

# Welcome to the Calais Water Department



## Water Source Education

City of Calais Water Department welcomes you and hope your visit is pleasant and informative. Our priority here at the Water Department is to filter any and all impurities in the water we pump to your home. Iron and Manganese are natural in these two wells. The first well is very high in Iron sediment and the second well beyond the railroad is high in manganese. Both these elements must be eliminated from the drinking water therefore we have to filter them out.

### Filter plant process

Water is very expensive to treat and to distribute to you the customers. Treated water is water that has been pumped out of the ground through two wells which we call raw water. The raw water is then filtered to remove Iron and Manganese. The two large vessels operated by programmable controllers are sand filled filters. Three types of sand make up of the filter to remove both Iron and Manganese.

The water is treated with a **polymer** to help collect the iron so it can be backwashed out of the filter. We pump **Chlorine** to the filter proportionally to the flow of water to disinfect and kill bacteria as well as help in the removal of iron and manganese. After the water has been successfully filtered we add a **poly phosphate** solution to help coat the water pipes to stop the lead solder or any faucets containing any lead from dissolving into your drinking water and too ensure that the water is safe to drink.

### Process control Testing

We sample the water at both, before and after filtration, usually three times a week for quality control. The Iron test before filtration usually measures an average of 1.47mg/l and after filtration an average of 0.04 or less. The MCL (**Maximum Contamination Level**) for iron should be less than or equal to 0.30 mg/l. The Manganese before filtration measures an average of 0.45mg/l and the filtered water measures 0.0 mg/l. The MCL for manganese should be less than or equal to 0.05 mg/l. We monitor the chlorine that we pump into the filter and the chlorine that is a residual which is sent out with the filtered water. Chlorine is fed proportionally to the flow of water that runs through the filters. The raw water (non-filtered) will measure an average of 2.9 mg/l to disinfect and the filtered water will average a residual of 1.54 mg/l to be distributed to the City. We also monitor the pH of the raw water and the filtered water. The Raw water has an average pH of 7.35 and the filtered water will have an average pH of 7.21 which indicates that our water is very close to neutral. Water with a pH less than 7.0 is said to be acidic and a water with a pH higher than 7 is said to be alkaline. Pure water has a pH very close to 7. In general, corrosion is the results of low pH. A low pH will indicate the water has an acidic nature which can be corrosive to the piping system. Not only do we monitor the water parameters but we also provide customers with a yearly **consumer confident report** to inform you the customer of our sampling and testing requirement to be in compliance with the Maine Drinking Water Program. We assure you that everything possible to eliminate contaminants has been done to provide you with clean potable (drinking) water.

## **The Scada system**

The scada system is computer base software that helps us to control various functions of the filter system. It has a wide range of monitoring features that sets of alarms if it detects any malfunction with the reservoir and the filters. It allows us to monitor remote places both the reservoir and the filter plant. We can monitor flow in gal per min or chlorine residual that is pumped to the water and monitor a trend to trouble shoot total flow at a given time. The scada also allows us to change settings that control the start and stopping of the filter process.

## **Distribution System**

### **Meters**

The next step is to deliver the water to your home through underground pipes in the streets. To maintain the pipes also is expensive. This is why we have meters ;( Watch the video) <http://sensus.com/web/usca/water/product-line/residential-water-metrology/product/iperl-usnovative> magnetic technology allows for the capture of previously unmeasured low flow. These meters are very accurate and reliable and will determine what your home uses so we can charge the customer a fee for the amount of water they use. Every 90 days we will read your house meter and this will generate a bill for water used. It is the City's policy that we provide a home with a meter and it is the responsibility of the home owner to protect the meter from any damage such as freezing. If the meter becomes damaged due to conditions other than natural cause, the meter will be charged to the home owner or tenant.

### **Street pipes (Water Mains)**

The street pipes are sort of a highway for water to flow, it flows from the wells to the filter plant then to the reservoir which is a large holding tank of 1 million, 500 thousand gallons and finally to every home or business in Calais. To maintain these streets however involves flushing the hydrants to clear the pipes from Iron Sediment that has collected on the walls of the pipe. This is expensive as this water is treated water that is wasted of flush to the ground. Also repairs to water main pipes that break and leak involve digging up the mains after shutting off the water to the area of the leak, repair the pipe and bury the hole, than pave the road where the hole was.

## **Gate Box Street shut-offs**

Street Gates are used to shut off a section of the streets from water. Their main function is to isolate an area that must be shut off for emergency such as a water main break. Those gates need to be exercised annually to maintain their use in good working order.

## **Leak detection**

When we have a suspicion that we are losing water, from monitoring the scada we start by listening on every hydrant in separate areas at a time. The electronic ear device can pinpoint the area of a leak. It amplifies the hissing water sound from 10 feet deep as if it was in front of you. The sound can get louder as you near the exact area of the leak.

## **Water Main Tracing**

The tracing device can trace any metal object underground by inductance. We use this device to trace our water lines. Tracing our water lines is helpful for a contractor who has to dig close to our water lines. This helps them avoid damaging our underground water lines.