

Wastewater Treatment Protects Shuswap Lake!

Facts about the Water Pollution Control Centre (WPCC)

- The Water Pollution Control Centre is one of the most advanced facilities in BC, providing high quality tertiary wastewater treatment before discharging to Shuswap Lake.
- The process involves primary, secondary and tertiary treatment using a biological nutrient removal (BNR) process to produce an excellent quality effluent.
- Removes 97-99% of solids, organic material and phosphorus.



- The plant also incorporates a state-of-the-art foul air, four-stage chemical scrubber; aerobic digestion; disk filtration and standby generator.
- Produces 'Class A' biosolids.
- Originally built in 1977 for 6,250 people. Has had upgrades in 1987, 1998 and 2004 to increase capacity and treatment level.



YEAR BUILT

1977



RESIDENTS SERVED

15,000



VOLUME OF
WASTEWATER
TREATED PER DAY

5,000,000 LITRES

Why do we need to upgrade the WPCC?

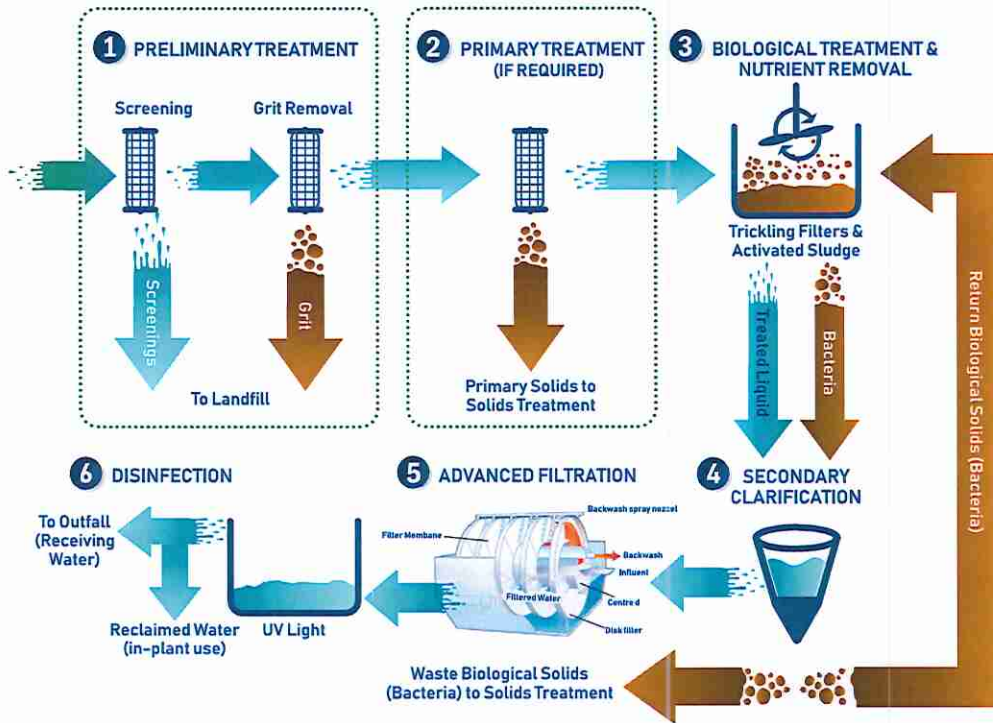
- The wastewater treatment plant will need to be upgraded within the next 5-10 years to meet the needs of a growing population.
- A decision needs to be made on whether to continue investing in the existing WPCC site and infrastructure or relocate the plant at a new site.



Here are a few things that are important to consider when assessing new sites for wastewater infrastructure:

- There is a moratorium on new outfall discharges into Shuswap Lake so any new system has to discharge treated effluent into the existing outfall. Permitting a new outfall into the Lake would not be feasible.
- Zoning and property ownership will affect the viability of new sites. The Agricultural Land Reserve is prioritized for farming, and non-agricultural uses are typically restricted.
- Wastewater would be collected and conveyed to a new WPCC site via the Wharf Street Pump Station location. This will require either upgrades or a replacement of the pump station at this location, and a pipe to the new site.
- Any new site must have sufficient space for use in the long-term, estimated to be a minimum of 1.5 ha to 2.0 ha (50 to 100 year site life).
- Proximity to residential and commercial areas must be considered for odour risk and visual aesthetics.
- Elevation of new site relative to existing WPCC is important to understand long-term pumping costs.
- Impact on riparian areas or other sensitive environmental areas.
- Site elevation must be above 200 year flood plain elevation (351 m) or facilities will require floodproofing.
- Truck traffic to and from the WPCC site for biosolids transport and construction impacts.
- Cost impacts include land purchase and extent of modification to conveyance and wastewater infrastructure.

How is Wastewater Treated?



1 PRELIMINARY TREATMENT
Removes coarse solids (rock, rags, plastics, etc.) and grit (sand and gravel) which are normally sent to landfill.

2 PRIMARY TREATMENT
Removes fecal solids by gravity settling, which are sent to the solids treatment processes

3 BIOLOGICAL (SECONDARY) TREATMENT & NUTRIENT REMOVAL
Removes organic substances and nutrients such as phosphorus by using bacteria to convert degradable organic matter into bacterial cells. Typically removes up to ~90% of organic substances.

4 SECONDARY CLARIFICATION
Separates the treated liquid from the bacterial cells grown in Step 3 by gravity settling. Some bacteria may be returned to Step 3, and the rest are sent to solids treatment with the primary solids.

5 ADVANCED FILTRATION
Polishing step to remove remaining solids in the wastewater. Typically removes up to 97% of organic substances.

6 DISINFECTION
Kills or disables disease causing organisms and viruses in the treated wastewater.

Concerned about Odour?

We get it, we don't like the smell either!

New wastewater treatment infrastructure can be designed with fully enclosed comprehensive odour control that treats odourous air streams through carbon or chemical scrubbers before release to the atmosphere. These are proven methods of odour control that are successful and reduce hydrogen sulphide concentrations in the air stream by over 99%.

Design options to reduce odour include:

- Enclosing smelly processes like screening and solids treatment.
- Covering primary and biological treatment process tanks.
- Using carbon and chemical scrubbers to treat the air before release to the atmosphere.

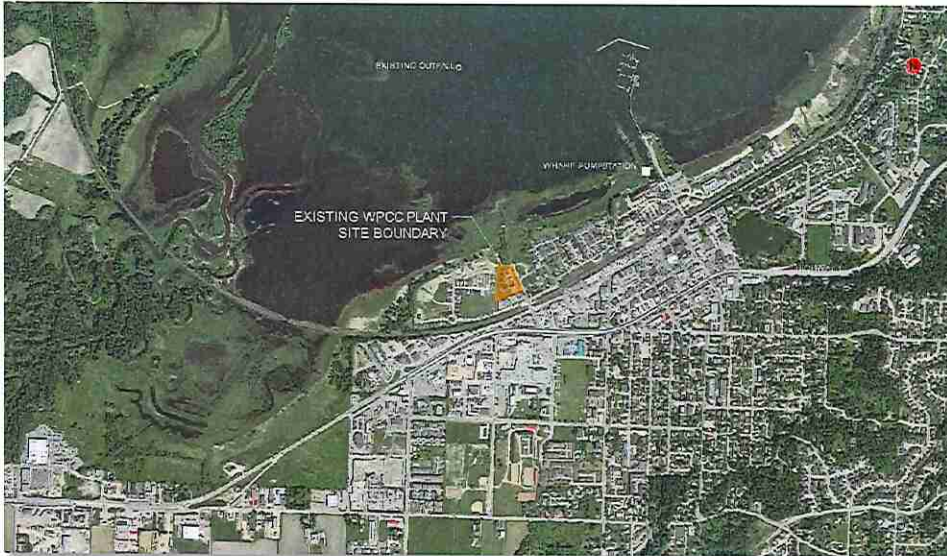


Covers on Primary Tanks help contain foul air



Foul air extraction and odour scrubbers can significantly reduce odour release to the atmosphere

Site Option 1 – Existing WPCC



THE FACTS

- Site area is 1 ha
- Site elevation is 348–353 m
- Distance to nearest resident is 70 m
- Distance to nearest commercial neighbour is 30 m
- Distance to downtown is 450 m
- Length of new conveyance piping required: 0 m

PROS

- Continued use of the existing equipment and facilities.
- Modifications to the conveyance infrastructure are not required.
- Existing outfall can be used without additional pumping.
- Minimum construction works within city.
- Good access to the site from Lakeshore Drive.
- Lower capital and operating costs relative to other site options.
- Opportunity to redesign area to accommodate parking/trailhead for park and future waterfront trail and increase park/buffer space.

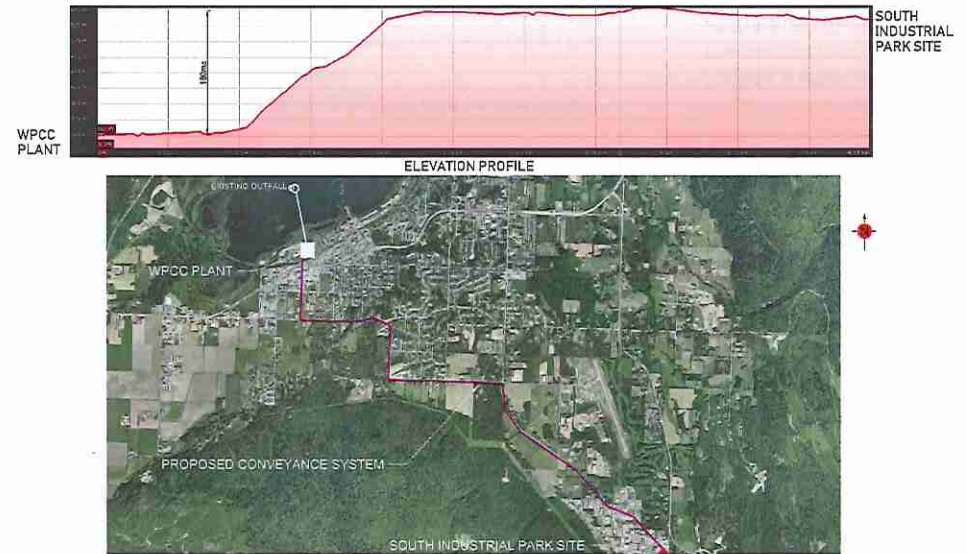
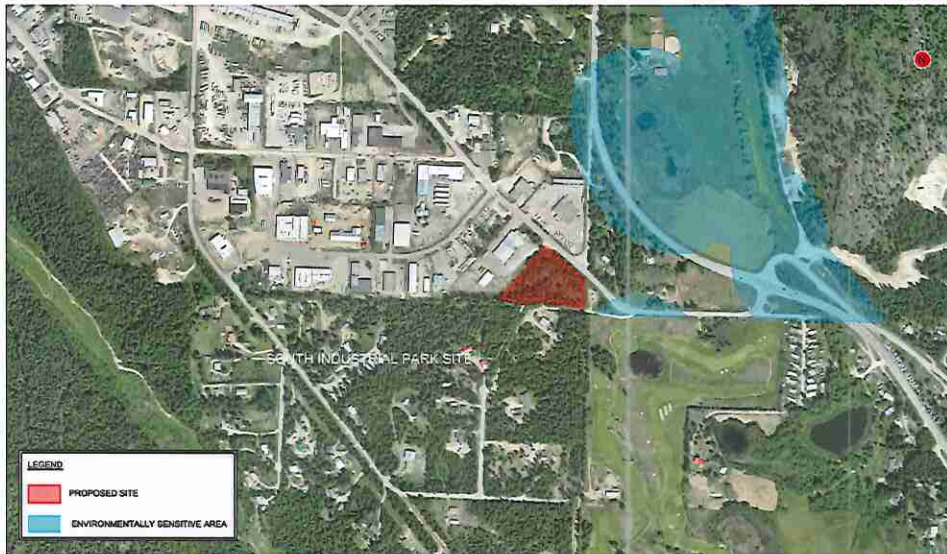
CONS

- Close to residential and commercial development.
- Route to the landfill goes through the residential area on the east part of the City.
- The site elevation is 1–3 metres below the 200-year flood elevation. Flood proofing of upgraded facilities is required.

RISKS

- Ongoing concerns of having a wastewater treatment facility close to the downtown core.
- Odour risks of wastewater treatment exist, but can be managed with enclosure of facilities.

Site Option 2 – South Industrial Park



THE FACTS

- Site area is 1.2 ha
- Site elevation is 530 m
- +180 m in elevation from existing WPCC
- Distance to nearest resident is 75 m
- Distance to downtown is 6.2 km
- Length of new conveyance piping required: 8.3 km

PROS

- Industrial zone area, minimal impact on residential areas.
- Good site access for new WWTP.
- City-owned land.
- Close to the landfill for biosolids trucking, only 3.6 km away.
- No flood risk.
- No impact on riparian areas.

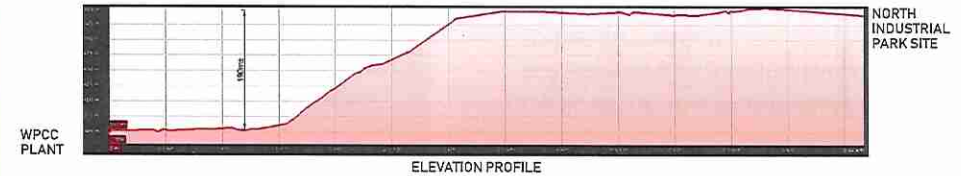
CONS

- Greenfield WWTP required, no reuse of existing treatment infrastructure.
- New conveyance infrastructure is required.
- +180 m site elevation will incur additional pumping costs.
- Site has a limited area and may not be large enough for long-term future expansion.
- Topographical site constraints.
- Possible site remediation due to old landfill location.

RISKS

- Small site will restrict process options.
- Significant new infrastructure will be expensive with high conveyance construction risk.

Site Option 3 – North Industrial Park



THE FACTS

- Site area is 5.7 ha
- Site elevation is 540 m
- Distance to nearest resident is 400 m
- Distance to downtown is 4.5 km
- Length of new conveyance piping required: 6.7 km

PROS

- Industrial zone location with minimal impacts on residential areas.
- City-owned land with enough space for future expansion.
- Lower odour risk.
- Close to the landfill for biosolids trucking, only 300 m away.
- No flood risk.
- No impact on riparian areas.

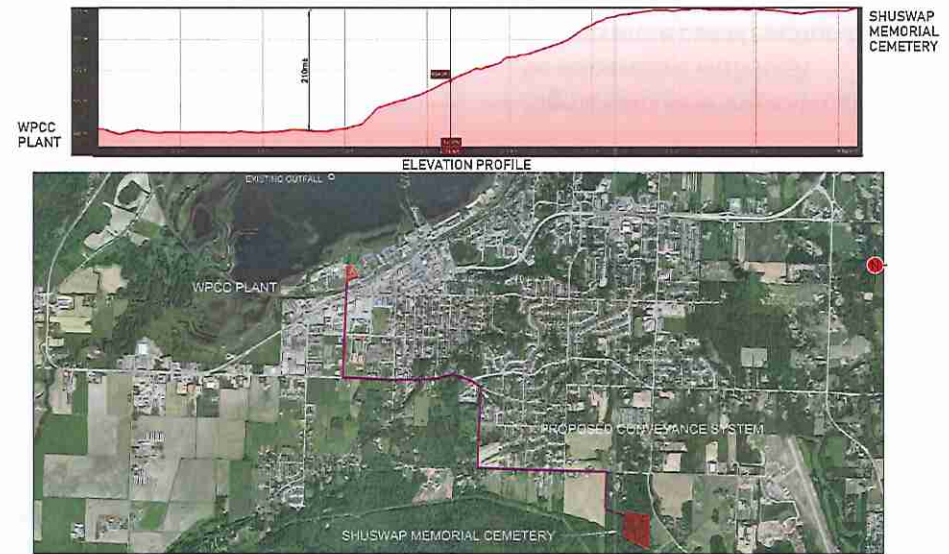
CONS

- Greenfield WWTP required, no reuse of existing treatment infrastructure.
- New conveyance infrastructure is required.
- +190 m site elevation will incur additional pumping costs.

RISKS

- Significant new infrastructure will be expensive with high conveyance construction risk.

Site Option 4 – Shuswap Memorial Cemetery



THE FACTS

- Site area is 8.7 ha
- Site elevation is 560 m
- Distance to nearest resident is 300 m
- Distance to downtown is 2.9 km
- Length of new conveyance piping required: ~5.0 km

PROS

- Minimum impact on residential areas.
- Convenient site access.
- No flood risk.
- Enough space for future expansion.
- City-owned land, no need to purchase.
- No impact on riparian areas.
- Potential for large treed buffer minimizing visual and odour impacts.

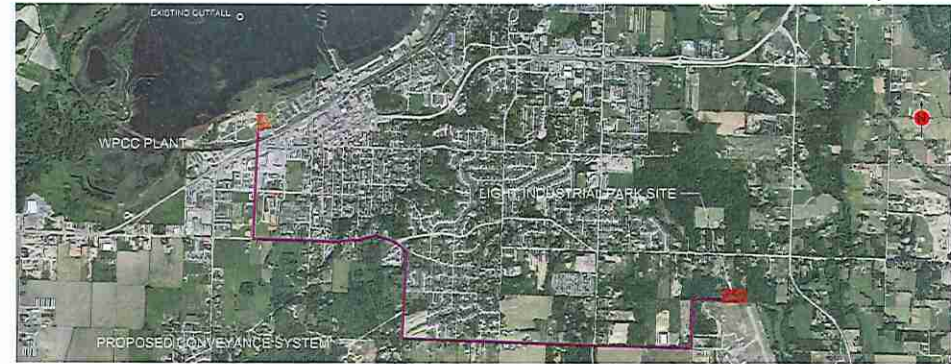
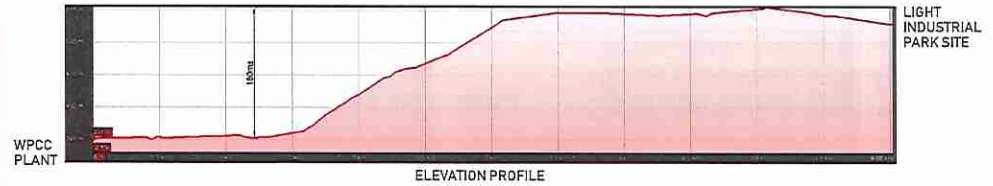
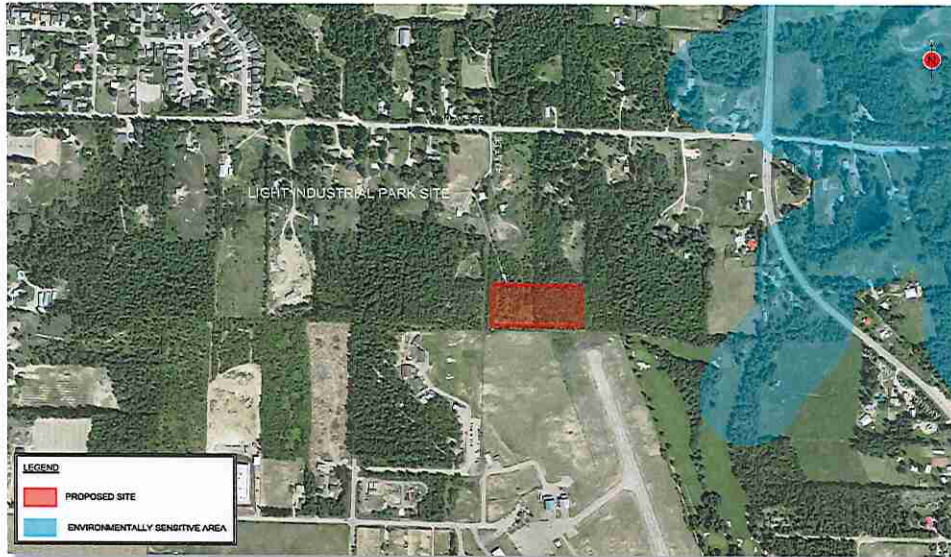
CONS

- Greenfield WWTP required, no reuse of existing treatment infrastructure.
- New conveyance infrastructure is required.
- +210 m site elevation will incur additional pumping costs.
- Borders the Cemetery.
- ALC approval required.

RISKS

- Opposition to a wastewater treatment plant being located next to the cemetery.
- Significant new infrastructure will be expensive with high conveyance construction risk.

Site Option 5 – Light Industrial Park



THE FACTS

- Site area is 1.5 ha
- Site elevation is 530 m
- Distance to nearest resident is 70 m
- Distance to downtown is 3.6 km
- Length of new conveyance piping required: ~6.0 km

PROS

- Industrial zone location.
- Close to landfill for transporting biosolids.
- No flood risk.
- City-owned land, but some additional property would have to be purchased.
- Minimum impact on environmentally sensitive areas.

CONS

- Greenfield WWTP required, no reuse of existing treatment infrastructure.
- Site elevation (+180m) will incur additional pumping costs.
- New conveyance infrastructure is required. 2/3 of the new conveyance system goes through an area with significant existing infrastructure.

RISKS

- Significant new infrastructure will be expensive with high conveyance construction risk.
- In the Agricultural Land Reserve which would require rezoning.
- ALC approval required (pre-approval has been granted to industrial zoning).

Site Option 6 – Minion Field



THE FACTS

- Site area is 30 ha
- Site elevation is 353 m
- Distance to nearest resident is 300-500 m
- Distance to downtown is 3.3 km
- Length of new conveyance piping required: ~3.5 km

PROS

- This site does not require significant routing of conveyance infrastructure through residential areas.
- Convenient access to the site.
- The location is relatively remote from residential areas reducing odour risks.
- Minimal extra pumping costs due to site elevation being similar to existing.
- Minimum impact on citizens during the construction period.
- City-owned land, no purchasing required.

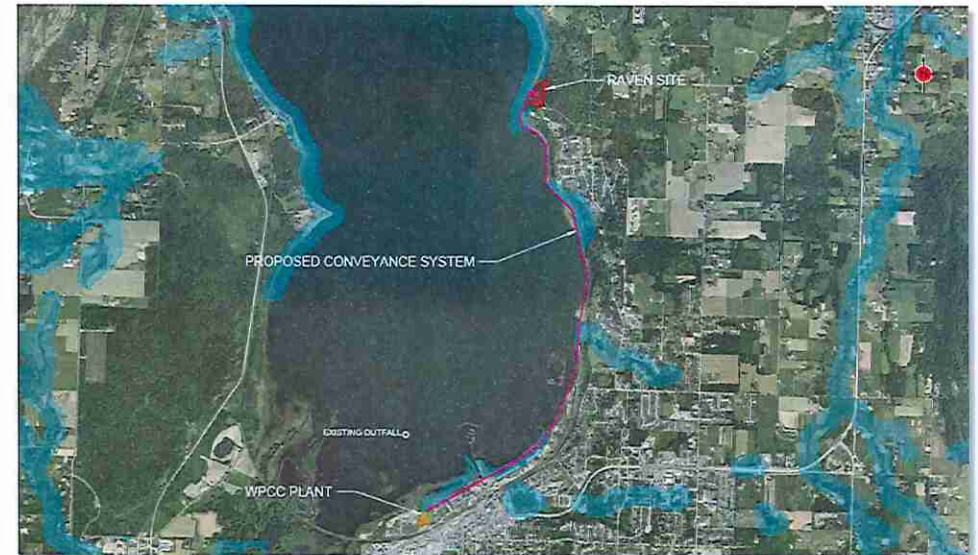
CONS

- Greenfield WWTP required, no reuse of existing treatment infrastructure.
- New conveyance infrastructure required for influent and effluent lines.
- Truck route to the landfill goes through the city.
- Treated effluent would need to be pumped to the existing outfall (two-way pumping).
- Located in floodplain.

RISKS

- Significant new infrastructure will be expensive with high conveyance construction risk.
- In the Agricultural Land Reserve which would require rezoning.
- Rezoning ALR land may be controversial.

Site Option 7 - Raven



THE FACTS

- Site area is 3 ha
- Site elevation is 360–390 m
- Distance to nearest resident is 300–500 m
- Distance to downtown is 3.3 km
- Length of new conveyance piping required: ~3.5 km

PROS

- This site does not require significant routing of conveyance infrastructure through residential areas.
- No flood risk.
- Relatively remote from residential areas reducing odour risks.
- Minimal extra pumping costs due to site elevation being similar to existing.
- Treated effluent conveyed to the outfall by gravity.
- Minimum impact on citizens during construction.
- City-owned land.

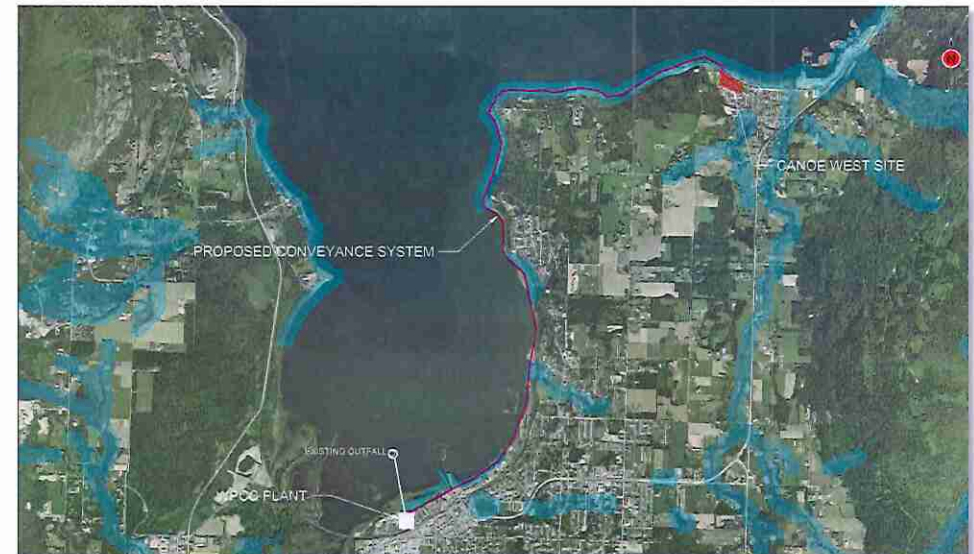
CONS

- Limited site access.
- Steep site, difficult construction.
- Some impact on riparian areas due to new conveyance system required along the lakeshore.
- Greenfield WWTP required, no reuse of existing treatment infrastructure.
- New conveyance infrastructure required for influent and effluent lines.

RISKS

- Significant new infrastructure will be expensive with high conveyance construction risk.
- In the Acreage Land Reserve which would require rezoning.
- Rezoning land may be controversial.

Site Option 8 – Canoe West



THE FACTS

- Site area is 3 ha
- Site elevation is 355 m
- Distance to nearest resident is 20 m
- Distance to downtown is 6.9 km
- Length of new conveyance piping required: ~10 km

PROS

- This site does not require significant routing of conveyance infrastructure through residential areas.
- Minimal extra pumping costs due to site elevation being similar to existing.
- Minimal flood risk for this site.
- Minimum impact on citizens during the construction period.

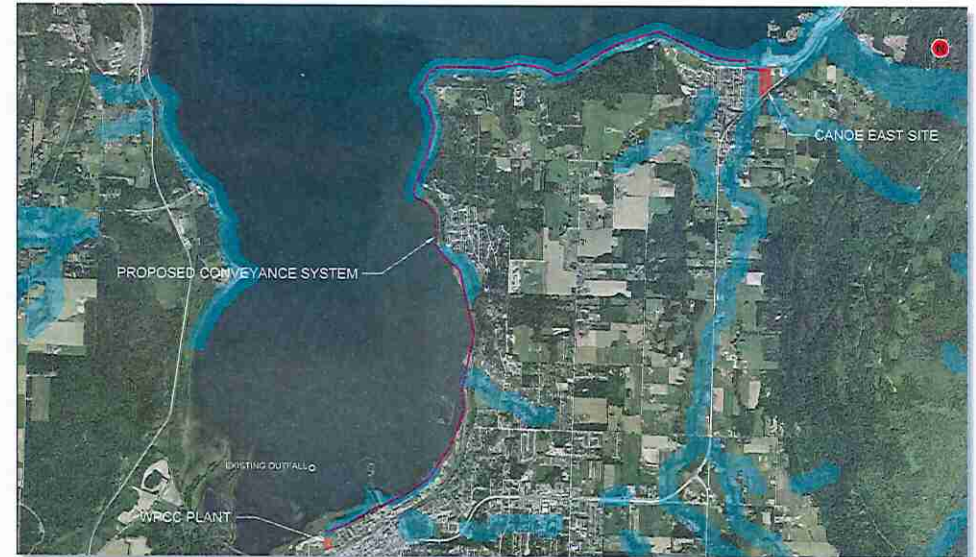
CONS

- Greenfield WWTP required, no reuse of existing treatment infrastructure.
- Reconfiguration of conveyance infrastructure required for influent and effluent lines.
- Impact on riparian areas: new conveyance system along the lakeshore.
- Truck route to the landfill goes through the city.
- Treated effluent would need to be pumped to the existing outfall (two-way pumping).
- Adjacent to existing residential development.

RISKS

- Significant new infrastructure will be expensive with high conveyance construction risk.
- In the Agricultural Land Reserve which would require rezoning.
- Pipeline construction along the lakeshore impacts riparian area and will require additional management.

Site Option 9 – Canoe East



THE FACTS

- Site area is 2.6 ha
- Site elevation is 355 m
- Distance to nearest resident is 20-70 m
- Distance to downtown is 7.2 km
- Length of new conveyance piping required: ~11 km

PROS

- This site does not require significant routing of conveyance infrastructure through residential areas.
- The location is relatively remote from residential areas reducing odour risks.
- Minimal extra pumping costs due to site elevation being similar to existing.
- Minimal flood risk for this site.
- Minimum impact on citizens during the construction period.

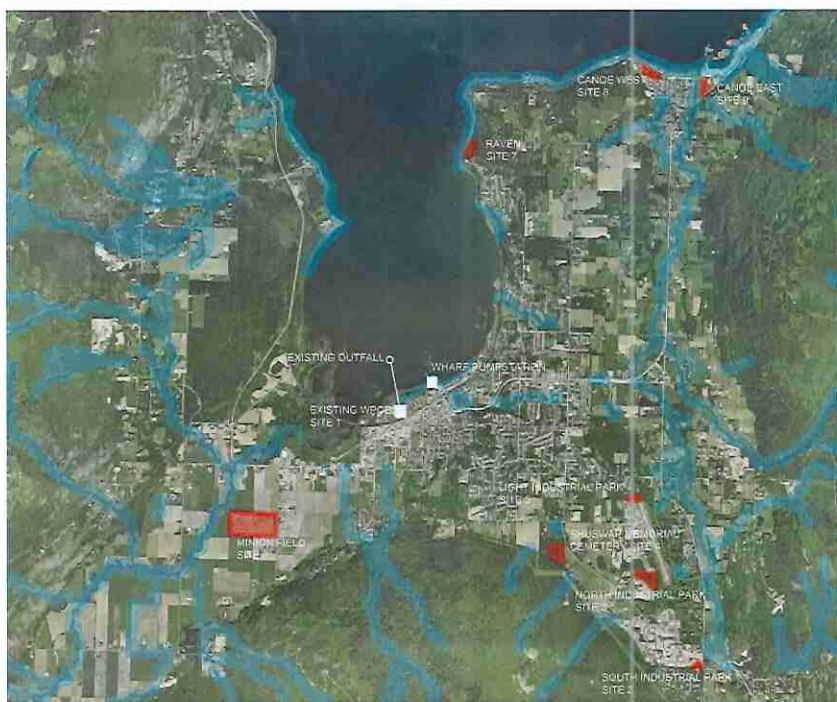
CONS

- Greenfield WWTP required, no reuse of existing treatment infrastructure.
- Reconfiguration of conveyance infrastructure required for influent and effluent lines.
- Some impact on riparian areas: new conveyance system along the lakeshore in the flooded soil.
- Treated effluent would need to be pumped to the existing outfall (two-way pumping).
- Truck route to the landfill goes through the city.
- Requires land purchase.

RISKS

- Significant new infrastructure will be expensive with high conveyance construction risk.
- In the Agricultural Land Reserve which would require rezoning.
- Pipeline construction along the lakeshore impacts riparian area and will require additional management.

SUMMARY OF SITE OPTIONS



	\$	🍃	👥	🔧	❓
Site 1 EXISTING WPCP	\$	🍃	👥	🔧	❓
Site 2 SOUTH INDUSTRIAL PARK	\$	🍃	👥	🔧	❓
Site 3 NORTH INDUSTRIAL PARK	\$	🍃	👥	🔧	❓
Site 4 SHUSWAP CEMETERY	\$	🍃	👥	🔧	❓
Site 5 LIGHT INDUSTRIAL PARK	\$	🍃	👥	🔧	❓
Site 6 MINION FIELD	\$	🍃	👥	🔧	❓
Site 7 RAVEN	\$	🍂	👥	🔧	❓
Site 8 CANOE WEST	\$	🍃	👥	🔧	❓
Site 9 CANOE EAST	\$	🍃	👥	🔧	❓

LEGEND: 🟢 Low Risk 🟡 Medium Risk 🔴 High Risk