DRINKING WATER QUALITY MONITORING PROGRAM

Annual Report for 2019

VILLAGE OF LYTTON
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1. INTRODUCTION

Under the terms of the BC Drinking Water Protection Act & Regulation the Village is required to provide an annual report to users of the system that gives an overview of the water system, a summary of water test results, and a review of maintenance and improvements made to the system. This report has been submitted to Interior Health and is posted on the Village of Lytton website www.lytton.ca

2. LYTTON WATER DISTRIBUTION SYSTEM

The Village of Lytton has 143 residential and 33 commercial water connections (176 total) serving the residents of Lytton. Water is also distributed to, two Lytton First Nation Reserves bordering the village of Lytton,

- IR-17 with 17 connections
- IR-18 with 28 connections

In total there are 221 water service connections, serving a population of approximately 346. The population distribution is: 203 for the village, 61 for IR-17 and 82 for IR-18.

The primary drinking water source is Lytton Creek. The intake is located approximately 1km upslope and east of the Trans-Canada Highway. The village also has an emergency backup source, Well 1 located at Alonzo Way within the village. It has not been used as a backup source since August 2009.

Currently, water the Lytton Creek source has two forms of treatment, which is 12% liquid sodium hypochlorite (bleach/chlorine) and UV. After treatment the chlorine level becomes diluted. Bacterial samples are taken from four locations in the distribution system on a weekly basis and then sent to CARO Analytical Services in Kelowna for bacterial analysis. Zone 1 is located at 951 - IR-18 at the Lytton First Nation Band Office, or 938, - IR-18. Zone 2 is located at the Village of Lytton Office. Zone 3 is 155 HWY 12 forestry. Zone 4 is #4 Trans Canada HWY IR-17. The chlorine level is also monitored at the wastewater treatment plant. Turbidity (NTU) levels are also monitored at the dam intake, at the chlorine treatment facility and the 5 areas in the distribution system.

(Note: 265 & 345 refers to elevation above sea level in meters, as well as where the reservoirs are located as pressure zones on a map. Lytton's elevation is listed as 195 meters).

The Village maintains approximately 6.5 km of water mains of various type and size, as well as the new high pressure waterline from Wells 2 and 3 to the new water treatment plant and 3 reservoirs throughout the water distribution system. The old reservoir capacity is 445 cubic metres of water. The new 345 reservoir has 480 cubic metres and the new 265 reservoir has 360 cubic metres of water. The combined total of all 3 reservoirs is 1285 Cubic Metres of water storage (282,659 Imperial Gallons).

Water from Wells 2 and 3 are treated before it enters into the distribution system. Well 1 is not working at this time, if a new well is established we will do away with well 1 or we may connect it to the high pressure line and treat it in the new water treatment plant, which treats water with UV and 12% hypochlorite, then into our 3 reservoirs and then to customers.

Figures 1 & 2, show the layout of the Village's water distribution system. The new 345 reservoir is located above the old reservoir shown in Figure 1. And the new 265 reservoir that is located north of IR-17 shown in Figure 2.

FIGURE 1

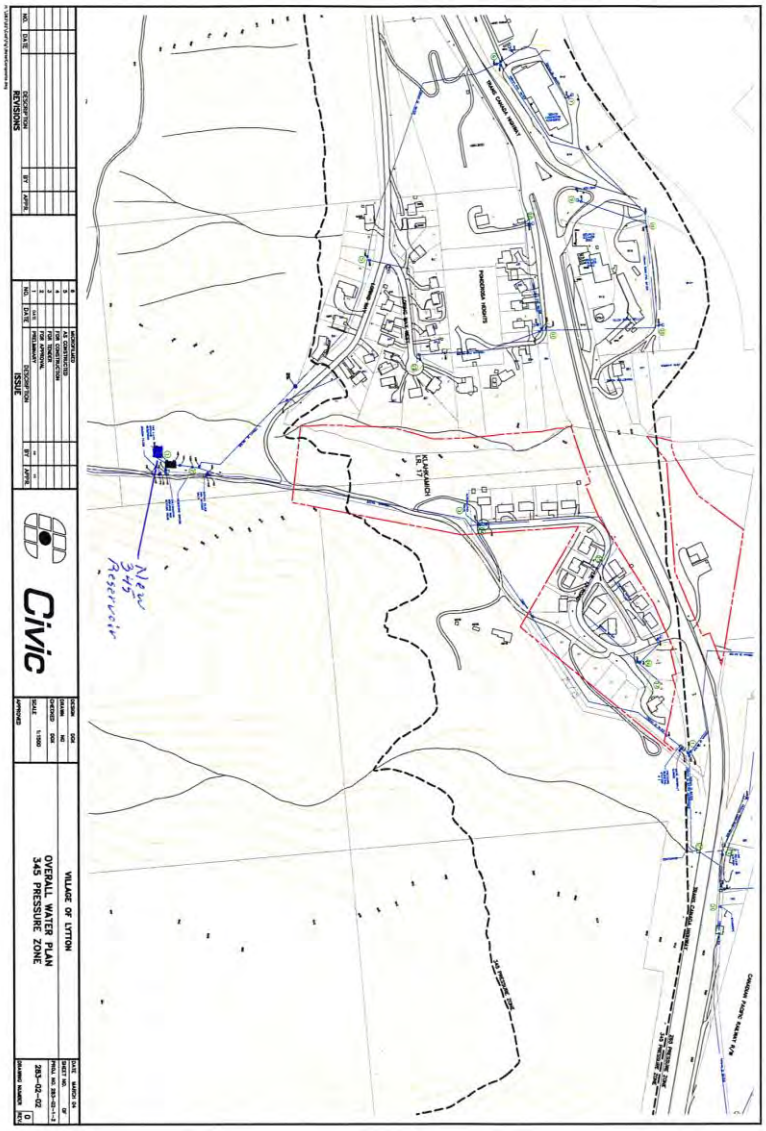
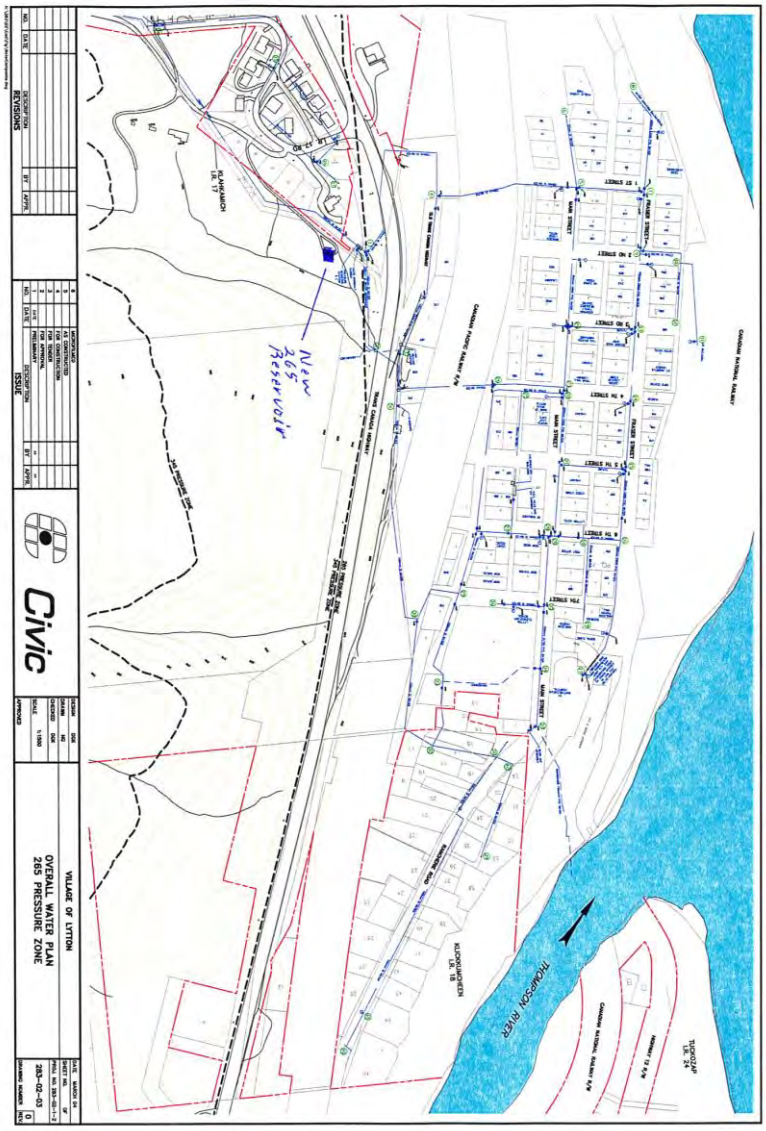
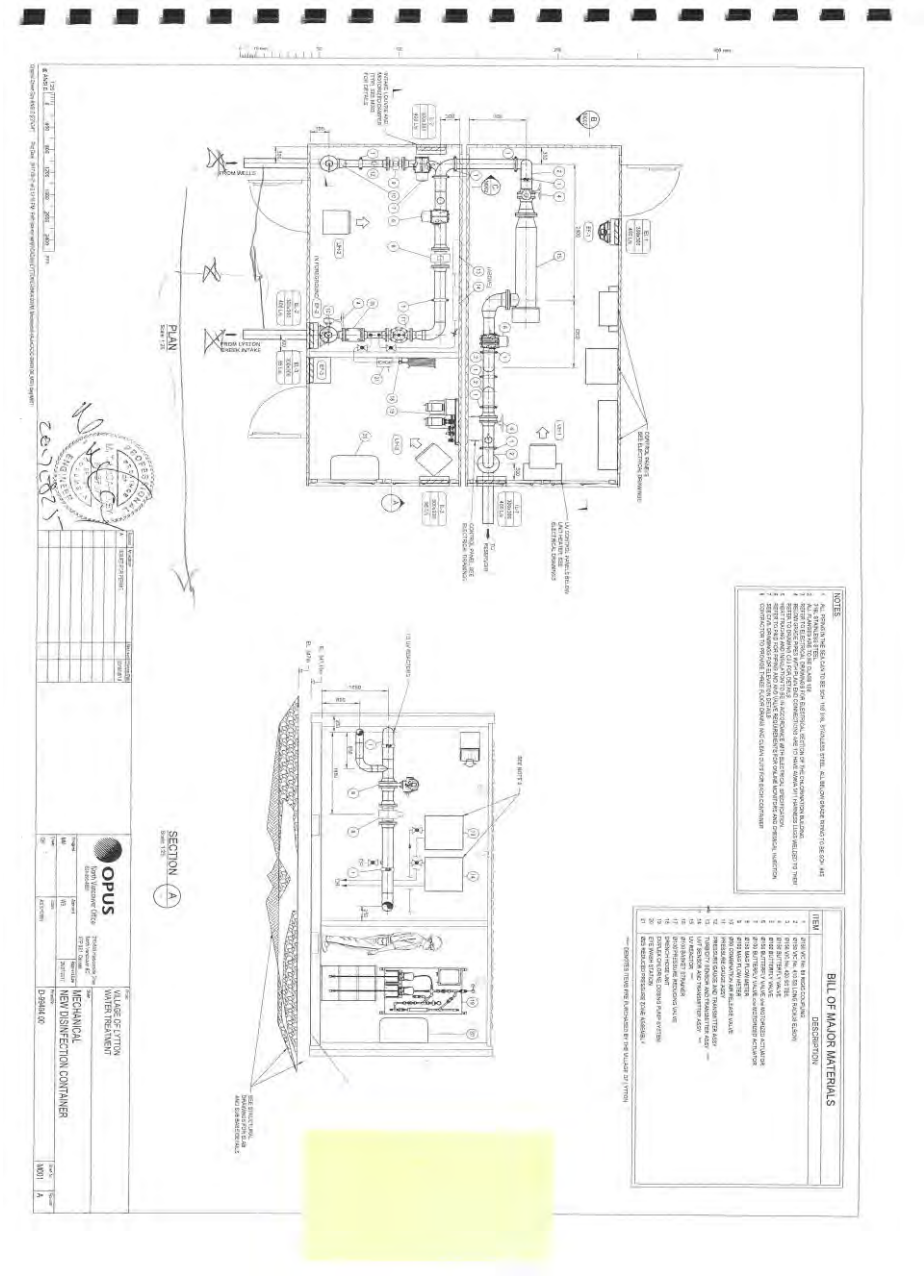

New 345 Reservoir
VILLAGE OF LYTTON
OVERALL WATER PLAN
345 PRESSURE ZONE
Civic

FIGURE 2


New 265 Reservoir
THOMPSON RIVER
VILLAGE OF LYTTON
OVERALL WATER PLAN
265 PRESSURE ZONE
Civic

NEW SYSTEM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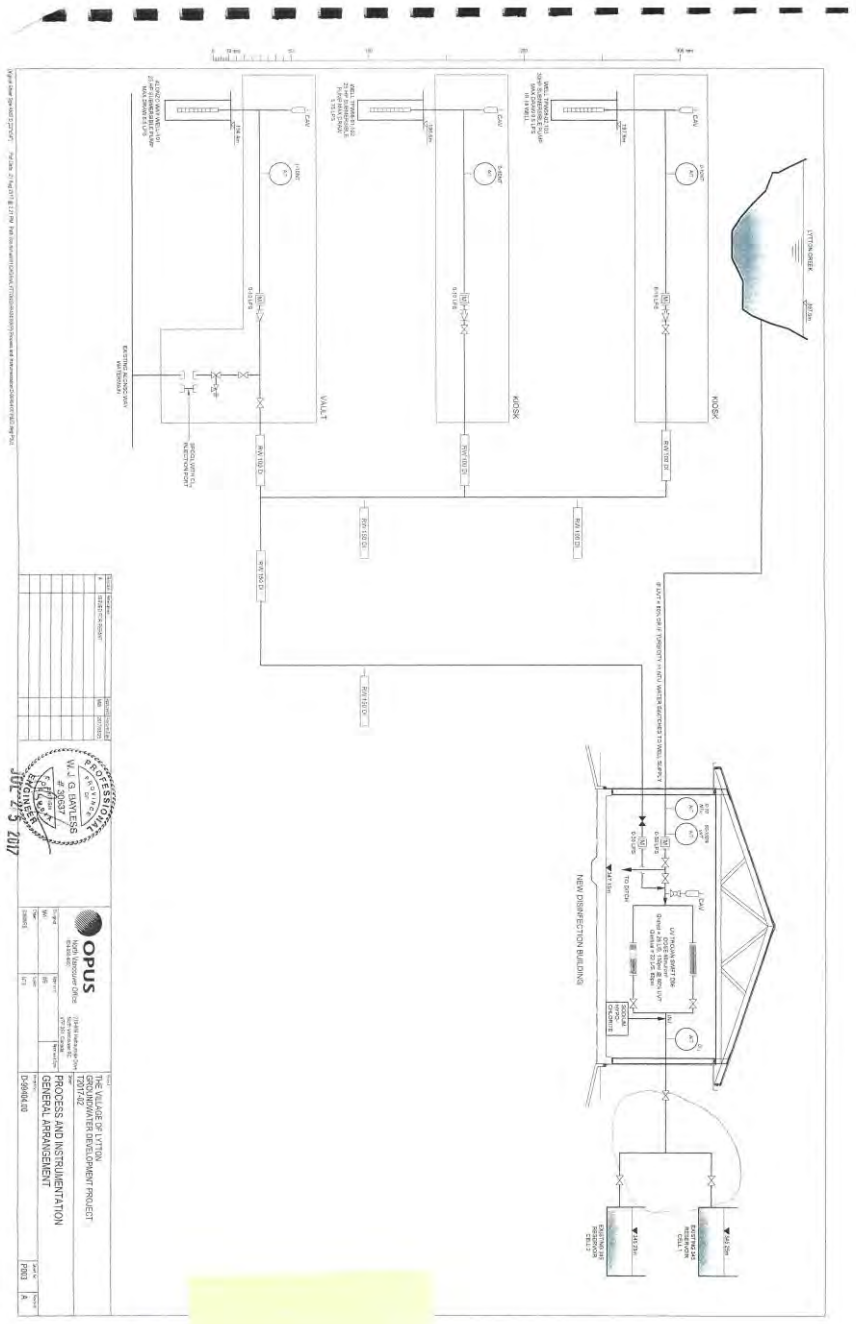
D-94448-00


FRASER RIVER
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KIOSK
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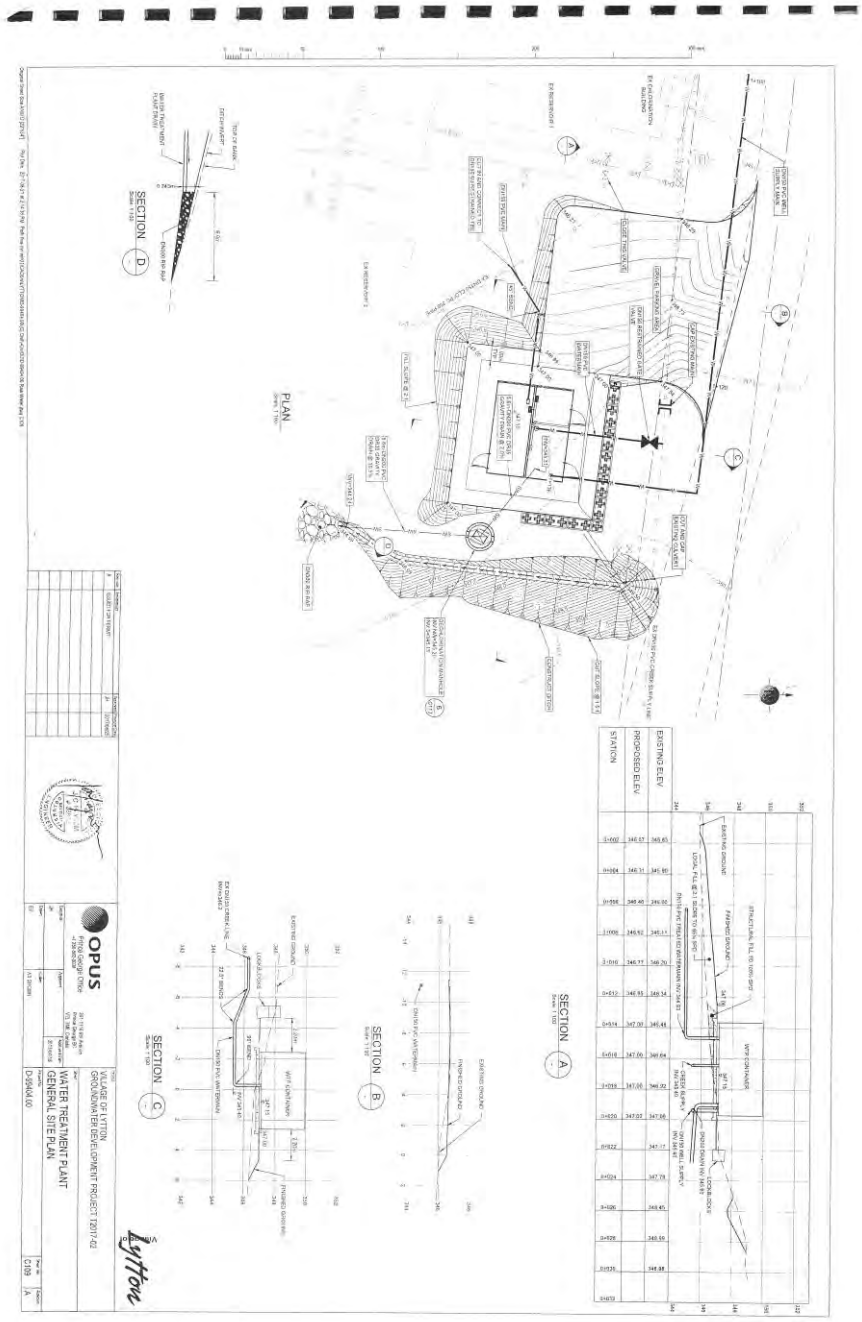
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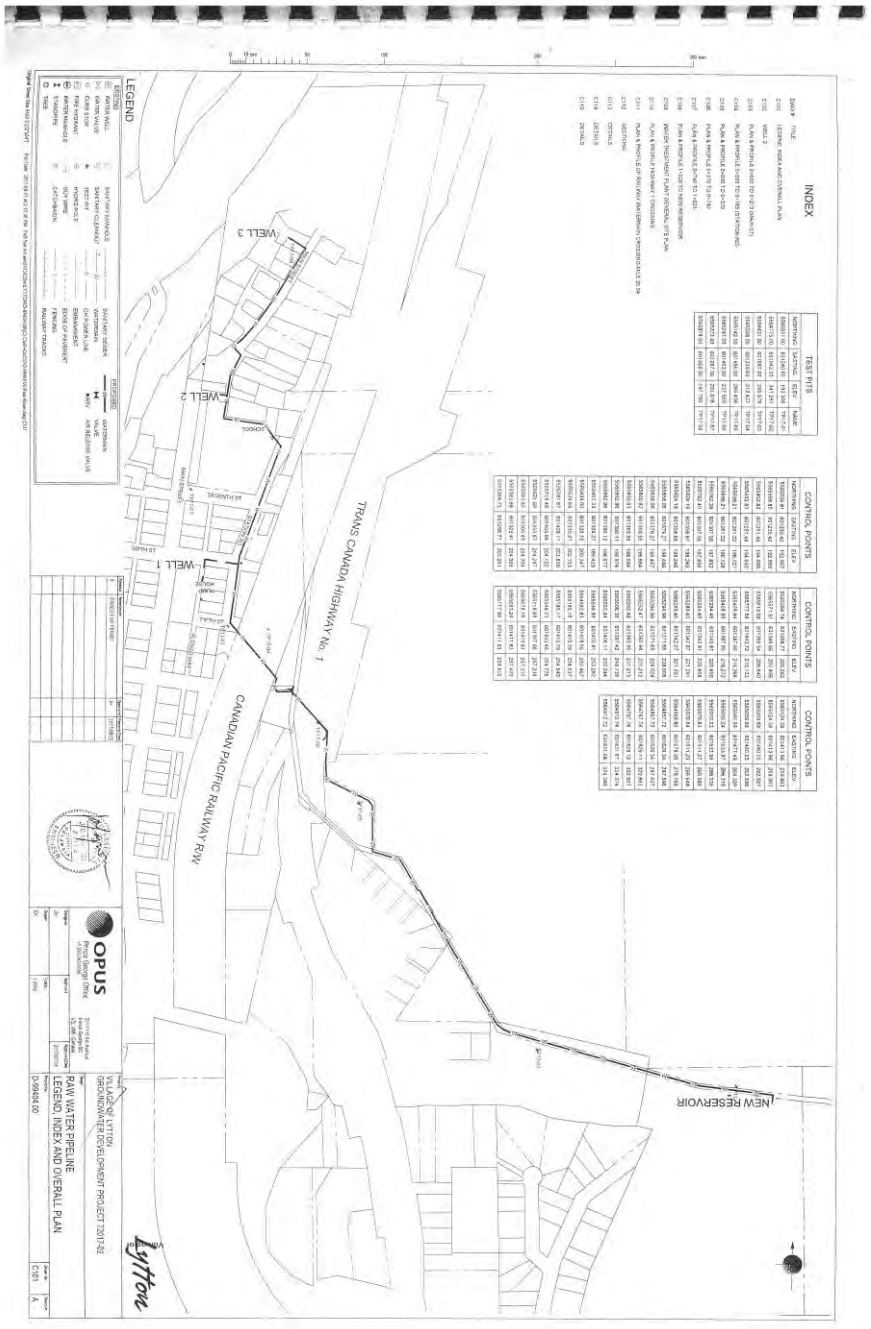
D-WM-44-00
C139
Lytton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RAW WATER PIPELINE
LEGEND, INDEX AND OVERALL PLAN
D-09408-00
Lytton

Water is disinfected inside the chlorine building located 1200 feet below the dam intake on Lytton Creek prior to entering the 345 upper reservoirs.. UV and Twelve percent (12%) liquid chlorine is injected directly into the flow stream piping as the reservoir is filling the mix/settlement chamber. Most fine sediment (organic or mineral) is captured by a 6" fine mesh screen and the remainder in the settlement chamber of the old 345 reservoir. Water then overflows into the main reservoirs, which in turn gives a better mix of water and chlorine to allow contact time for disinfection. The Interior Health Authority requires a minimum of 0.2 mg/L of free chlorine residual remaining in the water distribution system at the far ends of the water lines. To achieve this, the chlorine levels in the upper reservoirs are monitored and adjusted to maintain a reading of 1.0 mg/L of free chlorine. The amount of chlorine dosage is controlled by a flow meter that is attached to 2 chlorine pumps. The chlorine level is adjusted manually dependant on turbidity and free chlorine readings taken from the 3 Zones in the distribution system with portable hand held chlorine & turbidity meter readers once a day in the mornings except Wednesday. When testing and samples are taken in all 5 Zones, Turbidity, intake pressure, reservoir depth and free chlorine readings are monitored with a new modern SCADA (Supervisory Control and Data Acquisition) system. The instrumentation for monitoring turbidity, intake pressure and reservoir depth is located at the new water treatment plant. Free chlorine residual is monitored at the wastewater treatment plant at the south end of town and at the village office, the data is linked together through iPad program and available to operators over the internet through a secure log-in fiber optic network. Operators use this as a tool to monitor what's happening without being onsite. This gives the operator control to adjust all actions of the plant and pumps.

Commented [PW1]:

Water from the upper reservoirs at 345; distribute water to IR-17, Ponderosa Heights and Loring Way and to the Kumsheen Secondary School through to Kent Road. It also supplies water to the new 265 reservoir north of IR-17. The 265 reservoir in turn supplies water to all residents below the Trans-Canada Highway, which include downtown and IR-18.

3. SYSTEM CLASSIFICATION

3.1 Environmental Operators Certification Program re-classified the Village of Lytton Water System as a Class II Water System on May 17, 2012. Certificate No. 1126. (Certificate attached, Figure 3)

FIGURE
3

4. OPERATOR CERTIFICATION/TRAINING

4.1 Operators have the following certification:

3 certified in Small Water Systems
1 certified in Water Distribution Level 2 Pat Maw
0 certified in Cross Connection Control
1 in wwtm level 2 Tom Mc Phail

.

5. WATER QUALITY RESULTS

5.1 Chlorine/Turbidity

Chlorine and Turbidity levels are obtained daily from 2 areas in the distribution system. The sample areas were reduced from 5 to 2 in 2017, as a request from Council to reduce time and cost of Operation and Maintenance for water. A request to the Villages' Drinking Water Officer, Rob Fleming at IHA to change the sampling procedures was presented and accepted. In order to monitor and maintain proper treatment throughout the distribution system. The agreement to the reduction of sampling would entail the following procedure(s). Zone 1 and 3 would be sampled on odd days. Zone 2 and 4 would be sampled on even days. However, once a week on Wednesday bacterial samples taken all zones require chlorine and turbidity data readings to be included with the sample when shipped to the lab. Holiday samples would also be limited to water treatment/reservoir(s), Village Office.

Generally, when free chlorine residuals drop below the minimum acceptable requirements of 0.2mg/L or the turbidity levels rise above allowable limits of 1.0 NTU the plant switches over to wells, the creek is shut down until water clears. When it clears it shuts down the wells and resumes on the creek.

6. UPGRADES & FUTURE PLANS

6.1 2019 upgrades

The new water treatment plant went on line May 25th, 2019 and had some challenges with the ladder Logic program. So we changed over to a digital programing, which is very user friendly and now works on our iPads.

6.2 Cross Connection Control Program (CCCP)

On November 26, 2012, council adopted a new bylaw 664, 2012. This is part of the Village of Lytton's Drinking Water Quality Improvement Program – 2012 Conditions of Permit. This is item 4 listed in the conditions on Permit to Operate and is under Section 8 of the Drinking Water Protection Act. As such, there is a legal requirement to comply with all terms and conditions of the permit. Budget expenses have been allocated to move forward with assessments on village infrastructure assets first and

then with commercial properties in the future. This is to ensure that Lytton's potable water is protected from backflow incidents and prevent possible contamination.

6.3 Future Planning

The Village of Lytton continues to move toward upgrading its infrastructure. We have funding to add fibre internet to link all portions of the water system together.

1. Lytton Creek gabion baskets / flow direction for bank stabilization and to improve settlement and reduce solids reaching intake screen.

2. Repair to the intake dam.

3. Hydro to intake and 265 reservoir.

4. SCADA upgrade for chlorine and turbidity at first nations office IR18 and Women' Shelter IR 17

5. We added UV this year

6. Reconfiguration of water mains/valves adjacent to new treatment and upper reservoirs.

7. Ultrasonic water level sensors for reservoirs in progress

8. Water main looping at locations in distribution system where flows/residual levels would benefit.

9. Installation of automated blow offs on dead-end water mains where looping is not practical.

7. OPINION OF THE PROGRAM

General

The Village of Lytton is responsible for providing safe drinking water and notifying the public and health authorities about water quality problems.

8. APPENDICES

Appendix A	Chlorine & Bacterial Sampling Results
Appendix B	Chemical Summary
Appendix C	Flow/Use
Appendix D	Reservoir Storage Capacity
Appendix E	Certificates

Appendix A Chlorine & Bacterial Sampling Results

Appendix B Chemical Summary

Appendix C – Flow/Use

YEAR TO DATE SUMMARY AS OF DECEMBER 31, 2014 IN IMPERIAL GALLONS

2019		2020		2021	
Jan.	3830m3	Jan.	20610m2	Jan.	
Feb.	3822m3	Feb.	15666m3	Feb.	
Mar.	3990m3	Mar.	20203m3	Mar.	
Apr.	4194m3	Apr.	22464m3	Apr.	
May	16709m3	May	11305m3	May	
Jun.	34899m3	Jun.	14593m3	Jun.	
Jul.	33006m3	Jul.	34729m3	Jul.	
Aug.	30900m3	Aug.	36948m3	Aug.	
Sep.	26478m3	Sep.		Sep.	
Oct.	22457m3	Oct.		Oct.	
Nov.	20607m3	Nov.		Nov.	
Dec.	20956m3	Dec.		Dec.	
YEARLY	221848m3	YEARLY		YEARLY	

Appendix D Reservoir Storage Capacity

LYTTON RESERVOIRS CAPACITY

345 OLD RESERVOIR	445	cu.m.=	445000	Litres	97886	Imp.Gal.
345 NEW RESERVOIR	480	cu.m.=	480000	Litres	105585	Imp.Gal.
265 NEW RESERVOIR 2 CELLS x 180cu.m.	360	cu.m.=	360000	Litres	79188	Imp.Gal.

TOTAL	**VOLUME**	**1285**	**cu.m.=**	**1285000**	**Litres**	**282659**	**Imp.Gal.**

Appendix E Certificates

Attendance Certificate

This certifies that

Dylan Phillips

has attended the

Small Water Systems Course

(EOCP Course #8037) (Ceu's 1.8)

Offered by MTS Maintenance Training Systems Inc.

Date Completed: March 22, 2018 Instructor: Richard Bastiaansen

EOCP

CERTIFICATE of QUALIFICATION

Environmental Operators Certification Program

This is to certify that:

Patrick Maw

By examination has qualified as a

Small Wastewater System Operator Level

CHAIR, BOARD OF DIRECTORS

CHIEF EXECUTIVE OFFICER

Certification No. 6677

EOCP

CERTIFICATE of QUALIFICATION

Environmental Operators Certification Program

This is to certify that:

Patrick Maw

By examination has qualified as a

Water Treatment Operator

Level II

CHAIR, BOARD OF DIRECTORS

CHIEF EXECUTIVE OFFICER

Certification No. 6677

Valid until: 31 December 2020

A society incorporated under the Society Act, S.B.C. S-28724

EOCP

CERTIFICATE of QUALIFICATION

Environmental Operators Certification Program

This is to certify that:

Patrick Maw

By examination has qualified as a

Water Distribution Operator

Level II

CHAIR, BOARD OF DIRECTORS

CHIEF EXECUTIVE OFFICER

Certification No. 6677

Valid until: 31 December 2020

A society incorporated under the Society Act, S.B.C. S-28724

EOCP

CERTIFICATE of QUALIFICATION

Environmental Operators Certification Program

This is to certify that:

Tom McPhail

By examination has qualified as a

Small Water System Operator

Level

CHAIR, BOARD OF DIRECTORS

CHIEF EXECUTIVE OFFICER

Certification No. 7216

Valid until: 31 December 2020

A society incorporated under the Society Act, S.B.C. S-28724

ANNUAL REPORT
2019 YEAR