



# REGIONAL DISTRICT OF NORTH OKANAGAN

## MEMBER MUNICIPALITIES:

CITY OF ARMSTRONG  
DISTRICT OF COLDSTREAM  
CITY OF ENDERBY

VILLAGE OF LUMBY  
TOWNSHIP OF SPALLUMCHEEN  
CITY OF VERNON

## ELECTORAL AREAS:

"B" – SWAN LAKE  
"C" – B.X. DISTRICT  
"D" – LUMBY (RURAL)

"E" – CHERRYVILLE  
"F" – ENDERBY (RURAL)

## A NEW WATER TREATMENT PLANT FOR GREATER VERNON QUESTIONS & ANSWERS

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- 1. What is the cost of the new Duteau Creek Treatment Plant?**
  - The cost of the Duteau Creek Water Treatment Plant ("Plant") is \$29.2 million dollars. Stage I of the Plant is expected to be completed within the budget that was approved for the project by the Regional District of North Okanagan.
- 2. Did the Regional District of North Okanagan receive any grants for the Duteau Creek Water Treatment Plant?**
  - Yes. The following grants were received by the Greater Vernon Water Utility:
    - o \$10.5 million Federal Gas Tax Grant
    - o \$3.3 million Municipal Rural Infrastructure Fund Grant.
- 3. How long did it take to construct the Duteau Creek Water Treatment Plant?**
  - The contractor, Maple Reinders Inc., commenced construction in late February 2009 and has taken about 18 months to construct the Plant.
- 4. What is the design capacity of the Duteau Creek Water Treatment Plant?**
  - Following completion of Stage II Filtration the Plant will treat up to 160 ML (160 million litres (think of this as 40 million 4 litre milk jugs)) per day.
- 5. How much water storage is provided at the Duteau Creek Water Treatment Plant?**
  - Total capacity is 10ML (10 million litres) contained in 2 chambers. Each chamber is 5ML with 5 baffles that enable good mixing and sufficient time for the disinfection contact time to occur.
- 6. How much water is consumed by users of the Greater Vernon Water Utility?**
  - The Utility provides approximately 24,000ML (24 billion litres) of water to its customers in an average year of operation.
- 7. How much of Greater Vernon water will be supplied by the Duteau Creek Water Treatment Plant?**
  - On an annual basis the Plant will supply about 60% of all the water required by Greater Vernon Water Utility. Kalamalka Lake provides approximately 35% of the annual water supply and the wells make up the remainder 5% of the annual water supply.
- 8. How much water is required by agriculture?**
  - Agriculture irrigation use accounts for approximately 55% of the annual water demand.

**9. Why was the Duteau Creek Water Treatment Plant constructed?**

- The Plant was constructed as part of the Master Water Plan developed in 2002 and was considered necessary for improving the turbidity and colour in the Duteau Creek source.

**10. Why is it necessary to remove turbidity and colour?**

- To meet the requirements of the Canadian Drinking Water Standards. Organic carbon that makes up turbidity and colour were identified as long term health risks.

**11. Are there any other improvements required at the Duteau Creek Water Treatment Plant?**

- Yes. Typically, when a Plant of this nature is constructed a filter is also constructed. In this case the filter was removed from Stage I construction but will be constructed as part of the Stage II Filtration Plant Project scheduled to be completed by the end of 2015 as required by Interior Health Authority.

**12. When will Greater Vernon Water commence with Stage II Filtration?**

- Greater Vernon Water has budgeted for conceptual design of filtration in 2010. This will be followed in 2011 and part of 2012 by detailed design and Interior Health Authority approval. Once appropriate approvals are obtained construction will commence with an expected completion date by the end of 2015.

**13. What is the estimated cost of the future Stage II Filtration?**

- The Regional District of North Okanagan will undertake a preliminary evaluation of the filter construction later this year but the initial estimates are that the expected cost is about \$20 million dollars.

**14. Will we have future "Boil Water Notices " and/or "Water Quality Advisories "?**

- It should be noted that Boil Water / Water Quality Advisories may be required in the future due to water main breaks, variable source water quality, and necessary water main flushing which will, from time to time, occur.

**15. What disinfection will be utilized at the Duteau Creek Water Treatment Plant?**

- The Plant will use chlorine disinfection that is generated on site. This will not change from the current chlorine disinfection now located at the Headgates. The Headgates disinfection shall be abandoned as it is no longer required.

**16. How will chlorine be generated on site at the Duteau Creek Water Treatment Plant?**

- A Sodium Hypochlorite generating system utilizes brine (salt water) and energy to produce a 0.8% bleach solution that can be pumped to the reservoir. Although we are still using a chlorine ion for disinfection the process has changed significantly. Previously, chlorine gas was used which is a public health hazard if it escapes. This system is safer and less expensive than using commercial bleach at 12% (bleach purchased at a grocery store is typically 3%) and is much safer than using chlorine gas. The new process makes a solution similar to weak Javex from rock salt and electricity thereby eliminating the danger to the public and the plant operators. The byproduct from this process is small amounts of Hydrogen which are safely blown to atmosphere.

**17. Will the Duteau Creek Water Treatment Plant change the colour of my water?**

- Yes. The Plant will significantly reduce the characteristic “yellow” colour prominent in Duteau water. Colour is measured in True Colour Units [TCU], and on an annual basis the Duteau water runs at about 50 TCU. For comparison, Kalamalka Lake water is about 6 TCU, and the aesthetic objective from the Canadian Drinking Water Guidelines is 15 TCU. The Plant is designed to reduce the colour to below 5 TCU 95% of the time. Testing to date show the process is reducing colour to 3 TCU or below.

**18. Will the Duteau Creek Water Treatment Plant change the turbidity of my water?**

- Yes. The Plant will reduce turbidity by roughly half. Turbidity consists of particles (clay, silt, plankton etc.) in the water that scatter a beam of light, and is measured in Nephelometric Turbidity Units (NTU). Typically a turbidity of less than 5 NTU is not visible to the naked eye. The Plant, at Stage I, will reduce turbidity to below 1.5 NTU 95% of the time. The addition of Stage II Filtration to the Plant will provide this all the time.

**19. What type of treatment will the Duteau Creek Water Treatment Plant undertake?**

- The treatment will be by Dissolved Air Flotation (DAF) which requires a coagulant and a floccing agent to be added to the water to create a floc. Air bubbles from below lift the floc to the surface and skimmers remove the surface floc. Clear water is then drawn off the bottom of the DAF basin for follow-up chlorination, discharge to the reservoir and finally distribution into the water mains.

**20. What will happen on power failure at the Duteau Creek Water Treatment Plant?**

- Incorporated into the Plant design is full electrical generator backup that will automatically start up upon power grid failure. Temporary electrical power can be provided for a period of 12 hours without refueling the diesel storage tank. Upon power being restored an automatic switch back to the power grid will occur.

**21. What chemicals are being used in the Duteau Creek Water Treatment Plant process?**

- An aluminum compound (Poly Aluminum Chloride) and a coagulant (Epiamine) are used to create the floc (floc is the product created by combining fine particulate matter suspended in the raw water).

**22. How much aluminum is in the domestic water supply?**

- Since 2002 Greater Vernon Water Utility has monitored the raw water aluminum content in the supply water. This content has varied from 0.06mg/l to 0.16mg/l. The target aluminum content in the treated water is 0.15 mg/l for the DAF process and will reduce to 0.1 mg/l when filtration is added. Aluminum is an aesthetic quality and the recommended levels are 0.1 mg/l for a conventional plant and 0.2mg/l for a non-conventional plant. Until filtration is added the Plant is considered to be a non-conventional plant.

**23. What volume of residue byproduct (sludge) is being produced at the Duteau Creek Water Treatment Plant?**

- During the summer it is expected that two container loads of sludge will be generated in a week and in the winter it is expected that one container load of sludge will be generated in two weeks.

**24. What will happen to the residue byproduct (sludge) that is being produced at the Duteau Creek Water Treatment Plant?**

- In the interim the residue byproduct (sludge) shall be trucked to the landfill. The Regional District is currently exploring options for future beneficial re-use of the sludge.

**25. How will the quality of treated water be maintained at the Duteau Creek Water Treatment Plant?**

- The Plant will be manned during the day but in the evening and at night it is designed to operate on automatic. Qualified operators with appropriate certification levels together with support staff shall be responsible for the quality control at the plant. These operators shall rotate on a 24 hour / 7 day standby basis when the plant is operating on automatic.

**26. How will quality testing be maintained at the Duteau Creek Water Treatment Plant?**

- The Plant has numerous continuous analyzers that automatically test the water quality on an ongoing basis for free chlorine residual, turbidity, streaming current (a measure of the electrical repulsion of the fine particles and colour in the water). The SCADA System (Supervisory Control And Data Acquisition) will alert the operators when the desired water quality parameters are not being met allowing the operators to immediately respond. The Plant also contains a laboratory for chemical analysis to confirm automated monitored water quality.

**27. What parameters will be measured at the Plant?**

- The Plant will continuously measure parameters on the following:

**Test:**

pH  
Conductivity  
  
Turbidity  
  
Temperature  
Particle Count  
  
Dissolved Organic Carbon (DOC)

**Measures:**

- acid / basic
- conductance - which can be directly related to Total Dissolved Solids.
- Cloudiness caused by suspended particles
- Water temperature
- Particle count 2 to 900 micron in diameter
- Humic acids and dissolved organics

**28. How is the Duteau Creek Water Treatment Plant licensed?**

- The Plant is permitted to operate under the Operational Permit issued by Interior Health Authority. Weekly, monthly and annual reporting is required to be submitted by Greater Vernon Water Utility to Interior Health Authority to assure that the Plant is operating within the guidelines established by Interior Health Authority.