Permit to Take Water

Professional Geoscientists Ontario

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Amanda Prelaz

Vincent Bulman, P. Geo.

Drinking Water and Environmental
Compliance Division

Ontario

Objectives

- Permit to Take Water (PTTW) program overview
- Technical study requirements and errors and omissions with technical reports
    - Data and calculations
    - Site characteristics
    - Source information
    - Map
    - Discharge
    - Monitoring and contingency planning
    - Pumping Tests
- General information and reminders
- Technical Support - who we are and what we do
- PTTW program resources
- Appendix

Purpose of the Permit to Take Water (PTTW) Program

- A PTTW is a legal mechanism to implement the Ministry's water quantity management policy: "*Surface and groundwater quantity are to be managed to ensure a fair sharing, conservation, and sustainability of the resource*"

- In Ontario, water in its natural state belongs to everyone. When issuing a PTTW, the ministry is regulating withdrawals from the publicly-owned resource to prevent unacceptable impact with any other interests in the water

- Permitting enables monitoring and tracking of actual water use informs provincial water management initiatives and provides a mechanism to resolve incidents for unacceptable interference

Section 34 of the *Ontario Water Resources Act* (OWRA) states that a person shall not take more than 50,000 litres of water on any day by any means except in accordance with a permit.

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PTTW Application Processing for Paper Applications

Step 1: Proponent classifies (Category 1, 2 or 3) & submits completed application to Client Services and Permissions Branch (CSPB) Application Assessment Unit (AAU)

Step 2: AAU screens for administrative completeness; forwards to Regional Office (RO) and if required sends information to be posted to Environmental Registry of Ontario (ERO).

Step 3: RO screens for Regulatory/Policy conformance (Category 1), sends notifications to Indigenous communities ('Duty To Consult'), notifies the municipalities and conservation authorities (as EBR prescribed), and conducts Technical Review* (Category 2 & 3); the RO may also request site visits & discussions with Qualified Persons.

Step 4: PTTW Director takes comments and concerns into consideration and makes decision (issue, deny) within 90 days. Decision can be appealed to the Environmental Review Tribunal (ERT).

*Technical Reviews are conducted in the RO by Hydrogeologists, Surface Water Specialists and Hydrologists. The RO can request additional information and add unique terms and conditions to Permits.

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Purposes and Principles

- Ensure fair sharing and reasonable use of water
- Promote water conservation and stewardship
- Prevent unacceptable interference with other water use
- Safeguard ecosystems
- Regulate using a risk-based approach
- Consider cumulative impacts of water takings
- Ensure public and local agency involvement
- Notification and consultation with Indigenous communities

Note: The ministry will not issue a PTTW until it is satisfied that the proposed taking is unlikely to result in unacceptable impacts

Technical Study Requirements

Resources and references to Technical Study Requirements for Category 2 and 3 Hydrogeological Assessments and Surface Water Assessments:

- **Permit to Take Water Program Page** (https://www.ontario.ca/page/permits-take-water)
- **Permit to Take Water Manual** (archived online, request a copy from your local regional office)
- **The technical guidance documents for hydrogeological studies and surface water studies in support of category 3 applications** can be found on the PTTW program page (https://www.ontario.ca/page/permits-take-water)

- For efficiency, the ministry prefers to receive one assessment report that addresses both groundwater and surface water as appropriate, and which follows the structure in the technical guidance documents and consists of:
  - Introduction
  - Background (description of the water taking, geological setting)
  - Methodology (analysis – pumping/dewatering calculations)
  - Impact Assessment – radius of influence, compaction, interference
  - Conclusions and Recommendations – including monitoring / mitigation

Report must be signed and stamped by QP.

Technical Study Requirements – Hydrogeology

Data and Calculations

The intended purpose of the water taking should be identified and the rates and volumes of the proposed taking must be justified.

- The data must be relevant to the proposed site and source
  - the data should be up to date, historical data may be provided to supplement the report
  - the radius of influence calculation method must be fully referenced and all input parameters must be included, with calculations shown in an appendix
  - any complaints or interference issues should be included
- The data should be confirmed and summarized in a clean and concise manner, comprehensive table and summary reports are recommended
- The report should explain how the total requested water taking volumes were derived, any safety factors or specific considerations should be described
- The results should be interpreted, including; calibration data and input parameters and all assumptions should be explained
- Where appropriate data references should be provided

Technical Study Requirements – Surface Water

Data and Calculations

The purpose of the surface water study is to evaluate the potential adverse effects, including under the worst-case scenario, to the environment if the proposed water taking is permitted.

- The data must be up to date, relevant to the site and proposed taking, and should include:
  - Any monitoring of water level and flow and all relevant historical data
  - Analysis of historically collected data (i.e., flow statistics, hydrologic trends, sensitive habitat mapping, stream classification…)
  - If site data is not available, proponent should state what data is being used for analysis (i.e., prorated flow, precipitation data, climate data)
- Where appropriate, data references should be provided (i.e., reduction in flow or decrease in water level)

Technical Study Requirements

Data and Calculations – Information often missing from reports

Groundwater

- Pumping test rates
- Dewatering calculations
- Safety factor (justification)
- Radius of influence
- Lack of compilation tables
- Borehole logs
- References
- How rates & amounts were arrived at
- Describing assumptions
- Interference complaints
- Soil testing data, grain size analysis
- Infiltration rate calculations
- Water Well Record Numbers or Well Tag Numbers

Surface Water

- Measured stream flow data (i.e., actual data, methodology of collection)
- Summer low flows (i.e., data is not derived or no methodology on derivation is provided)
- Hydrologic data is not representative of site specific trends (i.e., too far from site, outside of tertiary watershed)
- Stream classification (Warm/cold water stream)
- Habitat mapping for any dewatered area

Technical Study Requirements

Site Characteristics

The study must include a characterization of the local physiographic and hydrogeological setting, including groundwater and surface water features and functions so that the potential for interference can be evaluated. The study should not be limited to the property boundary, but should focus on the area delineated by the maximum predicted area of influence.

- The characterization should include the quaternary/bedrock geology and the physical hydrogeology and the following should be considered;
    - Groundwater flow direction, groundwater elevations/levels, aquifer sustainability, geological cross-sections, hydraulic conductivity
    - Potential of basal heaving for the area that groundwater is under pressure and plan to seal any potential perforation of till layer to protect upgradient groundwater users
    - Contaminant and contaminant plume considerations, mechanisms to prevent any preferential pathways for potential contaminant migration in the area
    - Quantify the expected reduction to baseflow and water levels to surface water features (i.e., lakes, ponds, provincially significant wetlands)
- The radius of influence should be identified and all sensitive features should be listed in the report and identified on a map (e.g., wells, surface water, wetlands etc.)
- Source Protection Areas and Wellhead Protection Areas within the predicted radius of influence of the taking should be identified and the potential for impacts should be assessed

Note: A geotechnical engineer should provide comment on geotechnical matters such as subsidence/settlement due to any dewatering practice

Technical Study Requirements

Site Characteristics – Information often missing from reports

Groundwater

- Groundwater elevations & flow directions
- Location and impact to sensitive features
- Well Survey – missing or incomplete (door to door survey and reasonable effort expected)
- Source Protection not combined with Radius of Influence and sensitive receptors
- Rarely see table of area wells with expected drawdown
- Potential for basal heave
- Subsidence/settlement assessment with sign off from Geotechnical Engineer
- Hydraulic conductivity measurements

Surface Water

- Surface water flow directions, reduction to basal flow
- Location and impact to sensitive features, status of wetland features (evaluated, non-evaluated, provincially significant)
- Consideration of cumulative effects of and on other takings
- Appropriate estimates of low flow condition, baseline information on natural water fluctuations

Technical Study Requirements

Source Information

Well source information to be included in the report:

- Well name/identifier
- Water Well Record number
- Well depth, has the well been deepened?
- Type of well (drilled, bored, dug, driven or jetted), sandpoints/wellpoints?
- Pump schedule/timing
- Have you installed a datalogger or water meter?
- Groundwater quality results (filtered and unfiltered)
- Map showing location of registered and unregistered wells

Surface Water source information to be included in the report:

- Bathymetry of water body (i.e., lake or pond)
- Thermal regime
- Location of proposed monitoring sites
- Watershed area
- Appropriate flow statistics

Technical Study Requirements

Source Information missing from reports

General

- Background Information is incomplete
- Historical information is not included
- Water requirements not included (i.e., crop water requirements)
- Incorrect UTM coordinates

Groundwater Sources

- Well characteristics that assess the potential for well interference
- Potential drawdown, well depth, screened interval, aquifer, water level
- Table of pumping and surrounding water wells with the Water Well Record number and the UTM coordinates
- Groundwater quality results, filtered and unfiltered
- Where water is found during drilling elevation/depths, pump intake elevations/depths, available water column in meters, total water column from end of hole in meters, indicate confined vs, unconfined and indicate the well water use (domestic, irrigation, commercial/industrial, monitoring, abandoned, etc.)
- Lack of maps illustrating boreholes, well locations, surface water features, sensitive features

Technical Study Requirements

Source Information missing from reports

Surface Water Sources

- Low flows, with appropriate methodology used to determine these flows
- Other takings that may impact the source
- Lack of maps illustrating surface water features, sensitive features
- Missing water quality data for groundwater that may be dewatered and need to be discharges – may require treatment (ECA potentially required)

Technical Study Requirements

Map

An 1: 10 000 Ontario Based Map should be drawn to scale and must be included with the application, mark and label:

- All existing and proposed water taking locations with sources corresponding with source name
- All of the following features within at least 500m (1km is preferred) of each source: existing wells, boreholes, springs, watercourses, wetlands, waterbodies, property lines, locations and name of property owners, nearest road intersection and dwellings
- The estimated radius of influence

All features should be clearly marked and labelled on the map, correct and accurate UTM coordinates should be provided for each water taking source. **UTM coordinates should be specific to the source, not the site.**

Map should include a scale and a north arrow.

Technical Study Requirements

Discharge

- The ministry encourages that water directly discharged from an operation be returned to its source, provided there is no physical or chemical alteration, otherwise it may require an Environmental Compliance Approval (ECA)
- The study must address the physical impacts to the natural environment that may result from a discharge (e.g., erosion and sedimentation)
- Monitoring and contingency plans are required all discharges
- The study may need to address water quality impacts, water quality impacts may be required to be regulated by an ECA
- **Discharge information missing from reports:**
    - Status of ECA
    - Location of the discharge (i.e., land, surface water, storm/sanitary sewer etc.)
    - Discharge approval letters (i.e., municipal approval to sanitary/storm sewer)
    - Location of nearby receptors and an analysis of impacts to nearby receptors, impacts to surface water and/or wetlands
    - Details on the impacts to discharge receiver, known contaminate sources
    - Description of erosion and sediment controls

Technical Study Requirements

Monitoring and Contingency Planning for Surface water and/or Groundwater takings

- Studies must include proposed monitoring and contingency planning
- Studies should also identify; **if monitoring is needed**, confirm if the monitoring plan is reasonable, verify the plans and proposals, include monitoring data, include methodology and consolidate discharge, monitoring and mitigation planning
- If monitoring is needed a monitoring plan is required to be provided
- Contingency plans should contain a description of mitigative measures that will be taken in the event that unforeseen and unacceptable impacts occur as a result of the proposed taking

Technical Study Requirements

Pumping Test

A detailed graphical and/or analytical analysis of the pumping test and step drawdown test data should be provided in the report. This analysis should include, but is not limited to the following:

- Calculations of transmissivity and hydraulic conductivity and (where observation wells exist) storativity or specific yield
- Identification of boundary conditions
- Assessment of the potential drawdown at various times and selected distances from the pumping well. A map drawn to scale should show the estimated radius of influence
- Predicted drawdown in the potentially affected neighbouring wells compared to the amount of available head and to the pump intake depth
- The rationale for selecting a specific analytical method (including a discussion of its assumptions and limitations) should be clearly stated

General Information and Reminders

PTTW Application Submission Reminders

- Applications for new proposals and renewals of existing permits should be made at least **90 days in advance** of the time that the water taking is intended to start or the expiration of the existing permit (the ministry has a 90 calendar day service standard)
- Pre-submission consultation is recommended and may be requested by contacting your local regional office
- There needs to be an intent to take water in the near future – no water reservation
- Permits are issued for established sources (i.e., wells that have been drilled)
- One PTTW per site – PTTWs may be grouped for a well field
- Other approvals may be required before a PTTW can be issued (e.g., EA, ECA, NEC)
- Data should be in excel format and should be provided in a manner that can be copy and pasted
- Renewals of permits that have conditions requiring a technical study upon renewal and/or amendment must be submitted as a category 3 application with an appropriate technical report included
- The issuance of a new permit revokes and replaces the preceding permit

Who We Are and What We Do – Technical Support Section

Technical Support is:

A multi-disciplinary team of applied science experts, professionals, Provincial Officers. Including; surface water specialists, hydrologists, hydrogeologists, professional geoscientists, engineers and environmental scientists.

Technical Support Provides:

- Science to support compliance and environmental enforcement
- Practical scientific advice and professional oversight for permissions/Environmental Assessment & Planning
- Field assistance to Government partners
- Support for a wide range of Acts & Regulations
- Policy and program development support
- Expert witness services for investigations & prosecutions

PTTW Program Resources

PTTW Program Page: https://www.ontario.ca/page/permits-take-water

PTTW Map: https://www.ontario.ca/environment-and-energy/map-permits-take-water

PTTW Open Data Catalogue: https://www.ontario.ca/data/permit-take-water

Section 34 of the Ontario Water Resources Act: https://www.ontario.ca/laws/statute/90o40

The Water Taking and Transfer Regulation: https://www.ontario.ca/laws/regulation/040387

INFO-GO (MECP Regional/District Offices):
http://www.infogo.gov.on.ca/infogo/home.html#orgProfile/-181/en

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Appendix

- Regulating Water Takings
- Purposes and Principles
- What Does a PTTW Generally Do?
- What a PTTW Does Not Do?
- Classification of Permits to Take Water
- Considerations for Evaluating PTTWs

Appendix: Regulating Water Takings

Section 34 of the *Ontario Water Resources Act* (OWRA) states that a person shall not take more than 50,000 litres of water on any day by any means except in accordance with a permit.

- Exemptions and clarifications to PTTW requirements OWRA Section 34(2) and O. Reg. 387/04 Section 4.2:
  - Taking for domestic purposes as long as it does not involve a transfer between Great Lakes watersheds
  - Taking <379,000 L/day for the watering of livestock or poultry
  - Firefighting and other emergency purposes
  - 'Grand-fathered', constructed before March 30, 1961
  - Weirs constructed before March 29, 2016
  - Structures or works for wetland conservation
  - Active diversions to maintain a dewatered work area located within a waterbody
  - Passive diversion to maintain a dewatered work area located within a waterbody is not a water taking
- A PTTW is not required for any water taking associated with a renewable energy project approved under the Environmental Protection Act
- Environmental Activity Sector Registry (EASR) – Water Taking EASR O. Reg. 63/16

Appendix: Purposes and Principles

- Ensure fair sharing and reasonable use of water
- Promote water conservation and stewardship
- Prevent unacceptable interference with other water use
- Safeguard ecosystems
- Regulate using a risk-based approach
- Consider cumulative impacts of water takings
- Ensure public and local agency involvement
- Notification and consultation with Indigenous communities

Note: The ministry will not issue a PTTW until it is satisfied that the proposed taking is unlikely to result in unacceptable impacts

Appendix: What Does a PTTW Generally Do?

- Identifies the water taker & sources; specifies taking purposes (e.g., irrigation)
- Establishes an expiry date (short-term up to 10 year term)
- Specifies maximum taking rate (L/min), duration (h/day; days/y), amount (L/day)
- Requires monitoring & record keeping and reporting of water taking events
- Requires notification of complaints & actions taken to resolve same
- Allows the ministry to suspend or reduce the permitted taking

Appendix: What a PTTW Does Not Do?

- Allocate a right to water
- Guarantee a supply of water for any taking event or that a permit will be renewed upon expiry
- Establish priorities on water use → all must take in accordance with 'fair sharing' principle
- It does not regulate the location, installation, construction, operation, maintenance, etc., of the **means** to take water or facilities or enterprises that **use** water (these matters may be subject to approvals under the:
    i. *Planning Act*,
    ii. *Aggregate Resources Act*,
    iii. *Lakes and Rivers Improvement Act*,
    iv. *Ontario Building Code*,
    v. *Ontario Water Resources Act (other sections)*
    vi. *Safe Drinking Water Act*,
    vii. *Environmental Assessment Act*, etc.
- Where a sewage discharge environmental compliance approval (ECA) is required the PTTW will not regulate the quantity or quality of the discharge

Appendix: Classification of Permits to Take Water

Permit applications are classified by their anticipated risk to the environment

Groundwater		Surface Water
Category 1		**Category 1**
Renewal same or lesser amount, same purpose, same location, same source, no past interference/ impacts , and no scientific study required as part of renewal.		**Renewal** same or lesser amount, same purpose, same location, same source, no past interference/ impacts, and no scientific study required as part of renewal.
Ponds (e.g. irrigation and agriculture) • not connected to, nor receiving water from surface water; and • less than 4m deep and more than 100m from sensitive features**; or • less than 7m deep and more than 250m from sensitive features**		**Ponds** less than 1500 cubic meters in volume that collect runoff and that are not drawing from groundwater, watercourses, wetlands, other lakes or ponds
		Great Lakes or connecting channel takings less than 1,000,000 L/day
Groundwater		**Surface Water**
Category 2		**Category 2**
Short-term, non-recurring taking less than 7 days (e.g. pumping test **and** hydro-static test).		**Great Lakes** or connecting channels takings less than the Great Lakes Charter threshold (19,000,000L/day)
Short-term, non-recurring taking less than 30 consecutive days and less than 400,000 litres/day (e.g. construction dewatering and dust suppression).		**Takings from sources with previous assessments** (i.e. further to a previous study and implementing previously established controls)
		River and Streams (3rd order or higher order) takings less than 5% of 7Q20
		Transitional Permits where the Director previously required upgrades/modifications to water taking
		Takings and Returns where water is removed for a short time only and water is returned to a nearby point with no significant change to water quantity or quality (i.e. for cooling, hydrostatic testing, hydraulic lake dredging)
		Lakes and Ponds takings less than 1,000,000L/day twice per week from water bodies greater than 10ha in size that are not on-stream and not part of the headwaters of any watercourse. More frequent takings require supporting studies.

Groundwater		Surface Water
Category 3		**Category 3**
All groundwater takings that do not meet Category 1 or Category 2 criteria.		All surface water takings that do not meet Category 1 or Category 2 criteria and new takings from 1st or 2nd order watercourses, wetlands, new on-stream reservoirs, impoundments and ponds, groundwater sources that potentially affect surface waters.

Appendix: Classification of Permits to Take Water

Category	Applicant Submits	Ministry Action
1	• Completed Application Form. • Information required by conditions of previous permit.	• Ministry staff will check the information submitted by the applicant for completeness. • Technical Screening: Check whether existing permit requirements and screening criteria are met. Check to ensure conformity with O. Reg. 387/04 requirements (e.g., High Use Watersheds, Great Lakes Charter, water conservation and complete required notifications).
2	• Completed Application Form. • Information required by conditions of previous permit. • Scientific evaluation completed by a qualified person.	• Ministry staff will check the information submitted by the applicant for completeness. • Technical Screening (as in Category 1). • Ministry staff will check the scientific evaluation (schedule 2 and/or 3) prepared by a qualified person for completeness and may undertake audits to determine if the requirements are being met.
3	• Completed Application Form. • Information required by conditions of previous permit. • Scientific study (hydrogeological and/or hydroecological study) completed by a qualified person.	• Ministry staff will check the information submitted by the applicant for completeness. • Technical Screening (as in Category 1). • Ministry staff will conduct a scientific review of studies prepared by a qualified person.

Categories 2 and 3 applications require assessment by a **qualified person**, as follows:

- For **groundwater studies**, a licensed professional geoscientist or accepted professional engineer as set out in the Professional Geoscientists Act, 2000 of Ontario
- For **surface water studies**, a professional engineer or a person with a degree in environmental science with specialization in hydrology, aquatic ecology, limnology, biology, physical geography and/or water resource management

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Appendix: Considerations for Evaluating PTTWs

In evaluating PTTW applications, the Director must consider the following matters to the extent that they are relevant and information is available to the Director.

1. **Natural functions of the ecosystem, including:**

- potential impact on: the natural variability of water flow or water levels, minimum stream flow, and habitat that depend on water flow or water levels; and
- interrelationships between groundwater and surface water, including impact or potential impact on water quantity and quality

Note: To determine the natural functions of the ecosystem consultants may be required to engage with aquatic biologists, ecologists, wetland specialists.

Appendix: Considerations for Evaluating PTTWs

2. Water availability, including:

- potential impacts on:
  - water balance and sustainable yield;
  - existing uses of water for municipal water supply and sewage disposal, private domestic, agricultural purposes, livestock and for other applicable purposes;
- low water conditions;
- whether the water taking or proposed water taking is in a high use watershed or a medium use watershed; and
- planned municipal use of water that has been approved under a municipal official plan or an Environmental Assessment
- Source Water Protection water budgets

Appendix: Considerations for Evaluating PTTWs

3. Use of water, including:

- water conservation in accordance with best water management practices for the relevant sector is proposed to be implemented;
- the purpose for which the water is being used or is proposed to be used; and
- if the water is not currently being used, whether there is reasonable prospect that the person will actually use the water in the near future

4. Other issues, including:

- the interests of other persons who have an interest in the water taking; and any other matters that the Director considers relevant
- comments and concerns received through notice and consultation, including:
    - The Environmental Registry
    - Indigenous communities
    - Municipalities
    - Conservation Authorities
    - Niagara Escarpment Commission

Contact Information

Amanda Prelaz, Divisional Program Specialist

Drinking Water and Environmental Compliance Division, Southwest Region

Email: Amanda.Prelaz@ontario.ca

Tel: (226) 268-7920

Vincent Bulman, Groundwater Group Leader

Drinking Water and Environmental Compliance Division, Central Region

Email: Vincent.Bulman@ontario.ca

Tel: (416) 326-3787