WELCOME TO THE

Gantahaz Water Treatment Facility

OPEN HOUSE

L&M ENGINEERING LIMITED

MACKENZIE BRITISH COLUMBIA

WELCOME TO THE

GANTAHAZ WATER TREATMENT FACILITY

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We are here today to:

1. Provide you with an overview of the Gantahaz Water Treatment Facility project.
2. Collect additional information from residents about the current water distribution system in the Gantahaz Subdivision.
3. Listen to your concerns and answer any questions that you may have.

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Why do we need this project?

- The Project is to design and install a Potable Water Treatment Facility to address issues of iron and manganese in the source water and establish residual chlorination in the water distribution system.

- Due to recent changes to the guidelines for drinking water quality from Health Canada, the water in the Gantahaz subdivision no longer meets the requirements outlined in the Canadian Drinking Water Guidelines.

- **The Northern Health Authority has directed the District of Mackenzie to address the issue.**

- Historical and current chemical analysis of the Gantahaz source water shows that levels of manganese and iron are nearly three times higher than the maximum acceptable concentration.

- Manganese may be harmful to health, especially in children. Both manganese and iron cause discoloration of water, making it look dirty.

How is this project organized and managed?

- This is a Design-Build project. The Prime Contractor, Canadian Western Mechanical (CWM) is responsible for the design and construction of the facility.

- True Consulting is the Engineer of Record and sub-consultant to CWM.

- L&M Engineering Limited is the District of Mackenzie's representative. **L&M is not the Engineer for this Project.** L&M's role in this Project is to ensure quality and represent the District and your interests.

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How does the treatment process work?

The proposed concept for the treatment process is generally described as follows:

- Groundwater is pumped from the aquafer and piped to the treatment facility.
- An initial pre-filtration process removes background turbidity.
- The water enters the primary filtration units. Within the primary units, an oxidizing process causes the iron and manganese to precipitate out of solution and become insoluble. The insoluble particles are filtered out by a filtration media (Filox-R Filtration Media).
- After leaving primary filtration, the water passes through a final 5-micron polishing filtration process.
- The water then undergoes residual chlorine injection to achieve a target residual level of 0.2 mg/L.
- The treatment facility periodically will perform a backwash operation to clean the filtration systems. Untreated water is pumped through the filters and directed to a ground infiltration disposal system.
- Periodically, depending on water usage rates, the filter media in the three filtration processes needs to be changed.

Are there any other options for treating the water?

- Standard methods for iron and manganese removal are:
  - Reverse Osmosis filtration processes (R.O.).
  - Ion exchange process (as found in typical home water softeners).
  - Oxidation Filtration processes (chosen process).

- Oxidization Filtration systems best serve a facility of this size.

- The benefits of Oxidization Filtration are simplicity of operations, reduced maintenance complexity, lower operating costs and reduced initial investment.

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Have any other similar systems been installed elsewhere, and what was their experience?

- Generally, Oxidation Filtration processes are widely used and are established, proven water treatment methods.
- Specifically, the proposed Filox Oxidization/Filtration treatment system was installed last year for BC Parks in their large Mount Robson Campground communities.
- This BC Parks project had very similar variables for size and water chemistry.
- L&M Engineering oversaw the BC Parks project and confirmed to the District that this treatment process worked as required.

What is the timeline for the Project?

- Design of the system in the summer of 2024.
- Construction of the facility through the Fall and Winter 2024.
- Commissioning in the Spring of 2025.

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What are the allowable chemical concentrations in drinking water?

- The Canadian Drinking Water Standards and the Northern Health Authority define Maximum Allowable Concentrations (MAC) of chemicals in potable water. The standard also defines an Aesthetic Objective (AO).
- This Project is generally concerned with treatment to achieve compliance with the following chemical concentrations:
  - Total Iron: AO: 0.3 mg
  - Total Manganese MAC: ≤ 0.12 mg/L / AO: 0.02mg/L

Will this Project deal with the subdivision's cloudy water issues?

- Manganese and iron are sources of cloudiness in untreated water.
  - Manganese and iron in untreated water naturally deposit in mains, service lines and home plumbing.
  - Changes to water usage and pressures in the water system mobilize this deposition and cause it to enter the homes.
  - The District flushes the lines to reduce this potential, but that has limited effectiveness.
  - Manganese and iron turbidity ranges in colour from red to brown to black.
- This Project only addresses turbidity caused by the source water, not other potential sources of turbidity.
- Other sources of turbidity may exist in the subdivision. For example, it can be caused by water main breaks or leakage. Turbidity can also be caused by certain pipe materials used in home plumbing.
- Manganese and iron deposits are already in the water mains and will remain following the completion of the Project.
- This existing build up of material may continue to mobilize after the treatment facility is completed. This will reduce with time.
- The District will perform additional flushing of the mains to reduce this potential.

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Will this Project help with my water pressure?

- This Project only addresses the treatment of the source water.
- Water pressures will remain as they are now.

Will any water lines be replaced?

- This Project only addresses the treatment of the source water.
- This Project will not replace water distribution or service lines.

Why is this Project not fixing the other problems with the system?

- The treatment facility project must maintain a specific scope per the terms of the funding agreements in place with federal and provincial agencies.
- L&M Engineering is completing a separate, parallel project to evaluate the condition of the distribution system.

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What will the water be like following the completion of the facility?

- Some people may notice the taste of the residual chlorine in the water, however opinions on the water aesthetics can be subjective.

- Chlorine taste and smell in the water may vary due to the following anticipated variables:
  - Personal preference and subjective taste.
  - Taste and smell may only occur initially, while the chlorine dosage system is calibrated.
  - During times of non-typical usage or heavy demands on the system.
  - Proximity to the treatment facility.

- Some people may notice a subtle change in the "taste" of the water.
  - Removing metals from the source water also removes elements that contribute to the taste of the water.
  - For example, the iron that the treatment facility will remove from the water can provide a subtle flavour profile that residents are currently used to.
  - Again, the taste of water can be subjective. However, most people will likely describe the treated water as having "less taste".

- With their more sensitive sense of smell, some animals and pets may need to adjust to the residual chlorine smell in their water and may initially reject it. Leaving water out for a few hours will let the chlorine naturally dissipate.