

# Steps for Upgrading Wastewater System Requirements under WSER

Wastewater is the largest source of pollution in Canadian waters by volume. The federal government created the *Wastewater Systems Effluent Regulations (WSER)* to reduce water pollution. These regulations came into force in 2012.

While ~75% of wastewater released into Canadian waters receives sufficient treatment, there are still communities that do not yet have wastewater treatment in place. These communities are mostly small and coastal. They may struggle to secure funding or go about the upgrades to their wastewater facilities.

The construction of a new or upgraded Wastewater Treatment Plant (WWTP) is a very large capital project. This can be daunting for a small community with limited resources or experience.

The purpose of this handout is to explain the common steps of planning and doing a wastewater construction project. The figure on the right shows the steps and the approximate time needed to complete each step.

**1 Getting Started**  
*When: Present*

**2 Secure Funding for Feasibility Study**  
*When: As soon as possible*  
*Ideally 10-15 years before the Transitional Authorization (TA) deadline*

**3 Hire Consultant to Complete Feasibility Study**  
*When: As soon as funding is secured*  
*Ideally 10-15 years before the TA deadline*

**4 Complete Feasibility Study**  
*When: As soon as possible*  
*Ideally 10-15 years before the TA deadline*  
*(study takes usually 6-12 months to complete)*

**5 Apply for Capital Funding**  
*When: As soon as feasibility study is complete*  
*Ideally 10 years before the TA deadline*

**6 Hire Consultant & Design & Construct WWTP**  
*When: As soon as funding is secured*  
*At least 4-6 years before the TA deadline*

**7 Operate WWTP**  
*When: No later than 2030 or 2040 according to TA deadline*

## 1 Getting Started

The first step when planning wastewater upgrades is to understand the current state of your infrastructure. Some communities rely solely on septic tanks, while others operate outdated treatment systems or discharge wastewater through one or more sewage outfalls. These wastewater practices are no longer accepted and must be upgraded.

First, ensure all your outfalls are identified and adequately maintained. Systems (including outfalls) discharging 100 m<sup>3</sup>/day or more of wastewater need to report under WSER. You must monitor flows, collect samples and report all results to Environment and Climate Change Canada (ECCC). For more information on monitoring and reporting requirements, please review [these factsheets](#).

### Transitional Authorization

Wastewater systems that cannot provide sufficient treatment may be eligible for a Transitional Authorization (TA) under the WSER. If eligible, you should consider applying.

A TA provides time to plan, design, finance and upgrade the wastewater system. Communities with a TA are given an extension to either 2030 or 2040 for upgrading the system. The extension depends on the risk to the receiving environment. Small communities can also benefit from reduced sampling, flow monitoring and reporting during the time when the TA is valid.

The application is straightforward, with no technical background required. Contact ECCC at [eu-ww@ec.gc.ca](mailto:eu-ww@ec.gc.ca) to determine your community's eligibility and receive support to apply for a TA. For more information, please review [this factsheet](#).

Not all communities are eligible for a TA. If you are not eligible, we recommend actively planning to upgrade your wastewater systems. You should:

- Continue to monitor and report under the WSER.
- Seek funding to take next steps.
- Do a feasibility study to explore treatment options that could work best for your community's needs.

You may also reach out to your enforcement officer to discuss your current situation and share the steps you are taking. You can then work together to set a reasonable, efficient timeline for compliance.

## 2

## Securing Funding for Feasibility Study

A feasibility study determines how to upgrade the wastewater system by adding or modifying treatment processes, with the goal of meeting the WSER standards. It assesses which treatment technologies may be the most appropriate for your community, along with identifying upgrades that may be required to the existing wastewater collection system. They often include collecting flow and effluent data to help plan wastewater upgrades. These studies should be completed by qualified professionals with extensive wastewater treatment knowledge. They are reviewed by the community and the Water Resources Management Division (WRMD), as well as the Municipal Infrastructure Division (MI) if funded by MI.



For small systems, the cost of a feasibility study may exceed available budget. In this case, external funding may be required.

Funding programs that are commonly used for municipal wastewater feasibility studies are:

- MCW – Municipal Capital Works (Provincial).
- Canada Community Building Fund (soon to be rolled into Build Communities Strong Fund).
- Canada Housing Infrastructure Fund (soon to be rolled into Build Communities Strong Fund).
- Green Municipal Fund (Federation of Canadian Municipalities).



Depending on the funding program, the cost of collecting flow and effluent data can possibly be included in the funding application to support a feasibility study. WRMD suggests at least 12 months of data be collected to support a feasibility study. Other programs may also provide funding to be used for sampling and flow monitoring to support a feasibility study or design.

Provincial MCW applications take place in autumn. Other program deadlines may vary. The Province can assist with the funding application process, though there is no guarantee that the funding will be approved. Additional funding streams may be found [here](#).

# 3

## Hire Consultant to Complete Feasibility Study

The next step is to secure a qualified consultant to complete the feasibility study. If the community receives MI funding, MI will assist throughout this process, and WRMD will assist with some steps.

When selecting a consultant for a feasibility study, it is important that they:

- Have the technical expertise and experience in wastewater treatment.
- Are independent and have no ties to specific wastewater manufacturers.
- Provide strong references.



**Tip:** Using an independent consultant is recommended to get unbiased advice and a full range of options.

MI will walk communities with provincial funding through all the steps for selecting and hiring a consultant. The steps include:

- Developing a consultant scope of work and required deliverables for the feasibility study.
- Developing and issuing a Request for Proposal (RFP) to receive proposals from qualified professionals. MI posts RFPs on MERX.
- Reviewing submitted proposals, with the community and WRMD. Consultants must be qualified engineers with wastewater treatment design experience.
- Compare financial proposals to available funding.
- Awarding project to successful consultant.

If a community chooses to complete a project without provincial funding, WRMD can support them in evaluating bids on an RFP and choosing a consultant.



**Tip:** Look for a consultant that you can build a good working relationship with. Stay engaged and ask questions throughout the process. Make sure you fully understand and are comfortable with the proposed treatment options. Keep in mind that this system will operate in your community for many years to come.

# 4

## Complete Feasibility Study

The feasibility study will help identify options to treat wastewater for your community. It will also be the basis for funding applications for design and construction. Building upgrades or a new WWTP is a very large capital project. Therefore, it is critical that certain items are included in the feasibility studies. This gives the community the information they need to make good, informed decisions. WRMD, and MI if the project has MI funding, will assist the community in reviewing the draft feasibility study. The recommended option gives a plan for the community going forward so they can apply for funding. It does not prevent them from choosing a different option during detailed design.



**Tip:** Think “present-future” considerations for the feasibility study.

The feasibility study should include the following items, for the present and for the future:

## Present

- Assessment of the condition of the current system infrastructure. This includes the collection system, pump stations, treatment, outfalls, etc.
- Review of historical effluent quality, industry contribution (if any) and target treatment goals.
- Review of historical flow data. This must include daily or more frequent data from all flow-monitored outfalls.
  - This may be available in the raw data from WSER monitoring. If this is not available, new flow meter data will need to be collected. A flow meter must be installed, maintained, and data collected for about 12 months. New flow data may also be needed for any outfalls without reliable historical flow data. It is important to collect totalized flow data instead of just instantaneous data.
  - Historical data review must consider both dry- and wet-weather flows. It must also consider the influence of industrial users, if present in the community.
- Where flows-per-person are high, there may be inflow and infiltration in the sewer system. This can be studied and steps taken to reduce rainwater and groundwater in the sewers.

## Future

### Future Design Criteria

- Projected future population, flow and influent wastewater quality, for a 25-year operating period.

### Analysis of Wastewater Treatment Options

- The best number of treatment plants for the community. Usually, consolidating outfalls into one treatment facility is most cost effective. Neighbouring communities could also connect multiple areas into a single, regional, treatment facility.
- Recommended technologies that are appropriate to meet WSER limits, well-known, and used locally.
- Both land-based and mechanical treatment system types should be considered. Land-based systems include lagoons and wetlands. Mechanical systems include SBRs and more. It is not important to evaluate several examples of each type of system at this stage, as they tend to have similar costs, space requirements, and operational needs.
- Treatment plant location considerations should include upgrades to the collection system, land required for the system, and getting approvals or permits.
- Tip: Lagoons are cheaper and easier to operate than mechanical systems. They also require less monitoring and reporting under the WSER. However, geotechnical conditions and available land space should also be considered.

### Details on the Recommended System

- System design criteria including system capacity, redundancy, level of operator involvement, size and required geotechnical conditions.
- Climate change considerations to be used for future climate lens assessment.
- Class D (high-level) capital cost estimate for the preferred option, including appropriate contingencies.
- Annual operation and maintenance costs for a 25-year operating period.
- Recommendations for future work to confirm feasibility design criteria (if required).

# 5

## Apply for Capital Funding

Once the feasibility study is complete and you have selected a treatment technology, the next step is to apply for funding to complete the project. It can take several years to apply for and receive provincial or federal capital funding for a WWTP. The timing depends on the funding programs available. It depends on the number of other communities applying for funding, and the strength of the funding application. You should make every effort to apply for capital funding as soon as possible.

The community should consider the following, as a minimum, when sourcing funding:

- Approximate timeline for design and construction of a WWTP.
- Inflation allowance of 3-4% for each year that goes by between the Feasibility Study and the intended construction date.
- Available funding programs and deadlines for submitting applications.
  - Ensure the community has all necessary information. This includes the capital cost estimates, climate impact lens, etc.
- Financing of community's portion of capital costs (through loan, savings, etc.).
- Additional work required before design that may need separate funding to complete. This could include more flow monitoring and upgrades to the collection system to reduce inflow and infiltration if needed.

Check with MI or with the Feasibility Study consultant for current funding programs. These change periodically. At the moment, the following funding programs are available for capital upgrades.

- MCW – Municipal Capital Works (Provincial).
- Canada Community Building Fund (soon to be rolled into Build Communities Strong Fund).
- Canada Housing Infrastructure Fund (soon to be rolled into Building Communities Strong Fund).

The funding awarded will be for capital upgrades only. The community must also plan and budget for ongoing annual costs, such as operating and maintaining the WWTP.

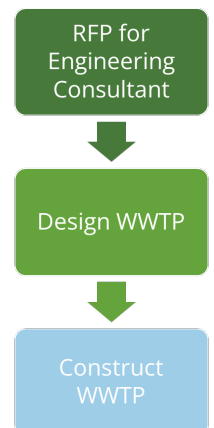
# 6

## Hire Consultant & Design & Construct WWTP

Once funding is secured, MI and WRMD will form a technical committee to assist the communities in completing the next steps, on projects with MI funding.

- The community will issue an RFP to hire an engineering consultant.
- The consultant will produce drawings and write specifications for the new or upgraded WWTP.
- The RFP should select qualified engineering consultants with relevant wastewater experience. Independent consultants (rather than equipment vendors) can better provide unbiased advice while considering the needs of the community better.

Design and construction of the selected WWTP will take place, generally over a 2–3-year period. During this time, the community should have regular meetings with the project managers to get updates on the project deliverables and schedule. The community should request updated estimates periodically to ensure budget control. The estimate Class will progress from Class D (high-level) to Class A (detailed) as design is completed. The



community will need to complete regulatory approval applications. This includes applying for an Approval to Construct. This application must be made to WRMD.

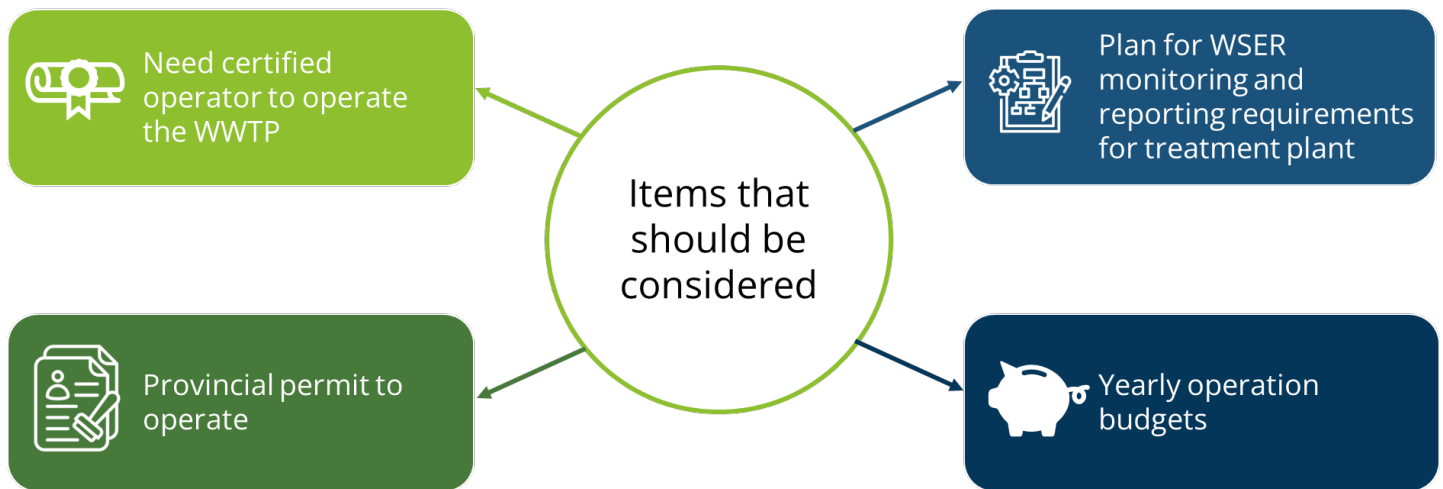
Throughout the design phase, the MI and WRMD technical committee will provide support to the community by assisting with project administration and reviewing design submissions. They will give advice for funding compliance, cost control, and required permit submission deadlines. During construction, MI will continue to assist with project administration, on projects with MI funding.

## 7 Operate WWTP Online & Operating

When construction of the WWTP is complete, there are several transitions. The Province requires a commissioning period where the contractor must show that the treatment system works and training is provided to the operator. Once this is complete, the community's operator will take over operation of the facilities. There can be an additional operational support period to gradually transition from contractor operation to the community's operator. Finally, there is a warranty period, where the construction contractor must fix deficiencies.

The upgraded WWTP may be more complex than what was previously operated by the community. It may cost more to operate. The community will require the following, before construction is finished:

- A plan in place for hiring and training operations staff. Please see details of provincial training here.
- An updated provincial Permit to Operate (check with WRMD for timelines for applying for the Permit).
- A plan for fulfilling the federal WSER and applicable provincial sampling, monitoring and reporting requirements. The sampling and reporting schedule depends on the type and size of treatment plant.
- An operations budget including staffing, operations and maintenance for the WWTP.



### Disclaimer

This information does not in any way supersede or modify the *Wastewater Systems Effluent Regulations* or the *Fisheries Act*, or offer any legal interpretation of those Regulations or Act. Where there are any inconsistencies between this information and the Regulations or Act, the Regulations or Act take precedence, respectively.