

MVLWB

Operation and Maintenance Plan Templates for Municipal Water Licences: Water Treatment Plant

Plan prepared:



Mackenzie Valley Land and Water Board

Template updated: March 2018

**Operation & Maintenance Plan Templates for Municipal Water Licences: Water Treatment Plant
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Operation & Maintenance Plan Templates for Municipal Water Licences: Water Treatment Plant

If you have any questions about this document, please contact your regional Manager of Community Infrastructure Planning.

1. Site Description

Date this plan was prepared:

Where is the Water Treatment Plant (WTP) located?

Community:

Latitude:

Longitude:

Which coordinate system was used for these coordinates?

Decimal Degrees

Degrees, Decimal Minutes

Universal Transverse Mercator (UTM)

Location Map Attached

Map to include drawing scale, north arrow, and site access/roads.

Date of Commissioning of WTP: yyyy/mm/dd (if date is unknown, estimate year)

2. WTP Staff

Provide the name, contact information, and role for each staff member.

Name Phone Email

Role/Responsibilities

Name Phone Email

Role/Responsibilities

Name	Phone	Email
Role/Responsibilities		

3. Security and Control

How is public access to the facility controlled? (Check any that apply.)

No control

Chain-link fence around reservoir

Locked man-door

Other:

Is the following signage posted at the WTP? (Check any that apply.)

Name of facility

Notification of restriction of public access

Warning signage regarding chemicals used in the treatment process

4. Facility Design

Facility design shall be provided in the form of a piping and instrumentation diagram (P&ID) and general arrangement views of the equipment and facility prepared by a Professional Engineer or Geoscientist registered with NAPEG, who has expertise in the subject area. Attach one of the following drawing options with the documents you are submitting. As-built drawings are preferred, if available. All drawings are required to have scales and north arrows (for plan views).

Indicate what type of drawings are attached:

As-built drawings Design drawings Other:

Note: As Built drawings has been previously provided as part of the Inuvik WTP O&M Manual.

5. Raw Water Sources

Name of **primary** raw water source (if applicable). Note that if you have a second water source, there will be a place to add information for the secondary source later in this section. For now, enter the information for the source that is used most often.

Type of raw water source (check any that apply):

Lake River Groundwater Other:

Average annual quantity of water drawn from the source:

m^3/year

For **river** sources, what is the flow rate of the river? m^3/d

For **lake** sources, what is the size (area) of the lake? m^2

When does the ice on the water source normally **freeze up**?

When does the ice on the water source normally **break up**?

What is the flow rate of raw water being withdrawn from the **primary** source? L/s

Does raw water from the **primary** source fill a reservoir (i.e. seasonal or annual fill), or does it go directly to the treatment system, tanks, or trucks?

Reservoir fill Direct to treatment, tanks, or trucks

fills/year

All Months

January	February	March	April	May	June
July	August	September	October	November	December

days/week

times/day

What type of intake is used for the **primary** water source?

Inclined shaft (submersible pump and discharge pipe inside a larger casing pipe)

Gravity-fed wetwell (gravity fed well from which raw water is drawn – NOT a storage well filled by a pump from the source)

Groundwater well

Infiltration gallery

Temporary/seasonal surface intake (pump and piping are removed from the source after use or at the end of the season)

Other (specify):

Provide the opening size for the mesh on the fish screen at the end of the intake in the water (the smallest dimension of the openings in the mesh): mm

Is a Source Water Protection Plan (SWPP) in place for the **primary** raw water source?

Yes No

If **yes**, provide the following information for the plan:

Prepared by (name of company or person that wrote the plan):

Title of document:

Completion date: yyyy/mm/dd

Location of document (where is the plan kept, or where can a copy be obtained?):

If **no**, what is being done to protect the **primary** raw water source?

Identify the type of raw water storage (check any that apply):

None Reservoir Storage Tank Other:

Raw water storage capacity: m³

Name of **secondary or alternate** raw water source (if applicable). This could include a source used seasonally, during maintenance, when there are problems with the primary source, or any other backup raw water source. If only one water source is used, skip to Section 6.

Type of raw water source (check any that apply):

Lake River Groundwater Other:

Average annual quantity of water drawn from the source:

m³/year

For **river** sources, what is the flow rate of the river? m³/d

For **lake** sources, what is the size (area) of the lake? m²

When does the ice on the water source normally **freeze up**?

When does the ice on the water source normally **break up**?

What is the flow rate of raw water being withdrawn from the **secondary** source? L/s

Does raw water from the **primary** source fill a reservoir (i.e. seasonal or annual fill), or does it go directly to the treatment system, tanks, or trucks?

Reservoir fill Direct to treatment, tanks, or trucks

fills/year

All Months

January	February	March	April	May	June
July	August	September	October	November	December

days/week

times/day

What type of intake is used for the **secondary** water source?

Inclined shaft (submersible pump and discharge pipe inside a larger casing pipe)

Gravity-fed wetwell (gravity fed well from which raw water is drawn – NOT a storage well filled by a pump from the source)

Groundwater well

Infiltration gallery

Temporary/seasonal surface intake (pump and piping are removed from the source after use or at the end of the season)

Other (specify):

Provide the opening size for the mesh on the fish screen at the end of the intake in the water (the smallest dimension of the openings in the mesh): mm

Is a Source Water Protection Plan (SWPP) in place for the **secondary** raw water source? (Skip this question if no secondary source is used.)

Yes No

If **yes**, provide the following information for the plan:

Prepared by (name of company or person that wrote the plan):

Title of document:

Completion date: yyyy/mm/dd

Location of document (where is the plan kept, or where can a copy be obtained?):

If **no**, what is being done to protect the **secondary** raw water source?

Explain the reasons or situations where the secondary raw water source is used, including the time of year for seasonal sources (skip this question if no secondary source is used):

6. Water Treatment Process

Indicate any **pre-treatment** processes that are used at the WTP. (Check any that apply.)

Screen pH adjustment Gravity settling Other:

Indicate any treatment technologies that are used at the WTP. (Check any that apply.)

Coagulation and Flocculation

(A chemical is added to the water to make particles of dirt stick together and sink.)

List chemical(s) added:

Clarification (methods to help particles settle out after they are stuck together)

Gravity Inclined plate Settling tubes Dissolved air floatation (DAF)

Other:

Filtration (filters use various methods to trap particles and remove them from the water)

Slow sand Rapid rate gravity Rapid rate pressure Bag/cartridge

Other:

Membrane Filtration (a material with tiny holes is used to strain particles from the water)

Microfiltration Ultrafiltration Nanofiltration Reverse osmosis

Membrane of unknown type

Other:

Additional Treatment Processes

Activated carbon Ion exchange (softening or targeted removal)

Other:

Iron and/or Manganese Removal

Greensand Oxidation/filtration

Other:

Indicate what types of disinfection are done at the facility. (Check any that apply.)

Chlorination

 Solid Liquid Gas

Ozonation

Ultraviolet Radiation (UV)

Other:

Water Demand, Production and Distribution:

Total annual water usage:

 m³/year

Identify the water distribution methods used (check any that apply):

 Piped (underground or utilidor) Trucked Other:

Identify the type of treated water storage (check any that apply):

 None Reservoir Storage Tank Other:

Treated water storage capacity:

 m³

7. WTP Waste Production

Skip this section if the WTP does not produce sludge.

Is sludge composition data available? (Lab report, engineering study, etc. showing what substances are in the sludge.)

Yes No

 If yes, please attach the data to this document when submitting.

 Sludge composition data attached

Estimate monthly quantity of sludge disposal:

 m³/month

How is the sludge disposed of?

Discharged to sewage system or lagoon

Direct discharge to waterbody (lake, river, etc)

Discharged onto land

Mechanical dewatering

Evaporative sludge drying (sludge is spread out to air dry before disposal)

Other:

Skip this section if the WTP does not produce wastewater from backwashing, regeneration (e.g. for softeners), or a reject water stream from membrane filtration.

Estimate monthly quantity of filter backwash, regeneration and/or membrane reject wastewater disposal:

m³/month

How is the backwash/regeneration/membrane reject water disposed of?

Discharged to sewage system or lagoon

Direct discharge to waterbody (lake, river, etc)

Exfiltration

Discharged onto land

Other:

Combination (describe):

Indicate if any of the following waste streams are produced at the plant. Provide the annual quantity and the disposal method for each. (Check any that apply.) **Skip** this section if no waste is generated at the WTP.

Check the items that apply:	Method of Disposal	Quantity per year	Units
Spent cartridges or other disposable filters			
Spent media and/or resin			
Expired reagents such as DPD			
Expired calibration standards			
Chemical waste (specify):			
Other*:			

*Do not include regular municipal waste (garbage, such as paper towels and packaging) or wastewater from a sink or washroom that is discharged to the municipal system (trucked or piped).

8. WTP O&M and Record-Keeping

Does the WTP have an existing O&M Plan or Manual?

Yes No

If yes, please provide the following information for the plan:

Prepared by (name of company or person that wrote the plan):

Title of document:

Completion date: yyyy/mm/dd

Location of document (where is the plan kept, or where can a copy be obtained?):

The following are record keeping requirements related to O&M of the WTP and should be filed as an annual report with the MVLWB no later than the date stipulated in the water licence for the previous year. The annual report should include the following items:

- Monthly and annual quantities of fresh water obtained from all sources, reported in cubic metres.
How and where is this recorded?
Where are these records kept?
- A summary of modifications and/or major maintenance work carried out on the WTP, including all associated structures. Check your water licence for specific requirements regarding modifications.
How and where is this recorded?
Where are these records kept?
- A list of spills and unauthorized discharges.
How and where is this recorded?
Where are these records kept?
- A summary of any studies requested by the MVLWB that relate to water treatment waste disposal or water use and a brief description of any future studies planned.
How and where is this recorded?
Where are these records kept?

Are records of repairs kept?

Yes No

Are records of upgrades kept?

Yes No

9. Surveillance Network Program

Annex A of the Community's water licence, "the Surveillance Network Program", outlines the requirements for water quality/quantity monitoring for the Water Treatment Plant.

10. Additional Comments or Notes

If there is any additional information that was not covered or didn't fit in the sections above, please include it here.

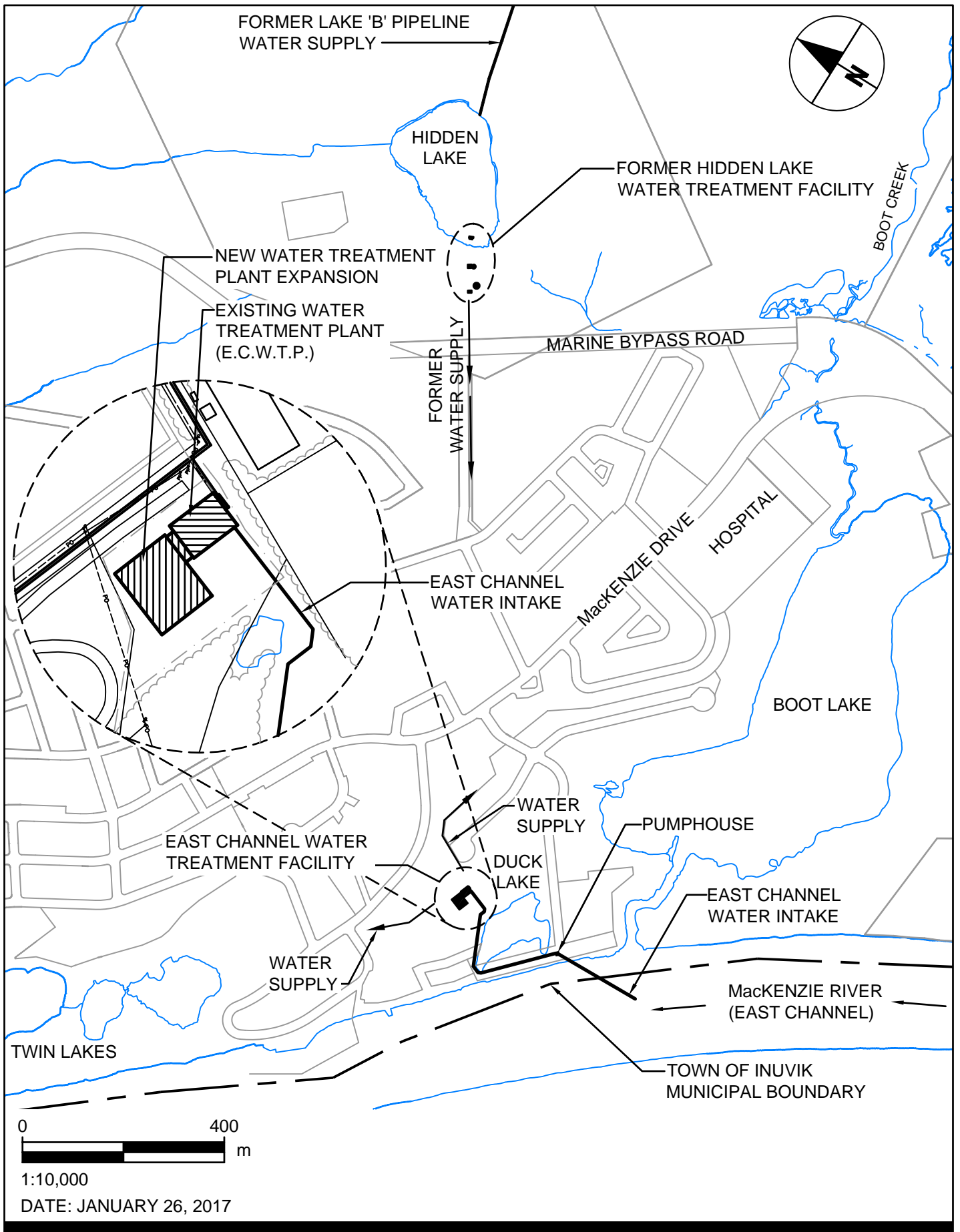
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**WATER SUPPLY
 FACILITIES PLAN**

For Section 1. Site Location



FIGURE 1