed 30 hp for replacement value					3	ea	1987		20	0	\$50,000	\$10,000	Good				3	2	3	Inspects the condition of the WTP pumps, chlorine system, generator, and communications for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
3	615	3717 Abutus Drive North	Water treatment plant	Site Visit / Photos	W WTP	WTP-3	WTP-3	21, 24 to 26	Chlorine system					1	ea	1987		20	0	\$10,000	\$10,000	Good				3	2	3	Inspects the condition of the chlorine system.	Operations	Included above	1-3 Year				
4	615	3717 Abutus Drive North	Water treatment plant	Site Visit / Photos	W WTP	WTP-4	WTP-4	30	Backup generator, assumed 150 kW for replacement value					1	ea	1987		40	0	\$120,000	\$120,000	Good				3	2	3	Inspects the condition of the generator.	Operations	Included above	1-3 Year				
5	615	3717 Abutus Drive North	Water treatment plant	Site Visit / Photos	W WTP	WTP-5	WTP-5	13, 18 to 21, 21, 21, 33	Communications (WTP)					2	LS	1987		20	0	\$9,000	\$9,000	Good - added radio communications between well and WTP				2	2	4	Inspects the condition of the communications.	Operations	Included above	1-3 Year				
6	615	3717 Abutus Drive North	Water treatment plant	Site Visit / Photos	W WTP	WTP-6	WTP-6	12, 14 to 18, 24 to 29	Process piping (w/ valves, pipes, tees)					1	LS	1987		40	0	\$50,000	\$50,000	Fair - older pipe headers (ludox header)				2	2	4	Repair aging pipe headers. Inspect/assess the condition of the rest of the process piping for deterioration.	Capital Upgrade/New	\$10,000	1-3 Year				
7	615	3717 Abutus Drive North	Reservoir (behind water treatment plant)	Site Visit / Photos	W RES	RES-1	RES-1	12, 13, 31	Reservoir - 1,291 x10 (280,000 Imp. Gall) concrete, located behind water treatment building	Concrete				1	LS	1987		40	0	\$1,300,000	\$1,300,000	Good - concrete in good shape				3	2	4	Inspects the condition of the reservoir for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
8	615	3717 Abutus Drive North	Country club parking pump station		W PS	PS-1	PS-1	NA	Pump station					1	ea	2006		28	0	\$10,000	\$10,000					3	2	4	Inspects the condition of the pump station and pumps for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
9	615	3717 Abutus Drive North	Country club parking pump station		W PS	PS-2	PS-2	NA	Pump, 5HP	Moruech	ZKRM			1	ea	2006		20	0	\$5,000	\$5,000					2	2	4	Inspects the condition of the pumps for deterioration to determine replacement timing/strategy.	Operations	Included above	1-3 Year				
10	615	3717 Abutus Drive North	Country club parking pump station		W PS	PS-3	PS-3	NA	Process piping (w/ valves, pipes, tees)					1	ea	2006		28	0	\$50,000	\$50,000					2	2	4	Inspects the condition of the process piping for deterioration to determine replacement timing/strategy.	Operations	Included above	1-3 Year				
11	615	3717 Abutus Drive North	Abutus ridge marine view PWR	Site Visit / Photos	W PWR	PWR-1	PWR-1	2 to 4	Pressure reducing valve (w/ chamber, process piping, 4" and 6" valves)					1	LS	1987		40	0	\$200,000	\$200,000					2	3	3	Inspects the condition of the pressure reducing valve (w/ chamber) for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
12	615	3717 Abutus Drive North	Abutus ridge ocean view PWR	Site Visit / Photos	W PWR	PWR-2	PWR-2	6, 7	Pressure reducing valve (w/ chamber, process piping, 4" and 6" valves)					1	LS	1987		40	0	\$200,000	\$200,000					2	3	3	Inspects the condition of the pressure reducing valve (w/ chamber) for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
13	615	3717 Abutus Drive North	Abutus rd. N. (south of 4th St.)		W WS	WS-1	WS-1	300	Watermain pipe, 250mm					300	m	1986		50	0	\$500	\$150,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
14	615	3717 Abutus Drive North	Country club dr. (S-115 to T12-000-0-027)		W WS	WS-2	WS-2	15 to 16	Watermain pipe, 200mm	CNO	PVC			400	m	1994		50	0	\$500	\$20,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
15	615	3717 Abutus Drive North	Country club dr.		W WS	WS-3	WS-3	17	Watermain pipe, 200mm					54	m	1994		50	0	\$500	\$10,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
16	615	3717 Abutus Drive North	Country club parking, 2-000-0-050, Country club dr. (S-115 to T12-000-0-027) N		W WS	WS-4	WS-4	18	Watermain pipe, 200mm	CNO	PVC			180	m	1994		50	0	\$500	\$80,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
17	615	3717 Abutus Drive North	Country club parking		W WS	WS-5	WS-5	19	Watermain pipe, 200mm					2	ea	1994		50	0	\$5,000	\$5,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
18	615	3717 Abutus Drive North	Country club parking		W WS	WS-6	WS-6	20	Watermain pipe, 200mm	CNO	PVC			50	m	2012		50	0	\$400	\$15,500					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
19	615	3717 Abutus Drive North	Country club parking		W WS	WS-7	WS-7	21	Watermain pipe, 200mm					5	m	2012		50	0	\$4,000	\$15,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
20	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-8	WS-8	22	Watermain pipe, 200mm	CNO	PVC			3,200	m	1988		50	0	\$500	\$600,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
21	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-9	WS-9	23	Watermain pipe, 200mm					346	m	1994		50	0	\$500	\$17,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
22	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-10	WS-10	24	Watermain pipe, 200mm	CNO	PVC			112	m	1994		50	0	\$500	\$15,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
23	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-11	WS-11	25	Watermain pipe, 200mm					1	ea	1987		40	0	\$1,000	\$1,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
24	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-12	WS-12	26	Watermain pipe, 200mm					1	ea	1987		40	0	\$1,000	\$1,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
25	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-13	WS-13	27	Watermain pipe, 200mm					1	ea	1987		40	0	\$1,000	\$1,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
26	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-14	WS-14	28	Watermain pipe, 200mm					14	m	1987		40	0	\$400	\$1,400					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
27	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-15	WS-15	29	Watermain pipe, 200mm					218	m	1987		40	0	\$500	\$108,000					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
28	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-16	WS-16	30	Watermain pipe, 200mm (includes 30m unknown material and 40m of unknown diameter) (GS minus catalogued length from BORIS)					511	m	1987		40	0	\$500	\$261,100					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
29	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-17	WS-17	31	Watermain pipe, 200mm					294	m	1987		40	0	\$400	\$112,716					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
30	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-18	WS-18	32	Watermain pipe, 200mm					57	m	1987		40	0	\$500	\$31,221					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
31	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-19	WS-19	33	Watermain pipe, 200mm					74	m	1987		40	0	\$400	\$31,481					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
32	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-20	WS-20	34	Watermain pipe, 200mm					248	m	1987		40	0	\$400	\$111,585					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
33	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-21	WS-21	35	Watermain pipe, 200mm (GS minus catalogued length from BORIS)					493	m	1994		50	0	\$500	\$201,376					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
34	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-22	WS-22	36	Watermain pipe, 200mm (includes 30m of unknown diameter) (GS minus catalogued length from BORIS)					0	m	1994		50	0	\$500	\$0					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
35	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-23	WS-23	37	Watermain pipe, 200mm					83	m	1987		40	0	\$500	\$41,905					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
36	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-24	WS-24	38	Watermain pipe, 200mm					236	m	1987		40	0	\$400	\$100,060					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
37	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-25	WS-25	39	Watermain pipe, unknown diameter (Assume 150mm for replacement costing)					0	m	1987		40	0	\$400	\$0					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
38	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-26	WS-26	40	Watermain pipe, 200mm					107	m	1987		40	0	\$500	\$51,950					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations	\$5,000	1-3 Year				
39	615	3717 Abutus Drive North	Country club parking (w/ underground to Abutus rd. North)		W WS	WS-27	WS-27	41	Watermain pipe, 200mm					261	m	1987		40	0	\$400	\$112,385					2	2	4	Inspects the condition of the watermain for deterioration to determine replacement timing/strategy.	Operations						

615- Arbutus Ridge Water-See Infrastructure Condition Assessment table with corresponding photo ID's



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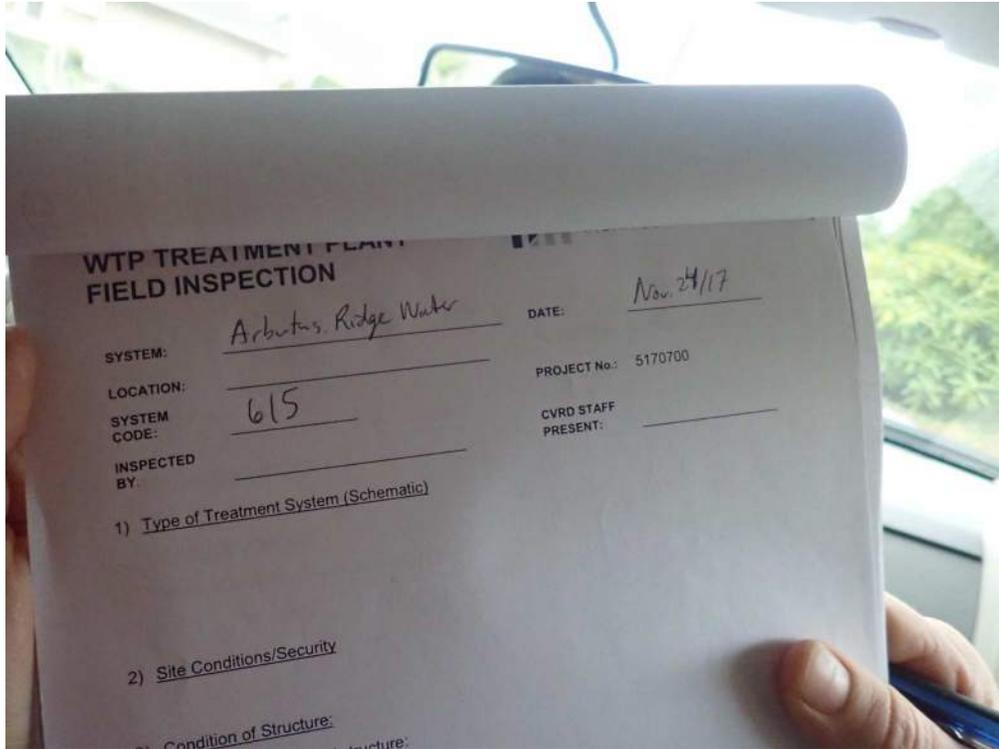


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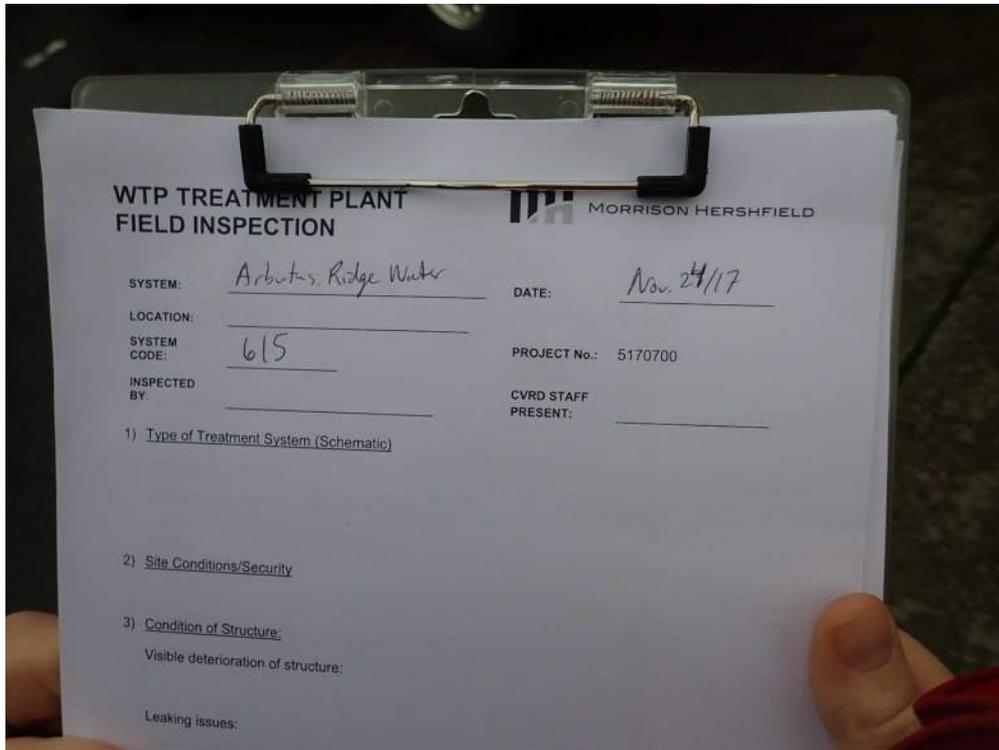


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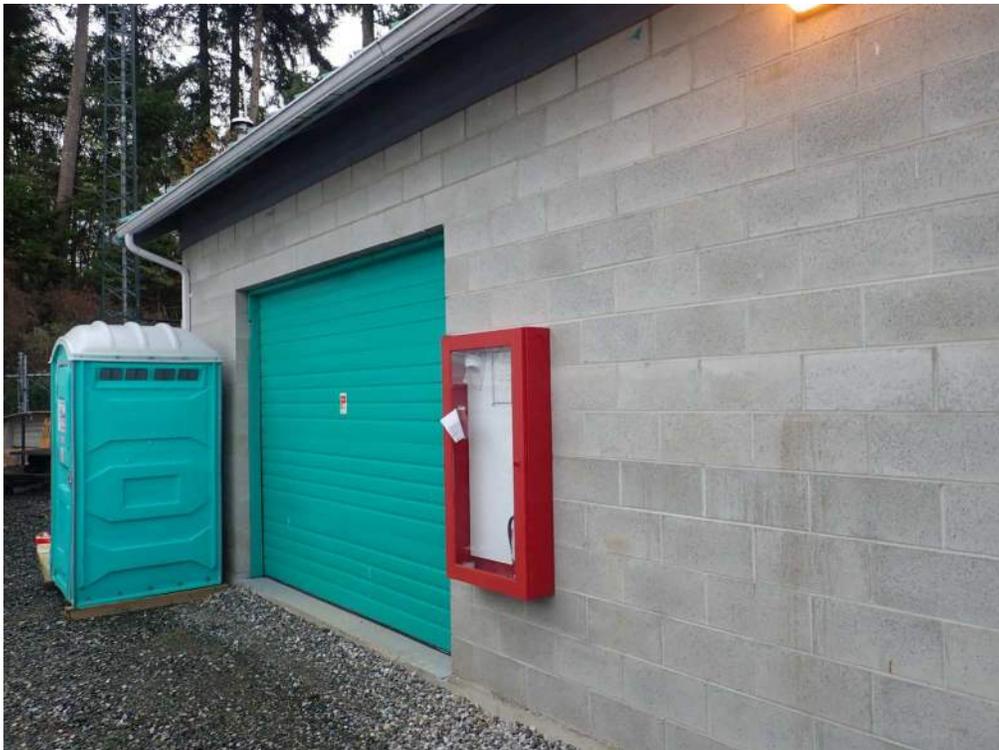


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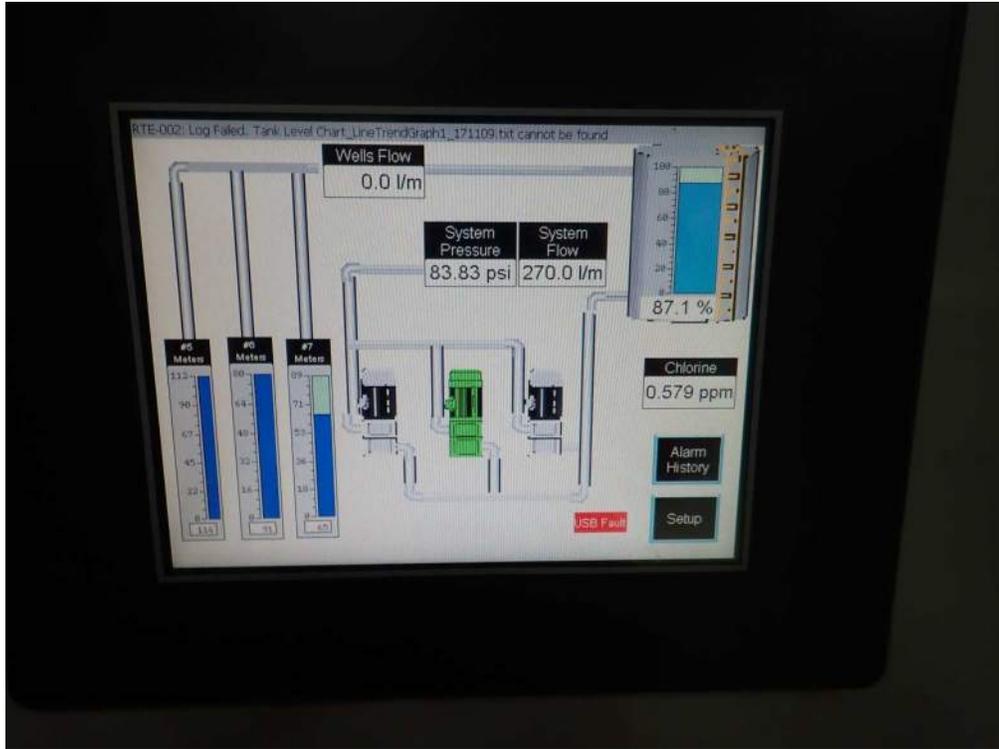


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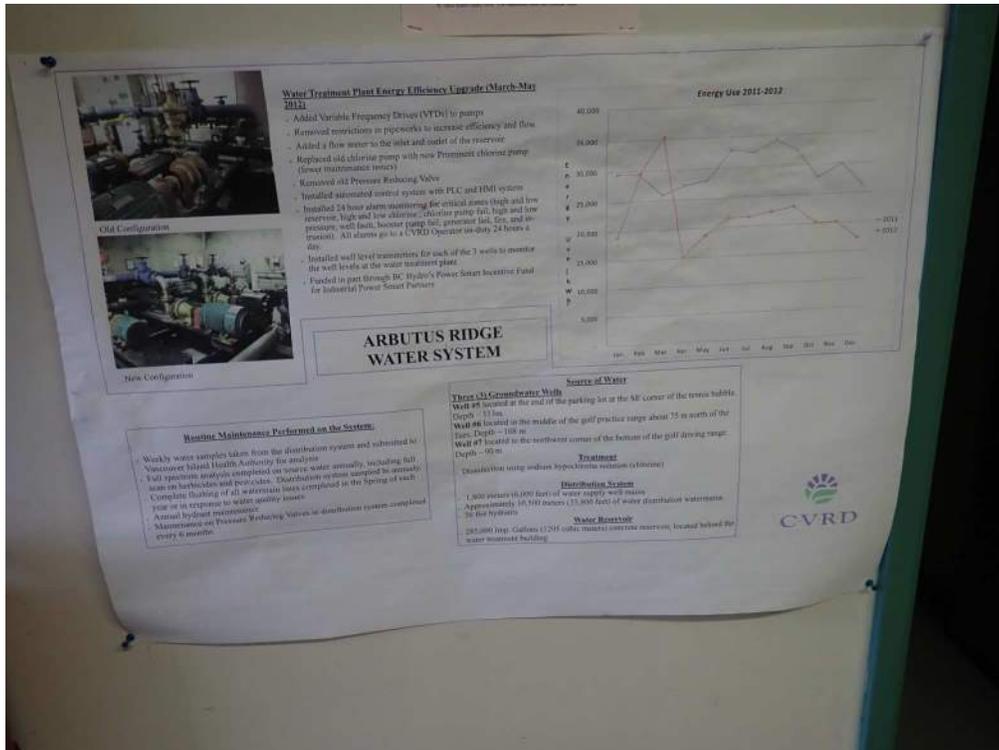


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**Cowichan Valley Regional District**  
**Facility Condition Assessment and Capital Plan**  
**Arbutus Ridge - Water Treatment Building - Functional Code 615**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr. Review or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1-3	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	4	4	1990	21-Nov-17	MH	28	50	22	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$20	SF	\$12,000	0%	5%	5%	\$14,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1-3	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	1990	21-Nov-17	MH	28	50	22	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	600	\$10	SF	\$6,000	0%	5%	5%	\$7,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1-3	The superstructure is comprised of masonry blocks. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1990	21-Nov-17	MH	28	50	22	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Wood Elements	1-3	Wood cladding and wood trim (included roof framing) is present through sections of the building. The wood cladding sections appear to be retrofit areas. Some deterioration was noted in these elements.	3	3	2000	21-Nov-17	MH	18	12	2	Repaint wood cladding, install flashing over exposed wood roof framing.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	10%	5%	\$2,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	B Shell	B20 Exterior Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/Windows	1-3	Three metal windows are present on the exterior. These windows are retrofit assemblies, their age has been assumed.	4	4	2000	21-Nov-17	MH	18	30	12	Replace windows at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	3	\$500	EA	\$1,500	0%	10%	5%	\$2,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1-3	Two painted metal doors are present on the building.	4	4	1990	21-Nov-17	MH	28	30	5	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1-3	One painted overhead door is present on the building.	4	4	1990	21-Nov-17	MH	28	30	5	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1-3	The roof is sloped assembly which has been waterproofed with a metal roof assembly. The roof drains via aluminum gutters to rain water leaders.	4	4	1990	21-Nov-17	MH	28	40	12	Replace metal roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	630	\$30	SF	\$18,900	0%	5%	5%	\$21,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1-3	The roof is sloped assembly which has been waterproofed with a metal roof assembly. The roof drains via aluminum gutters to rain water leaders.	4	4	1990	21-Nov-17	MH	28	30	20	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	50	\$10	LF	\$500	0%	10%	5%	\$1,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1-3	The roof is sloped assembly which has been waterproofed with a metal roof assembly. Fascia board are painted wood assemblies.	4	4	1990	21-Nov-17	MH	28	15	2	Repair and repaint wood fascia boards.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes		Sections of the building have been finished with gypsum wall board and plywood.  The timeline of the last repainting cycle was not known and has been assumed.	4	4	2010	21-Nov-17	MH	8	20	10	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Arbutus Ridge - Water Treatment Building	Water Treatment Building	615	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	1990	21-Nov-17	MH	28	20	10	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Arbutus Ridge -Water Treatment Building - Functional Code 615



Photo 1

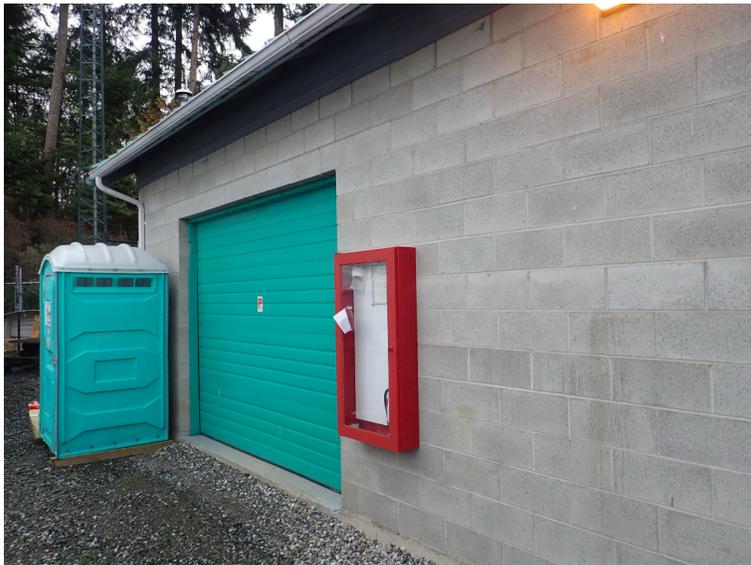


Photo 2

Cowichan Valley Regional District

Arbutus Ridge -Water Treatment Building - Functional Code 615



Photo 3



## 616 - Carlton Water

Infrastructure Condition Assessment and Capital Plan  
1356 Carlton Drive, Cobble Hill, BC

Date Prepared July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 6, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 616 - Carlton Water

Infrastructure Condition Assessment and Capital Plan  
1356 Carlton Drive, Cobble Hill, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	ALL	Capital Upgrade/New	Construct a new water treatment building. Include VFDs on booster pump replacements to eliminate the pressure tanks, install a larger generator, install new communications and electrical, redesign setup of process piping, and include a separate room for the chlorine system.	\$500,000	\$500,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$500,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	ALL	Operations	Inspect/assess the condition of the well, well pump, and control kiosk.	\$10,000	\$10,000
	8						
	9						
Medium Term (5 - 10 Year)	10	4	W-RES-TNK-18	Operations	Inspect/assess the condition of the reservoir, and fix cracked fill line.	\$20,000	\$40,000
	11	5, 9 to 14	ALL	Operations	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$20,000	
	12						
	13						
	14						
						Total	\$50,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CVRD)
System:	656 Carlton Water System
Site Address:	1356 Carlton Dr
Geographic Location:	East of Sawmills Lake
Customer:	Parrets 46
Users:	45

Infrastructure Condition Assessment

Current Year	2018	Total Replacement Value	\$1,774,819
		Value per unit	\$42,235

Asset ID	Function Code	Location	Address	Location	DWS Ref	Major	Minor	Spec	ID	Asset Code	Photo	Description	Make	Model	Material	Asset Inventory		Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Functional Condition	Condition Assessment			Recommendations / Action Items	Type of Work	10 Year Capital Plan				
																Quantity	Quantity Unit									Demanded Condition	Probability of Failure	Severity of Failure			Condition	Budget Estimate	Timing		
1	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	WTP	1	W-WTP-WTP-1	3 to 15, 28, MOV 1	Water Treatment Plant building (Replacement recommended in Utility Review, 2016)				1	ea	1978		40	0	Refer to Carlton Water System Building Condition Assessment								Refer to Carlton Water System Building Condition Assessment					
1	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	FT	2	W-WTP-FT-2	7 to 9	Pressure Tanks				3	ea	1978		20	0	\$8,000	\$24,000	Fair	Meets standard			3	2	3	Construct a new water treatment building. Include VFDs on booster pump replacements to eliminate the pressure tanks, install a larger generator, install new communications and electrical, redesign setup of process piping, and include a separate room for the chlorine system.	Capital Upgrade/New	\$500,000	2-5 Year	
1	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	PMP	5	W-WTP-PMP-5	8,9	Booster pumps, assumed 5 hp for replacement value				2	ea	1978		20	0	\$5,000	\$10,000	Fair	Meets standard			3	2	3	Include VFDs on booster pump replacements to eliminate pneumatic tanks	Capital Upgrade/New	Included above	2-5 Year	
1	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	FRP	7	W-WTP-FRP-7	9,11,15	Fire pump, assumed 20 hp for replacement value				1	ea	2015		20	17	\$20,000	\$20,000	Good	Meets standard			3	2	3					
1	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	GN	8	W-WTP-GN-8	11,13,14	Generator, assumed 20 kW for replacement value				1	ea	1978		40	0	\$16,000	\$16,000	Poor - old	Does not meet standard			4	2	3	Replace existing generator with larger genset	Capital Upgrade/New	Included above	2-5 Year	
1	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	CH	9	W-WTP-CH-9	10,12,18	Chlorination system c/w chlorine tank				1	LS	1978		20	0	\$35,000	\$35,000	Fair	Does not meet standard			3	2	3	Include separate chlorine room in new WTP	Capital Renewal	Included above	2-5 Year	
1	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	PP	10	W-WTP-PP-10	7 to 10, 18	Process piping c/w valves, gates, tees				1	LS	1978		40	0	\$50,000	\$50,000	Fair	Does not meet standard			3	2	3	Redesign setup of process piping in new WTP	Capital Renewal	Included above	2-5 Year	
1	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	ELC	11	W-WTP-ELC-11	12,15 to 17,19,20	Communications (WTP)				1	LS	1978		20	0	\$9,000	\$9,000	Poor - old, intrusion alarm	Does not meet standard			3	2	3	Install new communications and electrical in new WTP	Capital Renewal	Included above	2-5 Year	
2	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	WTP	12	W-WTP-WTP-12	29 to 31	Production Well #1 Building				1	ea	1978		40	0	Refer to Carlton Water System Building Condition Assessment										Refer to Carlton Water System Building Condition Assessment			
2	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	WLL	13	W-WTP-WLL-13	30	Production Well #1				1	ea	1978		40	0	\$10,000	\$10,000	Fair - not visible	Meets standard			3	2	3	Inspect/assess the condition of the well, well pump, and control knob.	Operations	\$10,000	2-5 Year	
2	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	PMP	14	W-WTP-PMP-14	30	Water Pump, assumed 7.5 hp for replacement value				1	ea	1978		20	0	\$7,500	\$7,500	Fair	Meets standard			3	2	3					
2	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	COM	15	W-WTP-COM-15	29 to 31	Control Knob (Well #1)				1	LS	1978		20	0	\$8,000	\$8,000	Fair	Meets standard			3	2	3	Inspect/assess the condition of the well control knob	Operations	Included above	2-5 Year	
3	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	WLL	16	W-WTP-WLL-16	2	Production water well 2, 5.2-6m depth				1	ea	2014		40	36	\$10,000	\$10,000	Good	Meets standard			3	2	3					
3	616	1356 Carlton Dr.		Water treatment plant	Site Visit / Photos	W	WTP	PMP	17	W-WTP-PMP-17	2	Submersible Well 2 pump c/w 25mm PVC riser pipe, assumed 7.5 hp for replacement value				1	ea	2014		20	16	\$7,500	\$7,500	Good	Meets standard			3	2	3					
4	616	1356 Carlton Dr.	Shawmigan Lake Mill Bay Road		513-1104	W	RES	TNK	18	W-RES-TNK-18	21 to 27	Reservoir, cylindrical above ground c/w with concrete foundation (OD 27' 6") and process pipe, 71,737 gal @ 272,000L				272	'000L	2014		80	76	\$1,000	\$272,000	Good - level transducer present, fill line cracked	Meets standard	able to meet capacity			3	2	4	Inspect/assess the condition of the reservoir, and fix cracked fill line	Operations	\$20,000	5-10 Year
5	616	1356 Carlton Dr.		Hydrant Place		321409	W	PP	PP	19	W-PP-PP-19	Watermain pipe, 100mm			C100	PVC	185	m	1984		80	46	\$400	\$74,000					2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	\$20,000	5-10 Year
6	616	1356 Carlton Dr.		Strata Rd off Nora Place		220-1	W	PP	PP	20	W-PP-PP-20	Watermain pipe, 50mm, min 1m depth, Asphalt Roadway			SCH 40	PVC	121	m	2014		80	76	\$350	\$42,350					1	2	5				
6	616	1356 Carlton Dr.		Strata Rd off Nora Place		220-1	W	PP	PP	21	W-PP-PP-21	Water service connections 50mm PVC, Asphalt Roadway/2m min Boulevard				PVC	5	ea	2014		40	36	\$1,000	\$15,000					1	2	5				
6	616	1356 Carlton Dr.		Strata Rd off Nora Place		220-1	W	PP	PP	22	W-PP-PP-22	Watermain pipe, 150mm, min 1m depth, Asphalt Roadway				PVC	220	m	2014		80	76	\$450	\$99,000					1	2	5				
7	616	1356 Carlton Dr.		Nora Place		141-16364-00	W	PP	PP	23	W-PP-PP-23	Watermain pipe, 50mm, from well to 50mm main, min 1m depth, boulevard				PE	45	m	2014		80	76	\$350	\$15,750					1	2	5				
7	616	1356 Carlton Dr.		Nora Place		141-16364-00	W	PP	PP	25	W-PP-PP-25	Watermain pipe, 50mm, min 1m depth, boulevard				HDPE	280	m	2014		80	76	\$350	\$98,000					1	2	5				
7	616	1356 Carlton Dr.		Nora Place		141-16364-00	W	PP	PP	26	W-PP-PP-26	Watermain pipe, 150mm			C100	PVC	220	m	2014		80	76	\$450	\$99,000					1	2	5				
8	616	1356 Carlton Dr.		Carlton Dr		141-16364-00	W	PP	PP	24	W-PP-PP-24	Watermain pipe, 50mm, min 1m depth, boulevard				HDPE	160	m	2014		80	76	\$350	\$126,000					1	2	5				
8	616	1356 Carlton Dr.		Carlton Dr/Nora Place		141-16364-00	W	PP	PP	27	W-PP-PP-27	Service Connections, 50mm				PE	10	ea	2014		40	36	\$3,000	\$30,000					1	2	5				
9	616	1356 Carlton Dr.		CARLTON DRIVE	GIS		W	PP	PP	37	W-PP-PP-37	Watermain pipe, 50mm (GIS minus catalogued length from 141-16364-00)									20	\$350	\$14,444					2	2	4					
9	616	1356 Carlton Dr.		CARLTON DRIVE	GIS		W	PP	PP	38	W-PP-PP-38	Watermain pipe, 100mm									20	\$400	\$4,804					2	2	4					
9	616	1356 Carlton Dr.		CARLTON DRIVE	GIS		W	PP	PP	39	W-PP-PP-39	Watermain pipe, 150mm (includes 238m of unknown diameter)									20	\$450	\$423,851					2	2	4					
9	616	1356 Carlton Dr.		CARLTON DRIVE	GIS		W	PP	PP	40	W-PP-PP-40	Watermain pipe, 200mm									20	\$500	\$8,585					2	2	4					
10	616	1356 Carlton Dr.		CHEAL PLACE	GIS		W	PP	PP	41	W-PP-PP-41	Watermain pipe, 150mm									20	\$450	\$56,346					2	2	4					
11	616	1356 Carlton Dr.		ETHEL LANE	GIS		W	PP	PP	42	W-PP-PP-42	Watermain pipe, 150mm									20	\$450	\$23,365					2	2	4					
12	616	1356 Carlton Dr.		NORA PLACE	GIS		W	PP	PP	43	W-PP-PP-43	Watermain pipe, 50mm (GIS minus catalogued length from 141-16364-00)									20	\$350	\$11,559					2	2	4					
12	616	1356 Carlton Dr.		NORA PLACE	GIS		W	PP	PP	44	W-PP-PP-44	Watermain pipe, 150mm (GIS minus catalogued length from 141-16364-00)									20	\$450	\$65,515					2	2	4					
13	616	1356 Carlton Dr.		DELVA PLACE	GIS		W	PP	PP	45	W-PP-PP-45	Watermain pipe, 150mm (GIS minus catalogued length from 321409)									20	\$450	\$0												
14	616	1356 Carlton Dr.		Trinix system	GIS		W	PP	FT	46	W-PP-FT-46	Touch transmission water meters									40	\$3,000	\$90,000					3	1	4					

616- Carlton Water-See Infrastructure Condition Assessment table with corresponding photo ID's

**TREATMENT PLANT  
INSPECTION**

**MH MORRISON HERSHFIELD**

Client: Carlton Water DATE: Nov. 23/17

Location: 616 PROJECT No.: 5170700

Inspector: Adan CVRD STAFF PRESENT: Todd

of Treatment System (Schematic)

Conditions/Security

*AC in the past  
C900 new part*

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616- Carlton Water-See Infrastructure Condition Assessment table with corresponding photo ID's



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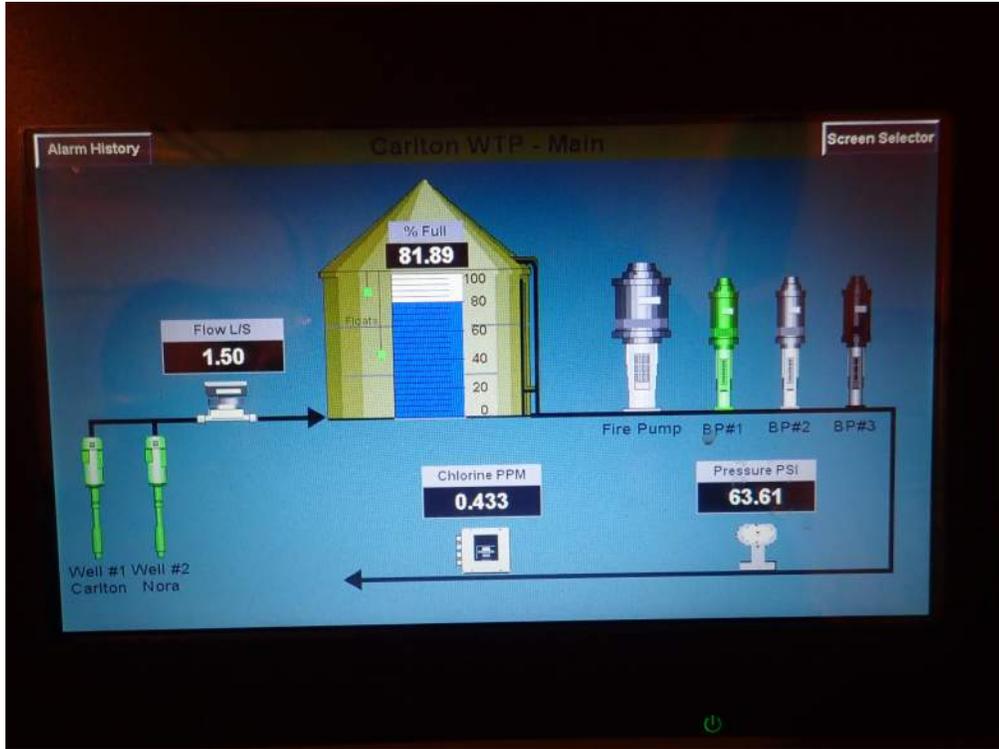


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Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Carlton Water - Water Treatment Building - Functional Code 616

BLOG Name	BLOG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to Complete or Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars
Carlton Water - Water Treatment Building	Water Treatment Building	616	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of this building was not confirmed and has been assumed.	4	4	1990	21-Nov-17	MH	28	50	22	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	350	\$20	SF	\$7,000	0%	15%	5%	\$9,000
Carlton Water - Water Treatment Building	Water Treatment Building	616	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	1990	21-Nov-17	MH	28	50	22	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	350	\$10	SF	\$3,500	0%	15%	5%	\$5,000
Carlton Water - Water Treatment Building	Water Treatment Building	616	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1990	21-Nov-17	MH	28	50	22	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	350	\$40	SF	\$14,000	0%	15%	5%	\$17,000
Carlton Water - Water Treatment Building	Water Treatment Building	616	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted wood siding and wood trim are present on the exterior walls.	3	3	1990	21-Nov-17	MH	28	12	2	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	360	\$8	SF	\$2,880	0%	15%	5%	\$4,000
Carlton Water - Water Treatment Building	Water Treatment Building	616	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted wood siding and wood trim are present on the exterior walls.	4	4	1990	21-Nov-17	MH	28	50	22	The wood siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	360	\$35	SF	\$12,600	0%	5%	5%	\$14,000
Carlton Water - Water Treatment Building	Water Treatment Building	616	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	4	4	1990	21-Nov-17	MH	28	30	22	Replace door at the end of its their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	EA	\$1,000	0%	5%	5%	\$2,000
Carlton Water - Water Treatment Building	Water Treatment Building	616	B Shell	D30 Roofing	B3010 Roof Coverings	B301002 Low Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a low sloped assembly waterproofed a two-ply SBS membrane system. MH was not able to access the roof at the time of this review. The age of the roof has been assumed.  The roof drains via aluminum gutters to grade.	4	4	2000	21-Nov-17	MH	18	22	4	Replace the roofing assembly at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	400	\$12	SF	\$4,800	0%	5%	5%	\$6,000
Carlton Water - Water Treatment Building	Water Treatment Building	616	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	3	3	1990	21-Nov-17	MH	28	20	3	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Carlton Water - Water Treatment Building	Water Treatment Building	616	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	1990	21-Nov-17	MH	28	20	5	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Carlton Water - Water Treatment Building - Functional Code 616

BLDD Name	BLDD Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT							LIFECYCLE DATA				RECOMMENDATION				OPINION OF PROBABLE COST								10-YEAR CAPITAL PLAN															
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr. New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Interval or Action Interval	E.E. Time Remaining to DOI or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Base	Unit	Subtotal Replacement Cost	Conting.	Contingency	5% Tax	Total 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027					
																																	\$0	\$4,000	\$1,000	\$6,000	\$1,000	\$0	\$0	\$0	\$0	\$0					
Carlton Water - Water Treatment Building	Water Treatment Building	616	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations. The age of this building was not confirmed and has been assumed.	4	4	1990	21-Nov-17	MH	28	50	22	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	350	\$20	SF	\$7,000	0%	15%	5%	\$9,000														
Carlton Water - Water Treatment Building	Water Treatment Building	616	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	1990	21-Nov-17	MH	28	50	22	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	350	\$10	SF	\$3,500	0%	15%	5%	\$5,000														
Carlton Water - Water Treatment Building	Water Treatment Building	616	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1990	21-Nov-17	MH	28	50	22	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	350	\$40	SF	\$14,000	0%	15%	5%	\$17,000														
Carlton Water - Water Treatment Building	Water Treatment Building	616	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls Enclosure	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding		1	Painted wood siding and wood trim are present on the exterior walls.	3	3	1990	21-Nov-17	MH	28	12	2	Repaint siding and trim. At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	360	\$8	SF	\$2,880	0%	15%	5%	\$4,000	\$4,000													
Carlton Water - Water Treatment Building	Water Treatment Building	616	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls Enclosure	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding		1	Painted wood siding and wood trim are present on the exterior walls.	4	4	1990	21-Nov-17	MH	28	50	22	The wood siding is expected to last the life of the building. Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	360	\$35	SF	\$12,600	0%	5%	5%	\$14,000														
Carlton Water - Water Treatment Building	Water Treatment Building	616	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		1	One painted metal door is present on the building.	4	4	1990	21-Nov-17	MH	28	30	22	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	EA	\$1,000	0%	5%	5%	\$2,000														
Carlton Water - Water Treatment Building	Water Treatment Building	616	B Shell	B30 Roofing	B3010 Roof Coverings	B301002 Low Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is a low sloped assembly waterproofed a two-ply SBS membrane system. MH was not able to access the roof at the time of this review. The age of the roof has been assumed. The roof drains via aluminum gutters to grade.	4	4	2000	21-Nov-17	MH	18	22	4	Replace the roofing assembly at the end of its service life. Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	400	\$12	SF	\$4,800	0%	5%	5%	\$6,000				\$6,000										
Carlton Water - Water Treatment Building	Water Treatment Building	616	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes		2	The interior gypsum and plywood walls and ceilings are painted.	3	3	1990	21-Nov-17	MH	28	20	3	Repaint interiors as required. Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000				\$1,000										
Carlton Water - Water Treatment Building	Water Treatment Building	616	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment			An exterior light is present on the building near the entrance.	4	4	1990	21-Nov-17	MH	28	20	5	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000				\$1,000										

Cowichan Valley Regional District

Carlton Water - Water Treatment Building - Functional Code 616



Photo 1



Photo 2

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Carlton Water - Well Building - Functional Code 616

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	Description & History	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION				OPINION OF PROBABLE COST											
						ID	Location / Type			Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL on Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Estimate or Replacement Cost	Consult	Contingency	5% Tax	Total in 2017 Dollars
Carlton Water - Well Building	Well Building	616	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of this building was not confirmed and has been assumed.	4	4	1990	21-Nov-17	MH	28	50	22	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$20	SF	\$800	0%	15%	5%	\$1,000
Carlton Water - Well Building	Well Building	616	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	1990	21-Nov-17	MH	28	50	22	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$10	SF	\$400	0%	15%	5%	\$1,000
Carlton Water - Well Building	Well Building	616	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1990	21-Nov-17	MH	28	50	22	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$40	SF	\$1,600	0%	15%	5%	\$2,000
Carlton Water - Well Building	Well Building	616	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Stucco Siding	1	Painted stucco siding and wood trim are present on the exterior walls. Stucco is also present at the soffit areas.	3	3	1990	21-Nov-17	MH	28	12	4	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	200	\$8	SF	\$1,600	0%	15%	5%	\$2,000
Carlton Water - Well Building	Well Building	616	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted stucco siding and wood trim are present on the exterior walls. Stucco is also present at the soffit areas.	4	4	1990	21-Nov-17	MH	28	50	22	The stucco siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	200	\$40	SF	\$8,000	0%	5%	5%	\$9,000
Carlton Water - Well Building	Well Building	616	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	4	4	1990	21-Nov-17	MH	28	30	22	Replace door at the end of its their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	EA	\$1,000	0%	5%	5%	\$2,000
Carlton Water - Well Building	Well Building	616	B Shell	D30 Roofing	B3010 Roof Coverings	B301002 Low Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a low sloped assembly waterproofed a two-ply SBS membrane system. MH was not able to access the roof at the time of this review. The age of the roof has been assumed.  The roof is edge drained.	4	4	2000	21-Nov-17	MH	18	22	4	Replace the roofing assembly at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	40	\$20	SF	\$800	0%	5%	5%	\$1,000
Carlton Water - Well Building	Well Building	616	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	3	3	1990	21-Nov-17	MH	28	20	3	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Carlton Water - Well Building	Well Building	616	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	1990	21-Nov-17	MH	28	20	5	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Carlton Water - Well Building - Functional Code 616



Photo 1



Photo 2



## 617 - Shellwood Water

Infrastructure Condition Assessment and Capital Plan

4275 Shellbeach Road, Ladysmith, BC

Date Prepared

July 18, 2017

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 6, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 617 - Shellwood Water

Infrastructure Condition Assessment and Capital Plan  
4275 Shellbeach Road, Ladysmith, BC

Date Prepared July 18, 2017

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	W-WTP-WLL-11 to W-WTP-COM-13	Capital Upgrade/New	Install a pitless adapter, and consider installing radio communications. Inspect/assess condition of abandoned wells 2 and 3.	\$30,000	\$30,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$30,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	3	W-RES-RES-14	Operations	Inspect/assess the condition of the reservoir, and construct a perimeter drain.	\$20,000	\$40,000
	11	4 to 6	ALL	Operations	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$20,000	
	12						
	13						
	14						
						Total	\$40,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Infrastructure Condition Assessment

Civic Address:	4275 Shellbeach Road
Geographic Location:	East side of LadySmith Harbour
Customers:	31
Users:	27

Total Replacement Value	\$1,219,700
Value per user	\$45,174

Asset ID	Location		DWG Ref	Major	Minor	Spec	Asset Code		Photo	Description	Unit price	Replacement Value of Asset	Condition Assessment			Recommendations / Action Items	Type of Work	10 Year Capital Plan						
	Function Code	Address					ID	Asset Code					Physical Condition	Level of Service Condition	Demand Condition			Probability of Failure	Severity of Failure	Condition	Budget Estimate	Timing	Comment/Question to be resolved	
1	617	4275 Shellbeach Road	2166-1-2	W	WTP	WTP	1	W-WTP-WTP-1	14, 17 to 30, MOV 2	Water Treatment Plant (Pumphouse)	Refer to Shellwood Water System Building Condition Assessment.													
1	617	4275 Shellbeach Road	2166-1-2	W	WTP	GEN	2	W-WTP-GEN-2	NA	Pumphouse emergency generator, assumed 20kW for replacement value	\$16,000	\$16,000												
1	617	4275 Shellbeach Road	2166-1-3	W	WTP	CH	3	W-WTP-CH-3	17 to 21	Chlorination system c/w process piping, chlorine tanks	\$13,000	\$13,000	Good	Meets standard										
1	617	4275 Shellbeach Road	2166-1-3	W	WTP	PT	4	W-WTP-PT-4	24, 25	Hydro-pneumatic Tank	\$8,000	\$8,000	Good	Meets standard										
1	617	4275 Shellbeach Road	2166-1-3	W	WTP	FM	5	W-WTP-FM-5	22, 30	Flow Meter, 40mm	\$4,000	\$4,000	Good	Meets standard										
1	617	4275 Shellbeach Road	2166-1-3	W	WTP	PMP	6	W-WTP-PMP-6	23, 25, 29	Booster Pump, 3HP, Design operating point 1.9 l/s	\$3,000	\$6,000	Good	Meets standard										
1	617	4275 Shellbeach Road	2166-1-3	W	WTP	PP	8	W-WTP-PP-8	22 to 25, 29, 30	Process piping c/w valves, pipes, tees	\$50,000	\$50,000	Good	Meets standard										
1	617	4275 Shellbeach Road	2166-1-3	W	WTP	COM	9	W-WTP-COM-9	26 to 28, 33	Communications (WTP)	\$9,000	\$9,000	Good	Meets standard										
2	617	4275 Shellbeach Road	Site Visit / Photos	W	WTP	WLL	10	W-WTP-WLL-10	2 to 13	Well #1 building	Refer to Shellwood Water System Building Condition Assessment.													
2	617	4275 Shellbeach Road	Well 1	Site Visit / Photos	W	WTP	WLL	11	W-WTP-WLL-11	2, 3, 6 to 9, 13, MOV 1	Well #1	\$10,000	\$10,000	Poor	Does not meet standard	Well depletes in summer, only one source, no redundancy	3	3	3	Install a pitless adapter, and consider installing radio communications. Inspect/assess condition of abandoned wells 2 and 3.	Capital Upgrade/New	\$30,000	2-5 Year	
2	617	4275 Shellbeach Road	Well 1	Site Visit / Photos	W	WTP	PMP	12	W-WTP-PMP-12	2, 3, 6 to 9, 13, MOV 1	Well #1 pump	\$7,500	\$7,500	Poor	Does not meet standard	Well depletes in summer, only one source, no redundancy	3	3	3	Install a pitless adapter, and consider installing radio communications. Inspect/assess condition of abandoned wells 2 and 3.	Capital Upgrade/New	Included above	2-5 Year	
2	617	4275 Shellbeach Road	Well 1	Site Visit / Photos	W	WTP	COM	13	W-WTP-COM-13	3, 5, 7 to 9, 13	Communications (Well 1)	\$9,000	\$9,000	Poor - thru com cable	Does not meet standard		3	2	3	Consider replacing with radio communications	Capital Upgrade/New	Included above	2-5 Year	
3	617	4275 Shellbeach Road	Reservoir	S13-1103	W	RES	RES	14	W-RES-RES-14	14, 15	Reservoir, steel bolted tank, 420,000L (OD 7674mm) c/w process piping	\$1,000	\$420,000	Good - no perimeter drain	Meets standard	Overflow at resident's driveway due to lack of perimeter drain	1	3	4	Inspect/assess the condition of the reservoir, and construct a perimeter drain.	Operations	\$20,000	5-10 Year	
4	617	4275 Shellbeach Road	Entrance Avenue	GIS	W	PP	PP	15	W-PP-PP-15		Watermain pipe, 50mm, no material info	\$200	\$37,800				2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	\$20,000	5-10 Year	
4	617	4275 Shellbeach Road	Entrance Avenue	GIS	W	PP	PP	16	W-PP-PP-16		Watermain pipe, 100mm, no material info (includes 6m of unknown diameter watermain)	\$400	\$58,800				2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year	
5	617	4275 Shellbeach Road	Rock Drive	GIS	W	PP	PP	17	W-PP-PP-17		Watermain pipe, 50mm, no material info	\$200	\$23,200				2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year	
5	617	4275 Shellbeach Road	Rock Drive	GIS	W	PP	PP	18	W-PP-PP-18		Watermain pipe, 100mm, no material info	\$400	\$70,800				2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year	
6	617	4275 Shellbeach Road	Shell Beach Rd	GIS	W	PP	PP	19	W-PP-PP-19		Watermain pipe, 50mm, no material info	\$200	\$113,000				2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year	
6	617	4275 Shellbeach Road	Shell Beach Rd	GIS	W	PP	PP	20	W-PP-PP-20		Watermain pipe, 100mm, no material info	\$400	\$343,600				2	2	4	Inspect/assess watermain for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year	
7	617	4275 Shellbeach Road	Rock Drive	GIS	W	WTP	WLL	21	W-WTP-WLL-21		Well 2 (no information available during assessment)	\$10,000	\$10,000				2	3	3	Inspect/assess the well buildings	Operations	Included above	2-5 Year	
7	617	4275 Shellbeach Road	Rock Drive	GIS	W	WTP	WLL	22	W-WTP-WLL-22		Well 3 (no information available during assessment)	\$10,000	\$10,000				2	3	3	Inspect/assess the well buildings	Operations	Included above	2-5 Year	

617- Shellwood Water-See Infrastructure Condition Assessment table with corresponding photo ID's

**WTP TREATMENT PLANT  
FIELD INSPECTION**

**MORRISON HERSHFIELD**

SYSTEM: Shellwood Water      DATE: Nov. 20/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 617      PROJECT No.: 5170700

INSPECTED BY: \_\_\_\_\_      CVRD STAFF PRESENT: \_\_\_\_\_

1) Type of Treatment System (Schematic)

2) Site Conditions (Schematic)

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617- Shellwood Water-See Infrastructure Condition Assessment table with corresponding photo ID's



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617 (5)



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617- Shellwood Water-See Infrastructure Condition Assessment table with corresponding photo ID's



617 (33)

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Shellwood - Pump House - Functional Code 617

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST													
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult	Contingency	5% Tax	Total in 2017 Dollars
Shellwood - Pump House	Pump House	617	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade, the structure appears to be built on the slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2013	21-Nov-17	MH	5	50	45	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$20	SF	\$2,000	0%	5%	5%	\$3,000
Shellwood - Pump House	Pump House	617	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  Deterioration of the wood cladding was observed at the base of the wall, this has resulted in exposed wood framing. Areas of the wood framing appear to be showing signs of deterioration.	4	4	2013	21-Nov-17	MH	5	50	45	Interior protected structural components are expected to last the life of the building. Complete repairs to the exterior cladding to ensure the wood framing is not exposed to the exterior elements. Membrane and flashing should be installed at the base of the wall to eliminate the potential for water to sit on the concrete slab-on-grade and affect the wood framed structure.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$40	SF	\$4,000	0%	5%	5%	\$5,000
Shellwood - Pump House	Pump House	617	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted wood siding and wood trim are present on the exterior walls.  Deterioration of the wood cladding was observed at the base of the wall, this has resulted in exposed wood framing. Areas of the wood framing appear to be showing signs of deterioration.	3	3	2013	21-Nov-17	MH	5	50	1	Repair the wood siding where required. Complete isoalted repairs to the wall assemblies as required at this time.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$2,000	LS	\$2,000	0%	5%	5%	\$3,000
Shellwood - Pump House	Pump House	617	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted wood siding and wood trim are present on the exterior walls.  Deterioration of the wood cladding was observed at the base of the wall, this has resulted in exposed wood framing. Areas of the wood framing appear to be showing signs of deterioration.	3	3	2013	21-Nov-17	MH	5	10	1	Repaint exsteior cladding.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	5%	5%	\$2,000
Shellwood - Pump House	Pump House	617	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	A wood door is present at the entrance.	4	4	2013	21-Nov-17	MH	5	20	15	Replace door assembly at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000
Shellwood - Pump House	Pump House	617	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped assembly with asphalt shingles installed.  The roof drains over the edge.	4	4	2013	21-Nov-17	MH	5	25	20	Replace the asphalt shingles at the end of their service life.  Ongoing maintenance of the roof should include review and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	120	\$10	SF	\$1,200	0%	5%	5%	\$2,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Shellwood - Pump House - Functional Code 617

BLDD Name	BLDD Type	Function Code	Level 1 Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT							LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST							10-YEAR CAPITAL PLAN																			
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027					
Shellwood - Pump House	Pump House	617	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade, the structure appears to be built on the slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2013	21-Nov-17	MH	5	50	45	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$20	SF	\$2,000	0%	5%	5%	\$3,000														
Shellwood - Pump House	Pump House	617	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  Deterioration of the wood cladding was observed at the base of the wall, this has resulted in exposed wood framing. Areas of the wood framing appear to be showing signs of deterioration.	4	4	2013	21-Nov-17	MH	5	50	45	Interior protected structural components are expected to last the life of the building. Complete repairs to the exterior cladding to ensure the wood framing is not exposed to the exterior elements. Membrane and flashing should be installed at the base of the wall to eliminate the potential for water to sit on the concrete slab-on-grade and affect the wood framed structure.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$40	SF	\$4,000	0%	5%	5%	\$5,000														
Shellwood - Pump House	Pump House	617	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted wood siding and wood trim are present on the exterior walls.  Deterioration of the wood cladding was observed at the base of the wall, this has resulted in exposed wood framing. Areas of the wood framing appear to be showing signs of deterioration.	3	3	2013	21-Nov-17	MH	5	50	1	Repair the wood siding where required. Complete isolated repairs to the wall assemblies as required at this time.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$2,000	LS	\$2,000	0%	5%	5%	\$3,000	\$3,000													
Shellwood - Pump House	Pump House	617	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted wood siding and wood trim are present on the exterior walls.  Deterioration of the wood cladding was observed at the base of the wall, this has resulted in exposed wood framing. Areas of the wood framing appear to be showing signs of deterioration.	3	3	2013	21-Nov-17	MH	5	10	1	Repair exterior cladding.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	5%	5%	\$2,000	\$2,000													
Shellwood - Pump House	Pump House	617	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		1	A wood door is present at the entrance.	4	4	2013	21-Nov-17	MH	5	20	15	Replace door assembly at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000														
Shellwood - Pump House	Pump House	617	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is sloped assembly with asphalt shingles installed.  The roof drains over the edge.	4	4	2013	21-Nov-17	MH	5	25	20	Replace the asphalt shingles at the end of their service life.  Ongoing maintenance of the roof should include review and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	120	\$10	SF	\$1,200	0%	5%	5%	\$2,000														

Cowichan Valley Regional District

Shellwood - Pump House- Functional Code 617



Photo 1

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Shellwood - Water Treatment Building - Functional Code 617**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOY for Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete, can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings' security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars
Shellwood - Water Treatment Building	Water Treatment Building	617	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2015	21-Nov-17	MH	3	50	43	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	450	\$20	SF	\$9,000	0%	5%	5%	\$10,000
Shellwood - Water Treatment Building	Water Treatment Building	617	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2015	21-Nov-17	MH	3	50	43	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	450	\$10	SF	\$4,500	0%	5%	5%	\$5,000
Shellwood - Water Treatment Building	Water Treatment Building	617	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2015	21-Nov-17	MH	3	10	3	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Shellwood - Water Treatment Building	Water Treatment Building	617	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2015	21-Nov-17	MH	3	50	43	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2015	21-Nov-17	MH	3	50	43	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	450	\$49	SF	\$22,050	0%	5%	5%	\$25,000
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2015	21-Nov-17	MH	3	12	9	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	500	\$8	SF	\$4,000	0%	15%	5%	\$5,000
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2015	21-Nov-17	MH	3	50	47	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	500	\$35	SF	\$17,500	0%	5%	5%	\$20,000
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Perforated metal soffit is present at the roof overhangs.	5	5	2015	21-Nov-17	MH	3	50	47	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$20	SF	\$2,000	0%	10%	5%	\$3,000
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	5	5	2015	21-Nov-17	MH	3	30	27	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped roof assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2015	21-Nov-17	MH	3	25	22	Replace the asphalt shingles at the end of its service life.  Ongoing maintenance of the roof should include review and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	500	\$15	SF	\$7,500	0%	5%	5%	\$9,000
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped roof assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2015	21-Nov-17	MH	3	25	22	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	40	\$10	SF	\$400	0%	10%	5%	\$1,000
Shellwood - Water Treatment Building	Water Treatment Building	617	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301099 Other Wall Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	5	5	2015	21-Nov-17	MH	3	20	17	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	0%	5%	\$2,000
Shellwood - Water Treatment Building	Water Treatment Building	617	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2015	21-Nov-17	MH	3	20	17	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Shellwood - Water Treatment Building - Functional Code 617

BLDD Name	BLDD Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT							LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST							10-YEAR CAPITAL PLAN																			
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Type of Life Cycle or Action Interval	E.E. Time Remaining to COL (if applicable)	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Replacement Cost	Contingency	5% Tax	Total in 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027						
																																\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Shellwood - Water Treatment Building	Water Treatment Building	617	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2015	21-Nov-17	MH	3	50	43	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	450	\$20	SF	\$9,000	0%	5%	5%	\$10,000														
Shellwood - Water Treatment Building	Water Treatment Building	617	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2015	21-Nov-17	MH	3	50	43	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	450	\$10	SF	\$4,500	0%	5%	5%	\$5,000														
Shellwood - Water Treatment Building	Water Treatment Building	617	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains		1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2015	21-Nov-17	MH	3	10	3	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000			\$1,000											
Shellwood - Water Treatment Building	Water Treatment Building	617	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains		1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2015	21-Nov-17	MH	3	50	43	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No																						
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would abate to concealed structural damage.	5	5	2015	21-Nov-17	MH	3	50	43	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	450	\$48	SF	\$22,050	0%	5%	5%	\$25,000														
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2015	21-Nov-17	MH	3	12	9	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	500	\$8	SF	\$4,000	0%	15%	5%	\$5,000														
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2015	21-Nov-17	MH	3	50	47	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	500	\$35	SF	\$17,500	0%	5%	5%	\$20,000														
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Perforated metal soffit is present at the roof overhangs.	5	5	2015	21-Nov-17	MH	3	50	47	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$20	SF	\$2,000	0%	10%	5%	\$3,000														
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B20 Exterior Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		1	Two painted metal doors are present on the building.	5	5	2015	21-Nov-17	MH	3	30	27	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000														
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is a sloped roof assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2015	21-Nov-17	MH	3	25	22	Replace the asphalt shingles at the end of its service life.  Ongoing maintenance of the roof should include review and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	500	\$15	SF	\$7,500	0%	5%	5%	\$9,000														
Shellwood - Water Treatment Building	Water Treatment Building	617	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is a sloped roof assembly with asphalt shingles.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2015	21-Nov-17	MH	3	25	22	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	40	\$10	SF	\$400	0%	10%	5%	\$1,000														
Shellwood - Water Treatment Building	Water Treatment Building	617	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301009 Other Wall Finishes	Interior/Interior Finishes		2	The interior gypsum and plywood walls and ceilings are painted.	5	5	2015	21-Nov-17	MH	3	20	17	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	0%	5%	\$2,000														
Shellwood - Water Treatment Building	Water Treatment Building	617	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment			An exterior light is present on the building near the entrance.	5	5	2015	21-Nov-17	MH	3	20	17	Repake lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000														

Cowichan Valley Regional District

Shellwood - Water Treatment Building - Functional Code 617



Photo 1



Photo 2



## 618 - Woodley Range Water

Infrastructure Condition Assessment and Capital Plan

5025 Aho Road, Ladysmith, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 6, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 618 - Woodley Range Water

Infrastructure Condition Assessment and Capital Plan

5025 Aho Road, Ladysmith, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4	11	W-WTP-WLL-24	Capital Renewal	Install/find a well with more capacity.	\$30,000	\$30,000
	5						
	6						
Short Term (2 - 5 Year)	7	1	ALL	Capital Upgrade/New	Inspect/assess the condition of the WTP, process piping, and communications. Replace pumps with VFDs, eliminate the pressure tanks, and install the chlorine system in a separate room from the water treatment.	\$50,000	\$50,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						<b>Total</b>	<b>\$80,000</b>

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	14	W-RES-TNK-27	Operations	Inspect/assess the condition of the reservoir.	\$5,000	\$55,000
	11	16 to 23	ALL	Operations	Inspect/assess watermain, hydrants, valves, and valve chambers for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$50,000	
	12						
	13						
	14						
						<b>Total</b>	<b>\$55,000</b>

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

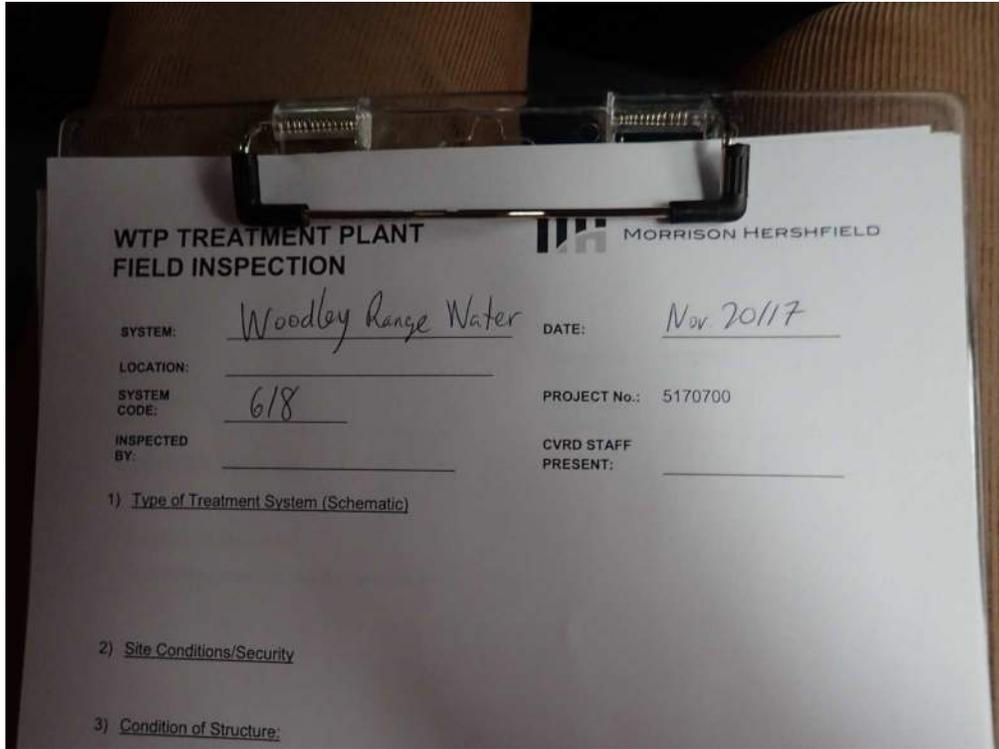
Owner:	Cowichan Valley Regional District (CVRD)
System:	GS1 Woodley Range Water
Site Address:	5025 Aho Rd
North of:	Woodley Range Water
Geographic Location:	North of Ladysmith
Parcels:	37
Users:	26

Infrastructure Condition Assessment

Current Year:	2018	Total Replacement Value:	\$4,678,550
		Value per user:	\$179,944

Asset ID	Function Code	Location	Address	Location	DWG Ref	Major	Minor	Asset Code	Asset Code	Photo	Description	Make	Model	Material	Quantity	Asset Inventory	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Condition Assessment					Recommendations / Action Items	Type of Work	10 Year Capital Plan			
																							Physical Condition	Level of Service Condition	Demand Condition	Probability of Failure	Severity of Failure			Condition	Budget Estimate	Timing	Comment/Question to be resolved
1	618	5025 Aho Rd		Pumphouse / WTP	35892-01 / Unnumbered drawings	W	WTP	FT 1	W-WTP-FT-1	3, 15, MDV 1	Water treatment plant (pumphouse) building				1	ea	1999		40	21	Refer to Woodley Range Water System Building Condition Assessment								Refer to Woodley Range Water System Building Condition Assessment				
1	618	5025 Aho Rd		Pumphouse / WTP	35892-01 / Unnumbered drawings	W	WTP	FT 2	W-WTP-FT-2	8, 9, 13	Hydro-pneumatic tank	Meyers	WR300-03		4	ea	1999		20	1	\$8,000	\$32,000	Good	Meets standard	Not enough water	3	2	3	Inspect/assess the condition of the WTP, process piping, and communications. Replace pumps with VFDs, eliminate the pressure tanks, and install the chlorine system in a separate room from the water treatment.	Capital Upgrade/New	\$50,000	2-5 Year	
1	618	5025 Aho Rd		Pumphouse / WTP	35892-01 / Unnumbered drawings	W	WTP	FM 6	W-WTP-FM-6	6	Pressure pump, single phase, 2hp	Meyers	MECM-300		3	ea	1999		20	1	\$2,000	\$6,000	Fair	Meets standard	Offline - not in use	3	2	3	Proceed with plan to replace pumps with VFDs.	Capital Upgrade/New	\$25,000 included above	3-5 Year	
1	618	5025 Aho Rd		Pumphouse / WTP	35892-01 / Unnumbered drawings	W	WTP	FT 9	W-WTP-FT-9	NA	High Flow VFD and manganese green sand filter c/w ammonia layer, differential pressure switch and automatic backwash operation				2	ea	1999		20	1	\$25,000	\$50,000	Offline - not in use	Meets standard	Offline - not in use	3	2	3		Capital Upgrade/New	\$25,000 included above	3-5 Year	
1	618	5025 Aho Rd		Pumphouse / WTP	35892-01 / Unnumbered drawings	W	WTP	CH 11	W-WTP-CH-11	13	Chlorine solution tank C/A Meyers A151 1205 chemical feed pump	Meyers	26350-1		1	ea	1999		20	1	\$13,000	\$13,000	Good - located in same room as water treatment	Does not meet standard	Offline - not in use	3	2	3	Inspect/assess the chlorine system in the WTP	Operations	Included above	2-5 Year	
1	618	5025 Aho Rd		Pumphouse / WTP	35892-01 / Unnumbered drawings	W	WTP	FT 12	W-WTP-FT-12	NA	Potassium permanganate tank c/w LM chemical feed pump	Meyers	26350-1		1	ea	1999		20	1	\$20,000	\$20,000	Offline - not in use	Meets standard	Offline - not in use	2	2	4	Inspect/assess the process piping in the WTP	Operations	Included above	5-10 Year	
1	618	5025 Aho Rd		Pumphouse / WTP	35892-01 / Unnumbered drawings	W	WTP	PP 31	W-WTP-PP-31	4, 6, 6, 8, 5, 12	Process piping assembly c/w reducers, couplings, tee valves				5	LS	1999		40	21	\$50,000	\$50,000	Good	Meets standard		3	2	3	Inspect/assess the communications in the WTP	Operations	Included above	2-5 Year	
1	618	5025 Aho Rd		Pumphouse / WTP	35892-01 / Unnumbered drawings	W	WTP	COM 14	W-WTP-COM-14	7, 11, 12	Communications (WTP)				1	LS	1999		20	1	\$9,000	\$9,000	Good	Meets standard		3	2	3	Inspect/assess the communications in the WTP	Operations	Included above	2-5 Year	
2	618	5025 Aho Rd		Aho rd	35892-01 / Unnumbered drawings	W	WTP	WLL 15	W-WTP-WLL-15		Well 49				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
3	618	5025 Aho Rd		Aho rd	35892-01 / Unnumbered drawings	W	WTP	WLL 16	W-WTP-WLL-16		Well 19				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
4	618	5025 Aho Rd		Aho rd	35892-01 / Unnumbered drawings	W	WTP	WLL 17	W-WTP-WLL-17		Well 42				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
5	618	5025 Aho Rd		Aho rd	35892-01 / Unnumbered drawings	W	WTP	WLL 18	W-WTP-WLL-18		Abrasive well 43				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
6	618	5025 Aho Rd		Aho rd	35892-01 / Unnumbered drawings	W	WTP	WLL 19	W-WTP-WLL-19		Abrasive well 30				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
7	618	5025 Aho Rd		Magdalena dr	35893-01 / Unnumbered drawings	W	WTP	WLL 20	W-WTP-WLL-20		Abrasive well 18				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
8	618	5025 Aho Rd		Magdalena dr	35892-01 / Unnumbered drawings	W	WTP	WLL 21	W-WTP-WLL-21		Well 26				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
9	618	5025 Aho Rd		Judiths run	35892-01 / Unnumbered drawings	W	WTP	WLL 22	W-WTP-WLL-22		Abrasive well 60				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
10	618	5025 Aho Rd		Judiths run	35892-01 / Unnumbered drawings	W	WTP	WLL 23	W-WTP-WLL-23		Well 61				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
11	618	5025 Aho Rd		Boethel rd	35893-01 / Unnumbered drawings	W	WTP	WLL 24	W-WTP-WLL-24	19 to 22	Well 67				1	ea	1999		40	21	\$10,000	\$10,000	Fair	Does not meet standard	Not enough water, truck fill required most summers	3	3	2	Install/fit a well with more capacity.	Capital Renewal	\$30,000	1-2 Year	
12	618	5025 Aho Rd		Boethel rd	35893-01 / Unnumbered drawings	W	WTP	WLL 25	W-WTP-WLL-25		Abrasive well 11				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
13	618	5025 Aho Rd		Boethel rd	35892-01 / Unnumbered drawings	W	WTP	WLL 26	W-WTP-WLL-26		Abrasive well 66				1	ea	1999		40	21	\$10,000	\$10,000				2	1	5				10 Year	
14	618	5025 Aho Rd		Reservoir	Site Visit / Photos		RES	TNK 37	W-RES-TNK-37	3, 14, 16 to 18	Steel Bolted Reservoir, 136,000 imp.gallons - 638,000L				638	000L	2014		80	76	\$1,000	\$638,000	Good	Meets standard	Truck filled during most summers	1	3	4	Inspect/assess the condition of the reservoir.	Operations	\$5,000	5-10 Year	
15	618	5025 Aho Rd		Aho rd	35892-01 / Unnumbered drawings	W	PP	PP 28	W-PP-PP-28		Watermain pipe, 150mm				926	m	1999		80	61	\$450	\$416,700				1	2	5				5-10 Year	
15	618	5025 Aho Rd		Pump House to Aho rd	35892-01 / Unnumbered drawings	W	PP	PP 29	W-PP-PP-29		Booster watermain pipe, 75mm				970	m	1999		80	61	\$400	\$388,000				1	2	5				5-10 Year	
15	618	5025 Aho Rd		Reservoir to Aho rd	35892-01 / Unnumbered drawings	W	PP	PP 30	W-PP-PP-30		Watermain pipe, 250mm				520	m	1999		80	61	\$510	\$266,000				1	2	5				5-10 Year	
15	618	5025 Aho Rd		Aho rd	35892-01 / Unnumbered drawings	W	PP	SL 31	W-PP-SL-31		Service lines, from 75mm booster watermain				19	ea	1999		60	41	\$3,000	\$57,000				1	2	5				5-10 Year	
15	618	5025 Aho Rd		Aho rd/Magdalena dr/Judiths run	35892-01 / Unnumbered drawings	W	PP	ARV 32	W-PP-ARV-32		ARV 14.5' w/ release valve c/w standard manhole frame and cover, 25mm bronze gate valve, 300mm reinforced concrete pipe				8	LS	1999		40	21	\$8,000	\$64,000				2	1	4				10 Year	
16	618	5025 Aho Rd		Magdalena Dr	35893-01 / Unnumbered drawings	W	PP	PP 33	W-PP-PP-33		Watermain pipe, 150mm				700	m	1999		60	41	\$450	\$315,000				2	2	4				5-10 Year	
16	618	5025 Aho Rd		Magdalena dr/Boethel rd/Judiths run	35892-01 / Unnumbered drawings	W	PP	SL 34	W-PP-SL-34		Service lines, from 150mm watermain				16	ea	1999		60	41	\$3,000	\$48,000				1	2	5				10 Year	
17	618	5025 Aho Rd		Judiths run	35893-01 / Unnumbered drawings	W	PP	PP 35	W-PP-PP-35		Watermain pipe, 150mm				406	m	1999		60	41	\$450	\$182,700				2	2	4				5-10 Year	
17	618	5025 Aho Rd		Judiths run	35892-01 / Unnumbered drawings	W	PP	PP 36	W-PP-PP-36		Well foreman pipe, 38mm				380	m	1999		80	61	\$330	\$123,000				2	2	4				5-10 Year	
18	618	5025 Aho Rd		Boethel rd	35892-01 / Unnumbered drawings	W	PP	PRV 37	W-PP-PRV-37		Pressure reducing chamber c/w 100mm gate valve, 1" APCD model 50.3 air release valve, 100mm DNHf model 6211 pressure gauge				1	ea	1999		40	21	\$200,000	\$200,000				2	2	4				5-10 Year	
18	618	5025 Aho Rd		Wells 67 to Pumphouse/Reservoir	35892-01 / Unnumbered drawings	W	PP	PP 38	W-PP-PP-38		Well foreman pipe, 75mm				1,400	m	1999		80	61	\$400	\$564,000				2	2	4				5-10 Year	
19	618	5025 Aho Rd		AHO ROAD	GIS	W	PP	PP 39	W-PP-PP-39		Watermain pipe, 75mm (GIS minus catalogued length from 35892-01)				0	m	1999		60	41	\$400	\$0				2	2	4				5-10 Year	
19	618	5025 Aho Rd		AHO ROAD	GIS	W	PP	PP 40	W-PP-PP-40		Watermain pipe, 150mm (includes 897m of unknown diameter) (GIS minus catalogued length from 35892-01)				319	m	1999		60	41	\$450	\$143,411				2	2	4				5-10 Year	
19	618	5025 Aho Rd		AHO ROAD	GIS	W	PP	PP 41	W-PP-PP-41		Watermain pipe, 250mm (GIS minus catalogued length from 35892-01)				291	m	1999		60	41	\$510	\$150,961				2	2	4				5-10 Year	
19	618	5025 Aho Rd		AHO ROAD	GIS	W	PP	PP 42	W-PP-PP-42		Watermain pipe, 300mm				20	m	1999		60	41	\$600	\$12,227				2	2	4				5-10 Year	
20	618	5025 Aho Rd		HENRY ROETHEL ROAD	GIS	W	PP	PP 43	W-PP-PP-43		Watermain pipe, 75mm (GIS minus catalogued length from 35892-01)				0	m	1999		60	41	\$400	\$0				2	2	4				5-10 Year	
20	618	5025 Aho Rd		HENRY ROETHEL ROAD	GIS	W	PP	PP 44	W-PP-PP-44		Watermain pipe, 150mm				1,104	m	1999		60	41	\$450	\$497,024				2	2	4				5-10 Year	
21	618	5025 Aho Rd		JUDITHS RUN	GIS	W	PP	PP 45	W-PP-PP-45		Watermain pipe, 38mm (GIS minus catalogued length from 35892-01)				0	m	1999		60	41	\$350	\$0				2	2	4				5-10 Year	
21	618	5025 Aho Rd		JUDITHS RUN	GIS	W	PP	PP 46	W-PP-PP-46		Watermain pipe, 75mm (GIS minus catalogued length from 35892-01)				0	m	1999																

618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



WTP TREATMENT PLANT  
FIELD INSPECTION

MORRISON HERSHFIELD

SYSTEM: Woodley Range Water DATE: Nov 2017

LOCATION: \_\_\_\_\_

SYSTEM CODE: 618 PROJECT No.: 5170700

INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Type of Treatment System (Schematic)

2) Site Conditions/Security

3) Condition of Structure:

618 (1)



618 (2)  
1 of 11

618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



618 (3)



618 (4)  
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618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



618 (5)



618 (6)  
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618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



618 (7)



618 (8)  
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618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



618 (9)



618 (10)  
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618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



618 (11)



618 (12)  
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618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



618 (13)



618 (14)  
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618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



618 (15)



618 (16)  
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618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



618 (17)



618 (18)  
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618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



618 (19)



618 (20)  
10 of 11

618- Woodley Range Water-See Infrastructure Condition Assessment table with corresponding photo ID's



618 (21)



618 (22)  
11 of 11

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Woodley Range - Water Treatment Building - Functional Code 618**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION				OPINION OF PROBABLE COST											
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr Review or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Woodley Range - Water Treatment Building	Water Treatment Building	618	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1 & 2	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	1997	21-Nov-17	MH	21	50	29	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	260	\$20	SF	\$5,200	0%	5%	5%	\$6,000
Woodley Range - Water Treatment Building	Water Treatment Building	618	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1 & 2	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	1997	21-Nov-17	MH	21	50	29	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	260	\$10	SF	\$2,600	0%	5%	5%	\$3,000
Woodley Range - Water Treatment Building	Water Treatment Building	618	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1 & 2	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	1997	21-Nov-17	MH	21	10	2	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Woodley Range - Water Treatment Building	Water Treatment Building	618	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1 & 2	Perimeter drain pipes are assumed to be installed at the footing level. No information was available regarding the scoping of the system to review for continuity.	5	5	1997	21-Nov-17	MH	21	50	29	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Woodley Range - Water Treatment Building	Water Treatment Building	618	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1 & 2	The superstructure is comprised of split faced masonry blocks with a wood framed roof.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	1997	21-Nov-17	MH	21	30	29	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Woodley Range - Water Treatment Building	Water Treatment Building	618	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Soffits	1 & 2	Perforated metal soffit is present at the roof overhangs.	5	5	1997	21-Nov-17	MH	21	50	29	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	120	\$20	SF	\$2,400	0%	10%	5%	\$3,000
Woodley Range - Water Treatment Building	Water Treatment Building	618	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1 & 2	One metal door is present on the building.	4	4	1997	21-Nov-17	MH	21	30	9	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Woodley Range - Water Treatment Building	Water Treatment Building	618	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Asphalt Single Roof Assembly	1 & 2	The roof is sloped assembly which has been waterproofed with asphalt shingles. The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	1997	21-Nov-17	MH	21	30	9	Replace asphalt shingles at the end of its service life.  Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	300	\$15	SF	\$4,500	0%	5%	5%	\$5,000
Woodley Range - Water Treatment Building	Water Treatment Building	618	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Asphalt Single Roof Assembly	1 & 2	The roof is sloped assembly which has been waterproofed with asphalt shingles. The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	1997	21-Nov-17	MH	21	30	9	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	40	\$10	LF	\$400	0%	10%	5%	\$1,000
Woodley Range - Water Treatment Building	Water Treatment Building	618	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	1997	21-Nov-17	MH	21	20	5	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Woodley Range - Water Treatment Building - Functional Code 618



Photo 1



Photo 2



## 619 - Burnum Water

### Infrastructure Condition Assessment and Capital Plan

Andy Place, Cobble Hill, BC

Date Prepared

July 18, 2018

#### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 6, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 619 - Burnum Water

Infrastructure Condition Assessment and Capital Plan  
Andy Place, Cobble Hill, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	6	W-RES-RES-25 and W-RES-RD-26	Capital Upgrade/New	Consider access and safety improvements as part of reservoir expansion.	\$10,000	\$10,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						<b>Total</b>	<b>\$10,000</b>

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4	4	W-WTP-WLL-19	Maintenance	Decommission well 4	\$10,000	\$10,000
	5						
	6						
Short Term (2 - 5 Year)	7	1	ALL	Operations	Inspect/assess the condition of the well house 1 /WTP, the well, pump, process piping, communications, and add a secondary containment for the chlorine solution tank.	\$10,000	\$40,000
	8	2	ALL	Operations	Inspect/assess the condition of the well house 2 /WTP, the well, pump, process piping, and communications	\$10,000	
	9	3	ALL	Operations	Inspect/assess the condition of the well house 3 /WTP, the well, pump, process piping, communications, and add a secondary containment for the chlorine solution tank.	\$10,000	
	10	5	ALL	Operations	Inspect/assess the condition of the well house 5 /WTP, the well, pump, process piping, and communications.	\$10,000	
	11						
Medium Term (5 - 10 Year)	12	10 to 19	ALL	Operations	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$40,000	\$40,000
	13						
	14						
	15						
	16						
						<b>Total</b>	<b>\$90,000</b>

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

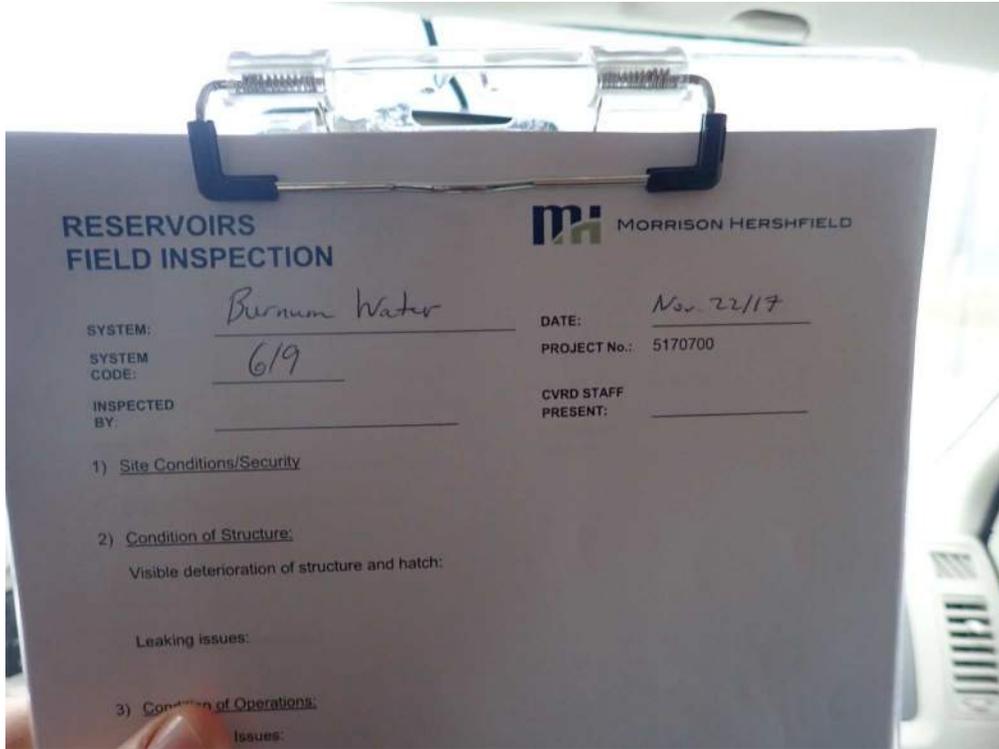
Infrastructure Condition Assessment

Owner:	Lowishan Valley Regional District (CVRD)
System:	Burnham Water
Civic Address:	Andy Place
Geographic Location:	Southwest of Cobble Hill
Customers:	Parcels: 88 Users: 83

Total Replacement Value	\$3,556,331
Value per user	\$42,847

Asset ID	Location			DWG Ref	Major	Minor	Spec	Asset Code	Photo	Description	Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Condition Assessment			Recommendations / Action Items	Description	Type of Work	10 Year Capital Plan		
	Function Code	Address	Location												Demand Condition	Probability of Failure	Severity of Failure				Condition	Budget Estimate	Timing
1	619	Andy Place	Burnham Rd.	13328-1	W	WTP	WTP	1	W-WTP-WTP-1	18 to 23	Water treatment plant building / well house (Well 1)	Refer to Burnham Water System Building Condition Assessment.								Refer to Burnham Water System Building Condition Assessment.			
1	619	Andy Place	Burnham Rd.	13328-1	W	WTP	WLL	2	W-WTP-WLL-2	21	Well 1, West	\$10,000	\$10,000	Fair - Looking at adding arsenic filters	Meets standard	Online, need more water	2	3	3	Inspect/assess the condition of the well house 1 /WTP, the well, pump, process piping, communications, and add a secondary containment for the chlorine solution tank.	Operations	\$10,000	2-5 Year
1	619	Andy Place	Burnham Rd.	13328-1	W	WTP	PMP	3	W-WTP-PMP-3	21	Submersible Pump, Well 1, assumed 5 hp for replacement value	\$5,000	\$5,000	Good - pump replaced with VFD in 2016	Meets standard		1	2	3		Operations	Included above	5-10 Year
1	619	Andy Place	Burnham Rd.	13328-1	W	WTP	PP	4	W-WTP-PP-4	21	Process piping c/w valves, pipes, tees (Well 1)	\$10,000	\$10,000				2	2	4	Inspect/assess the condition of the process piping in well house 1 /WTP	Operations	Included above	2-5 Year
1	619	Andy Place	Burnham Rd.	13328-1	W	WTP	COM	5	W-WTP-COM-5	22, 23	Communications (Well 1)	\$9,000	\$9,000				3	2	3	Inspect/assess the condition of the communications in well house 1 /WTP	Operations	Included above	2-5 Year
1	619	Andy Place	Burnham Rd.	13328-1	W	WTP	CH	6	W-WTP-CH-6	21	Chlorination system c/w piping, dosing pump (Well 1)	\$10,000	\$10,000	Fair - no secondary containment	Does not meet standard		2	2	4	Add secondary containment for the chlorine solution tank	Maintenance	Included above	5-10 Year
2	619	Andy Place	Burnham Rd.	13328-1	W	WTP	WTP	7	W-WTP-WTP-7	10 to 17	Water treatment plant building / well house (Well 2)	Refer to Burnham Water System Building Condition Assessment.								Refer to Burnham Water System Building Condition Assessment.			
2	619	Andy Place	Burnham Rd.	13328-1	W	WTP	WLL	8	W-WTP-WLL-8	12	Well 2, East	\$10,000	\$10,000	Looking at adding arsenic filters		Offline	2	3	3	Inspect/assess the condition of the well house 2 /WTP, the well, pump, process piping, and communications	Operations	\$10,000	2-5 Year
2	619	Andy Place	Burnham Rd.	13328-1	W	WTP	PMP	9	W-WTP-PMP-9	12	Submersible Pump, Well 2, assumed 5 hp for replacement value	\$5,000	\$5,000	Pump is being serviced			3	2	3		Operations	Included above	2-5 Year
2	619	Andy Place	Burnham Rd.	13328-1	W	WTP	PP	10	W-WTP-PP-10	12	Process piping c/w valves, pipes, tees (Well 2)	\$10,000	\$10,000				2	2	4	Inspect/assess the condition of the process piping in well house 2 /WTP	Operations	Included above	5-10 Year
2	619	Andy Place	Burnham Rd.	13328-1	W	WTP	COM	11	W-WTP-COM-11	11, 13 to 15	Communications (Well 2)	\$9,000	\$9,000	No intrusion alarms - Well house 2 houses all the controls for the wells			3	2	3	Inspect/assess the condition of the communications in well house 2 /WTP	Operations	Included above	2-5 Year
3	619	Andy Place	Burnham Rd.	13328-1	W	WTP	WTP	12	W-WTP-WTP-12	2 to 9	Water treatment plant building / well house (Well 3)	Refer to Burnham Water System Building Condition Assessment.								Refer to Burnham Water System Building Condition Assessment.			
3	619	Andy Place	Burnham Rd.	13328-1	W	WTP	WLL	13	W-WTP-WLL-13	3,4,8	Well 3	\$10,000	\$10,000			Online	2	3	3	Inspect/assess the condition of the well house 3 /WTP, the well, pump, process piping, communications, and add a secondary containment for the chlorine solution tank.	Operations	\$10,000	2-5 Year
3	619	Andy Place	Burnham Rd.	13328-1	W	WTP	PMP	14	W-WTP-PMP-14	3,4,8	Submersible Pump, Well 3, assumed 5 hp for replacement value	\$5,000	\$5,000				3	2	3	Inspect/assess the condition of well pump 3	Operations	Included above	2-5 Year
3	619	Andy Place	Burnham Rd.	13328-1	W	WTP	PP	15	W-WTP-PP-15	3 to 8	Process piping c/w valves, pipes, tees (Well 3)	\$10,000	\$10,000				2	2	4	Inspect/assess the condition of the process piping in well house 3 /WTP	Operations	Included above	5-10 Year
3	619	Andy Place	Burnham Rd.	13328-1	W	WTP	COM	16	W-WTP-COM-16	4, 6, 9	Communications (Well 3)	\$9,000	\$9,000	No intrusion alarms			3	2	3	Inspect/assess the condition of the communications in well house 3 /WTP	Operations	Included above	2-5 Year
3	619	Andy Place	Burnham Rd.	13328-1	W	WTP	CH	17	W-WTP-CH-17	5, 6	Chlorination system c/w piping, dosing pump (Well 3)	\$10,000	\$10,000	Fair - no secondary containment	Does not meet standard		3	2	3	Add secondary containment for the chlorine solution tank	Maintenance	Included above	2-5 Year
4	619	Andy Place	Burnham Rd.	13328-1	W	WTP	WTP	18	W-WTP-WTP-18	36 to 40	Water treatment plant building / well house (Well 4)	Refer to Burnham Water System Building Condition Assessment.								Refer to Burnham Water System Building Condition Assessment.			
4	619	Andy Place	Burnham Rd.	13328-1	W	WTP	WLL	19	W-WTP-WLL-19	3, 4, 8	Well 4	\$10,000	\$10,000			Offline	2	3	3	Decommission well 4	Maintenance	\$10,000	2-5 Year
5	619	Andy Place	Burnham Rd.	13328-1	W	WTP	WTP	20	W-WTP-WTP-20	24	Water treatment plant building / well house (Well 5)	Refer to Burnham Water System Building Condition Assessment.								Refer to Burnham Water System Building Condition Assessment.			
5	619	Andy Place	Burnham Rd.	13328-1	W	WTP	WLL	21	W-WTP-WLL-21	24	Well 5	\$10,000	\$10,000			Online	2	3	3	Inspect/assess the condition of the well house 5 /WTP, the well, pump, process piping, and communications.	Operations	\$10,000	2-5 Year
5	619	Andy Place	Burnham Rd.	13328-1	W	WTP	PMP	22	W-WTP-PMP-22	24	Submersible Pump, Well 5, assumed 5 hp for replacement value	\$5,000	\$5,000				3	2	3	Inspect/assess the condition of well pump 5	Operations	Included above	2-5 Year
5	619	Andy Place	Burnham Rd.	13328-1	W	WTP	PP	23	W-WTP-PP-23	NA	Process piping c/w valves, pipes, tees (Well 5)	\$10,000	\$10,000				2	2	4	Inspect/assess the condition of the process piping in well house 5 /WTP	Operations	Included above	5-10 Year
5	619	Andy Place	Burnham Rd.	13328-1	W	WTP	COM	24	W-WTP-COM-24	24	Communications (Well 5)	\$9,000	\$9,000	Alarms for wells at reservoir site, next to well 5			3	2	3	Inspect/assess the condition of the communications in well house 5 /WTP	Operations	Included above	2-5 Year
6	619	Andy Place	Melrose Cres.	13328-1	W	RES	RES	25	W-RES-RES-25	28 to 33	Concrete reservoir (326,000 L) c/w connections	\$2,000	\$652,000	Fair - some signs of concrete deterioration (cracks on roof), some sediment in reservoir, no fencing or safety rails	Does not meet standard	Not able to meet capacity	2	3	3	Consider access and safety improvements as part of reservoir expansion.	Capital Upgrade/New	\$10,000	2-5 Year
6	619	Andy Place	Melrose Cres.	13328-1	W	RES	RD	26	W-RES-RD-26	34, 35	Access road to reservoir	\$50,000	\$50,000	Fair - Very steep, locked gated, turning movements restricted	Does not meet standard	Water truck can't access reservoir, has to pump from lower section of access road	2	2	4	Consider access and safety improvements as part of reservoir expansion	Capital Upgrade/New	Included above	5-10 Year
7	619	Andy Place	Sherburn Rd	13-229	W	PP	PP	27	W-PP-PP-27		Watermain pipe, 150mm, distribution, min depth 0.9m	\$450	\$166,150				1	2	5				
7	619	Andy Place	Sherburn Rd	13-229	W	PP	PP	28	W-PP-PP-28		Watermain pipe, 50mm, raw, (c/w comm cable in conduit)	\$350	\$184,450				1	2	5				
8	619	Andy Place	Northgate Rd	13-229	W	PP	PP	29	W-PP-PP-29		Watermain pipe, 150mm, distribution, min depth 0.9m	\$450	\$39,600				1	2	5				
8	619	Andy Place	Northgate Rd	13-229	W	PP	PP	30	W-PP-PP-30		Watermain pipe, 50mm, raw, (c/w comm cable in conduit)	\$350	\$30,800				1	2	5				
9	619	Andy Place	"Road A"	13-229	W	PP	PP	31	W-PP-PP-31		Watermain pipe, 50mm, raw, (c/w comm cable in conduit)	\$350	\$73,500				1	2	5				
9	619	Andy Place	"Road A"	13-229	W	PP	PP	32	W-PP-PP-32		Watermain pipe, 150mm, distribution, min depth 0.9m	\$450	\$159,750				1	2	5				5-10 Year
9	619	Andy Place	"Road A", Northgate Rd., Sherburn Rd.	13-229	W	PP	SL	33	W-PP-SL-33		20mm Service connection lines, surface unknown, installed at mid-point of lot frontage	\$3,000	\$48,000				1	2	5				10+ Year
10	619	Andy Place	Burnham Rd.	13328-2	W	PP	PP	34	W-PP-PP-34		75mm Watermain	\$400	\$140,000				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	\$40,000	5-10 Year
11	619	Andy Place	ANDY PLACE	GIS	W	PP	PP	35	W-PP-PP-35		Watermain pipe, 75mm	\$400	\$60,216				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
11	619	Andy Place	ANDY PLACE	GIS	W	PP	PP	36	W-PP-PP-36		Watermain pipe, 150mm (includes 6m of unknown diameter)	\$450	\$68,610				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
12	619	Andy Place	BURNHAM ROAD	GIS	W	PP	PP	37	W-PP-PP-37		Watermain pipe, 50mm	\$350	\$103,722				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
12	619	Andy Place	BURNHAM ROAD	GIS	W	PP	PP	38	W-PP-PP-38		Watermain pipe, 75mm (GIS minus catalogued length from 13-228-2)	\$400	\$63,792				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
12	619	Andy Place	BURNHAM ROAD	GIS	W	PP	PP	39	W-PP-PP-39		Watermain pipe, 150mm (includes 739m of unknown diameter)	\$450	\$692,389				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
13	619	Andy Place	EMPRESS ROAD	GIS	W	PP	PP	40	W-PP-PP-40		Watermain pipe, 150mm	\$450	\$177,418				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
14	619	Andy Place	MELROSE CRESCENT	GIS	W	PP	PP	41	W-PP-PP-41		Watermain pipe, 150mm	\$450	\$45,573				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
15	619	Andy Place	RAYMOND CRESCENT	GIS	W	PP	PP	42	W-PP-PP-42		Watermain pipe, 150mm	\$450	\$87,854				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
16	619	Andy Place	SHERBURN ROAD	GIS	W	PP	PP	43	W-PP-PP-43		Watermain pipe, 50mm (GIS minus catalogued length from 13-229)	\$350	\$0				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
16	619	Andy Place	SHERBURN ROAD	GIS	W	PP	PP	44	W-PP-PP-44		Watermain pipe, 150mm (GIS minus catalogued length from 13-229)	\$450	\$11,250				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
17	619	Andy Place	SIMARD PLACE	GIS	W	PP	PP	45	W-PP-PP-45		Watermain pipe, 150mm	\$450	\$100,017				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
18	619	Andy Place	THAIN ROAD	GIS	W	PP	PP	46	W-PP-PP-46		Watermain pipe, 150mm	\$450	\$68,662				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
19	619	Andy Place	TYERMAN PLACE	GIS	W	PP	PP	47	W-PP-PP-47		Watermain pipe, 150mm	\$450	\$142,578				2	2	4	Inspect/assess watermain, hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year
20	619	Andy Place	Entire system	GIS	W	FT	FT	48	W-PP-FT-48		Touch transmission water meters	\$3,000	\$225,000				1	2	5				10+ Year

619- Burnum Water-See Infrastructure Condition Assessment table with corresponding photo ID's



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619 (9)

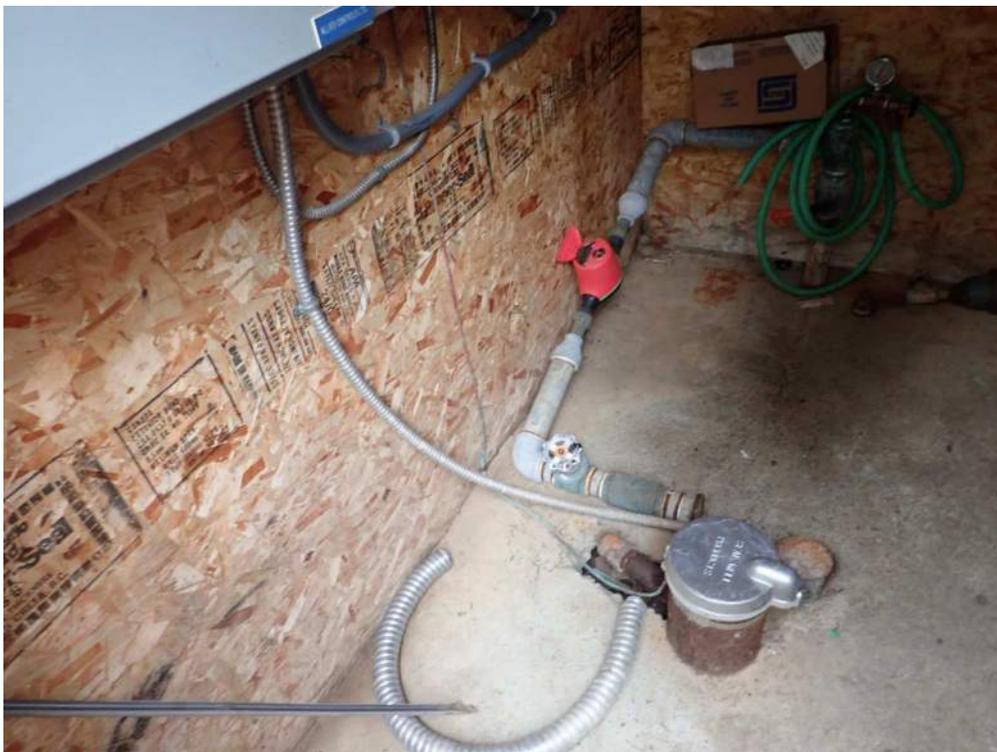


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619- Burnum Water-See Infrastructure Condition Assessment table with corresponding photo ID's



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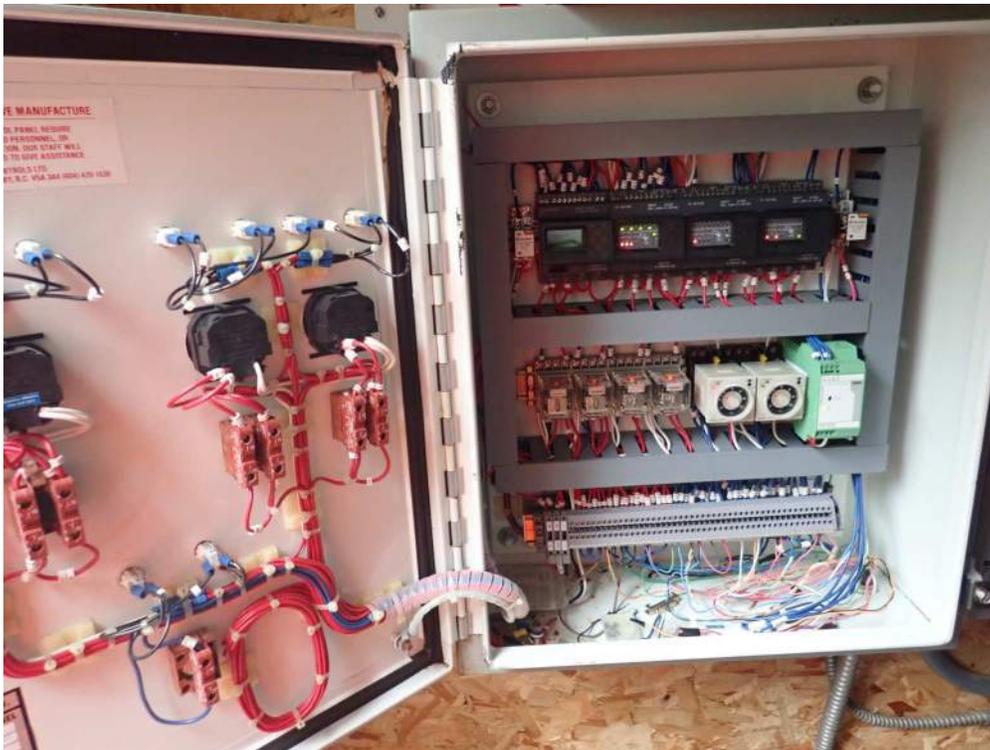


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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Burnum Lake - Water Building #1 - Functional Code 619**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	Description & History	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	OPINION OF PROBABLE COST								
						ID	Location / Type			Condition	Performance	Yr. Next or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL on Major Action	Recommendation	Type					Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Burnum Lake - Water Building #1	Water Treatment Building	619	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of concrete blocks, these blocks were concealed from review.  The age of the structure was not confirmed.	4	4	2000	21-Nov-17	MH	18	50	32	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$20	SF	\$800	0%	5%	5%	\$1,000
Burnum Lake - Water Building #1	Water Treatment Building	619	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2000	21-Nov-17	MH	18	50	32	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$10	SF	\$400	0%	5%	5%	\$1,000
Burnum Lake - Water Building #1	Water Treatment Building	619	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2000	21-Nov-17	MH	18	50	32	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$40	SF	\$1,600	0%	5%	5%	\$2,000
Burnum Lake - Water Building #1	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Vinyl Siding	1	Vinyl siding and wood trim are present on the exterior walls. Isolated areas of damaged siding were observed.	3	3	2000	21-Nov-17	MH	18	10	1	Repaint wood trim.  Replace sections of damaged vinyl siding as required.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	LS	\$1,500	0%	15%	5%	\$2,000
Burnum Lake - Water Building #1	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Vinyl Siding	1	Vinyl siding and wood trim are present on the exterior walls.	3	3	2000	21-Nov-17	MH	18	50	32	The vinyl siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	150	\$15	SF	\$2,250	0%	5%	5%	\$3,000
Burnum Lake - Water Building #1	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	4	4	2000	21-Nov-17	MH	18	50	32	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	20	\$20	SF	\$400	0%	10%	5%	\$1,000
Burnum Lake - Water Building #1	Water Treatment Building	619	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	4	4	2000	21-Nov-17	MH	18	30	12	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000
Burnum Lake - Water Building #1	Water Treatment Building	619	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped assembly with asphalt shingles. Shingles have been installed over a previous skylight.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2000	21-Nov-17	MH	18	30	12	Replace the asphalt shingles at the end of its service life. Remove skylight at the time of roof replacement.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	40	\$12	SF	\$480	0%	5%	5%	\$1,000
Burnum Lake - Water Building #1	Water Treatment Building	619	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2000	21-Nov-17	MH	18	20	2	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Burnum Lake - Water Building 1- Functional Code 619



Photo 1

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Burnum Lake - Water Building #2 - Functional Code 619**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	OPINION OF PROBABLE COST										
						ID	Location / Type		Description & History	Condition	Performance	Yr Review or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation					Type	Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars	
Burnum Lake - Water Building #2	Water Treatment Building	619	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1		The foundation is comprised of concrete blocks, these blocks were concealed from review.  The age of the structure was not confirmed.	4	4	2000	21-Nov-17	MH	18	50	32	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$20	SF	\$800	0%	5%	5%	\$1,000
Burnum Lake - Water Building #2	Water Treatment Building	619	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1		The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2000	21-Nov-17	MH	18	50	32	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$10	SF	\$400	0%	5%	5%	\$1,000
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1		The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2000	21-Nov-17	MH	18	50	32	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$40	SF	\$1,600	0%	5%	5%	\$2,000
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Vinyl Siding	1		Vinyl siding and wood trim are present on the exterior walls.	4	4	2000	21-Nov-17	MH	18	10	2	Repaint wood trim.  Replace sections of damaged vinyl siding as required.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	LS	\$1,500	0%	15%	5%	\$2,000
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Vinyl Siding	1		Vinyl siding and wood trim are present on the exterior walls.	4	4	2000	21-Nov-17	MH	18	50	32	The vinyl siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	150	\$15	SF	\$2,250	0%	5%	5%	\$3,000
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1		Perforated metal soffit is present at the roof overhangs.	4	4	2000	21-Nov-17	MH	18	50	32	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	20	\$20	SF	\$400	0%	10%	5%	\$1,000
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1		One painted metal door is present on the building.	4	4	2000	21-Nov-17	MH	18	30	12	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1		The roof is a sloped assembly with asphalt shingles. Shingles have been installed over a previous skylight.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2000	21-Nov-17	MH	18	30	12	Replace the asphalt shingles at the end of its service life. Remove skylight at the time of roof replacement.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	40	\$12	SF	\$480	0%	5%	5%	\$1,000
Burnum Lake - Water Building #2	Water Treatment Building	619	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment			An exterior light is present on the building near the entrance.	4	4	2000	21-Nov-17	MH	18	20	2	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Burnum Lake - Water Building #2 - Functional Code 619

BLDD Name	BLDD Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST							10-YEAR CAPITAL PLAN																		
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027				
Burnum Lake - Water Building #2	Water Treatment Building	619	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of concrete blocks, these blocks were concealed from review. The age of the structure was not confirmed.	4	4	2000	21-Nov-17	MH	18	50	32	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$20	SF	\$800	0%	5%	5%	\$1,000													
Burnum Lake - Water Building #2	Water Treatment Building	619	A Substructure	A10 Foundations	A1010 Slab on Grade	A101001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2000	21-Nov-17	MH	18	50	32	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$10	SF	\$400	0%	5%	5%	\$1,000													
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2000	21-Nov-17	MH	18	50	32	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	40	\$40	SF	\$1,600	0%	5%	5%	\$2,000													
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Wall/ Vinyl Siding		1	Vinyl siding and wood trim are present on the exterior walls.	4	4	2000	21-Nov-17	MH	18	10	2	Repaint wood trim. Replace sections of damaged vinyl siding as required. At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	LS	\$1,500	0%	15%	5%	\$2,000		\$2,000				\$8,000							
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Wall/ Vinyl Siding		1	Vinyl siding and wood trim are present on the exterior walls.	4	4	2000	21-Nov-17	MH	18	50	32	The vinyl siding is expected to last the life of the building. Note: Isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	150	\$15	SF	\$2,250	0%	5%	5%	\$3,000													
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Wall/ Soffit		1	Perforated metal soffit is present at the roof overhangs.	4	4	2000	21-Nov-17	MH	18	50	32	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	20	\$20	SF	\$400	0%	10%	5%	\$1,000													
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Wall/ Door		1	One painted metal door is present on the building.	4	4	2000	21-Nov-17	MH	18	30	12	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000													
Burnum Lake - Water Building #2	Water Treatment Building	619	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is a sloped assembly with asphalt shingles. Shingles have been installed over a previous skylight. The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2000	21-Nov-17	MH	18	30	12	Replace the asphalt shingles at the end of its service life. Remove skylight at the time of roof replacement. Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	40	\$12	SF	\$480	0%	5%	5%	\$1,000													
Burnum Lake - Water Building #2	Water Treatment Building	619	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment			An exterior light is present on the building near the entrance.	4	4	2000	21-Nov-17	MH	18	20	2	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000		\$1,000											

Cowichan Valley Regional District

Burnum Lake - Water Building 2- Functional Code 619



Photo 1

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Burnum Lake - Water Building #3 - Functional Code 619**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	OPINION OF PROBABLE COST									
						ID	Location / Type		Condition	Performance	Yr Review or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type					Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars	
Burnum Lake - Water Building #3	Water Treatment Building	619	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of concrete blocks, these blocks were concealed from review.  The age of the structure was not confirmed.	4	4	2000	21-Nov-17	MH	18	50	32	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$20	SF	\$2,000	0%	5%	5%	\$3,000
Burnum Lake - Water Building #3	Water Treatment Building	619	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2000	21-Nov-17	MH	18	50	32	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$10	SF	\$1,000	0%	5%	5%	\$2,000
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2000	21-Nov-17	MH	18	50	32	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$40	SF	\$4,000	0%	5%	5%	\$5,000
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Vinyl Siding	1	Vinyl siding and wood trim are present on the exterior walls.	4	4	2000	21-Nov-17	MH	18	10	1	Repaint wood trim.  Replace sections of damaged vinyl siding as required.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	LS	\$1,500	0%	15%	5%	\$2,000
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Vinyl Siding	1	Vinyl siding and wood trim are present on the exterior walls.	4	4	2000	21-Nov-17	MH	18	50	32	The vinyl siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	250	\$15	SF	\$3,750	0%	5%	5%	\$5,000
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	4	4	2000	21-Nov-17	MH	18	50	32	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	20	\$20	SF	\$400	0%	10%	5%	\$1,000
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	4	4	2000	21-Nov-17	MH	18	30	12	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped assembly with asphalt shingles. Shingles have been installed over a previous skylight.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2000	21-Nov-17	MH	18	30	12	Replace the asphalt shingles at the end of its service life. Remove skylight at the time of roof replacement.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	110	\$12	SF	\$1,320	0%	5%	5%	\$2,000
Burnum Lake - Water Building #3	Water Treatment Building	619	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2000	21-Nov-17	MH	18	20	2	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Burnum Lake - Water Building #3 - Functional Code 619

BLDD Name	BLDD Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST							10-YEAR CAPITAL PLAN																
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027		
Burnum Lake - Water Building #3	Water Treatment Building	619	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of concrete blocks, these blocks were concealed from review. The age of the structure was not confirmed.	4	4	2000	21-Nov-17	MH	18	50	32	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$20	SF	\$2,000	0%	5%	5%	\$3,000											
Burnum Lake - Water Building #3	Water Treatment Building	619	A Substructure	A10 Foundations	A1010 Slab on Grade	A101001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2000	21-Nov-17	MH	18	50	32	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$10	SF	\$1,000	0%	5%	5%	\$2,000											
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2000	21-Nov-17	MH	18	50	32	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$40	SF	\$4,000	0%	5%	5%	\$5,000											
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Wall/ Vinyl Siding		1	Vinyl siding and wood trim are present on the exterior walls.	4	4	2000	21-Nov-17	MH	18	10	1	Repaint wood trim. Replace sections of damaged vinyl siding as required. At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	LS	\$1,500	0%	15%	5%	\$2,000	\$2,000										
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Wall/ Vinyl Siding		1	Vinyl siding and wood trim are present on the exterior walls.	4	4	2000	21-Nov-17	MH	18	50	32	The vinyl siding is expected to last the life of the building. Note: Isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	250	\$15	SF	\$3,750	0%	5%	5%	\$5,000											
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Wall/ Soffit		1	Perforated metal soffit is present at the roof overhangs.	4	4	2000	21-Nov-17	MH	18	50	32	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	20	\$20	SF	\$400	0%	10%	5%	\$1,000											
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	B20 Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Wall/ Door		1	One painted metal door is present on the building.	4	4	2000	21-Nov-17	MH	18	30	12	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000											
Burnum Lake - Water Building #3	Water Treatment Building	619	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is a sloped assembly with asphalt shingles. Shingles have been installed over a previous skylight. The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2000	21-Nov-17	MH	18	30	12	Replace the asphalt shingles at the end of its service life. Remove skylight at the time of roof replacement. Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	110	\$12	SF	\$1,320	0%	5%	5%	\$2,000											
Burnum Lake - Water Building #3	Water Treatment Building	619	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment			An exterior light is present on the building near the entrance.	5	5	2000	21-Nov-17	MH	18	20	2	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000	\$1,000										

Cowichan Valley Regional District

Burnum Lake - Water Building 3- Functional Code 619



Photo 1

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Burnum Lake - Water Building #4 - Functional Code 619**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	Description & History	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	OPINION OF PROBABLE COST								
						ID	Location / Type			Condition	Performance	Yr. Next or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL on Major Action	Recommendation	Type					Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Burnum Lake - Water Building #4	Water Treatment Building	619	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of concrete blocks, these blocks were concealed from review.  The age of the structure was not confirmed.	4	4	1990	21-Nov-17	MH	28	50	12	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$20	SF	\$2,000	0%	5%	5%	\$3,000
Burnum Lake - Water Building #4	Water Treatment Building	619	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	1990	21-Nov-17	MH	28	50	12	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$10	SF	\$1,000	0%	5%	5%	\$2,000
Burnum Lake - Water Building #4	Water Treatment Building	619	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1990	21-Nov-17	MH	28	50	12	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	100	\$40	SF	\$4,000	0%	5%	5%	\$5,000
Burnum Lake - Water Building #4	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Wood siding and wood trim are present on the exterior walls.	3	3	1990	21-Nov-17	MH	28	10	1	Repaint wood siding and trim, replace damaged sections as required.  At the time of painting, replace sealant joints.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$2,000	LS	\$2,000	0%	15%	5%	\$3,000
Burnum Lake - Water Building #4	Water Treatment Building	619	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Wood siding and wood trim are present on the exterior walls.	3	3	1990	21-Nov-17	MH	28	50	12	The wood siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	250	\$15	SF	\$3,750	0%	5%	5%	\$5,000
Burnum Lake - Water Building #4	Water Treatment Building	619	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted wood door is present, this door is in poor shape.	3	3	1990	21-Nov-17	MH	28	30	1	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	EA	\$500	0%	5%	5%	\$1,000
Burnum Lake - Water Building #4	Water Treatment Building	619	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped assembly with asphalt shingles. Shingles have been installed over a previous skylight.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	1990	21-Nov-17	MH	28	30	2	Replace the asphalt shingles at the end of its service life. Remove skylight at the time of roof replacement.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	110	\$12	SF	\$1,320	0%	5%	5%	\$2,000
Burnum Lake - Water Building #4	Water Treatment Building	619	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	No interior finishes are present, the interior insulation is in poor condition. Deterioration of the exposed interior components were observed.	3	3	2018	21-Nov-17	MH	0	20	1	Install interior finishes.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	0%	5%	\$2,000
Burnum Lake - Water Building #4	Water Treatment Building	619	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	1990	21-Nov-17	MH	28	20	2	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Burnum Lake - Water Building 4- Functional Code 619



Photo 1



Photo 2



## 620 - Mesachie Lake Water

### Infrastructure Condition Assessment and Capital Plan

6720 Forestry Road, Mesachie Lake, BC

Date Prepared

July 18, 2018

#### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 6, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 620 - Mesachie Lake Water

Infrastructure Condition Assessment and Capital Plan

6720 Forestry Road, Mesachie Lake, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	ALL	Capital Upgrade/New	Inspect/assess the condition of the WTP, generator and communications. Replace the pump, process piping, and the electrical.	\$80,000	\$80,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$80,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	W-RES-TNK-7 and W-RES-RD-8	Maintenance	Inspect/assess the condition of the reservoir and improve the access road to the reservoir.	\$30,000	\$30,000
	8						
	9						
Medium Term (5 - 10 Year)	10	3 to 7	ALL	Operations	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$40,000	\$40,000
	11						
	12						
	13						
	14						
						Total	\$70,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

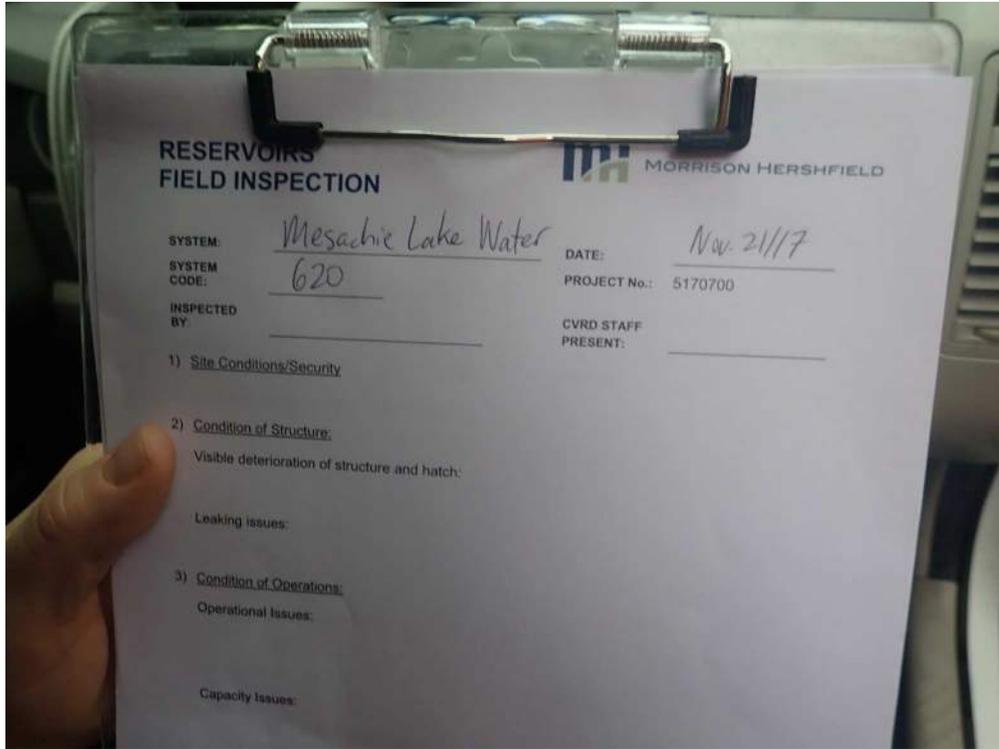
Owner:	Cowichan Valley Regional District (CVRD)
System:	620 Menasche Lake Water
CWC Address:	6720 Forestry Rd
Geographic Location:	South of Cowichan Lake
Customers:	63
Users:	78

Infrastructure Condition Assessment

Current Year	2018	Total Replacement Value	\$1,037,542
		Value per user	\$26,122

Asset ID	Function Code	Location	Address	Location	DWG Ref	Asset Code			Photo	Description	Make	Model	Asset Inventory			Year Retired	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Condition Assessment			Recommendations / Action Items	Type of Work	10 Year Capital Plan				
						Major	Minor	Spec					Quantity	Quantity Unit	Year Installed							Level of Service Condition	Demand Condition	Probability of Failure			Severity of Failure	Condition	Budget Estimate	Timing	Comments/Question to be resolved
1	620	6720 Forestry Rd	Water treatment plant	Site Visit / Photos	W WTP	WTP	1	W-WTP-WTP-1	2 to 6, AND V's	Water treatment plant building			1	ea	1977	40	0		\$5,000	\$5,000	Refer to Menasche Lake Water System Building Condition Assessment.										
1	620	6720 Forestry Rd	Water treatment plant	Site Visit / Photos	W WTP	PMP	2	W-WTP-PMP-2	5, 6	Pump, assumed 5 hp for replacement value (WTP)			1	ea	1977	20	0	\$5,000	\$5,000	Fair	3	2	3	Inspect/Assess the condition of the WTP generator and communications. Replace the pump, process piping, and the electrical.	Capital Upgrade/New	\$80,000	2-5 Year				
1	620	6720 Forestry Rd	Water treatment plant	Site Visit / Photos	W WTP	PP	3	W-WTP-PP-3	5, 6, 10	Process piping, c/w valves, pipes, tees			1	LS	1977	40	0	\$50,000	\$50,000	Poor	3	1	3	Inspect/Assess the condition of the WTP generator and communications. Replace the pump, process piping, and the electrical.	Capital Upgrade/New	Included above	2-5 Year				
1	620	6720 Forestry Rd	Water treatment plant	Site Visit / Photos	W WTP	COM	4	W-WTP-COM-4	4, 5, 10	Communications (WTP)			1	LS	1977	20	0	\$3,000	\$3,000	Good - intrusion alarm, remote communications	Meets standard	3	2	3	Inspect/Assess the communications in the WTP	Operations	Included above	2-5 Year			
1	620	6720 Forestry Rd	Water treatment plant	Site Visit / Photos	W WTP	GEN	5	W-WTP-GEN-5	7	Backup generator, assumed 20 kW for replacement value	Generac		1	ea	1977	40	0	\$20,000	\$20,000	Good - lots of power outages	Meets standard	3	2	3	Inspect/Assess the generator in the WTP	Operations	Included above	2-5 Year			
1	620	6720 Forestry Rd	Water treatment plant	Site Visit / Photos	W WTP	ELC	6	W-WTP-ELC-6	4, 5, 10	Electrical (WTP)			1	LS	1977	20	0	\$10,000	\$10,000	Poor - old, not up to code	Does not meet standard	3	3	3	Inspect/Assess the electrical in the WTP	Operations	Included above	2-5 Year			
2	620	6720 Forestry Rd	Reservoir	Site Visit / Photos	W RES	TNK	7	W-RES-TNK-7	11 to 15	Reservoir, steel bolted above ground, 240,000 L			240	1000 L	1977	80	39	\$1,000	\$240,000	Fair - roof was replaced a few years ago after a tree fell on it, supply line was exposed at creek crossing	Meets standard	2	3	3	Inspect/Assess the condition of the reservoir and improve the access road to the reservoir	Maintenance	\$80,000	2-5 Year			
2	620	6720 Forestry Rd	Reservoir	Site Visit / Photos	W RES	RD	8	W-RES-RD-8	11	Access road to reservoir			1	LS	1977	40	0	\$50,000	\$50,000	Poor	Does not meet standard	3	2	3	Improve the access road to the reservoir	Maintenance	Included above	2-5 Year			
3	620	6720 Forestry Rd		REAR LAKE ROAD	GIS	W PP	9	W-PP-PP-9		Watermain pipe, 150mm					1977	80	39	\$450	\$396,767					Inspect/Assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (expanding), and/or reviewing historical maintenance and repair frequencies.	Operations	\$40,000	5-10 Year				
3	620	6720 Forestry Rd		REAR LAKE ROAD	GIS	W PP	10	W-PP-PP-10		Watermain pipe, 200mm					1977	80	39	\$500	\$1,109					Inspect/Assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (expanding), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year				
4	620	6720 Forestry Rd		CARLTON ROAD	GIS	W PP	11	W-PP-PP-11		Watermain pipe, 150mm					1977	80	39	\$450	\$44,810					Inspect/Assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (expanding), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year				
5	620	6720 Forestry Rd		FORESTRY ROAD	GIS	W PP	12	W-PP-PP-12		Watermain pipe, 100mm					1977	60	19	\$400	\$179,958					Inspect/Assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (expanding), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year				
5	620	6720 Forestry Rd		FORESTRY ROAD	GIS	W PP	13	W-PP-PP-13		Watermain pipe, 100mm					1977	80	39	\$400	\$2,400					Inspect/Assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (expanding), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year				
5	620	6720 Forestry Rd		FORESTRY ROAD	GIS	W PP	14	W-PP-PP-14		Watermain pipe, 100mm					1977	80	39	\$400	\$8,000					Inspect/Assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (expanding), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year				
5	620	6720 Forestry Rd		FORESTRY ROAD	GIS	W PP	15	W-PP-PP-15		Watermain pipe, 150mm					1977	80	39	\$450	\$403,665					Inspect/Assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (expanding), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year				
6	620	6720 Forestry Rd		SOUTH SHORE ROAD	GIS	W PP	16	W-PP-PP-16		Watermain pipe, 150mm					1977	80	39	\$450	\$605,833					Inspect/Assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (expanding), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year				
7	620	6720 Forestry Rd	Entire system	GIS	W PP	FT	17	W-PP-FT-17		Touch transmission water meters			3	ea	1977	40	0	\$3,000	\$9,000					Inspect/Assess water meters for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (expanding), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5-10 Year				

620 Mesachie Lake Water-See Infrastructure Condition Assessment table with corresponding photo ID's



620 (1)



620 (2)  
1 of 8

620 Mesachie Lake Water-See Infrastructure Condition Assessment table with corresponding photo ID's



620 (3)



620 (4)  
2 of 8

620 Mesachie Lake Water-See Infrastructure Condition Assessment table with corresponding photo ID's



620 (5)



620 (6)  
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620 Mesachie Lake Water-See Infrastructure Condition Assessment table with corresponding photo ID's



620 (7)



620 (8)  
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620 Mesachie Lake Water-See Infrastructure Condition Assessment table with corresponding photo ID's



620 (9)



620 (10)  
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620 Mesachie Lake Water-See Infrastructure Condition Assessment table with corresponding photo ID's



620 (11)



620 (12)  
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620 Mesachie Lake Water-See Infrastructure Condition Assessment table with corresponding photo ID's



620 (13)



620 (14)  
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620 Mesachie Lake Water-See Infrastructure Condition Assessment table with corresponding photo ID's



620 (15)

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Mesachie Lake - Water Treatment Building - Functional Code 620**

BLOG Name	BLOG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION				OPINION OF PROBABLE COST											
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Useful Life or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Mesachie Lake Water Treatment Building	Water Treatment Building	620	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	1950	21-Nov-17	MH	68	50	10	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	180	\$20	SF	\$3,600	0%	5%	5%	\$4,000
Mesachie Lake Water Treatment Building	Water Treatment Building	620	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	1950	21-Nov-17	MH	68	50	10	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	180	\$10	SF	\$1,800	0%	5%	5%	\$2,000
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	1950	21-Nov-17	MH	68	50	10	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	180	\$40	SF	\$7,200	0%	5%	5%	\$8,000
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted wood siding and wood trim are present on the exterior walls. The existing paint is in poor condition and is in need of replacement.	5	5	1950	21-Nov-17	MH	68	12	2	Repaint siding and trim. At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	480	\$8	SF	\$3,840	0%	15%	5%	\$5,000
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted wood siding and wood trim are present on the exterior walls.	5	5	1950	21-Nov-17	MH	68	50	10	Replacement of wood siding. Note: Isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	480	\$50	SF	\$24,000	0%	5%	5%	\$27,000
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Window	1	One wood door is present on the building.	5	5	1950	21-Nov-17	MH	68	30	5	Windows are present on the sides of the building. These windows are single pane wood framed assemblies. Security screening has been installed over the windows.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,000	EA	\$2,000	0%	5%	5%	\$3,000
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One wood door is present on the building.	5	5	1950	21-Nov-17	MH	68	30	5	Replace the door at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	EA	\$1,000	0%	5%	5%	\$2,000
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped assembly with cedar shakes installed. The roof is edge drained, no gutters are present.	5	5	1950	21-Nov-17	MH	68	40	5	Replace the cedar shake roof at the end of its service life. Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	200	\$15	SF	\$3,000	0%	5%	5%	\$4,000
Mesachie Lake Water Treatment Building	Water Treatment Building	620	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301099 Other Wall Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	5	5	1950	21-Nov-17	MH	68	20	13	Repaint interiors as required. Note: a long service life has been included to reflect building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	0%	5%	\$2,000
Mesachie Lake Water Treatment Building	Water Treatment Building	620	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502099 Other Lighting and Branch Wiring	Exterior Lighting		An exterior light is present on the building near the entrance.	5	5	2010	21-Nov-17	MH	8	20	12	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

All quantities are approximate only for capital budgeting purposes, and would require confirmation prior to obtaining any quotes for work.

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Mesachie Lake - Water Treatment Building - Functional Code 620

BUDG Name	BUDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT							LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST							10-YEAR CAPITAL PLAN																	
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age to 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total to 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027			
Mesachie Lake Water Treatment Building	Water Treatment Building	620	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some above-grade foundation wall on some elevations.	5	5	1950	21-Nov-17	MH	68	50	10	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	180	\$20	SF	\$3,600	0%	5%	5%	\$4,000												
Mesachie Lake Water Treatment Building	Water Treatment Building	620	A Substructure	A10 Foundations	A1010 Slab on Grade	A101001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	1950	21-Nov-17	MH	68	50	10	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	180	\$10	SF	\$1,800	0%	5%	5%	\$2,000												
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	1950	21-Nov-17	MH	68	50	10	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	180	\$40	SF	\$7,200	0%	5%	5%	\$8,000												
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding		1	Painted wood siding and wood trim are present on the exterior walls. The existing paint is in poor condition and is in need of replacement.	5	5	1950	21-Nov-17	MH	68	12	2	Repaint siding and trim. At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	480	\$8	SF	\$3,840	0%	15%	5%	\$5,000												
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	C820 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding		1	Painted wood siding and wood trim are present on the exterior walls.	5	5	1950	21-Nov-17	MH	68	50	10	Replacement of wood siding. Note: Isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	480	\$50	SF	\$24,000	0%	5%	5%	\$27,000												
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Window		1	One wood door is present on the building.	5	5	1950	21-Nov-17	MH	68	30	5	Windows are present on the sides of the building. These windows are single pane wood framed assemblies. Security screening has been installed over the windows.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,000	EA	\$2,000	0%	5%	5%	\$3,000												
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		1	One wood door is present on the building.	5	5	1950	21-Nov-17	MH	68	30	5	Replace the door at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	EA	\$1,000	0%	5%	5%	\$2,000												
Mesachie Lake Water Treatment Building	Water Treatment Building	620	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is a sloped assembly with cedar shakes installed. The roof is edge drained, no gutters are present.	5	5	1950	21-Nov-17	MH	68	40	5	Replace the cedar shake roof at the end of its service life. Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	200	\$15	SF	\$3,000	0%	5%	5%	\$4,000												
Mesachie Lake Water Treatment Building	Water Treatment Building	620	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301099 Other Wall Finishes	Interior/Interior Finishes		2	The interior gypsum and plywood walls and ceilings are painted.	5	5	1950	21-Nov-17	MH	68	20	13	Repaint interiors as required. Note: a long service life has been included to reflect building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	0%	5%	\$2,000												
Mesachie Lake Water Treatment Building	Water Treatment Building	620	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502099 Other Lighting and Branch Wiring	Exterior Lighting			An exterior light is present on the building near the entrance.	5	5	2010	21-Nov-17	MH	8	20	12	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000												

All quantities are approximate only for capital budgeting purposes, and would require confirmation prior to obtaining any quotes for work.

Cowichan Valley Regional District

Mesachie Lake - Water Treatment Building - Functional Code 620



Photo 1



Photo 2

## 640 - Saltair Water

### Infrastructure Condition Assessment and Capital Plan

10620 South Watts Road, Ladysmith, BC

Date Prepared

July 18, 2018

#### PROPERTY STATISTICS AND REPORT SUMMARY

System Replacement Cost Estimate	\$17,497,642	
Number of Users	864	
Replacement Cost Per User	\$20,252	
Annual Replacement Cost (40 Years)	\$243,608	per year
Annual Replacement Cost (80 Years)	\$216,020	per year
10 Year Capital Plan Total	\$5,000	
10 Year Operations and Maintenance Plan Total	\$230,000	

#### PROPERTY DESCRIPTION

The Saltair Water System started construction in 1987 and includes the phases outlined in the table below.

Development	Year Installed	Source
Distribution System	1987	Innova Report
Clifcoe Road Upgrades	2006	Record Drawings (85837 01 D1)
South Oyster School Road Upgrades	2008	Record Drawings (176-01-2)
Finch Place Upgrades	2009	Record Drawings (CI-08-S1)
Hilsea Crescent Upgrades	2013	Record Drawings (525)
Private Road Upgrades	2014	Record Drawings (L914-01)
Westdowne Road Upgrades	2014	Record Drawings (2231-33903-1)
Maytree Road	2014	Record Drawings (525)
Seaview Crescent Upgrades	2014	Record Drawings (525)
Water Treatment Plant	2014	Record Drawings (2167-3)
Reservoir	2014	Record Drawings (176-04-1)
Chemainus Road Upgrades	2015	Record Drawings (525)

#### PROJECT TEAM

Austin Tokarek, Asset Coordinator  
 Todd Etherington, Utility Operations Superintendent  
 David Parker, Engineering Technologist III  
 Rob Grant, GIS Supervisor  
 Andrea Kross, GIS Technician I  
 Adam Greenwood, Project Engineer  
 Kieran Bertsch, E.I.T.  
 Caleb Light, GIS

#### CONTACT INFORMATION

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## 640 - Saltair Water

Infrastructure Condition Assessment and Capital Plan

10620 South Watts Road, Ladysmith, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 7, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 640 - Saltair Water

Infrastructure Condition Assessment and Capital Plan  
10620 South Watts Road, Ladysmith, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	1	W-WTP-PP-3	Capital Renewal	Inspect/assess the condition of the WTP and process piping. Install a generator for backup power.	\$5,000	\$5,000
	11						
	12						
						Total	\$5,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	3	W-RES-ELEC-9	Operations	Inspect/assess the condition of the transmission line from the lake to the reservoir.	\$25,000	\$70,000
	8	4	W-PP-VAL-11	Operations	Inspect/assess the condition of the valve chambers.	\$15,000	
	9	78	W-RES-RES-136	Operations	Inspect/assess the dam for deterioration.	\$30,000	
	10						
Medium Term (5 - 10 Year)	11	3	W-RES-TNK-8	Operations	Inspect/assess the condition of the reservoir.	\$10,000	\$160,000
	12	20 to 77	ALL	Operations	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$150,000	
	13						
	14						
	15						
						Total	\$230,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

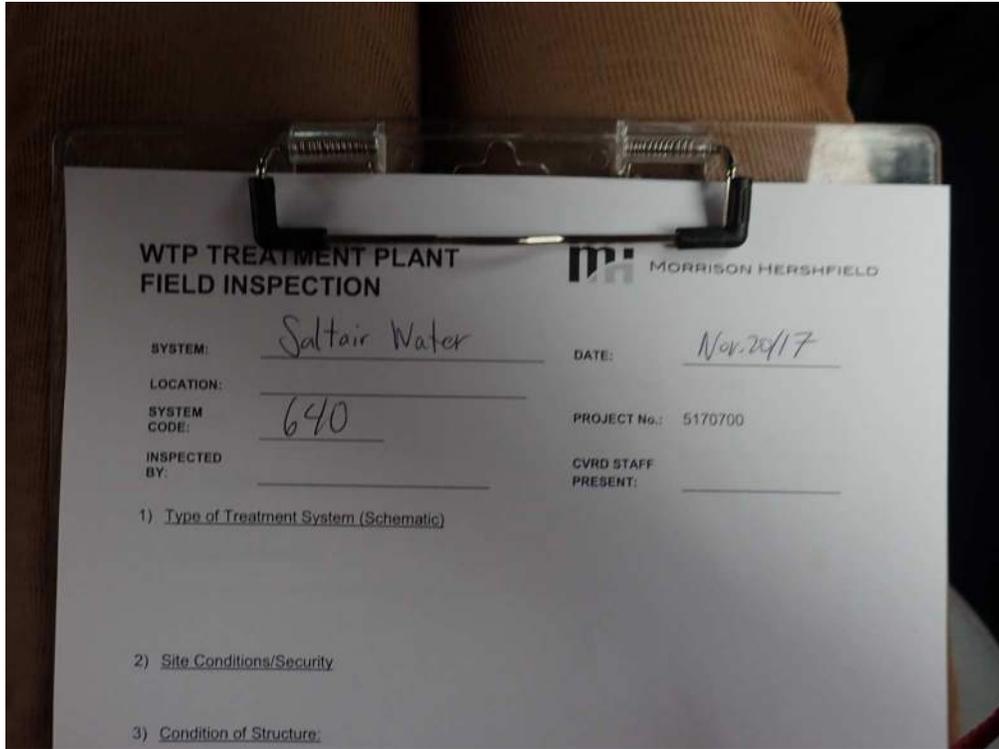








640 Saltair Water-See Infrastructure Condition Assessment table with corresponding photo ID's



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640 (2)  
1 of 15

640 Saltair Water-See Infrastructure Condition Assessment table with corresponding photo ID's



640 (3)



640 (4)  
2 of 15

640 Saltair Water-See Infrastructure Condition Assessment table with corresponding photo ID's



640 (5)



640 (6)  
3 of 15

640 Saltair Water-See Infrastructure Condition Assessment table with corresponding photo ID's



640 (7)



640 (8)  
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640 Saltair Water-See Infrastructure Condition Assessment table with corresponding photo ID's



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640 (10)  
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640 Saltair Water-See Infrastructure Condition Assessment table with corresponding photo ID's

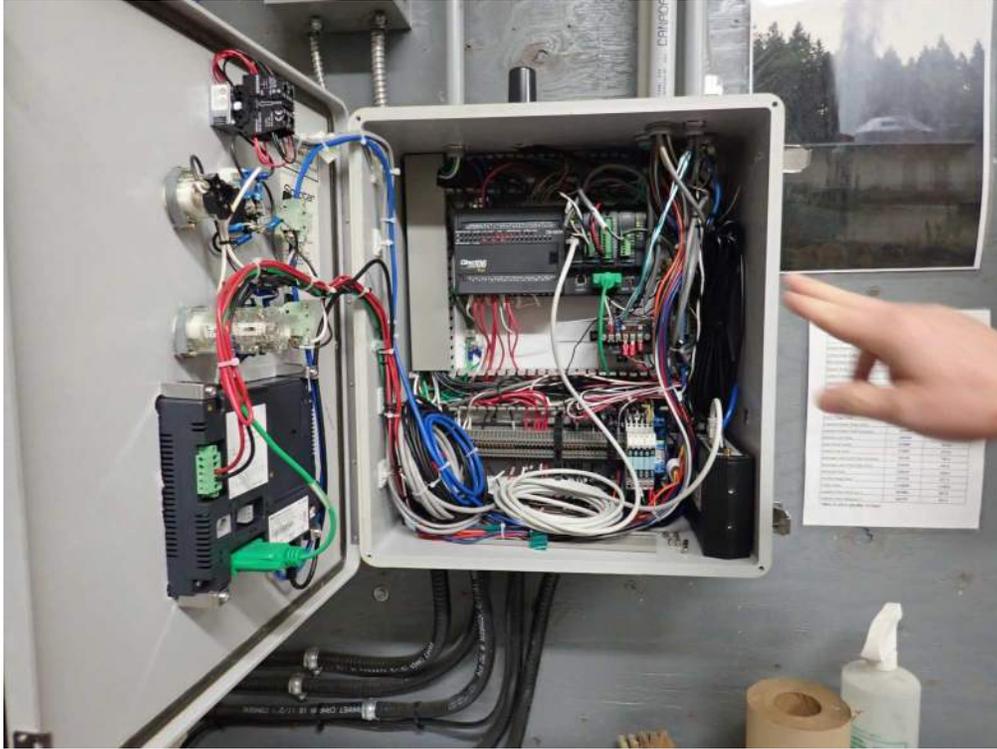


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640 Saltair Water-See Infrastructure Condition Assessment table with corresponding photo ID's



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640 Saltair Water-See Infrastructure Condition Assessment table with corresponding photo ID's



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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Saltair - Storage Building - Functional Code 640**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	Description & History	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	OPINION OF PROBABLE COST								
						ID	Location / Type			Condition	Performance	Yr. Next or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOJ or Major Action	Recommendation	Type					Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	% Tax	Total in 2017 Dollars
Saltair Water - Storage Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	4	4	2014	21-Nov-17	MH	4	50	46	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	550	\$20	SF	\$11,000	0%	5%	5%	\$13,000
Saltair Water - Storage Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2014	21-Nov-17	MH	4	50	46	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No major capital expenditures are expected with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	550	\$10	SF	\$5,500	0%	5%	5%	\$7,000
Saltair Water - Storage Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2014	21-Nov-17	MH	4	10	6	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Saltair Water - Storage Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2014	21-Nov-17	MH	4	50	46	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Saltair Water - Storage Building	Water Treatment Building	640	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2014	21-Nov-17	MH	4	50	46	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	550	\$40	SF	\$22,000	0%	5%	5%	\$25,000
Saltair Water - Storage Building	Water Treatment Building	640	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2014	21-Nov-17	MH	4	12	8	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	700	\$6	SF	\$4,200	0%	15%	5%	\$6,000
Saltair Water - Storage Building	Water Treatment Building	640	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2014	21-Nov-17	MH	4	50	43	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	700	\$35	SF	\$24,500	0%	5%	5%	\$28,000
Saltair Water - Storage Building	Water Treatment Building	640	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	4	4	2014	21-Nov-17	MH	4	50	43	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	100	\$20	SF	\$2,000	0%	10%	5%	\$3,000
Saltair Water - Storage Building	Water Treatment Building	640	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted overhead door is present on the building.	4	4	2014	21-Nov-17	MH	4	20	16	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Saltair Water - Storage Building	Water Treatment Building	640	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	A painted metal door is present on the building.	4	4	2014	21-Nov-17	MH	4	30	26	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,500	EA	\$1,500	0%	5%	5%	\$2,000
Saltair Water - Storage Building	Water Treatment Building	640	B Shell	B20 Exterior Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/Windows	1	Vinyl windows are present on the exterior.	4	4	2014	21-Nov-17	MH	4	25	21	Replace windows at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	6	\$200	EA	\$1,200	0%	10%	5%	\$2,000
Saltair Water - Storage Building	Water Treatment Building	640	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped assembly with a metal roof installed.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2014	21-Nov-17	MH	4	30	26	Replace the roof assembly at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	600	\$30	SF	\$18,000	0%	5%	5%	\$20,000
Saltair Water - Storage Building	Water Treatment Building	640	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped assembly with a metal roof installed.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2014	21-Nov-17	MH	4	25	21	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	10%	5%	\$1,000
Saltair Water - Storage Building	Water Treatment Building	640	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes		The interior gypsum and plywood walls and ceilings are painted.	4	4	2014	21-Nov-17	MH	4	20	16	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000
Saltair Water - Storage Building	Water Treatment Building	640	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2014	21-Nov-17	MH	4	20	16	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Saltair Water- Storage Building - Functional Code 640



Photo 1



Photo 2

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Saltair Water - Water Treatment Building - Functional Code 640**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?		If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	OPINION OF PROBABLE COST							
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOQ or Major Action	Recommendation	Type	Priority	Quantity				Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars	
Saltair Water - Water Treatment Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	4	4	2014	21-Nov-17	MH	4	50	46	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$20	SF	\$8,000	0%	5%	5%	\$9,000
Saltair Water - Water Treatment Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2014	21-Nov-17	MH	4	50	46	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$10	SF	\$4,000	0%	5%	5%	\$5,000
Saltair Water - Water Treatment Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains		Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2014	21-Nov-17	MH	4	10	6	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Saltair Water - Water Treatment Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2014	21-Nov-17	MH	4	50	46	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Saltair Water - Water Treatment Building	Water Treatment Building	640	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of masonry blocks with a wood framed roof. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2014	21-Nov-17	MH	4	50	46	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Saltair Water - Water Treatment Building	Water Treatment Building	640	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of masonry blocks with a wood framed roof. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  The exterior block has been painted. Wood elements are present at the fascia areas.	4	4	2014	21-Nov-17	MH	4	10	6	Repaint exterior masonry block and wood trims.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	720	\$6	SF	\$4,320	0%	10%	5%	\$5,000
Saltair Water - Water Treatment Building	Water Treatment Building	640	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Wood soffit is present at the roof overhangs.	5	5	2014	21-Nov-17	MH	4	50	46	The wood soffit is expected to last the life of the building. Paint soffit at the time of masonry block painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No								
Saltair Water - Water Treatment Building	Water Treatment Building	640	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Three painted metal doors are present on the building.	4	4	2014	21-Nov-17	MH	4	30	26	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	3	\$1,500	EA	\$4,500	0%	5%	5%	\$5,000
Saltair Water - Water Treatment Building	Water Treatment Building	640	B Shell	D30 Roofing	B3010 Roof Coverings	B301002 Low Slope Roof Coverings	Roof/Low Sloped Roof Assembly	1	The roof is low sloped assembly which has been waterproofed with a 2-ply SBS membrane.  The roof drains via rain water leaders to the below grade system.	4	4	2014	21-Nov-17	MH	4	20	16	Replace SBS membrane at the end of its service life.	Replacement	3 - Future Renewal	No	Yes	No	No	450	\$12	SF	\$5,400	0%	5%	5%	\$6,000
Saltair Water - Water Treatment Building	Water Treatment Building	640	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Low Sloped Roof Assembly	1	Fascia board are painted wood assemblies.	4	4	2014	21-Nov-17	MH	4	8	2	Repair and repaint wood fascia boards.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Saltair Water - Water Treatment Building	Water Treatment Building	640	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	Sections of the building have been finished with gypsum wall board and plywood.  The timeline of the last repainting cycle was not known and has been assumed.	4	4	2014	21-Nov-17	MH	4	20	16	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Saltair Water - Water Treatment Building	Water Treatment Building	640	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2014	21-Nov-17	MH	4	20	16	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Saltair Water - Water Treatment Building - Functional Code 640

BUD Name	BUD Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT							LIFECYCLE DATA			RECOMMENDATION				OPINION OF PROBABLE COST							10-YEAR CAPITAL PLAN															
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age to 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to COC for Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	Quantity	Unit Rate	Unit	Subtotal Building Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027			
																																	\$0	\$1,000	\$1,000	\$0	\$4,000	\$6,000	\$0	\$0	\$0	\$0	\$2,000		
Saltair Water - Water Treatment Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations					The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some above-grade foundation wall on some elevations.	4	4	2014	21-Nov-17	MH	4	50	46	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$20	SF	\$8,000	0%	5%	5%	\$9,000										
Saltair Water - Water Treatment Building	Water Treatment Building	640	A Substructure	A10 Foundations	A101001 Standard Slab on Grade	A101001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade					The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2014	21-Nov-17	MH	4	50	46	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$10	SF	\$4,000	0%	5%	5%	\$5,000										
Saltair Water - Water Treatment Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains					Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2014	21-Nov-17	MH	4	10	6	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000			\$1,000							
Saltair Water - Water Treatment Building	Water Treatment Building	640	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains					Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2014	21-Nov-17	MH	4	50	46	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No																		
Saltair Water - Water Treatment Building	Water Treatment Building	640	B She8	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure					The superstructure is comprised of masonry blocks with a wood framed roof. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2014	21-Nov-17	MH	4	50	46	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the masonry block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000										
Saltair Water - Water Treatment Building	Water Treatment Building	640	B She8	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure					The superstructure is comprised of masonry blocks with a wood framed roof. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  The exterior block has been painted. Wood elements are present at the fascia areas.	4	4	2014	21-Nov-17	MH	4	10	6	Repaint exterior masonry block and wood trim.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	720	\$6	SF	\$4,320	0%	10%	5%	\$5,000						\$6,000				
Saltair Water - Water Treatment Building	Water Treatment Building	640	B She8	C120 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit					Wood soffits is present at the roof overhangs.	5	5	2014	21-Nov-17	MH	4	50	46	The wood soffit is expected to last the life of the building. Paint soffits at the time of masonry block painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No																		
Saltair Water - Water Treatment Building	Water Treatment Building	640	B She8	B20 Enclosure	C2010 Exterior Doors	B201001 Solid Doors	Exterior Walls/ Door					Three painted metal doors are present on the building.	4	4	2014	21-Nov-17	MH	4	30	26	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	3	\$1,500	EA	\$4,500	0%	5%	5%	\$5,000					\$4,000					
Saltair Water - Water Treatment Building	Water Treatment Building	640	B She8	D30 Roofing	B3010 Roof Coverings	B301002 Low Slope Roof Coverings	Roof/Low Sloped Roof Assembly					The roof is low sloped assembly which has been waterproofed with a 2-ply SBS membrane.  The roof drains via rain water leaders to the below grade system.	4	4	2014	21-Nov-17	MH	4	20	16	Replace SBS membrane at the end of its service life.	Replacement	3 - Future Renewal	No	Yes	No	No	450	\$12	SF	\$5,400	0%	5%	5%	\$6,000										
Saltair Water - Water Treatment Building	Water Treatment Building	640	B She8	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Low Sloped Roof Assembly					Fascia board are painted wood assemblies.	4	4	2014	21-Nov-17	MH	4	8	2	Repair and repaint wood fascia boards.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000		\$1,000								
Saltair Water - Water Treatment Building	Water Treatment Building	640	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes					Sections of the building have been finished with gypsum wall board and plywood.  The timeline of the last repainting cycle was not known and has been assumed.	4	4	2014	21-Nov-17	MH	4	20	16	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000									\$1,000	
Saltair Water - Water Treatment Building	Water Treatment Building	640	C Interiors	D50 Electrical	D5000 Lighting and Branch Wiring	D500002 Lighting Equipment	Exterior Lighting Equipment					An exterior light is present on the building near the entrance.	4	4	2014	21-Nov-17	MH	4	20	16	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000									\$1,000	

Cowichan Valley Regional District

Saltair Water- Water Treatment Building - Functional Code 640



Photo 1



Photo 2



## 653 - Youbou Water

Infrastructure Condition Assessment and Capital Plan  
9696 Youbou Road, Youbou, BC

Date Prepared July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 7, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management seperately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create seperate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 653 - Youbou Water

Infrastructure Condition Assessment and Capital Plan  
9696 Youbou Road, Youbou, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	ALL	Capital Upgrade/New	Decommission the WTP once the new well is online. Salvage the UV filter units to be used in the Creekside WTP. Build new pump station and chlorination system at reservoir outlet.	\$300,000	\$300,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$300,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	ALL	Maintenance	Inspect/assess the condition of the Creekside WTP, chlorine system, and communications. Replace the UV units with the ones from the other WTP, and replace the process piping and valves.	\$75,000	\$90,000
	8	43	W-RES-RES-262	Operations	Inspect/assess the condition of the dam.	\$15,000	
	9						
Medium Term (5 - 10 Year)	10	3	W-RES-TNK-17	Operations	Inspect/assess the condition of the reservoir.	\$5,000	\$35,000
	11	4	W-RES-TNK-18	Operations	Inspect/assess the condition of reservoir #1.	\$5,000	
	12	5	W-RES-TNK-19	Operations	Inspect/assess the condition of reservoir #2.	\$5,000	
	13	6	W-PS-BLD-20 and W-PS-COM-24	Operations	Inspect/assess the condition of the Arnold Rd pumphouse/PRV building. Improve interface and tweak communications.	\$20,000	
	14						
						Total	\$125,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CRD)
System:	Ysouyou Water System
Client Address:	8656 Youbou rd
North side of	
Geographic Location:	Cowichan Lake
Customers:	Private Users
	SRB
	SRB

Infrastructure Condition Assessment

Current Year	2018	Total Replacement Value	\$11,423,403
		Value per user	\$21,554

Asset ID	Function Code	Location	Address	Location	DWG Ref	Major	Minor	Spec ID	Asset Code	Photo	Description	Make	Model	Material	Quantity	Asset Inventory	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Condition Assessment			Recommendations / Action Items	Type of Work	20 Year Capital Plan	Timing	Comments/Question to be resolved	
																							Physical Condition	Level of Service Condition	Demand Condition						Probability of Failure
1	053	8656 Youbou rd	WTP (water source from dam)		208-22	W	WTP	WTP-1	W-WTP-WTP-1	28 to 41, MOV 1	Water treatment plant building (WTP source from dam)				1	ea	2006		40	28	\$11,000	\$11,000	Good	Meets standard	Refer to Youbou Water System Building Condition Assessment	Refer to Youbou Water System Building Condition Assessment					
1	053	8656 Youbou rd	WTP (water source from dam)		208-22	W	WTP	PMP-2	W-WTP-PMP-2	35, 36	Pump, Vertical split case 65x111 (8.5' imp) cen/fig pump, 660 (l/gpm) @30% Shp/230/111/10 rpm	Aurora		1	ea	2006		20	8	\$5,000	\$5,000	Good	Meets standard	Commission the WTP once the new well is online. Salvage the UV filter units to be used in the Creekside WTP. Build new pump station and chlorination system at reservoir outlet.	Capital Upgrade/Repl	\$300,000	5-10 Year				
1	053	8656 Youbou rd	WTP (water source from dam)		208-22	W	WTP	FR-3	W-WTP-FR-3		Fiber assembly, 250/130, 5 micron bag	Krytox/Flex	2424	1	ea	2006		20	8	\$13,000	\$13,000	Good	Meets standard								
1	053	8656 Youbou rd	WTP (water source from dam)		208-22	W	WTP	FR-4	W-WTP-FR-4	30 to 40	Process piping/c/w valves, pipes, tees, reducers			1	ea	2006		20	8	\$50,000	\$50,000	Good	Meets standard	Does not meet source water quality requirements	Maintenance	Included above	2-5 Year				
1	053	8656 Youbou rd	WTP (water source from dam)		208-22	W	WTP	GEN-5	W-WTP-GEN-5	41, 45	Generator, propane powered, air cooled 12kW automatic standby	Gasparian	445E	1	ea	2006		40	28	\$12,000	\$12,000	Good	Meets standard	Commission once new well is online	Maintenance	Included above	5-10 Year				
1	053	8656 Youbou rd	WTP (water source from dam)		208-22	W	WTP	FP-6	W-WTP-FP-6		Pump, vertical split	Meyers	800C-60	1	ea	2006		20	8	\$1,000	\$1,000	Good	Meets standard	Commission once new well is online	Maintenance	Included above	2-5 Year				
1	053	8656 Youbou rd	WTP (water source from dam)		208-22	W	WTP	UV-7	W-WTP-UV-7	35 to 39	UV filter unit	Trojan	Swift	2	ea	2006		20	8	\$15,000	\$30,000	Good	Meets standard	Salvage, to be used in Creekside WTP	Capital Renewal	Included above	2-5 Year				
1	053	8656 Youbou rd	WTP (water source from dam)		208-22	W	WTP	COM-10	W-WTP-COM-10	38, 31	Chlorination system			1	ea	2006		20	8	\$15,000	\$15,000	Good	Meets standard	Commission once new well is online	Maintenance	Included above	2-5 Year				
1	053	8656 Youbou rd	WTP (water source from dam)		208-22	W	WTP	COM-10	W-WTP-COM-10	32, 46	Communications (WTP source from dam)			1	ea	2006		20	8	\$10,000	\$10,000	Good	Meets standard	Commission once new well is online	Maintenance	Included above	2-5 Year				
2	053	8656 Youbou rd	Miscellaneous WTP		182-10-W5	W	WTP	WTP-11	W-WTP-WTP-11	2 to 12, MOV 1	Water treatment plant building (Creekside)			1	ea	2004		40	26	\$11,000	\$11,000	Good	Meets standard	Refer to Youbou Water System Building Condition Assessment	Refer to Youbou Water System Building Condition Assessment						
2	053	8656 Youbou rd	Miscellaneous WTP		182-10-W5	W	WTP	UV-12	W-WTP-UV-12	3, 4, 6	UV treatment unit	Trojan	Swift SC	2	ea	2004		20	6	\$15,000	\$30,000	Fair	Meets standard								
2	053	8656 Youbou rd	Miscellaneous WTP		182-10-W5	W	WTP	EN-24	W-WTP-EN-24	11, 12	Chlorine analyzer, transmitter and controller			1	ea	2004		20	6	\$11,000	\$11,000	Good	Meets standard	Inspect/assess the condition of the Creekside WTP, phone system, and communications. Replace the UV units with the ones from the other WTP, and replace the process piping and valves.	Maintenance	Included above	2-5 Year				
2	053	8656 Youbou rd	Miscellaneous WTP		182-10-W5	W	WTP	PP-15	W-WTP-PP-15	1, 10, 8	Process piping/c/w valves, pipes, tees, reducers	Severn tank	Series 400B	1	ea	2004		40	26	\$50,000	\$50,000	Fair	Meets standard	Inspect/assess the condition of the phone system, internet and phone lines for repairs.	Capital Upgrade/Repl	Included above	2-5 Year				
2	053	8656 Youbou rd	Miscellaneous WTP		182-10-W5	W	WTP	COM-16	W-WTP-COM-16		Communications (Creekside WTP)			1	ea	2004		20	6	\$8,000	\$8,000	Good	Meets standard	Commission once new well is online	Maintenance	Included above	2-5 Year				
3	053	8656 Youbou rd	Reservoir		208-26	W	RES	TK-17	W-RES-TK-17	26, 27	Reservoir, (1.1M L) steel tank c/w process piping, valves			1,100	1000 L	2008		80	70	\$1,000	\$1,100,000	Good - gated, ROW to reservoir	Meets standard	Inspect/assess the condition of the reservoir.	Operations	\$5,000	5-10 Year				
4	053	8656 Youbou rd	Reservoir near Miracle way		182-10-W3	W	RES	TK-18	W-RES-TK-18		Reservoir #1, steel tank, 107,000L			307	1000 L	1999		80	63	\$1,800	\$547,500		Meets standard	Inspect/assess the condition of reservoir #1.	Operations	\$5,000	5-10 Year				
5	053	8656 Youbou rd	Reservoir near Miracle way		182-10-W3	W	RES	TK-19	W-RES-TK-19		Reservoir #2, steel tank, 245,000L			181	1000 L	1999		80	63	\$3,000	\$547,500		Meets standard	Inspect/assess the condition of reservoir #2.	Operations	\$5,000	5-10 Year				
6	053	8656 Youbou rd	Arnold rd pump station / RVV		2212-036	W	PS	RD-20	W-PS-RD-20	15 to 25, MOV 2	Pumphouse / RVV station building			1	ea	2014		40	38	\$170,000	\$170,000	Good - secure building, no backup power	Meets standard								
6	053	8656 Youbou rd	Arnold rd pump station / RVV		2212-036	W	PS	PMP-21	W-PS-PMP-21	17 to 20, 24, 25	Pump, SFP	Grunbeck	CR-20-2	2	ea	2014		20	18	\$5,000	\$10,000	Good	Meets standard								
6	053	8656 Youbou rd	Arnold rd pump station / RVV		2212-036	W	PS	PP-23	W-PS-PP-23	17 to 20, 22, 25	Process piping c/w pressure reducing valves, tees, pressure gauges			1	ea	2014		20	18	\$50,000	\$50,000	Good	Meets standard								
6	053	8656 Youbou rd	Arnold rd pump station / RVV		2212-036	W	PS	COM-24	W-PS-COM-24	20, 21	Communications (Pumphouse/RVV station)			1	ea	2014		20	18	\$8,000	\$8,000	Good	Meets standard	Interface needs to be improved	Capital Renewal	Included above	5-10 Year				
7	053	8656 Youbou rd	Arbutus Rd		208-00	W	PP	PP-25	W-PP-PP-25		Watermain pipe, 150mm	CNOO	PVC 150	m	2006		80	68	\$450	\$24,500		Meets standard									
8	053	8656 Youbou rd	Arbutus Rd		208-00	W	PP	PP-26	W-PP-PP-26		Watermain pipe, 100mm	CNOO	PVC 75	m	2006		80	68	\$400	\$30,000		Meets standard									
9	053	8656 Youbou rd	Bremner Rd		208-00	W	PP	PP-27	W-PP-PP-27		Watermain pipe, 200mm	CNOO	PVC 200	m	2006		80	68	\$500	\$20,000		Meets standard									
10	053	8656 Youbou rd	Coon Creek Rd		208-00	W	PP	PP-28	W-PP-PP-28		Watermain pipe, 150mm	CNOO	PVC 90	m	2006		80	68	\$450	\$40,500		Meets standard									
10	053	8656 Youbou rd	Coon Creek Rd		208-00	W	PP	PP-29	W-PP-PP-29		Watermain pipe, 100mm	CNOO	PVC 65	m	2006		80	68	\$400	\$26,000		Meets standard									
11	053	8656 Youbou rd	Creekside dr. 1-1080 - 2-170		182-10-00	W	PP	PP-30	W-PP-PP-30		Watermain pipe, 200mm, distribution	CNOO	PVC 120	m	2004		80	66	\$500	\$66,000		Meets standard									
11	053	8656 Youbou rd	Creekside dr. 1-1080 - 2-170 (Water #B)		182-10-00	W	PP	PP-31	W-PP-PP-31		Watermain pipe, 150mm, supply	CNOO	PVC 90	m	2004		80	66	\$400	\$42,000		Meets standard									
11	053	8656 Youbou rd	Creekside dr. 2-170 - 1-115		182-10-00	W	PP	PP-32	W-PP-PP-32		Watermain pipe, 150mm	CNOO	PVC 90	m	2004		80	66	\$450	\$34,500		Meets standard									
11	053	8656 Youbou rd	Creekside dr.		182-10-00	W	PP	VAL-33	W-PP-VAL-33		Air relief valve assembly			8	ea	2004		40	25	\$4,000	\$32,000		Meets standard								
12	053	8656 Youbou rd	Lakelsehwa Terrace		208-00	W	PP	PP-34	W-PP-PP-34		Watermain pipe, 100mm	CNOO	PVC 100	m	2006		80	68	\$400	\$40,000		Meets standard									
13	053	8656 Youbou rd	3a Seen-Cr Rd		208-00	W	PP	PP-35	W-PP-PP-35		Watermain pipe, 200mm	CNOO	PVC 170	m	2006		80	68	\$500	\$28,000		Meets standard									
14	053	8656 Youbou rd	3a Seen-Cr Crs		208-00	W	PP	PP-36	W-PP-PP-36		Watermain pipe, 150mm	CNOO	PVC 120	m	2006		80	68	\$450	\$38,700		Meets standard									
14	053	8656 Youbou rd	3a Seen-Cr Crs		208-00	W	PP	VAL-37	W-PP-VAL-37		Air valve assembly c/w chamber, valves, process piping			1	ea	2006		40	28	\$10,000	\$10,000		Meets standard								
15	053	8656 Youbou rd	Whitby Rd (1-1080 - 1-1085)		208-00	W	PP	PP-38	W-PP-PP-38		Watermain pipe, 500mm	Schmid 80	CNOO	PVC 500	m	2006		80	68	\$500	\$45,000		Meets standard								
15	053	8656 Youbou rd	Whitby Rd		208-00	W	PP	PP-39	W-PP-PP-39		Watermain pipe, 100mm	CNOO	PVC 100	m	2006		80	68	\$400	\$19,200		Meets standard									
16	053	8656 Youbou rd	Youbou Rd		208-00	W	PP	PP-40	W-PP-PP-40		Watermain pipe, 200mm	CNOO	PVC 215	m	2006		80	68	\$500	\$1,017,500		Meets standard									
16	053	8656 Youbou rd	Youbou Rd		208-00	W	PP	PP-41	W-PP-PP-41		Watermain pipe, 150mm	CNOO	PVC 170	m	2006		80	68	\$480	\$87,500		Meets standard									
16	053	8656 Youbou rd	Youbou Rd (East)		208-00	W	PP	PP-42	W-PP-PP-42		Pressure reducing valve c/w chamber, valves, process piping			1	ea	2006		40	28	\$10,000	\$10,000		Meets standard								
17	053	8656 Youbou rd	Reservoir to Youbou rd, 8081 - 8-405		182-10-W3	W	PP	PP-43	W-PP-PP-43		Watermain pipe, 150mm	CS	124	m	2004		80	66	\$450	\$148,500		Meets standard									
17	053	8656 Youbou rd	Reservoir to WTP, 2-173 - 8-405		182-10-W3	W	PP	PP-44	W-PP-PP-44		Watermain pipe, 200mm	CNOO	PVC 212	m	2004		80	66	\$500	\$116,000		Meets standard									
17	053	8656 Youbou rd	Reservoir to WTP		182-10-W3	W	PP	VAL-45	W-PP-VAL-45		Air valve assembly			2	ea	2004		40	25	\$10,000	\$20,000		Meets standard								
18	053	8656 Youbou rd	ADRIANA LANE		GRS	W	PP	PP-46	W-PP-PP-46		Watermain pipe, 150mm			46	m	2005		80	67	\$450	\$20,580		Meets standard								
19	053	8656 Youbou rd	ALEXANDER CRESCENT		GRS	W	PP	PP-47	W-PP-PP-47		Watermain pipe, 150mm			300	m	2005		80	67	\$450	\$137,400		Meets standard								
20	053	8656 Youbou rd	ARBUCLUS ROAD		GRS	W	PP	PP-48	W-PP-PP-48		Watermain pipe, 15																				

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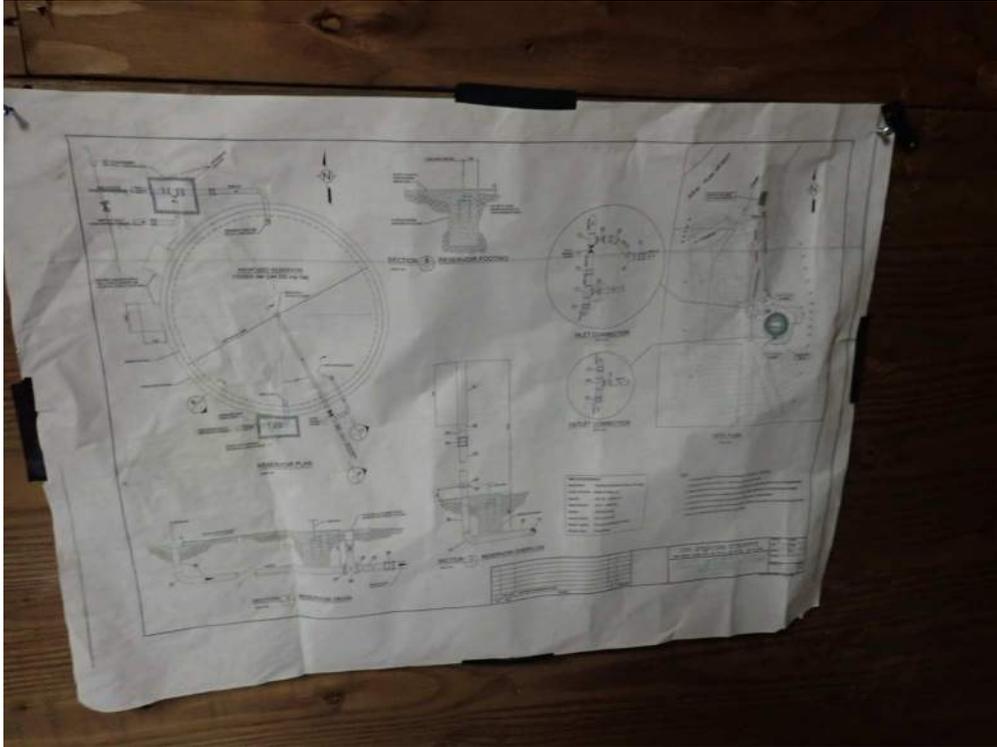


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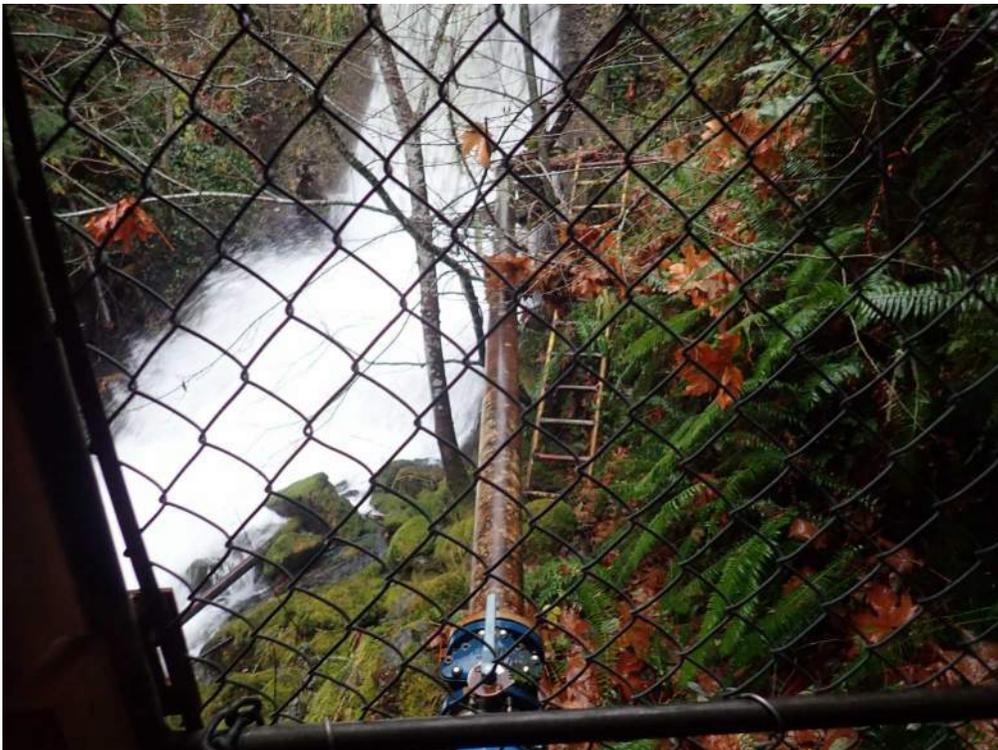


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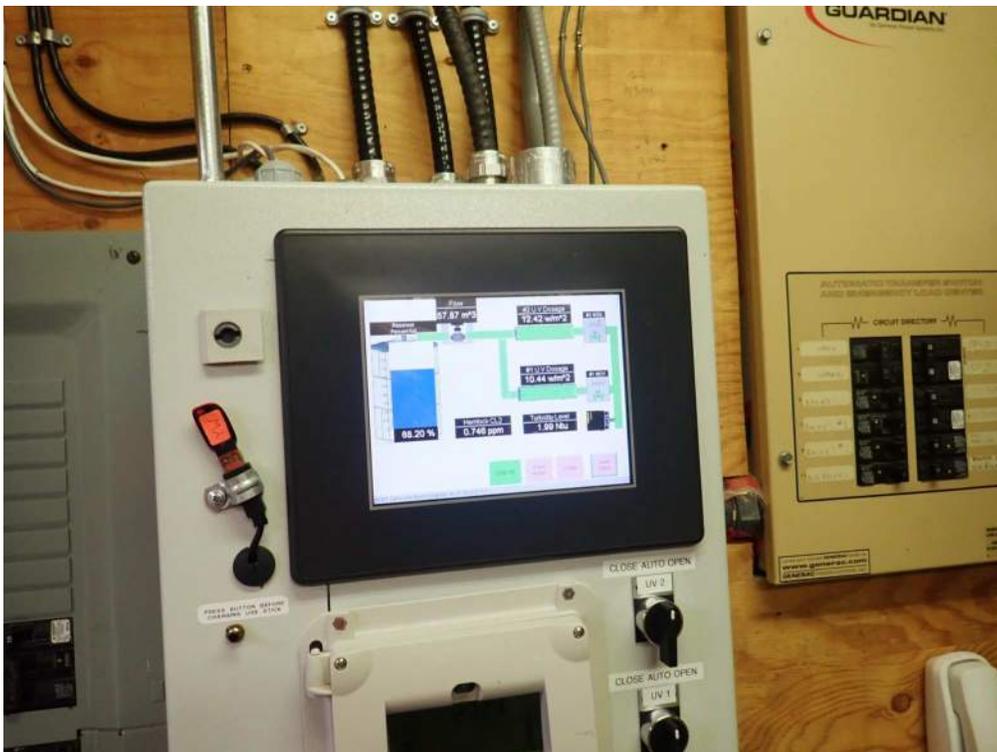


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Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Youbou - Water Treatment Building (1) - Functional Code 653

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical U/L Repair or Action Interval	E.G. Time Remaining to EOJ or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Youbou - Water Treatment Building (1)	Water Treatment Building	653	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	4	4	2007	21-Nov-17	MH	11	50	39	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	220	\$20	SF	\$4,400	0%	5%	5%	\$5,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2007	21-Nov-17	MH	11	50	39	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	220	\$10	SF	\$2,200	0%	5%	5%	\$3,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2007	21-Nov-17	MH	11	10	1	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2007	21-Nov-17	MH	11	50	39	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Youbou - Water Treatment Building (1)	Water Treatment Building	653	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2007	21-Nov-17	MH	11	50	39	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	220	\$40	SF	\$8,800	0%	5%	5%	\$10,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2007	21-Nov-17	MH	11	12	4	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	430	\$8	SF	\$3,440	0%	15%	5%	\$5,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2007	21-Nov-17	MH	11	50	39	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	430	\$35	SF	\$15,050	0%	5%	5%	\$17,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	4	4	2007	21-Nov-17	MH	11	50	39	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	50	\$20	SF	\$1,000	0%	10%	5%	\$2,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	4	4	2007	21-Nov-17	MH	11	30	19	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	EA	\$1,000	0%	5%	5%	\$2,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2007	21-Nov-17	MH	11	30	19	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	250	\$30	SF	\$7,500	0%	5%	5%	\$9,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	4	4	2007	21-Nov-17	MH	11	25	14	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	10%	5%	\$1,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	4	4	2007	21-Nov-17	MH	11	20	9	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2007	21-Nov-17	MH	11	20	9	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Youbou - Water Treatment Building (1) - Functional Code 653



Photo 1



Photo 2

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Youbou - Water Treatment Building (2) - Functional Code 653**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Expectancy or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars
Youbou - Water Treatment Building (2)	Water Treatment Building	653	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	4	4	1994	21-Nov-17	MH	24	50	26	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	110	\$20	SF	\$2,200	0%	5%	5%	\$3,000
Youbou - Water Treatment Building (2)	Water Treatment Building	653	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	1994	21-Nov-17	MH	24	50	26	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	110	\$10	SF	\$1,100	0%	5%	5%	\$2,000
Youbou - Water Treatment Building (2)	Water Treatment Building	653	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1994	21-Nov-17	MH	24	50	26	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	110	\$40	SF	\$4,400	0%	5%	5%	\$5,000
Youbou - Water Treatment Building (2)	Water Treatment Building	653	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Metal Siding	1	Painted metal siding present on the exterior walls.	4	4	1994	21-Nov-17	MH	24	20	2	The metal siding is expected to last the life of the building. A contingency has been included for the replacement of sealant joints and gaskets as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	15%	5%	\$1,000
Youbou - Water Treatment Building (2)	Water Treatment Building	653	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	4	4	1994	21-Nov-17	MH	24	50	26	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	50	\$20	SF	\$1,000	0%	10%	5%	\$2,000
Youbou - Water Treatment Building (2)	Water Treatment Building	653	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	4	4	1994	21-Nov-17	MH	24	30	6	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	EA	\$1,000	0%	5%	5%	\$2,000
Youbou - Water Treatment Building (2)	Water Treatment Building	653	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors. The roofs are edge drained.	4	4	1994	21-Nov-17	MH	24	30	6	Replace the metal roof at the end of its service life. Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	120	\$30	SF	\$3,600	0%	5%	5%	\$4,000
Youbou - Water Treatment Building (2)	Water Treatment Building	653	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	Exterior Lighting Equipment	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	1994	21-Nov-17	MH	24	20	6	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Youbou - Water Treatment Building (2) - Functional Code 653



Photo 1

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Youbou - Water Treatment Building (3) - Functional Code 653

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		Photo	Description & History	CONDITION ASSESSMENT				LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type			Condition	Performance	Yr. Next or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Youbou - Water Treatment Building (3)	Water Treatment Building	653	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.  The age of the building was not confirmed and has been assumed.	4	4	2007	21-Nov-17	MH	11	50	39	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$20	SF	\$1,000	0%	5%	5%	\$2,000
Youbou - Water Treatment Building (3)	Water Treatment Building	653	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2007	21-Nov-17	MH	11	50	39	The concrete slab-on-grade is expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$10	SF	\$500	0%	5%	5%	\$1,000
Youbou - Water Treatment Building (3)	Water Treatment Building	653	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2007	21-Nov-17	MH	11	50	39	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$40	SF	\$2,000	0%	5%	5%	\$3,000
Youbou - Water Treatment Building (3)	Water Treatment Building	653	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Metal Siding	1	Painted metal siding present on the exterior walls.	4	4	2007	21-Nov-17	MH	11	20	9	The metal siding is expected to last the life of the building. A contingency has been included for the replacement of sealant joints and gaskets as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	15%	5%	\$1,000
Youbou - Water Treatment Building (1)	Water Treatment Building	653	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Wood soffit is present at the roof overhangs.	4	4	2007	21-Nov-17	MH	11	15	4	Repaint wood soffit.	Replacement	3 - Future Renewal	Yes	Yes	No	No	20	\$20	SF	\$400	0%	10%	5%	\$1,000
Youbou - Water Treatment Building (3)	Water Treatment Building	653	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	One painted metal door is present on the building.	4	4	2007	21-Nov-17	MH	11	30	19	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	EA	\$1,000	0%	5%	5%	\$2,000
Youbou - Water Treatment Building (3)	Water Treatment Building	653	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roofs are edge drained.	4	4	2007	21-Nov-17	MH	11	30	19	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	50	\$30	SF	\$1,500	0%	5%	5%	\$2,000
Youbou - Water Treatment Building (3)	Water Treatment Building	653	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2007	21-Nov-17	MH	11	20	5	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Youbou - Water Treatment Building (3) - Functional Code 653

BUD Name	BUD Type	Function Code	Level 1 Major Group Element	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA				RECOMMENDATION			OPINION OF PROBABLE COST								10-YEAR CAPITAL PLAN																	
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age to 2018	Typical Life Cycle or Action Interval	E.E. Time Remaining or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total 2017 Dollars	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027				
Youbou - Water Treatment Building (3)	Water Treatment Building	653	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations		1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations. The age of the building was not confirmed and has been assumed.	4	4	2007	21-Nov-17	MH	11	50	39	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$20	SF	\$1,000	0%	5%	5%	\$2,000													
Youbou - Water Treatment Building (3)	Water Treatment Building	653	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade		1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2007	21-Nov-17	MH	11	50	39	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$10	SF	\$500	0%	5%	5%	\$1,000													
Youbou - Water Treatment Building (3)	Water Treatment Building	653	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure		1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2007	21-Nov-17	MH	11	50	39	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	50	\$40	SF	\$2,000	0%	5%	5%	\$3,000													
Youbou - Water Treatment Building (3)	Water Treatment Building	653	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls Enclosure	B201001 Exterior Enclosure	Exterior Walls/ Metal Siding		1	Painted metal siding present on the exterior walls.	4	4	2007	21-Nov-17	MH	11	20	9	The metal siding is expected to last the life of the building. A contingency has been included for the replacement of sealant joints and gaskets as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	15%	5%	\$1,000												\$1,000	
Youbou - Water Treatment Building (3)	Water Treatment Building	653	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls Enclosure	B201001 Exterior Enclosure	Exterior Walls/ Soffit		1	Wood soffit is present at the roof overhangs.	4	4	2007	21-Nov-17	MH	11	15	4	Repaint wood soffit.	Replacement	3 - Future Renewal	Yes	Yes	No	No	20	\$20	SF	\$400	0%	10%	5%	\$1,000												\$1,000	
Youbou - Water Treatment Building (3)	Water Treatment Building	653	B Shell	B20 Exterior Enclosure	B2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door		1	One painted metal door is present on the building.	4	4	2007	21-Nov-17	MH	11	30	19	Replace door at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	EA	\$1,000	0%	5%	5%	\$2,000													
Youbou - Water Treatment Building (3)	Water Treatment Building	653	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly		1	The roof is standing seam metal roof. A snow guard is present over the doors. The roofs are edge drained.	4	4	2007	21-Nov-17	MH	11	30	19	Replace the metal roof at the end of its service life. Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	50	\$30	SF	\$1,500	0%	5%	5%	\$2,000												\$4,000	
Youbou - Water Treatment Building (3)	Water Treatment Building	653	C Interiors	C50 Electrical	C5020 Lighting and Branch Wiring	C502002 Lighting Equipment	Exterior Lighting Equipment		1	An exterior light is present on the building near the entrance.	4	4	2007	21-Nov-17	MH	11	20	5	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000												\$1,000	

Cowichan Valley Regional District

Youbou - Water Treatment Building (3) - Functional Code 653



Photo 1



## 660 - Honeymoon Bay Water

Infrastructure Condition Assessment and Capital Plan

9934 Gordon River Road, Honeymoon Bay, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 7, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 660 - Honeymoon Bay Water

Infrastructure Condition Assessment and Capital Plan

9934 Gordon River Road, Honeymoon Bay, BC

Date Prepared

July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$0

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	W-WTP-WLL-11 and W-WTP-PMP-12	Operations	Inspect/assess the condition of the well and well pump. Consider drilling a new well to meet peak demands.	\$10,000	\$10,000
	8						
	9						
Medium Term (5 - 10 Year)	10	1	ALL	Operations	Inspect/assess the condition of the WTP, chlorine system, and communications.	\$10,000	\$20,000
	11	3	W-RES-TNK-13	Operations	Inspect/assess condition of reservoir for deterioration to determine replacement timing/phasing. Consider building a new storage reservoir to meet peak demands.	\$10,000	
	12						
	13						
	14						
						Total	\$30,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CRD)
System:	660 Honeycomb Bay Water
City Address:	RR# Gordon River Rd
Geographic Location:	South end of Cowichan Lake
Customers:	Parcels: 229 Users: 487

Infrastructure Condition Assessment

Current Year:	2018	Total Replacement Value:	\$5,833,818
		Value per user:	\$10,672

Asset ID	Location	Function Code	Address	Location	DWSG Ref	Major	Minor	Spec	ID	Asset Code	Photo	Description	Make	Model	Material	Asset Inventory				Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Condition Assessment				Recommendations / Action Items	10 Year Capital Plan		Comments/Quantity to be replaced									
																Quantity	Quantity Unit	Year Installed	Year Renewed					Physical Condition	Level of Service Condition	Demand Condition	Probability of Failure		Severity of Failure	Condition		Type of Work	Budget Estimate	Timing						
1	660	South end of Cowichan Lake	Water treatment plant	1645-01-01	W	WTP	WTP	1	W-WTP-WTP-1	5 to 13		Water treatment plant building				1	ea	2009		40	31	\$4,000	\$4,000	Good	Meets standard							Refer to Honeycomb Bay Water System Building Condition Assessment.								
1	660	South end of Cowichan Lake	Water treatment plant	1645-01-01	W	WTP	FM	2	W-WTP-FM-2	6,7		75mm Flow meter, flanged c/w MAG5000 transmitter	Siemens	MAG5000	W	1	ea	2009		40	31	\$4,000	\$4,000	Good	Meets standard															
1	660	South end of Cowichan Lake	Water treatment plant	1645-01-01	W	WTP	FP	3	W-WTP-FP-3	16 to 8		Process piping (approx. 6m) c/w 13mm air release valve, ball valves, pressure gauges, 75mm gate valve, control valves				1	ea	2009		40	31	\$50,000	\$50,000	Good	Meets standard															
1	660	South end of Cowichan Lake	Water treatment plant	1645-01-01	W	WTP	CH	4	W-WTP-CH-4	10 to 11		Chlorine system c/w tank, dosing pump				4	ea	2009		20	11	\$13,000	\$52,000	Good	Meets standard									Inspect/assess the condition of the WTP, chlorine system and communications.	Operations	\$10,000	5-10 Year			
1	660	South end of Cowichan Lake	Water treatment plant	Site Visit / Photos	W	WTP	COM	8	W-WTP-COM-8	8,9		Communications (WTP)				1	LS	2009		20	11	\$9,000	\$9,000	Good - remote access	Meets standard									Inspect/assess the condition of the communications	Operations	Included above	5-10 Year			
1	660	South end of Cowichan Lake	Water treatment plant	Site Visit / Photos	W	WTP	GEN	9	W-WTP-GEN-9	14,15		Backup generator	SIMCO	T 20		1	ea	2009		40	31	\$30,000	\$30,000	Good	Meets standard															
1	660	South end of Cowichan Lake	Water treatment plant	Site Visit / Photos	W	WTP	ELC	10	W-WTP-ELC-10	N/A		Power supply line from gate #100m				500	m	2008		60	51	\$350	\$175,000																	
2	660	South end of Cowichan Lake	Water treatment plant	71005	W	WTP	WLL	11	W-WTP-WLL-11	3,4		Well #1				1	ea	2009		40	31	\$10,000	\$10,000	Good	Meets standard										Inspect/assess the condition of the well and well pump consider drilling a new well to meet peak demands.	Operations	\$10,000	2-5 Year		
2	660	South end of Cowichan Lake	Water treatment plant	Site Visit / Photos	W	WTP	PMF	12	W-WTP-PMF-12	3,4		Well #1 pump				1	ea	2009		20	11	\$7,500	\$7,500	Good	Meets standard										Inspect/assess the condition of the well pump.	Operations	Included above	5-10 Year		
3	660	South end of Cowichan Lake	Reservoir	9327020-075198	W	RES	TKN	13	W-RES-TKN-13	2		Steel bolted reservoir, 9 Met diameter (32ft), 654,000 L				454	'000 L	2009		80	71	\$1,000	\$454,000	Good - gated access, sample added to inlet and outlets, level transmitter	Meets standard											Inspect/assess condition of reservoir for deterioration to determine replacement timing/price. Consider building a new storage reservoir to meet peak demands.	Operations	\$10,000	5-10 Year	
4	660	South end of Cowichan Lake	Reservoir to WTP, 0-1000' 0-7300'	71005	W	FP	PP	14	W-FP-PP-14			Watermain pipe, 150mm	C900	PVC	740	m	2008		80	70	\$410	\$333,000																		
4	660	South end of Cowichan Lake	Reservoir to 0-1000'	71005	W	FP	PP	15	W-FP-PP-15			Watermain pipe, 200mm	C900	PVC	530	m	2008		80	70	\$500	\$265,000																		
5	660	South end of Cowichan Lake	South shore rd	176-03	W	FP	PP	16	W-FP-PP-16			Watermain pipe, 200mm	C1150	DR18	PVC	215	m	2014		80	76	\$500	\$107,500																	
5	660	South end of Cowichan Lake	South shore rd, 1-4803 - 1-4803	176-03	W	FP	PP	17	W-FP-PP-17			Watermain pipe, 200mm, insulated and wrapped	FRP/GR	DR11	HDPE	45	m	2014		80	76	\$200	\$9,000																	
5	660	South end of Cowichan Lake	South shore rd, 1-4895 - 2-4205	176-03	W	FP	PP	18	W-FP-PP-18			Watermain pipe, 50mm	HDPE	330	m	1990		80	52	\$310	\$115,500																			
5	660	South end of Cowichan Lake	South shore rd, 1-4950 - 2-4050	176-03	W	FP	PP	19	W-FP-PP-19			Watermain pipe, 50mm	SCH80	80	m	1990		60	32	\$310	\$31,000																			
5	660	South end of Cowichan Lake	South shore rd, 1-4955 - 1-4650	176-03	W	FP	PP	20	W-FP-PP-20			Watermain pipe, 38mm				45	m	1990		60	32	\$200	\$9,000																	
5	660	South end of Cowichan Lake	South shore rd, 1-4805	176-03	W	FP	PP	21	W-FP-PP-21			Air release valve chamber c/w manhole frame/cover, ball valve				1	ea	2014		40	36	\$10,000	\$10,000																	
6	660	South end of Cowichan Lake	BEACH DRIVE	GIS	W	FP	PP	22	W-FP-PP-22			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				133	m	1990		60	32	\$450	\$59,850																	
7	660	South end of Cowichan Lake	CHARLES PLACE	GIS	W	FP	PP	23	W-FP-PP-23			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				188	m	1990		60	32	\$450	\$84,540																	
8	660	South end of Cowichan Lake	FOURTH STREET	GIS	W	FP	PP	24	W-FP-PP-24			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				260	m	1990		60	32	\$450	\$116,870																	
9	660	South end of Cowichan Lake	CORDON RIVER ROAD	GIS	W	FP	PP	25	W-FP-PP-25			Watermain pipe, 150mm (includes 113m of unknown diameter) (GIS minus catalogued length from 71005)				1151	m	1990		80	52	\$450	\$517,950																	
9	660	South end of Cowichan Lake	CORDON RIVER ROAD	GIS	W	FP	PP	26	W-FP-PP-26			Watermain pipe, 200mm				187	m	1990		60	52	\$500	\$93,500																	
10	660	South end of Cowichan Lake	MARCH ROAD	GIS	W	FP	PP	27	W-FP-PP-27			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				494	m	1990		60	32	\$450	\$222,140																	
11	660	South end of Cowichan Lake	MYERS ROAD	GIS	W	FP	PP	28	W-FP-PP-28			Watermain pipe, 50mm				84	m	1990		60	32	\$330	\$27,810																	
12	660	South end of Cowichan Lake	PARK AVENUE	GIS	W	FP	PP	29	W-FP-PP-29			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				302	m	1990		60	32	\$450	\$136,100																	
13	660	South end of Cowichan Lake	PARK DRIVE	GIS	W	FP	PP	30	W-FP-PP-30			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				1,070	m	1990		60	32	\$450	\$481,130																	
14	660	South end of Cowichan Lake	PAUL'S ROAD	GIS	W	FP	PP	31	W-FP-PP-31			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				624	m	1990		60	32	\$450	\$276,260																	
15	660	South end of Cowichan Lake	SKIN'S STREET	GIS	W	FP	PP	32	W-FP-PP-32			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				160	m	1990		60	32	\$450	\$71,790																	
16	660	South end of Cowichan Lake	SOUTH SHORE ROAD	GIS	W	FP	PP	33	W-FP-PP-33			Watermain pipe, 38mm (GIS minus catalogued length from 176-03)				479	m	1990		60	32	\$200	\$95,726																	
16	660	South end of Cowichan Lake	SOUTH SHORE ROAD	GIS	W	FP	PP	34	W-FP-PP-34			Watermain pipe, 50mm (GIS minus catalogued length from 176-03)				8	m	1990		60	32	\$330	\$2,640																	
16	660	South end of Cowichan Lake	SOUTH SHORE ROAD	GIS	W	FP	PP	35	W-FP-PP-35			Watermain pipe, unknown diameter (Assume 200mm for replacement costing) (GIS minus catalogued length from 176-03 and 71005)				1,691	m	1990		60	32	\$500	\$845,470																	
17	660	South end of Cowichan Lake	STINQUA ROAD	GIS	W	FP	PP	36	W-FP-PP-36			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				362	m	1990		60	32	\$450	\$163,020																	
18	660	South end of Cowichan Lake	Unnamed line	GIS	W	FP	PP	37	W-FP-PP-37			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				326	m	1990		60	32	\$450	\$146,790																	
19	660	South end of Cowichan Lake	UNION STREET	GIS	W	FP	PP	38	W-FP-PP-38			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				369	m	1990		60	32	\$450	\$166,210																	
20	660	South end of Cowichan Lake	WALTON ROAD	GIS	W	FP	PP	39	W-FP-PP-39			Watermain pipe, unknown diameter (Assume 150mm for replacement costing)				389	m	1990		60	32	\$450	\$174,810																	
21	660	South end of Cowichan Lake	Entire system	GIS	W	WTP	PMF	40	W-WTP-PMF-40			Chlorine pump				8	ea	1990		20	0	\$5,000	\$40,000																	
21	660	South end of Cowichan Lake	Entire system	GIS	W	WTP	PMF	48	W-WTP-PMF-48			Booster pump				1	ea	1990		20	0	\$5,000	\$5,000																	
21	660	South end of Cowichan Lake	Entire system	GIS	W	WTP	FT	49	W-WTP-FT-49			Truck transmission water meter				10	ea	1990		40	12	\$10,000	\$100,000																	
21	660	South end of Cowichan Lake	Entire system	GIS	W	WTP	WLL	69	W-WTP-WLL-69			Groundwater production water wells (GIS minus catalogued number from record drawings)				1	ea	1990																						

## 660 Honeymoon Bay Water-See Infrastructure Condition Assessment table with corresponding photo ID's

**RESERVOIRS  
FIELD INSPECTION**

MORRISON HERSHFIELD

SYSTEM: Honeymoon Bay Water DATE: Nov 21/17  
SYSTEM CODE: 660 PROJECT No.: 5170700  
INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Site Conditions/Security

2) Condition of Structure:  
Visible deterioration of structure and hatch:  
  
Leaking issues:

3) Condition of Operations:  
Operational Issues:

660 (1)

660 (2)  
1 of 8

660 Honeymoon Bay Water-See Infrastructure Condition Assessment table with corresponding photo ID's



660 (3)



660 (4)  
2 of 8

660 Honeymoon Bay Water-See Infrastructure Condition Assessment table with corresponding photo ID's



660 (5)



660 (6)  
3 of 8

660 Honeymoon Bay Water-See Infrastructure Condition Assessment table with corresponding photo ID's



660 (7)



660 (8)  
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660 Honeymoon Bay Water-See Infrastructure Condition Assessment table with corresponding photo ID's



660 (9)



660 (10)  
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660 Honeymoon Bay Water-See Infrastructure Condition Assessment table with corresponding photo ID's



660 (11)



660 (12)

660 Honeymoon Bay Water-See Infrastructure Condition Assessment table with corresponding photo ID's



660 (13)



660 (14)  
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660 Honeymoon Bay Water-See Infrastructure Condition Assessment table with corresponding photo ID's



660 (15)



660 (16)  
8 of 8

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Honeymoon Bay - Water Treatment Building - Functional Code 660

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION				OPINION OF PROBABLE COST											
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr Review or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2007	21-Nov-17	MH	11	50	39	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$30	SF	\$12,000	0%	5%	5%	\$14,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2007	21-Nov-17	MH	11	50	39	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$30	SF	\$12,000	0%	5%	5%	\$14,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2007	21-Nov-17	MH	11	10	2	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2007	21-Nov-17	MH	11	50	39	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2007	21-Nov-17	MH	11	50	39	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	400	\$30	SF	\$12,000	0%	5%	5%	\$14,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2007	21-Nov-17	MH	11	12	3	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	650	\$8	SF	\$5,200	0%	15%	5%	\$7,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2007	21-Nov-17	MH	11	50	39	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	650	\$35	SF	\$22,750	0%	5%	5%	\$26,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	5	5	2007	21-Nov-17	MH	11	50	39	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	160	\$20	SF	\$3,200	0%	10%	5%	\$4,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Perforated metal soffit is present at the roof overhangs.	5	5	2007	21-Nov-17	MH	11	50	39	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	180	\$20	SF	\$3,600	0%	10%	5%	\$5,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two metal doors are present on the building.	5	5	2007	21-Nov-17	MH	11	30	19	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2007	21-Nov-17	MH	11	40	29	Replace the metal roof at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	450	\$30	SF	\$13,500	0%	5%	5%	\$15,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is standing seam metal roof. A snow guard is present over the doors.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2007	21-Nov-17	MH	11	25	14	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	50	\$10	SF	\$500	0%	10%	5%	\$1,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior plywood and gypsum walls and ceilings are painted.	5	5	2007	21-Nov-17	MH	11	20	9	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	0%	5%	\$2,000
Honeymoon Bay Water Treatment Building	Water Treatment Building	660	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502099 Other Lighting and Branch Wiring	Exterior Lighting		An exterior light is present on the building near the entrance.	5	5	2007	21-Nov-17	MH	11	20	9	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Honeymoon Bay - Water Treatment Building - Functional Code 660



Photo 1



Photo 2



## 670 - Cherry Point Water

### Infrastructure Condition Assessment and Capital Plan

4361 Brentview Drive, Cowichan Bay, BC

Date Prepared

July 18, 2018

#### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 7, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management seperately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create seperate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 670 - Cherry Point Water

Infrastructure Condition Assessment and Capital Plan  
4361 Brentview Drive, Cowichan Bay, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	ALL	Capital Upgrade/New	Inspect/assess the condition of the WTP, chlorination system, process piping and electrical controls. Remove the greensand filters from the building. Replace and reconfigure the process piping.	\$75,000	\$75,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						<b>Total</b>	<b>\$75,000</b>

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	W-WTP-WLL-7 and W-WTP-PMP-8	Operations	Inspect/assess the condition of the well and well pump.	\$10,000	\$20,000
	8	3	W-RES-TNK-9	Operations	Inspect/assess the condition of the reservoir.	\$10,000	
	9						
Medium Term (5 - 10 Year)	10	4 to 12	ALL	Operations	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$25,000	\$25,000
	11						
	12						
	13						
	14						
						<b>Total</b>	<b>\$45,000</b>

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.



670 Cherry Point Water-See Infrastructure Condition Assessment table with corresponding photo ID's

**WTP TREATMENT PLANT  
FIELD INSPECTION**

**MH MORRISON HERSHFIELD**

SYSTEM: Cherry Point Water DATE: Nov. 23/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 670 PROJECT No.: 5170700

INSPECTED BY: \_\_\_\_\_ CVRD STAFF PRESENT: \_\_\_\_\_

1) Type of Treatment System (Schematic)

2) Site Conditions/Security

670 (1)



670 (2)  
1 of 10

670 Cherry Point Water-See Infrastructure Condition Assessment table with corresponding photo ID's



670 (3)



670 (4)  
2 of 10

670 Cherry Point Water-See Infrastructure Condition Assessment table with corresponding photo ID's



670 (5)



670 (6)  
3 of 10

670 Cherry Point Water-See Infrastructure Condition Assessment table with corresponding photo ID's



670 (7)



670 (8)  
4 of 10

670 Cherry Point Water-See Infrastructure Condition Assessment table with corresponding photo ID's



670 (9)



670 (10)  
5 of 10

670 Cherry Point Water-See Infrastructure Condition Assessment table with corresponding photo ID's



670 (11)



670 (12)  
6 of 10

670 Cherry Point Water-See Infrastructure Condition Assessment table with corresponding photo ID's



670 (13)



670 (14)  
7 of 10

670 Cherry Point Water-See Infrastructure Condition Assessment table with corresponding photo ID's



670 (15)



670 (16)  
8 of 10

670 Cherry Point Water-See Infrastructure Condition Assessment table with corresponding photo ID's



670 (17)



670 (18)  
9 of 10

670 Cherry Point Water-See Infrastructure Condition Assessment table with corresponding photo ID's



670 (19)



670 (20)  
10 of 10

Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Cherry Point - Water Treatment Building - Functional Code 670

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	OPINION OF PROBABLE COST								
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to Complete or Action	Recommendation	Type					Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars
Cherry Point - Water Treatment Building	Water Treatment Building	670	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	1994	21-Nov-17	MH	24	50	26	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	280	\$20	SF	\$5,600	0%	5%	5%	\$7,000
Cherry Point - Water Treatment Building	Water Treatment Building	670	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	1994	21-Nov-17	MH	24	50	26	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	280	\$10	SF	\$2,800	0%	5%	5%	\$4,000
Cherry Point - Water Treatment Building	Water Treatment Building	670	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of split faced masonry blocks. No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	1994	21-Nov-17	MH	24	30	26	Masonry structural components are expected to last the life of the building. A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Cherry Point - Water Treatment Building	Water Treatment Building	670	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Soffits	1	Perforated metal soffit is present at the roof overhangs.	5	5	1994	21-Nov-17	MH	24	50	26	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	50	\$20	SF	\$1,000	0%	10%	5%	\$2,000
Cherry Point - Water Treatment Building	Water Treatment Building	670	B Shell	B20 Enclosure	E2030 Exterior Doors	E203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	5	5	1994	21-Nov-17	MH	24	30	6	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Cherry Point - Water Treatment Building	Water Treatment Building	670	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1	The roof is sloped metal roof assembly. The is sloped to edge drained.	5	5	1994	21-Nov-17	MH	24	40	16	Replace metal roofing and metal fascia at the end of its service life. Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	300	\$40	SF	\$12,000	0%	5%	5%	\$14,000
Cherry Point - Water Treatment Building	Water Treatment Building	670	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	Sections of the building have been finished with plywood and gypsum wall board.	5	5	1994	21-Nov-17	MH	24	20	10	Repaint interiors as required. Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	0%	5%	\$2,000
Cherry Point - Water Treatment Building	Water Treatment Building	670	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting		An exterior light is present on the building near the entrance.	5	5	1994	21-Nov-17	MH	24	20	10	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Cherry Point-Water Treatment Building - Functional Code 670



Photo 1

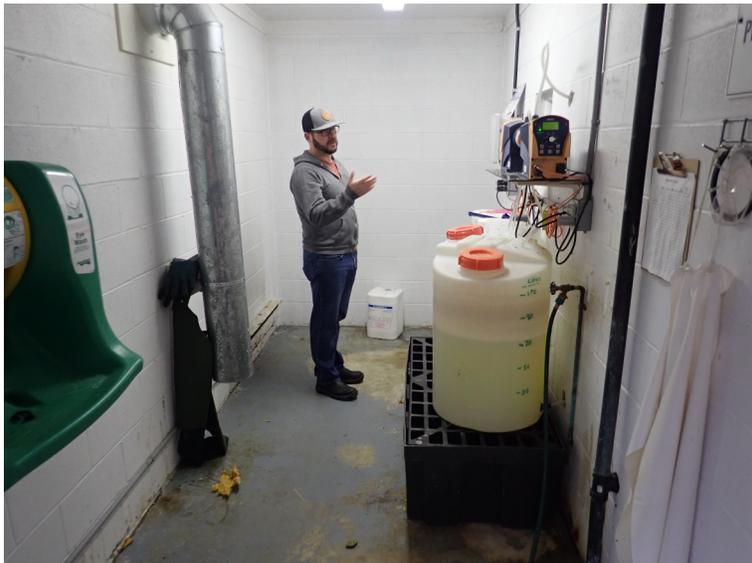


Photo 2

## 680 - Shawnigan Lake Water System

### Infrastructure Condition Assessment and Capital Plan

2660 Decca Road, Shawnigan Lake, BC

Date Prepared

July 18, 2018

#### PROPERTY STATISTICS AND REPORT SUMMARY

System Replacement Cost Estimate	\$9,469,434	
Number of Users	680	
Replacement Cost Per User	\$13,926	
Annual Replacement Cost (40 Years)	\$100,221	per year
Annual Replacement Cost (80 Years)	\$116,907	per year
10 Year Capital Plan Total	\$238,000	
10 Year Operations and Maintenance Plan Total	\$185,000	

#### PROPERTY DESCRIPTION

The Shawnigan Lake Water System started construction in 1972 and includes the phases outlined in the table below.

Development	Year Installed	Source
WTP at Lake	1972	CVRD Input
Concrete Reservoir and Supply Line	1972	CVRD Input
Phase 1	1972	CVRD Input
Phase 2	1989	CVRD Input
Wildflower	1994	Record Drawings (10808)
Meadowview	1991	CVRD Input
Lake WTP Upgrades	1997	Record Drawings (D9884)
Watermain Upgrade to Reservoir	2006	Record Drawings (1501-01-16/17)
Steel Bolted Reservoir	2007	CVRD Input
Ingot Rd Development	2008	CVRD Input
Well K1 - currently has failed pump	2012	Record Drawings (431C-01)
Well K2 - not in service	2012	Record Drawings (431C-01)
Ingot Rd WTP	2013	Record Drawings (431C-02)
Katy's Crescent Development	2013	Record Drawings (25240-2)
Ingot Rd Development, Baron Rd Upgrade	2016	Record Drawings (13-224-01)
Worthington Rd Watermain Replacement	2017	CVRD Input
Well School	???	???

#### PROJECT TEAM

Austin Tokarek, Asset Coordinator  
 Todd Etherington, Utility Operations Superintendent  
 David Parker, Engineering Technologist III  
 Rob Grant, GIS Supervisor  
 Andrea Kross, GIS Technician I  
 Adam Greenwood, Project Engineer  
 Kieran Bertsch, E.I.T.  
 Caleb Light, GIS

#### CONTACT INFORMATION

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## 680 - Shawnigan Lake Water System

### Infrastructure Condition Assessment and Capital Plan

2660 Decca Road, Shawnigan Lake, BC

Date Prepared

July 18, 2018

#### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 2, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
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**680 - Shawnigan Lake Water**  
**Infrastructure Condition Assessment and Capital Plan**  
 2660 Decca Road, Shawnigan Lake, BC

Date Prepared July 18, 2018

**10 Year Capital Plan and Operations and Maintenance Plan**

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1	6	W-PP-WL-21	Capital Upgrade/New	Replace well pump (Well K1).	\$8,000	\$8,000
	2						
	3						
Important (1 - 2 Year)	4	7	W-PP-WL-23	Capital Upgrade/New	Develop new well to meet demands and only use the school well as an emergency backup well.	\$40,000	\$40,000
	5						
	6						
Short Term (2 - 5 Year)	7	1	W-WTP-INT-2	Capital Renewal	Decommission/abandon intake structure and piping.	\$20,000	\$40,000
	8	3	W-RES-RES-18	Capital Renewal	Inspect reservoir and clean and patch leaks as required.	\$20,000	
	9						
	10						
	11						
Medium Term (5 - 10 Year)	12	1	W-WTP-PMP-5	Capital Renewal	Replace 50 hp pumps if surface water system is kept online.	\$80,000	\$150,000
	13	1	W-WTP-PMP-7	Capital Renewal	Replace lake intake pumps if surface water system is kept online.	\$10,000	
	14	1	W-WTP-PP-10	Capital Renewal	Replace piping and fittings if surface water system is kept online.	\$40,000	
	15	5	W-RES-RD-20	Capital Renewal	Complete maintenance on access road to reservoirs.	\$20,000	
	16						
	17						
						Total	\$238,000

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	W-WTP-COM-9	Operations	Review electrical/controls for necessary improvements.	\$10,000	\$160,000
	8	12 to 52	ALL	Operations	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$150,000	
	9						
	10						
Medium Term (5 - 10 Year)	11	2	W-WTP-PMP-12	Operations	Review treatment requirements when new well is developed to identify any system upgrades if surface water system is taken offline (ex. high calcium)	\$5,000	\$25,000
	12	2	W-WTP-COM-17	Operations	Review pump station electrical/controls for necessary improvements.	\$5,000	
	13	4	W-RES-TNK-19	Maintenance	Monitor condition of reservoir and determine future storage rehabilitation/expansion requirements.	\$10,000	
	14	6	W-PP-WL-22	Maintenance	Decommission Well if no longer required.	\$5,000	
	15						
	16						
						Total	\$185,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

City/County	Clark County
Division	Water
Function Code	080
City Address	2660 Deca rd
City	Shawnee KS, MO
State	MO
Zip	64155
Geographic Location	North End of Shawnee Lake
Parcel	730
Owner	680

Infrastructure Condition Assessment

Total Replacement Value	\$9,453,334
Value per asset	\$13,370

Asset ID	Function Code	Location	Address	Location	DBA Ref	Major	Minor	Asset Code	Asset Code	Photo	Description	Make	Model	Material	Quantity	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Est. Remaining Service Value	Est. Remaining Service Value of Asset	Physical Condition	Level of Service Condition	Condition Assessment	Probability of Failure	Severity of Failure	Condition	Recommendations / Action Items	Type of Work	10 Year Capital Plan	Timing	Comments/Questions to be resolved	
1	680	2660 Deca rd.		Deca Road Water Treatment Plant	088A	W	WTP	1	W-WTP-WTP-1	1 to 41, MOY 1	Water Treatment Plant, Deca rd (surface water from Shawnee LA.)				1	1978		40	0		\$0		Refer to Shawnee Lake Water System Building Condition Assessment.										
1	680	2660 Deca rd.		Deca Road Water Treatment Plant	088A	W	WTP	INT	2	W-WTP-INT-2	5 to 7, 10 to 11, 20	Intake pipes and wet wells (800)			2	1978		40	0	\$40,000	\$80,000	Condition Unknown - improvement may be required	High	High	High	3	3	3	Decommission/abandon intake structure and piping	Capital Renewal	\$20,000	2-5 Year	Cost of decommission/abandon intake structures and piping?
1	680	2660 Deca rd.		Deca Road Water Treatment Plant	088A	W	WTP	CH	4	W-WTP-CH-4	30 to 38	Chlorination System incl. chlorine contact chamber			1	1997		40	39	\$13,000	\$13,000	Fair	Meets standard	Meets standard	2	1	1	Replace 50 hp pumps if surface water system is kept online.	Capital Renewal	\$60,000	5-10 Year	Cost for new 50 hp pumps? Does CVRD want to include this line item if the WTP is going to be decommissioned?	
1	680	2660 Deca rd.		Deca Road Water Treatment Plant	088A	W	WTP	PAF	5	W-WTP-PAF-5	11, 18, 21, 26, 37	Vertical turbine pump, 4 stage bowl and impeller assembly and 50hp 230 v 3 phase 60 cycles, 3460 rpm 1P VHS electric motor with belt	Ferrous	728	1	ea	1997		20	0	\$100,000	\$100,000	Fair	Meets standard	Meets standard	2	1	4	Replace 50 hp pumps if surface water system is kept online.	Capital Renewal	\$60,000	5-10 Year	Cost for new 50 hp pumps? Does CVRD want to include this line item if the WTP is going to be decommissioned?
1	680	2660 Deca rd.		Deca Road Water Treatment Plant	088A	W	WTP	PAF	7	W-WTP-PAF-7	5 to 7, 10 to 11, 20	Pump Flange Model CF3102 MF CW 432 Impeller 220V, 60Hz, 3 Phase 3 HP (Lake intake pump)			2	ea	1997		20	0	\$5,000	\$10,000	Fair	Meets standard	Meets standard	3	1	4	Replace lake intake pumps if surface water system is kept online.	Capital Renewal	\$10,000	5-10 Year	Cost of new 5 hp pumps (2)? Does CVRD want to include this line item if the WTP is going to be decommissioned?
1	680	2660 Deca rd.		Deca Road Water Treatment Plant	Site Visit / Photos	W	WTP	COM	9	W-WTP-COM-9	19 to 21, 29	Communications (Deca rd WTP)			1	1978		20	0	\$8,000	\$8,000	Fair	Does not meet standard	Does not meet standard	3	2	3	Review electrical/controls for necessary upgrades.	Operations	\$10,000	2-5 Year	This will not be required if WTP is decommissioned. Scope of improvement? Radio communication?	
1	680	2660 Deca rd.		Deca Road Water Treatment Plant	088A	W	WTP	IP	10	W-WTP-IP-10	16, 20, 26	Process piping w/ pipe, valves			1	1978		40	0	\$50,000	\$50,000	Fair	Meets standard	Meets standard	3	1	4	Replace piping and fittings if surface water system is kept online.	Capital Renewal	\$40,000	5-10 Year	Cost for process piping? Does CVRD want to include this line item if the WTP is going to be decommissioned?	
2	680	2660 Deca rd.		Light Road Water Treatment Plant	431C-62	W	WTP	WTP	11	W-WTP-WTP-11	67 to 79	WTP / Pump station building incl rd			1	ea	2013		40	35			Refer to Shawnee Lake Water System Building Condition Assessment.										
2	680	2660 Deca rd.		Light Road Water Treatment Plant	431C-62	W	WTP	PAF	12	W-WTP-PAF-12	69 to 71, 74	Pump, 50hp 575 w/ vertical multi stage 3 phase booster pump	Grunbeck	CRN5.4	1	ea	2013		20	15	\$10,000	\$10,000	Good	Meets standard	Meets standard	2	2	4	Review treatment requirements when new well is developed to identify any system upgrades to new water system to ensure sufficient high calcium	Operations	\$5,000	5-10 Year	
2	680	2660 Deca rd.		Light Road Water Treatment Plant	431C-62	W	WTP	IP	13	W-WTP-IP-13	69 to 71, 74	Process piping w/ pipe, valves, fits			1	ea	2013		40	35	\$50,000	\$50,000	Good	Meets standard	Meets standard	2	1	3	Review treatment requirements when new well is developed to identify any system upgrades to new water system to ensure sufficient high calcium	Operations	\$5,000	5-10 Year	
2	680	2660 Deca rd.		Light Road Water Treatment Plant	431C-62	W	WTP	IP	14	W-WTP-IP-14	69 to 71, 74	Flow meter, 200m Digital flow meter w/ clean bypass	Siemens		1	ea	2013		40	35	\$5,000	\$5,000	Good	Meets standard	Meets standard	2	1	3	Review treatment requirements when new well is developed to identify any system upgrades to new water system to ensure sufficient high calcium	Operations	\$5,000	5-10 Year	
2	680	2660 Deca rd.		Light Road Water Treatment Plant	431C-62	W	WTP	IP	15	W-WTP-IP-15	77, 78	Chlorine solution tank, dosing pumps and chlorine analyzers			2	ea	2013		40	35	\$13,000	\$26,000	Good	Meets standard	Meets standard	2	1	3	Review treatment requirements when new well is developed to identify any system upgrades to new water system to ensure sufficient high calcium	Operations	\$10,000	5-10 Year	
2	680	2660 Deca rd.		Light Road Water Treatment Plant	Site Visit / Photos	W	WTP	COM	17	W-WTP-COM-17	72, 73, 75, 76	Communications (Light WTP)			1	ea	2013		20	15	\$9,000	\$9,000	Good	Meets standard	Improvement to current required (possibly switch to radio communication)	2	2	4	Review pump station electrical/controls for necessary improvements.	Operations	\$5,000	5-10 Year	
3	680	2660 Deca rd.		off Orange Rd	Site Visit / Photos	W	RES	RES	18	W-RES-RES-18	48 to 55, 57 to 66	750,000 Concrete Reservoir w/ process piping, gate valve			750	1000 L	1972		80	34	\$1,000	\$750,000	Fair	Meets standard	Meets storage needs	2	3	3	Inspect reservoir and clean and patch leaks as required.	Capital Renewal	\$20,000	2-5 Year	Confirm there are no capacity issues?
4	680	2660 Deca rd.		off Orange Rd	Site Visit / Photos	W	RES	Thk	19	W-RES-Thk-19	54 to 58	450,000 Steel Reservoir w/ process piping, gate valve			450	1000 L	1997		40	39	\$1,000	\$450,000	Good	Meets standard	Meets storage needs	2	2	4	Monitor condition of reservoir and determine future storage substitution/expansion requirements.	Maintenance	\$10,000	5-10 Year	
5	680	2660 Deca rd.		Reservoir	Site Visit / Photos	W	RES	RD	20	W-RES-RD-20	47	Access road to reservoirs (2-bay, CVRD does not own the access road)			1	ea			0	0	N/A	N/A	Fair	Meets standard	Access to reservoirs, road not maintained by CVRD	2	2	4	Complete maintenance on access road to reservoirs.	Capital Renewal	\$20,000	5-10 Year	
6	680	2660 Deca rd.		near trap rd	431C-62	W	IP	WHL	21	W-IP-WHL-21		Ground Water Well #1 (2420) (backed) w/ control valve, 2 gate valves, process piping			1	ea	2012		40	34	\$20,000	\$20,000	Good	Well pump not working	Capacity is 100 m <sup>3</sup> by winter - half of water demand for system	2	2	4	Replace well pump (WHL)	Capital Upgrade/Repair	\$8,000	1-1 Year	What is the size of the replacement well pump?
6	680	2660 Deca rd.		near trap rd	431C-62	W	IP	WHL	22	W-IP-WHL-22		Ground Water Well #2 (2420) (backed) w/ control valve			1	ea	2012		40	34	\$20,000	\$20,000	N/A	Meets standard	Meets storage needs	2	2	4	Capacity is 100 m <sup>3</sup> by winter - half of water demand for system	Maintenance	\$8,000	5-10 Year	
7	680	2660 Deca rd.		School	Site Visit	W	IP	WHL	23	W-IP-WHL-23		School well - owned and operated by school.			1	ea	N/A	N/A	N/A	N/A	N/A	N/A	Meets standard	Meets standard	4	3	2	Overhaul new well to meet demands and only use the school well as an emergency backup well.	Capital Upgrade/Repair	\$40,000	1-2 Year	Cost for new well, pump and appenwh? Has a location and/or piping configuration been identified?	
8	680	2660 Deca rd.		Baron rd. G-182 - G-300	1501-01-06	W	IP	IP	24	W-IP-IP-24		Watermain pipe, 150mm	PVC	100	m	2006		80	68	\$500	\$46,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
8	680	2660 Deca rd.		Baron rd. G-182 - G-300	1501-01-06	W	IP	IP	25	W-IP-IP-25		Watermain pipe, 150mm	PVC	100	m	2006		80	68	\$400	\$46,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
8	680	2660 Deca rd.		Baron rd. G-182 - G-300	1501-01-06	W	IP	IP	26	W-IP-IP-26		Watermain pipe, 150mm	PVC	100	m	2006		80	68	\$500	\$6,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
8	680	2660 Deca rd.		Baron rd. G-182 - G-300	1522A-01	W	IP	IP	27	W-IP-IP-27		Watermain pipe, 150mm	PVC	100	m	2006		80	78	\$400	\$70,164	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
8	680	2660 Deca rd.		Baron rd. G-182 - G-300	1522A-01	W	IP	IP	28	W-IP-IP-28		Watermain pipe, 150mm	PVC	100	m	2010		80	78	\$5,000	\$18,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
9	680	2660 Deca rd.		Watermain rd	1508B	W	IP	IP	29	W-IP-IP-29		Watermain pipe, 150mm	PVC	875	m	1994		80	59	\$400	\$35,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
9	680	2660 Deca rd.		Watermain rd	1508B	W	IP	IP	30	W-IP-IP-30		Watermain pipe, 150mm	PVC	875	m	1994		80	59	\$400	\$35,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
9	680	2660 Deca rd.		Watermain rd	1508B	W	IP	IP	31	W-IP-IP-31		Watermain pipe, 150mm	PVC	875	m	1994		80	59	\$400	\$35,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
10	680	2660 Deca rd.		Orange rd. Pipe to reservoir 11-0301-11-150	1501-01-17	W	IP	IP	32	W-IP-IP-32		Watermain pipe, 200mm	PVC	340	m	2006		80	68	\$500	\$170,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
10	680	2660 Deca rd.		Orange rd. Pipe to reservoir 11-0302-11-150	1501-01-17	W	IP	IP	33	W-IP-IP-33		Watermain pipe, 200mm	PVC	340	m	2006		80	68	\$400	\$138,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
10	680	2660 Deca rd.		Orange rd. Pipe to reservoir 11-0303-11-150	1501-01-17	W	IP	IP	34	W-IP-IP-34		Air release valves			4	ea	2006		40	28	\$4,000	\$18,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year	
11	680	2660 Deca rd.		Kelly's cessant, 1-002 - 1-122 (Phase 1 area)	20340-2	W	IP	IP	35	W-IP-IP-35		Watermain pipe, 150mm	PVC	118	m	2013		80	75	\$450	\$53,550	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
11	680	2660 Deca rd.		Kelly's cessant Phase 2 area	20340-2	W	IP	IP	36	W-IP-IP-36		Watermain pipe, 150mm	PVC	118	m	2013		80	75	\$8,000	\$48,000	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
11	680	2660 Deca rd.		Kelly's cessant, 1-127 - 1-138 1-2001 - 2-133 (Phase 1 area)	20340-2	W	IP	IP	37	W-IP-IP-37		Watermain pipe, 150mm	PVC	137	m	2013		80	75	\$400	\$54,800	Good	Meets standard	Meets standard	1	2	1	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$10,000	2-5 Year		
12	680	2660 Deca rd.		ARMBRIGHT LANE	080	W	IP	IP	38	W-IP-IP-38		Watermain pipe, 150mm	PVC	104	m			80	34	\$450	\$78,430	Good	Meets standard	Meets standard	1	2	3	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring. This may include pressure testing, visual inspections (inspecting), and/or reviewing historical maintenance and repair frequencies.	Operations	\$100,000	2-5 Year	CVRD provided the installation years for all GIS items.	
13	680	2660 Deca rd.		BARON ROAD	080	W	IP	IP	39	W-IP-IP-39		Watermain pipe, 150mm (GIS minus cataloged length from 1501-01-150)	PVC	308	m			80	70	\$400	\$128,877	Good	Meets standard	Meets standard	1	2	3	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine equipment stringing/shoring					



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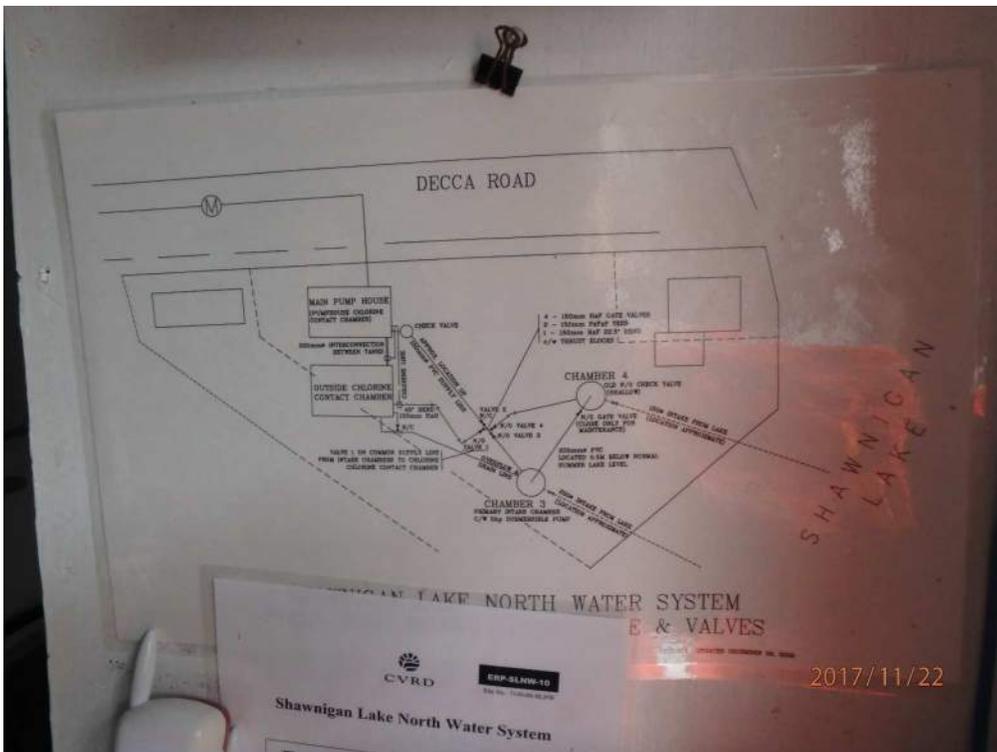


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Cowichan Valley Regional District  
 Facility Condition Assessment and Capital Plan  
 Shawmigan Lake - Water Treatment Building - Functional Code 680

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT		CONDITION ASSESSMENT						LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	OPINION OF PROBABLE COST								
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Useful Life or Action Interval	Est. Yr. Remaining to EOL or Major Action	Recommendation	Type					Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Consult.	Contingency	5% Tax	Total in 2017 Dollars
Shawmigan Lake - Water Treatment Building	Pump Station	601	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations. Deterioration of the foundations were reported.  The age of the building was not confirmed on site and has been assumed.	3	3	1990	21-Nov-17	MH	28	50	2	A contingency has been included to allow for foundation repairs (to address the issues reported on site). A further study is recommended to confirm the extent of repairs required.	Repair Allowance	2 - Restore Functionality	Yes	Yes	Yes	TBD	1	\$25,000	LS	\$25,000	0%	0%	5%	\$27,000
Shawmigan Lake - Water Treatment Building	Pump Station	601	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. Deterioration of the foundations were reported.	3	3	1990	21-Nov-17	MH	28	50	22	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	1200	\$10	SF	\$12,000	0%	5%	5%	\$14,000
Shawmigan Lake - Water Treatment Building	Pump Station	680	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	1990	21-Nov-17	MH	28	50	22	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	1200	\$20	SF	\$24,000	0%	5%	5%	\$27,000
Shawmigan Lake - Water Treatment Building	Pump Station	680	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted wood siding and wood trim are present on the exterior walls. The existing paint was noted to be in poor condition.	3	3	1990	21-Nov-17	MH	28	12	2	Repair siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1200	\$6	SF	\$7,200	0%	5%	5%	\$8,000
Shawmigan Lake - Water Treatment Building	Pump Station	680	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Wood Siding	1	Painted wood siding and wood trim are present on the exterior walls.	3	3	1990	21-Nov-17	MH	28	50	22	The wood siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1200	\$35	SF	\$42,000	0%	5%	5%	\$47,000
Shawmigan Lake - Water Treatment Building	Pump Station	680	B Shell	CB20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Plywood soffits are present at the roof overhangs. Some areas are painted and some are exposed plywood. Staining was noted in some locations.	4	4	1990	21-Nov-17	MH	28	12	2	Repaint soffits and trim.	Replacement	3 - Future Renewal	Yes	Yes	No	No	350	\$4	SF	\$1,400	0%	10%	5%	\$2,000
Shawmigan Lake - Water Treatment Building	Pump Station	680	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Three painted metal doors are present on the building.	4	4	1990	21-Nov-17	MH	28	30	5	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	3	\$1,000	EA	\$3,000	0%	5%	5%	\$4,000
Shawmigan Lake - Water Treatment Building	Pump Station	680	B Shell	B20 Exterior Enclosure	B2020 Exterior Windows	B202001 Windows	Exterior Walls/Windows	1	Two metal windows are present on the exterior.	3	3	1990	21-Nov-17	MH	28	30	2	Repalce windows at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$500	EA	\$1,000	0%	10%	5%	\$2,000
Shawmigan Lake - Water Treatment Building	Pump Station	680	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped assembly with asphalt shingles installed (two separate sections).  One section is edge drained and one section drains to gutters and down rain water leaders to grade.	4	4	1990	21-Nov-17	MH	28	25	5	Replace the roof assembly at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	1300	\$6	SF	\$7,800	0%	5%	5%	\$9,000
Shawmigan Lake - Water Treatment Building	Pump Station	680	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is sloped assembly with asphalt shingles installed (two separate sections).  One section is edge drained and one section drains to gutters and down rain water leaders to grade.	4	4	1990	21-Nov-17	MH	28	25	5	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	10%	5%	\$1,000
Shawmigan Lake - Water Treatment Building	Pump Station	680	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum and plywood walls and ceilings are painted.	4	4	1990	21-Nov-17	MH	28	20	5	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$1,000	LS	\$1,000	0%	0%	5%	\$2,000
Shawmigan Lake - Water Treatment Building	Pump Station	680	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	1990	21-Nov-17	MH	28	20	5	Repalce lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Shawnigan Lake Water - Pump Station - Functional Code 680



Photo 1



Photo 2

**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Shawmigan Lake - Pump Station - Functional Code 680**

BLDG Name	BLDG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			Can this work be phased over multiple years?	If recommended work not complete, can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the buildings security of safety?	OPINION OF PROBABLE COST								
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical Life Cycle or Action Interval	Est. Time Remaining to EOY Major Action	Recommendation	Type					Priority	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Contingency	5% Tax	Total in 2017 Dollars	
Shawmigan Lake - Pump Station	Pump Station	680	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from view, with the exception of some above-grade foundation wall on some elevations.  The age of the structure was not reported and has been assumed.	4	4	2010	21-Nov-17	MH	8	50	42	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	225	\$20	SF	\$4,500	0%	10%	5%	\$6,000
Shawmigan Lake - Pump Station	Pump Station	680	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade. Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	4	4	2010	21-Nov-17	MH	8	50	42	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	225	\$10	SF	\$2,250	0%	10%	5%	\$3,000
Shawmigan Lake - Pump Station	Pump Station	680	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2010	21-Nov-17	MH	8	10	2	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Shawmigan Lake - Pump Station	Pump Station	680	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	4	4	2010	21-Nov-17	MH	8	50	42	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Shawmigan Lake - Pump Station	Pump Station	680	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of masonry blocks and wood framed roof. Some efflorescence was noted on the interior; however, MH understands that no active leaks are present.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	4	4	2010	21-Nov-17	MH	8	50	42	Masonry structural components are expected to last the life of the building.  A contingency budget has been included for isolated mortar joint replacement and sealant replacement throughout the cinder block assemblies.	Repair Allowance	3 - Future Renewal	Yes	Yes	Yes	No	1	\$2,000	EA	\$2,000	0%	10%	5%	\$3,000
Shawmigan Lake - Pump Station	Pump Station	680	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/Wood Elements	1	Wood cladding and wood trim (included roof framing) is present through sections of the building. The wood cladding sections appear to be retrofit areas. Some deterioration was noted in these elements.	4	4	2010	21-Nov-17	MH	8	12	4	Repaint wood cladding, install flashing over exposed wood roof framing.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	10%	5%	\$1,000
Shawmigan Lake - Pump Station	Pump Station	680	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Soffit	1	Perforated metal soffit is present at the roof overhangs.	4	4	2010	21-Nov-17	MH	8	50	42	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$20	SF	\$1,200	0%	10%	5%	\$2,000
Shawmigan Lake - Pump Station	Pump Station	680	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	4	4	2010	21-Nov-17	MH	8	30	22	Replace door at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Shawmigan Lake - Pump Station	Pump Station	680	B Shell	D30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Metal Roof Assembly	1	The roof is sloped assembly which has been waterproofed with with a metal roof assembly. The roof drains via aluminum gutters to rain water leaders.	4	4	2010	21-Nov-17	MH	8	30	22	Replace metal roofing at the end of its service life.  Ongoing maintenance of the roof should include review of all penetrations when required.	Replacement	3 - Future Renewal	No	Yes	No	No	255	\$8	SF	\$2,040	0%	5%	5%	\$3,000
Shawmigan Lake - Pump Station	Pump Station	680	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	Sections of the building have been finished with gypsum wall board and plywood.  The timeline of the last repainting cycle was not known and has been assumed.	4	4	2010	21-Nov-17	MH	8	20	12	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Shawmigan Lake - Pump Station	Pump Station	680	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	D502002 Lighting Equipment	Exterior Lighting Equipment		An exterior light is present on the building near the entrance.	4	4	2010	21-Nov-17	MH	8	20	12	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Shawmigan Lake - Water Treatment - Functional Code 680



Photo 1



Photo 2



## 681 - Shawnigan Lake Weir

Infrastructure Condition Assessment and Capital Plan

Shawnigan Creek, BC

Date Prepared

July 18, 2018

### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 9, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 7, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: 1) Reorganize linear assets based on street names 2) Complete building asset management separately (to be completed by Chris Raudoy) 3) Include disclaimer on cost estimates 4) Create separate tables for O&M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New

## 681 - Shawnigan lake Weir

Infrastructure Condition Assessment and Capital Plan  
Shawnigan Creek, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						Total	\$0

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7						\$0
	8						
	9						
Medium Term (5 - 10 Year)	10	1	ALL	Operations	Inspect/assess the weir structure and fish ladder for deterioration to determine replacement timing/phasing.	\$10,000	\$10,000
	11						
	12						
	13						
	14						
						Total	\$10,000

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CVRD)
System:	681 Shawinigan Lake Weir
Civic Address:	Shawinigan Lake Weir
Geographic Location:	Shawinigan Creek
Customers:	Parcels: 710
Users:	680

Infrastructure Condition Assessment

Current Year	2018	Total Replacement Value	\$250,000
		Value per user	\$368

Asset ID	Location			Asset Code							Asset Inventory				Condition Assessment					Recommendations / Action Items				10 Year Capital Plan									
	Function Code	Address	Location	DWE Ref	Major	Minor	Spec	ID	Asset Code	Photo	Description	Make	Model	Material	Quantity	Quantity Unit	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Physical Condition	Level of Service Condition	Demand Condition	Probability of Failure	Severity of Failure	Condition	Description	Type of Work	Budget Estimate	Timing	Comment/Question to be resolved
1	681	Shawinigan Lake Weir	Weir	Site visit / Photos	W	RES	RES	1	W-RES-RES-1	1 to 7	Weir				1	ea	2006		40	28	\$50,000	\$50,000	Good	Meets standard	Able to manage the water level of Shawinigan Lake	2	2	4	Inspect/assess the weir structure and fit	Operations	\$10,000	5-10 Year	
1	681	Shawinigan Lake Weir	Weir	Site visit / Photos	W	RES	BLD	2	W-RES-BLD-2	1 to 7	Fish ladder				1	ea	2006		40	28	\$50,000	\$50,000	Good	Meets standard		2	2	4	Inspect/assess the fish ladder for detent	Operations	Included above	5-10 Year	
1	681	Shawinigan Lake Weir	Weir	Site visit / Photos	W	RES	BLD	3	W-RES-BLD-3	1 to 7	Concrete structure				1	ea	2006		40	28	\$150,000	\$150,000	Good	Meets standard		2	2	4	Inspect/assess the weir structure for det	Operations	Included above	5-10 Year	

681 Shawnigan Lake Weir-See Infrastructure Condition Assessment table with corresponding photo ID's



681 (1)



681 (2)  
1 of 4

681 Shawnigan Lake Weir-See Infrastructure Condition Assessment table with corresponding photo ID's



681 (3)



681 (4)  
2 of 4

681 Shawnigan Lake Weir-See Infrastructure Condition Assessment table with corresponding photo ID's



681 (5)



681 (6)  
3 of 4

681 Shawnigan Lake Weir-See Infrastructure Condition Assessment table with corresponding photo ID's



681 (7)



## 690 - Kerry Village Water

### Infrastructure Condition Assessment and Capital Plan

1045 Bourban Road, Mill Bay, BC

Date Prepared

July 18, 2018

#### REPORT NOTES

Date / Revision	Contact	Comment
November 21, 2017	Adam Greenwood and Kieran Bertsch	The visual reviews were completed on November 21-24, 2017 by Adam Greenwood and Kieran Bertsch of MH. During our review of the systems we were accompanied by Mr. Todd Etherington and Mr. David Parker, who provided access to each system.
March 2, 2018	Caleb Light	Rob Grant and Andrea Kross from CVRD provided the geodatabase to MH. Caleb Light from MH tabulated the length of infrastructure in the developed area of the system from the database. The GIS items are the difference between the record drawings and the length of infrastructure tabulated in the geodatabase.
March 7, 2018	Adam Greenwood and Kieran Bertsch	Draft inventory assessment was issued to CVRD for review.
June 29, 2018	Adam Greenwood and Kieran Bertsch	Updated draft inventory assessment was issued to CVRD for review.
July 18, 2018	Adam Greenwood and Kieran Bertsch	Updated inventory assessment was issued to CVRD during the March 27, 2018 review meeting. Updates included the following tasks: <ol style="list-style-type: none"> <li>1) Reorganize linear assets based on street names</li> <li>2) Complete building asset management separately (to be completed by Chris Raudoy)</li> <li>3) Include disclaimer on cost estimates</li> <li>4) Create separate tables for O&amp;M tasks and Capital Plans and update actions to Operations, Maintenance, Capital Renewal and Capital Upgrade/New</li> </ol>

## 690 - Kerry Village Water

Infrastructure Condition Assessment and Capital Plan  
1045 Bourban Road, Mill Bay, BC

Date Prepared July 18, 2018

### 10 Year Capital Plan and Operations and Maintenance Plan - DRAFT

The Capital Plan and Operations and Maintenance Plan outlined below are based on the findings of the initial condition assessment. The tasks identified in these plans should be completed within the next 10 years to inform the necessary infrastructure maintenance, rehabilitation and replacement work to maintain the appropriate level of service for the users of the system. The findings of the initial condition assessment should be reviewed by the CVRD to ensure they reflect the current condition of the system.

**Table 1: 10 Year Capital Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	1	ALL	Capital Upgrade/New	Inspect/assess the condition of the WTP, pumps, and chlorination system. Replace the fire pump with a 20 HP fire pump (scheduled). Install a secondary containment unit for the manganese sequestering agent system.	\$40,000	\$40,000
	8						
	9						
Medium Term (5 - 10 Year)	10						\$0
	11						
	12						
						<b>Total</b>	<b>\$40,000</b>

**Table 2: 10 Year Operations and Maintenance Plan - DRAFT**

Timing	Item	Asset ID	Asset Code	Type of Work	Recommendation Description	Value	Total
Critical (0 - 1 Year)	1						\$0
	2						
	3						
Important (1 - 2 Year)	4						\$0
	5						
	6						
Short Term (2 - 5 Year)	7	2	W-WTP-WLL-10 and W-WTP-PMP-11	Operations	Inspect/assess the condition of the well and well pump.	\$10,000	\$10,000
	8						
	9						
Medium Term (5 - 10 Year)	10	3	W-RES-RES-12	Operations	Inspect/assess the condition of the reservoir.	\$10,000	\$40,000
	11	7, 9 to 14	ALL	Operations	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (exposing), and/or reviewing historical maintenance and repair frequencies.	\$30,000	
	12						
	13						
	14						
						<b>Total</b>	<b>\$50,000</b>

**Disclaimer:** Cost estimates listed above are based on limited information and should only be considered as order of magnitude costs. Further assessment and design is required to improve the accuracy of these estimates.

Owner:	Cowichan Valley Regional District (CVRD)
System:	690 Kerry Village Water
Civic Address:	1045 Bourban road
Geographic Location:	West of Mill Bay
Customers:	98
Users:	89

Infrastructure Condition Assessment

Current Year	2018	Total Replacement Value	\$2,409,464
		Value per user	\$27,073

Asset ID	Location		DWG Ref	Major	Minor	Spec	ID	Asset Code	Photo	Description	Make	Model	Material	Quantity	Year Installed	Year Renewed	Service Life Expectancy	Est. Remaining Service Life	Unit Price	Replacement Value of Asset	Condition Assessment					Recommendations / Action Items	10 Year Capital Plan					
	Function Code	Address																			Physical Condition	Level of Service Condition	Demand Condition	Probability of Failure	Severity of Failure		Condition	Type of Work	Budget Estimate	Timing	Comment/Question to be resolved	
1	690	1045 Bourban road	1585-01	W	WTR	WTP	1	W-WTP-WTP-1	2 to 26	Water treatment plant building				1	ea	2011		40	33	Refer to Kerry Village Water System Building Condition Assessment.									Refer to Kerry Village Water System Building Condition Assessment.			
1	690	1045 Bourban road	1585-01	W	WTR	PMP	2	W-WTP-PMP-2	2, 3, 8, 13, 14	Duty pump, SHP, 230V/3PH/60Hz, 84L/s @ 54m TDH	Grundfos	CR15-3		2	ea	2011		20	13	\$5,000	\$10,000	Good	Meets standard		3	2	3	Inspect/assess the condition of the WTP, pumps, and chlorination system. Replace the fire pump with a 20 HP fire pump (scheduled). Install a secondary containment unit for the manganese sequestering agent system.	Capital Upgrade/New	\$40,000	2.5 Year	
1	690	1045 Bourban road	1585-01	W	WTR	PMP	4	W-WTP-PMP-4	2, 3, 5, 8, 10, 14	Diesel fire pump package, ac pump, 47.3 L/s @ 84.5m		Series B100		1	ea	2011		20	13	\$25,000	\$25,000	Offline - not in use	Does not meet standard	Offline - not in use	4	2	3	Replace with the fire pump with a 20HP fire pump (scheduled).	Capital Renewal	Included above	2.5 Year	
1	690	1045 Bourban road	1585-01	W	WTR	FM	5	W-WTP-FM-5	9	Electromagnetic flow meter, 50mm, w/ MAG5100W sensor and MAG5000 transmitter	Siemens	F M Magflo		1	ea	2011		40	33	\$4,000	\$4,000	Good	Meets standard		1	2	3		Operations	Included above	2.5 Year	
1	690	1045 Bourban road	1585-01	W	WTR	CH	6	W-WTP-CH-6	22 to 24	Chlorination system c/w analyzer, tank	Severn Trent	T17KCA400A		1	LS	2011		20	13	\$13,000	\$13,000	Good	Meets standard		2	2	4	Inspect/assess the condition of the chlorination system.	Operations	Included above	5.0 Year	
1	690	1045 Bourban road	1585-01	W	WTR	FTR	7	W-WTP-FTR-7	15 to 17	Manganese sequestering agent system				1	LS	2011		20	13	\$15,000	\$15,000	Fair	Does not meet standard	Does not have secondary containment	2	2	4	Install a secondary containment unit for the manganese sequestering agent system.	Capital Upgrade/New	Included above	5.0 Year	
1	690	1045 Bourban road	1585-01	W	WTR	PP	8	W-WTP-PP-8	2 to 10, 13 to 15, 18	Manganese piping c/w valves, pipes, tees				1	LS	2011		40	33	\$50,000	\$50,000	Good	Meets standard	Able to meet capacity	1	2	3		Operations	Included above	5.0 Year	
1	690	1045 Bourban road	1585-01	W	WTR	GEN	9	W-WTP-GEN-9	26, 27	Generator, 37 kW, propane powered	Generac			1	ea	2011		40	33	\$17,000	\$17,000	Good	Meets standard		1	2	3		Operations	Included above	5.0 Year	
2	690	1045 Bourban road	1585-01	W	WTR	WLL	10	W-WTP-WLL-10		Well BICDM 52011 (Well ID plate # 22414)				1	ea	2011		40	33	\$10,000	\$10,000	Good	Does not meet standard	Reductants used, stage 3 restriction in summer required	2	1	3	Inspect/assess the condition of the well and well pump.	Operations	\$10,000	2.5 Year	
2	690	1045 Bourban road	1585-01	W	WTR	PMP	11	W-WTP-PMP-11		Submersible Well pump, 2.5hp, 150mm 3 phase, 230V, c/w integral check valve	Grundfos	75575-12		1	ea	2011		20	13	\$7,500	\$7,500				2	2	4	Inspect/assess the condition of the well pump.	Operations	Included above	5.0 Year	
3	690	1045 Bourban road	1585-01	W	RES	RES	12	W-RES-RES-12	28 to 32, 34 to 39	Reservoir, 318,000 L (partition wall, 2 cell)		Concrete	318	000 L	1983		80	45	\$2,000	\$636,000	Fair - no visible signs of leaks, manganese settles in fire chamber so it is easy to clean, able to isolate either half for cleaning	Meets standard	Able to meet capacity	2	2	4	Inspect/assess the condition of the reservoir.	Operations	\$10,000	5.0 Year		
4	690	1045 Bourban road	1585-01	W	PP	PP	13	W-PP-PP-13		Watermain pipe, 150mm	CL150	C900	PVC	165	m	2011		80	73	\$450	\$110,250				1	1	3		Operations	Included above	5.0 Year	
4	690	1045 Bourban road	1585-01	W	PP	PP	14	W-PP-PP-14		Watermain pipe, 75mm		S0R21	PVC	105	m	2011		80	73	\$400	\$42,000				1	2	3		Operations	Included above	5.0 Year	
4	690	1045 Bourban road	1585-01	W	PP	PP	15	W-PP-PP-15		Watermain pipe, 50mm		DR11	HDPE	160	m	2011		80	73	\$350	\$56,000				1	2	3		Operations	Included above	5.0 Year	
4	690	1045 Bourban road	1585-01	W	PP	SC	16	W-PP-SC-16		Service connections				13	ea	2011		40	33	\$3,000	\$39,000				1	2	3		Operations	Included above	5.0 Year	
5	690	1045 Bourban road	1585-01	W	PP	PP	17	W-PP-PP-17		Watermain pipe, 150mm	CL150	C900	PVC	160	m	2011		80	73	\$450	\$72,000				1	2	3		Operations	Included above	5.0 Year	
5	690	1045 Bourban road	1585-01	W	PP	PP	18	W-PP-PP-18		Watermain pipe, 75mm		S0R21	PVC	160	m	2011		80	73	\$400	\$64,000				1	2	3		Operations	Included above	5.0 Year	
5	690	1045 Bourban road	1585-01	W	PP	PP	19	W-PP-PP-19		Watermain pipe, 150mm		DR11	HDPE	476	m	2011		80	73	\$450	\$214,200				1	2	3		Operations	Included above	5.0 Year	
5	690	1045 Bourban road	1585-01	W	PP	PP	20	W-PP-PP-20		Watermain pipe, 75mm		DR11	HDPE	476	m	2011		80	73	\$400	\$190,400				1	2	3		Operations	Included above	5.0 Year	
5	690	1045 Bourban road	1585-01	W	PP	VAL	21	W-PP-VAL-21		Air valve assembly				3	ea	2011		40	33	\$10,000	\$30,000				1	2	3		Operations	Included above	5.0 Year	
5	690	1045 Bourban road	1585-01	W	PP	SC	22	W-PP-SC-22		Service connections				13	ea	2011		40	33	\$3,000	\$39,000				1	2	3		Operations	Included above	5.0 Year	
6	690	1045 Bourban road	1585-01	W	PP	SC	23	W-PP-SC-23		Service connections				3	ea	2011		40	33	\$3,000	\$9,000				1	2	3		Operations	Included above	5.0 Year	
7	690	1045 Bourban road	GIS	W	PP	PP	24	W-PP-PP-24		Watermain pipe, 75mm		PVC	750	m	1983		45	40	\$400	\$100,030				2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	\$30,000	5.0 Year		
7	690	1045 Bourban road	GIS	W	PP	PP	25	W-PP-PP-25		Watermain pipe, 100mm		PVC	20	m	1983		45	40	\$400	\$8,025				2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year		
7	690	1045 Bourban road	GIS	W	PP	PP	26	W-PP-PP-26		Watermain pipe, 150mm (includes 50m of unknown diameter)		PVC	410	m	1983		45	40	\$450	\$184,620				2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year		
8	690	1045 Bourban road	GIS	W	PP	PP	27	W-PP-PP-27		Watermain pipe, 150mm (GIS minus catalogued length from 1585-01)		PVC	0	m	1983		80	45	\$450	\$0												
9	690	1045 Bourban road	GIS	W	PP	PP	28	W-PP-PP-28		Watermain pipe, 100mm		PVC	96	m	1983		45	40	\$400	\$38,432				2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year		
10	690	1045 Bourban road	GIS	W	PP	PP	29	W-PP-PP-29		Watermain pipe, 150mm		PVC	77	m	1983		45	40	\$450	\$34,848				2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year		
11	690	1045 Bourban road	GIS	W	PP	PP	30	W-PP-PP-30		Watermain pipe, 75mm (GIS minus catalogued length from 1585-01)		PVC	123	m	1983		45	40	\$400	\$49,333				2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year		
11	690	1045 Bourban road	GIS	W	PP	PP	31	W-PP-PP-31		Watermain pipe, 150mm (GIS minus catalogued length from 1585-01)		PVC	12	m	1983		45	40	\$450	\$5,557				2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year		
12	690	1045 Bourban road	GIS	W	PP	PP	32	W-PP-PP-32		Watermain pipe, 100mm		PVC	64	m	1983		45	40	\$400	\$25,616				2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year		
13	690	1045 Bourban road	GIS	W	PP	PP	33	W-PP-PP-33		Watermain pipe, 100mm		PVC	62	m	1983		45	40	\$400	\$24,620				2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year		
13	690	1045 Bourban road	GIS	W	PP	PP	34	W-PP-PP-34		Watermain pipe, 150mm		PVC	130	m	1983		45	40	\$450	\$58,332				2	2	4	Inspect/assess watermain, fire hydrants, and valves for deterioration to determine replacement timing/phasing. This may include pressure testing, visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year		
14	690	1045 Bourban road	GIS	W	PP	FT	35	W-PP-FT-35		Manual water meters (GIS minus catalogued service connections from 1585-01)				68	ea	1983		40	5	\$3,000	\$204,000				2	2	4	Inspect/assess valves for deterioration to determine replacement timing/phasing. This may include visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year	
14	690	1045 Bourban road	GIS	W	WTR	VAL	36	W-WTP-VAL-36		Groundwater Production Water wells (GIS minus catalogued amount from 1585-01)				1	ea	1983		40	5	\$10,000	\$10,000				2	2	4	Inspect/assess the condition of the well and well pump.	Operations	Included above	5.0 Year	
14	690	1045 Bourban road	GIS	W	PP	VAL	37	W-PP-VAL-37		Air control valves (GIS minus catalogued air valves from 1585-01)				3	ea	1983		40	5	\$4,000	\$12,000				2	2	4	Inspect/assess valves for deterioration to determine replacement timing/phasing. This may include visual inspections (leakage), and/or reviewing historical maintenance and repair frequencies.	Operations	Included above	5.0 Year	

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**WTP TREATMENT PLANT  
FIELD INSPECTION**

**MH MORRISON HERSHFIELD**

SYSTEM: Kerry Village Water DATE: Nov-22/17

LOCATION: \_\_\_\_\_

SYSTEM CODE: 690 PROJECT No.: 5170700

INSPECTED BY: Adele CVRD STAFF PRESENT: Todd

1) Type of Treatment System (Schematic)

2) Site Conditions/Security

3) Condition of Structure:  
Visible deterioration of structure:

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690 (9)

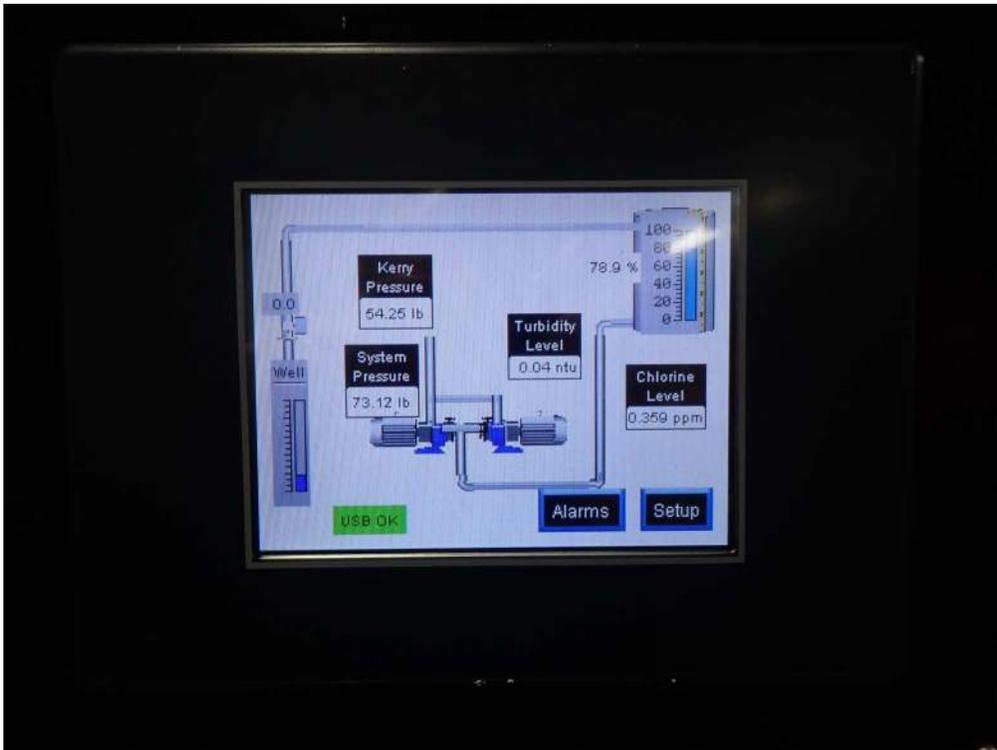


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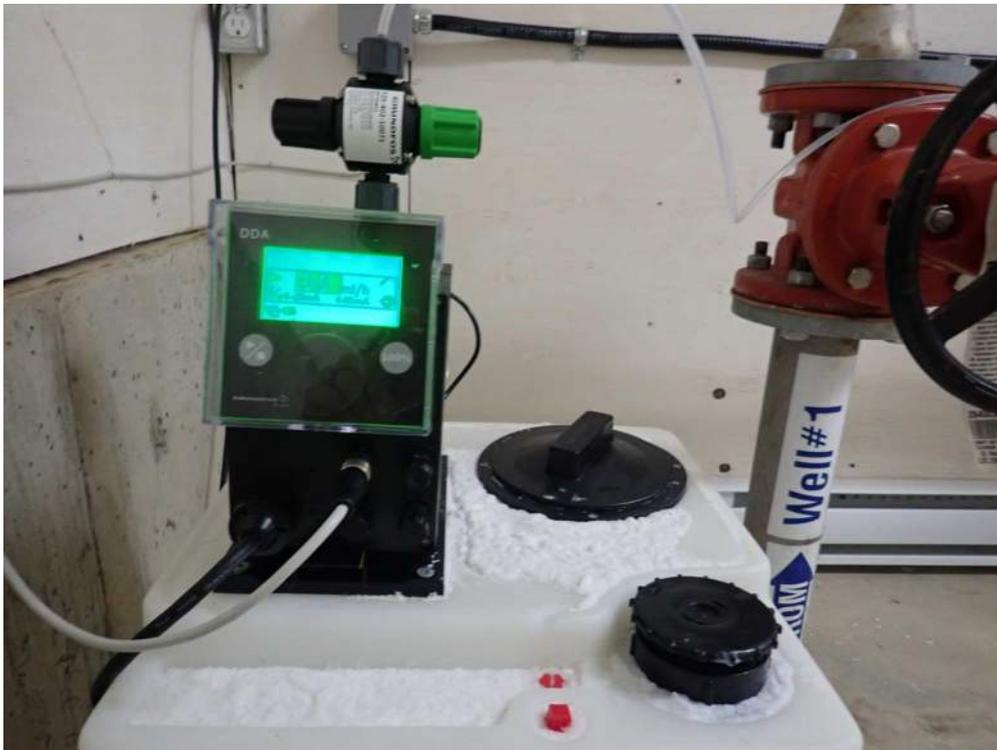


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Old treatment building

690 (19)



Old treatment building

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**Cowichan Valley Regional District  
Facility Condition Assessment and Capital Plan  
Kerry Village - Water Treatment Building - Functional Code 690**

BLOG Name	BLOG Type	Function Code	Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	COMPONENT			CONDITION ASSESSMENT					LIFECYCLE DATA			RECOMMENDATION			OPINION OF PROBABLE COST												
						ID	Location / Type	Photo	Description & History	Condition	Performance	Yr New or Last Major Action	Assessment Date	Assessed By	Age in 2018	Typical U/R Cycle or Action Interval	Est. Time Remaining to EOL or Major Action	Recommendation	Type	Priority	Can this work be phased over multiple years?	If recommended work not complete can the rate of deterioration be expected to increase?	Will a failure in this system lead to a loss of use of the facility?	Can the current condition adversely affect the building's security of safety?	Quantity	Unit Rate	Unit	Subtotal Repair or Replacement Cost	Conting.	Contingency	5% Tax	Total in 2017 Dollars
Kerry Village - Water Treatment Building	Water Treatment Building	690	A Substructure	A10 Foundations	A1010 Standard Foundations	A101001 Wall Foundations	Underground/ Foundations	1	The foundation is comprised of cast-in-place concrete footings with concrete foundation walls. The foundation is concealed from review, with the exception of some above-grade foundation wall on some elevations.	5	5	2011	21-Nov-17	MH	7	50	43	The foundations are expected to remain serviceable for the life of the building. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	500	\$20	SF	\$10,000	0%	5%	5%	\$12,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	A Substructure	A10 Foundations	A1030 Slab on Grade	A103001 Standard Slab on Grade	Interior of Building At-Grade/ Slab-on-Grade	1	The floor is concrete slab-on-grade (polished concrete throughout). Isolated hairline cracking was observed. No evidence of major settlement or heaving was reported or observed.	5	5	2011	21-Nov-17	MH	7	50	43	The concrete slab-on-grade is expected to remain serviceable for the life of the building, with isolated repairs, if needed. No capital expenses associated with this item are expected.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	500	\$10	SF	\$5,000	0%	5%	5%	\$6,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2011	21-Nov-17	MH	7	10	3	Periodic camera inspection and isolated repairs as required.	Study	Not Applicable	No	N/A	No	N/A	1	\$500	LS	\$500	0%	0%	5%	\$1,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	A Substructure	A10 Foundations	A1030 Slab on Grade	A103006 Foundation Drainage	Underground/ Perimeter Drains	1	Perimeter drain pipes are assumed to be installed at the footing level. No issues related to foundation drainage were noted by facility staff. No information was available regarding the scoping of the system to review for continuity.	5	5	2011	21-Nov-17	MH	7	50	43	The foundation drainage is expected to last the life of the building. No major capital expenditures are expected to be required.  Note: this should be updated with the results of the foundation drainage review recommended in A103006 Foundation Drainage (above).	Contingency	3 - Future Renewal	N/A	N/A	No	No								
Kerry Village - Water Treatment Building	Water Treatment Building	690	B Shell	B10 Superstructure	B10 Superstructure	B10 Superstructure	Interior of Building/ General Superstructure	1	The superstructure is comprised of wood framing on all four walls and roof trusses, supported on a cast-in-place concrete foundation.  No settlement or other evidence of structural distress was observed or reported. There was no evidence or reports of long-term leakage that would allude to concealed structural damage.	5	5	2011	21-Nov-17	MH	7	50	43	Interior protected structural components are expected to last the life of the building. No major capital expenditures are expected to be required.	Not Applicable	Not Applicable	Yes	Yes	Yes	No	500	\$40	SF	\$20,000	0%	5%	5%	\$23,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	4	4	2011	21-Nov-17	MH	7	12	5	Repaint siding and trim.  At the time of painting, replace sealant joints and wood trim as required.	Repair Allowance	3 - Future Renewal	Yes	Yes	No	No	700	\$8	SF	\$5,600	0%	15%	5%	\$7,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Painted cementitious siding and wood trim are present on the exterior walls.	5	5	2011	21-Nov-17	MH	7	50	43	The cementitious siding is expected to last the life of the building.  Note: isolated sealant and wood trim replacement should be completed as part of the ongoing painting.	Replacement	3 - Future Renewal	Yes	Yes	No	No	700	\$35	SF	\$24,500	0%	5%	5%	\$28,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201001 Exterior Enclosure	Exterior Walls/ Cementitious Siding	1	Perforated metal soffit is present at the roof overhangs.	5	5	2011	21-Nov-17	MH	7	50	43	The perforated metal soffit is expected to last the life of the building. No capital expenses associated with this item are expected.	Replacement	3 - Future Renewal	Yes	Yes	No	No	180	\$20	SF	\$3,600	0%	10%	5%	\$5,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	B Shell	B20 Exterior Enclosure	B2010 Exterior Walls	B201005 Exterior Louvers and Screens	Exterior Walls/Vent Louver	1	A metal louver vent is present on the exterior wall.	5	5	2011	21-Nov-17	MH	7	30	23	Replace the louver vent at the end of its service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	EA	\$200	0%	10%	5%	\$1,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	B Shell	B20 Enclosure	E2030 Exterior Doors	B203001 Solid Doors	Exterior Walls/ Door	1	Two painted metal doors are present on the building.	5	5	2011	21-Nov-17	MH	7	30	23	Replace doors at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	2	\$1,500	EA	\$3,000	0%	5%	5%	\$4,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped assembly with asphalt shingles installed.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2011	21-Nov-17	MH	7	30	23	Replace the asphalt shingles at the end of its service life.  Ongoing maintenance of the roof should include review of all exposed fasteners and resealing of penetrations.	Replacement	3 - Future Renewal	No	Yes	No	No	550	\$30	SF	\$16,500	0%	5%	5%	\$19,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	B Shell	B30 Roofing	B3010 Roof Coverings	B301001 High Slope Roof Coverings	Roof/Sloped Roof Assembly	1	The roof is a sloped assembly with asphalt shingles installed.  The roof drains via aluminum gutters to rain water leaders that drain into below grade piping.	5	5	2011	21-Nov-17	MH	7	25	18	Replace gutters at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	60	\$10	SF	\$600	0%	10%	5%	\$1,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	C Interiors	C30 Interior Finishes	C3010 Wall Finishes	C301003 Gypsum Wallboard Finishes	Interior/Interior Finishes	2	The interior gypsum walls and ceilings are painted.	5	5	2011	21-Nov-17	MH	7	20	13	Repaint interiors as required.  Note: a long service life has been included to reflect to building usage.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$2,500	LS	\$2,500	0%	0%	5%	\$3,000
Kerry Village - Water Treatment Building	Water Treatment Building	690	C Interiors	D50 Electrical	D5020 Lighting and Branch Wiring	C301003 Gypsum Wallboard Finishes	D502002 Lighting Equipment		An exterior light is present on the building near the entrance.	5	5	2011	21-Nov-17	MH	7	20	13	Replace lights at the end of their service life.	Replacement	3 - Future Renewal	Yes	Yes	No	No	1	\$200	LS	\$200	0%	0%	5%	\$1,000



Cowichan Valley Regional District

Kerry Village - Water Treatment Building - Functional Code 690



Photo 1



Photo 2