



## LLE Waterworks

### A Brief History of our Water System

On 3 June 1977, the British Columbia government passed an Order in Council that exempted Heather Jean Estates No. 1 Ltd, Heather Jean Estates No. 2 Ltd, and Heather Jean Estates No. 3 Ltd from the requirements of the *Water Utilities Act* and the *Energy Act*. Today the original companies (Heather Jean Estates No. 1 Ltd, Heather Jean Estates No. 2 Ltd, and Heather Jean Estates No. 3 Ltd) are known as **Lillooet Lake Estates Ltd**.

On June 7, 1977, the BC Department of the Environment sent a letter to Mr. Potvin, which said in part:

"The Comptroller of Water Rights has exempted Heather Jean Estates No. 1 Ltd., Heather Jean Estates No. 2 Ltd., and Heather Jean Estates No. 3 Ltd. from the provisions of the *Water Utilities Act* and the *Energy Act*. This exclusion is only valid for water systems within the boundaries of its own property, which is defined as District Lot 4901, Lillooet District."

So, as far back as 1977, the Province of British Columbia agreed that the primary water licences to the water sources within District Lot 4901 belonged to **Lillooet Lake Estates Ltd** as the successor company to Heather Jean Estates No. 1 Ltd., Heather Jean Estates No. 2 Ltd., and Heather Jean Estates No. 3 Ltd. This applied to water licence # CWL 59511 on McCulloch Creek and water licence # CWL 50297 on Cataline Creek. This same exemption order recognized Lillooet Lake Estates Ltd as the only water utility within DL4901.

Within the files at Land and Water BC Inc. are documents that confirm that the early water licences on McCulloch and Cataline Creeks belonged to Lillooet Lake Estates Ltd. One of these documents was an old Engineer's Report.

In the *Engineer's Report on a Water Application* that is in the L&WBC files, we are advised of the following:

"This intake is to feed water to common system to serve 128 lots with another 45 or so to be added in the future. Half of the water supply is to come from Potvin [McCulloch] Creek and half from an unnamed stream [Cataline Creek] (see file 0323080)."

"We are recommending a larger quantity than applied for as the applicant's plans have changed, but no licences other than Mr. Potvin's are affected. Attached is a letter from Mr. Potvin indicating he is agreeable to his existing licences C. L. 34210 and C. L. 27100 being made junior by priority date to this application. This was at our suggestion as the licences supply a power generator and are downstream from this intake."

On 28 June 1977, Mr Potvin wrote to the Water Rights Branch acknowledging the that three Heather Jean Estates companies would be a water utility without having to comply with the requirements of the Water Utilities Act. Then he made the following request:

"Would you issue the water licence in the name of Heather Jean Properties Ltd or HJ Developments Ltd who will be the managers of this water system."

Since all five companies were "Heather Jean" companies, it appears that the Water Rights Branch simply did not understand the relationships that existed between these companies nor the significance of issuing the water licence in the name of the wrong company.

The original "128 lots with another 45 or so" planned are today the 152 Lillooet Lake Estates lots. On 25 November 1998, Heather Jean Estates No. 1 Ltd, Heather Jean Estates No. 2 Ltd, and Heather Jean Estates No. 3 Ltd agreed to amalgamation and formation of a new company called Lillooet Lake Estates Ltd. This document is known as the **Amalgamation Agreement** and was effective as of January 1, 1999.

Although many lot owners firmly believed that the annual water assessments that they had been paying for many years were to cover the capital costs and the operation of the water works system, HJ Developments Ltd insisted that the payments only covered the operation of the water works system. In the signed **Water Agreement** dated December 6, 2000, Lillooet Lake Estates Ltd agreed to pay Heather Jean Properties Ltd and HJ Developments Ltd the sum of \$115,763.00 for the **assets** of the water utility. Note that there was no need to "sell" the water licences since Lillooet Lake Estates Ltd was already the "owner" of those licences. We only needed to purchase the infrastructure that delivered water to each lot at Lillooet Lake Estates.

### Our Water Licences as of 2003

Water licence # CWL 50297 for Cataline Creek is an inadequate source of water for all of Lillooet Lake Estates. When it rains, there is high turbidity in the creek water. Cataline Creek has also been subject to debris torrent flows. In the early 1990's, some remedial work was done to reduce the impact of subsequent flows but this has not changed the water quality. Cataline Creek can only supply water for eight months of the year at best, which leaves us with no drinking water or fire protection from November 15 to March 15.

McCulloch Creek can provide both an adequate source of potable water for all of Lillooet Lake Estates and an adequate flow of water for fire protection for the lots below the forestry road. To get water from McCulloch Creek to the water tank at the top of the Gate 2 road would



require a pumping station. Water licence # CWL 59511 for McCulloch Creek can supply water all year round.

### New Legislation

In May of 2003, the *Drinking Water Protection Act and Regulations* came into effect. This had a big impact on the Lillooet Lake Estates water system. It began with a letter from the Provincial Government to Lillooet Lake Estates Ltd and other water suppliers throughout the province.

### Coast Garibaldi Health Authority Puts Us Under Order

The Coast Garibaldi Health Authority served the Lillooet Lake Estates Water System with an Order under the new *Drinking Water Protection Act* on 28 October 2003. We were ordered to supply potable drinking water to the entire community year round.

Coast Garibaldi Health ordered us to do the following:

"I HEREBY ORDER, under sections 25 and 26 of the *Drinking Water Protection Act*, that you

(a) Immediately remind all users of the Lillooet Lake Water System, that the water supply contains harmful bacteria and is not safe for consumption. This notification must be in writing, and mailed or delivered to each customer, and must also be posted at the entrance to each gate as long as this Order remains in effect. The notification must contain instructions for water disinfection (see the attached) and state that the boil advisory remains in place until rescinded in writing by our office. A copy of this reminder is to be sent to our office with information as to how and when it was given. The written notice to each customer must be renewed monthly.

(b) Retain a professional Engineer with appropriate expertise to document the existing infrastructure, for our records as well as yours, and apply for construction permit(s) for any and all modifications required to bring the water system into compliance with the *Drinking Water Protection Act and Regulation* no later than March 31, 2004. Applications must include watershed / source assessments for surface water sources and/or well head protection programs for groundwater sources.

(c) Begin construction of the modifications immediately upon receipt of the construction permit.

(d) Provide a written emergency response and contingency plan in accordance with section 10 of the Act and section 13 of the Regulation.

(e) Provide a water quality monitoring plan.

(f) Submit an application for a Permit to operate the water system upon completion of the necessary work

in accordance with the Construction Permit and pending an inspection of the system by our office."

### Finding a New Water Source

We engaged a water hydrologist and an engineer to assist us. Based on their advice the Lillooet Lake Estates Water Committee developed a plan to provide potable water year round to the residents of Lillooet Lake Estates. The Lillooet Lake Estates Water Committee strongly believed and recommended that a locally built and locally operated water system was the best and cheapest alternative for LLE. We believed that we could build the entire system for about half a million dollars depending on some variables. We also believed that this compared very favourably with the alternatives.

Based on the recommendations of our hydro geologist, we applied for a water licence on **Babikoff Creek (aka Frank's Spring)** to use as the primary source of drinking water for all of Lillooet Lake Estates. We studied the Spring for a year. At the lowest flow in the summer of 2003, based on the requirement of 500 imperial gallons per lot, the flow was adequate to supply 191 lots. The chemical quality of the spring water is good with no fecal or total coliform. We believed that this source would allow us to meet the requirement to supply potable drinking water to the entire community in compliance with the Order under the *Drinking Water Protection Act* issued by the Coast Garibaldi Health Authority on 28 October 2003. Babikoff Creek (Frank's Spring) can supply potable drinking water year round.

After going through the application process with Land and Water BC Inc, we were finally successful. On January 16, 2004, Lillooet Lake Estates Ltd was granted water licence #119188 for Babikoff Creek for a maximum of 76,000 gallons a day year round – enough to supply all of LLE every day.

### The Phased In Approach

We contracted with Rob Arden of Arden Consulting Engineers Ltd to conduct an engineering study and prepare plans for the development of the spring water site and the pipeline to connect it to our existing water works system. The plans would also include an upgrade of the distribution system throughout Lillooet Lake Estates and a pumping station to get the water up to the upper storage reservoir.

We had to envision what the completed project would look like. We anticipated that there would be a collection facility at the spring, a water treatment building, and 10,000 gallon capacity storage tanks. From the spring we anticipated that we would run 6" pipe CN900 (blue brute) for approximately 600 feet south by southwest across



Crown land, across the BC Hydro Right of Way and under the forest service road, and then south-eastward for about 400 feet through Lillooet Lake Estates along an existing access easement to a connection with the existing LLE water works system. We also required an easement for the pipeline to cross Crown land and upon which to build an access road to the spring to both build and maintain the facility.

The first phase of the plan would provide potable water to the 65 LLE lots that lie below the forest service road. Gravity would ensure that the spring water was delivered to these lots. The lots above the forest service road would continue to be served by the existing intake on Cataline Creek.

Initially, we were awaiting the arrival of electricity for phases 2 and 3 of the project. Unfortunately, we have no time frame yet as to when electric power will be coming to Lillooet Lake Estates.

Without electricity, we began phases 2 and 3 of the project. We would pump the water from the spring up the hill to new in ground tanks. The spring water would then also be the water source for the 87 LLE lots above the forest service road. The water from Cataline Creek (**C050297**) would then serve only as a back up source of water in case of fire.

The water licence (**C059511**) on McCulloch Creek that was originally issued to us would become a significant source of back up water for the spring. We would use this licence to back up the water from the spring in the event of a drought and for use in the event of a fire.

Our study has also proven to us that there is more than enough water at the spring in the event that the Lillooet Lake water works system became the sole water supplier at DL4901. We could easily supply any future lot subdivisions that may occur on the Heather Jean Properties land.

### **Decision Requested**

On 11 June 2004, we applied for a general power water licence on Strawberry Creek. The purpose of the power licence was to generate enough power to treat the spring water and to heat the treatment building. We were advised by Land and Water BC Inc that this would have to be a commercial water licence application, not because of its size but because it was to generate electricity that would benefit more than one party. Accordingly, we amended our application.

On 5 August 2004, we submitted a second application. This application was for a commercial water licence and Crown Land Tenure for the route that the pipeline would take from the intake to the treatment building.

### **Alternative Intake Location**

Because of ongoing discussions with Land and Water BC, Coast Garibaldi Health, and our engineer, the water treatment changed from UV to chlorine. We no longer needed to have the spring water under great pressure as is needed for UV treatment. This caused us to relocate the water treatment building from the entrance to Gate 1. The new location would be next to the spring source. Water pressure is not needed for chlorinating the water.

We still needed to have water pressure at the treatment plant in order to accommodate the power generation needed for chlorination. We selected a site on Strawberry Creek where we could build an intake and run a pipe down the hillside to the treatment building at the spring. We monitored the flow on Strawberry Creek over many months and there was always a much greater flow that we needed.

As a result of more discussions and site visits, it was determined that the intake could be moved downstream from the planned intake on Strawberry Creek to a location below where the flume from where Strawberry Creek enters McCulloch Creek. The water flow at this point was a combination of McCulloch and Strawberry Creeks. This location required a shorter length of pipeline to the treatment plant than from the originally proposed intake on Strawberry Creek. This location also had an adequate flow and would provide sufficient pressure to generate the electricity needed to operate the treatment building and chlorinate the water.

Lillooet Lake Estates water works system is recognized as the only water utility at DL4901. The updated Exemption Order issued by Land and Water BC Inc reconfirmed this.

We submitted our engineer's plans to the Coast Garibaldi Health Authority and, at the end of December 2004; we were issued a Construction Permit to proceed with the upgrades to the system as we had proposed.

In order to have this project go ahead and reach a successful conclusion, we still needed a power licence on McCulloch Creek; and we were granted that licence in June 2005.

### **Construction Permit Cancelled**

On August 21<sup>st</sup> 2006, George Henry wrote to the Medical Health Officer in an attempt to resolve the outstanding issues between Coast Garibaldi Health and LLE. Coast Garibaldi Health had **arbitrarily cancelled our Construction Permit** for the new water system effective July 27<sup>th</sup> 2006. All work had stopped. Coast Garibaldi Health wanted us to address three additional issues in the plans for our new water system before we continued.

George replied as follows:



“Regarding the three issues that you have raised:

(1) Turbidity monitoring - The equipment for monitoring has been purchased and is on site. We were preparing to install it. Once it is installed and powered by our micro-hydro generation plan, it will become operational. The monitoring was scheduled to begin by the end of 2006 in the timeline we submitted in December 2006.

(2) Monitoring kiosks - At the October meeting with your people, we were given a variety of options regarding the installation of the monitoring kiosk. The results of our testing would determine the acceptability of our choice of design. The monitoring would start in 2007 in accordance with our timeline.

(3) Filtration and UV Treatment - The original Construction Permit specified that these are subject to monitoring the water conditions. As noted earlier, the monitoring equipment is not operational yet. When we met with your people last October, a one-year monitoring period was recommended. We have incorporated that into the timeline that we submitted to you. In the meantime, your water engineer was to supply additional information to our engineer. This was to give us an additional choice of options to consider.”

George went on to say:

“The infrastructure for our new water system is almost complete. The treatment equipment is on site and ready to be installed. The monitoring equipment is on site and ready to be installed. We have followed the engineered plans that allowed us to be issued a Construction Permit. We have invited your representatives to visit Lillooet Lake Estates for an ongoing inspection of our work. No one from Coast Garibaldi Health has been here since last October. Nevertheless, we stand by our offer to provide any of your representatives a tour of our new water system.

We have tried to comply with the original directive from the Minister of Health to work out an outcome-based solution to solve our drinking water problems. We have almost reached our goal. We were even a little ahead of the time line that we sent you.”

On August 27, Dr Paul Martiquet, Medical Health Officer, replied to George’s letter and the following is part of what he had to say:

“We have considered the issues that you have raised and are pleased that our differences seem resolvable. The differences stem from the interpretation of the conditions of the Construction Permit Issued by Don Miller. I see the solution to this as the application for a new construction permit,

complete with equipment treatment works and distribution system specifications, details and drawings. My office would expedite the processing of this application. A new construction permit would also allow you to consider treatment options that may be more suitable to your site scenario.

Provided your Construction Permit application is complete, we anticipate issuance of a new permit within a couple of weeks, which will not significantly delay the project.

Please note that we have no objection to a phase-in progressive treatment approach but please include in the new construction permit application the timelines you anticipate completion. Please ensure your application addresses those items contained in Louise Egan’s letter of June 2, 2005, our meeting of October 27, 2006, and my letter of July 27, 2006.”

Remember that LLE did not have the option of saying “no”. Coast Garibaldi Health regularly reminded us that we must consider the “cost” of saying “no”. That “cost” (substantial fines and jail terms) was not acceptable to any of your **volunteer** Board members:

“Convicted violators are liable to a fine of not more than \$200,000 per offence or \$200,000 per day for each day a continuing offence is continued, or imprisonment for not longer than 12 months, or both fine and imprisonment.”

The important issue was for us to have the time [a year] to operate our new water system with chlorination and do the water testing that we are required to do. We could not prejudice what those test results would be. However, some of the experts that we have consulted believed that chlorination was all the treatment that we needed.

The water levies that most of us have paid included the cost of chlorination. We did this based on the conditions of our original Construction Permit. Since that permit was issued, the **provincial government** has increased the water standards for the entire province. This was not included in our original budget. Coast Garibaldi Health was insisting that we agree to these new requirements.

The Water Committee was reluctant to agree to these requirements until we had an opportunity to sample and test our water for a year. We also wanted an opportunity to obtain cost estimates for this additional water treatment. Then we wanted to present the facts to all the lot owners to give you the opportunity to decide whether you wished to pay for this or not. The Water Committee did NOT want to commit the LLE lot owners to these additional costs. Coast Garibaldi Health said that they would not issue us a new Construction Permit unless we agree to this additional water treatment.



### **Changing Requirements**

While the provincial government continued to increase water treatment standards for the entire the province, they provided only limited funding to a few small water user groups throughout the province. The Water Committee believed that increased standards also require increased funding.

We have also seen that Gold Bridge with an estimated population of 41 received a grant of \$723,333 from the provincial government to upgrade their community water system. Meanwhile, in spite of our best efforts, we were unable to secure any funding for our water system upgrade from any level of government. The reason given was that we are not a local government. To date the Squamish-Lillooet Regional District has been unwilling to apply for any funding on our behalf.

We have great water of exceptional quality from an underground aquifer. We were asking Coast Garibaldi Health to allow us the time to prove this before we were forced to spend needlessly on additional water treatment.

### **Completed Infrastructure**

#### **Spring Catchment**

A concrete catchment structure was installed to collect the spring water as it rises to the surface. The concrete was poured on mineral based ground to prevent the water from contacting any organic material. The concrete was covered with a small wooden structure to keep out any debris and animals. The water was piped from the catchment to a poly tank array.

#### **Spring Tank Farm**

Eight 1500-gallon poly tanks were installed. They were plumbed to four strings of two tanks with an ingress and egress manifold system. The water is continually flowing through the tanks and the water that is not used is diverted back to the creek channel. Each tank string can be isolated for cleaning and maintenance using ball and gate valves. The water from the tanks enters the treatment building through a 4" PVC pipe.

#### **Treatment Building**

As water enters the building, it passes through a flow meter. This records the dynamic usage and a totalizer records the overall usage. A turbidity analyzer then samples the water and tests the water for clarity. To-date our water has tested for turbidity well below the target of 1 NTU, in fact the results have been .1 NTU which indicate that the level is below the ability of the equipment to detect any turbidity. Once the chlorination equipment is installed, the flow meter will control the amount of chlorine required to be injected into the pipeline via a boss located on an inline agitator. The water enters another

poly tank. This is designated as a mixing tank, where the water is ensured enough contact time for the chlorine to work.

#### **Treatment Building Power**

A micro-hydro system was installed to provide power for the control and monitoring equipment in the treatment building. Almost a thousand feet of 4" PVC piping was trenched into the hillside to provide an intake off of McCulloch Creek. This feeds into a small turbine, where once the kinetic energy is spent powering the unit, the water is replaced back into the reservoir behind Louis' dam on McCulloch Creek. This pipeline is also our backup reserve for fire suppression should the spring not be able to keep up to the demand. This source is also our contingency plan for our drinking water should something happen to our spring source.

#### **Water Mains**

From the spring source above Gate 1, a new pipeline was laid in the ground passing under the forestry road. It was connected into the existing system on the upper roadway in Gate 1 to the existing piping under McCulloch Creek. A new pipeline was installed around the HJD properties, as the original piping cut through the HJD lands. A Tee was installed on the hydro right-of-way to feed the Gate 2 pumping station and the new piping carried on down the Gate 4 roadway and tied into the existing main where the road branches. These water mains are 6" Blue Brute or C900 piping. This is standard AWWA approved municipal piping.

#### **Lot 93 Pumping Station**

The structure you pass as you enter Gate 2 is the pump house that contains all the equipment necessary to provide water to the lots above the forestry road. This was one of our biggest challenges of the project. We needed to move water from this location and elevate it 425 feet through 1 kilometre of piping. Our engineer, Rob Arden, and Engineered Pumps of Coquitlam designed the pump and piping requirements. The Water Committee conceptualized the design of the building, equipment layout, controls, power, and landscaping.

The building is a two-storey structure with a concrete basement housing a 2500-gallon tank in one compartment and a Kubota diesel generator in the other compartment. The upper floor contains all the control equipment and access to the pump tank. The pump tank is a food-grade fibreglass unit housing two 5hp well pumps. The pumps are connected to a 2.5" force main that delivers water to another tank array at the top of the development.

#### **Upper Tank Array**

Again we have eight 1500 gallon poly tanks tied together similarly to the lower tank structure. Once the water is



pumped up, it is now gravity fed to all the lots above the forestry road. We have deployed a pressure transducer in the tanks to signal the exact level to a radio-controlled device that is solar powered. This low power radio is programmed to provide telemetered information to a bi-directional radio in the pump house. This data is then fed into a PLC (Programmable Logic Controller), which provides the processing and control of the diesel generator starting, pump source determination and starting, as well as alarm controls. The PLC has a 'Real Time Clock' and we have deployed this mechanism to control time of day pumping. We currently do not pump between midnight and 8am.

### **Vancouver Coastal Health and Lillooet Lake Estates Meet – February 13, 2009**

The action items arising from that meeting:

1. VCH requested that all of the waterworks in contained on property owned by Lillooet Lake Estates Ltd and/or easements/right-of-ways registered on title. VCH will NOT issue a new construction permit until this legal access is confirmed.
2. LLE must advise owners if they own one of the few lots that have low pressure (requiring a booster pump) or high pressure (requiring a pressure reducing valve).
3. LLE must provide a letter to VCH describing the limitations of the water supply system which is designed to supply water for health and sanitation purposes only (indoor domestic use) and other uses such as irrigation and fire flows are not contemplated in the design. LLE would make additional water available for emergency fire fighting; however, operational procedures need to be in place to safeguard the potable water supply to the lots.
4. The water system was not designed to provide fire flows. If the water supply system is used for fire fighting, a Boil Water Notice must be immediately issued. A separate procedure must also be prepared for the Operations & Maintenance (O&M) Manual that outlines the procedures needed to disinfect the reservoirs, and distribution system in accordance with AWWA guidelines, and testing required before the Boil Water Notice can be lifted.
5. Regular flow rate measurements to determine any seasonal (or other fluctuations) is needed.
6. Additional water quality analyses for bacteriological, chemical, and physical parameters from the testing laboratory are required.
7. LLE' engineer will submit a report on the design capabilities of the system to provide water to the upper lots on a regular basis.

8. The turbidity meter and chlorination equipment, if installed, may be operated. [Note that this equipment is on site but not installed yet.]
9. The Operation and Maintenance Manual must contain instructions for cleaning the reservoir tanks, and for draining and cleaning the pump station.
10. VCH would review the existing works for general conformance with public health engineering guidelines and industry standards/guidelines. The objective is to reach a point where the Issuing Official could recommend to the Drinking Water Officer that consideration could be given to issuing an Operating Permit for the existing works. The issuance of the operation permit is at the discretion of the Drinking Water Official and would be subject to terms and conditions.

### **VCH Deals With Complaints**

VCH continued to hear from the Developer that LLE water mains were trespassing on his land. LLE's lawyer sent a series of documents to him for his signature to resolve this, as required by VCH, but the Developer refused to sign the documents.

VCH also had a complaint from an LLE lot owner that the interconnects at Cataline Creek and McCulloch Creek that would be used to supplement the water supply in the event of a fire emergency would compromise the water quality.

Based on these two complaints, on May 1, 2009, VCH ordered an independent study of the waterworks system to be completed by another engineering firm.

### **Current Status**

We await the final report on the waterworks system from the engineering firm. Then we will see what "next steps" are required by VCH.

Until tertiary water treatment is installed and fully operational, the Boil Water Notice remains in place.

### **Boil Water Advisory Continues**

Lillooet Lake Estates remains under a boil water advisory that has been issued by Coast Garibaldi Health Services. Water taken from the Lillooet Lake Estates water system should be boiled before drinking it since it does not meet current provincial drinking water standards. Lot owners are responsible for informing their family members and guests of this fact.