

# Well Interference Committee Meeting Agenda



**Wednesday, May 29, 2019 – 4:00 p.m.**

**Marg MacKinnon Community Room, Guelph City Hall, 1 Carden Street**

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## **Open Meeting – 4:00 p.m.**

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### **Well Interference Committee Orientation Session**

#### **Presentation:**

1. Introductions
2. Overview of Well Interference
3. City's Permit to Take Water Requirements
4. City's Standard Operating Procedure
5. Well Interference Committee – Terms of Reference
6. City's Upcoming Water Supply Projects
7. Comments or Questions

#### **Adjournment**

# Presentation to Well Interference Committee

Water Services


May 2019

Dave Belanger, M.Sc., P.Geo. – Water Supply Program Manager

The background of the slide is a solid blue color. At the bottom, there are several concentric white circles of varying sizes, resembling ripples on water, which are more prominent on the right side and fade out towards the left.

# Well Interference Committee

## ➤ Agenda

- Overview of Well Interference
  - City's Permit to Take Water Requirements
  - City's Standard Operating Procedure
  - Well Interference Committee – Terms of Reference
  - City's Upcoming Water Supply Projects
  - Comments or Questions
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# Overview of Well Interference

- Well Interference – what is it?
- Why is this a concern?
- Well hydraulics and water level response
- Water level monitoring
- City's Conditions for Permits to Take Water



# What is Well Interference?

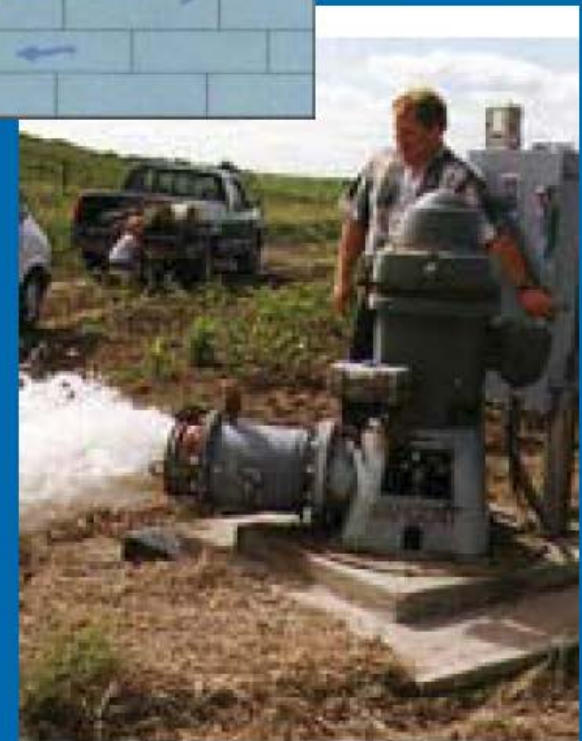
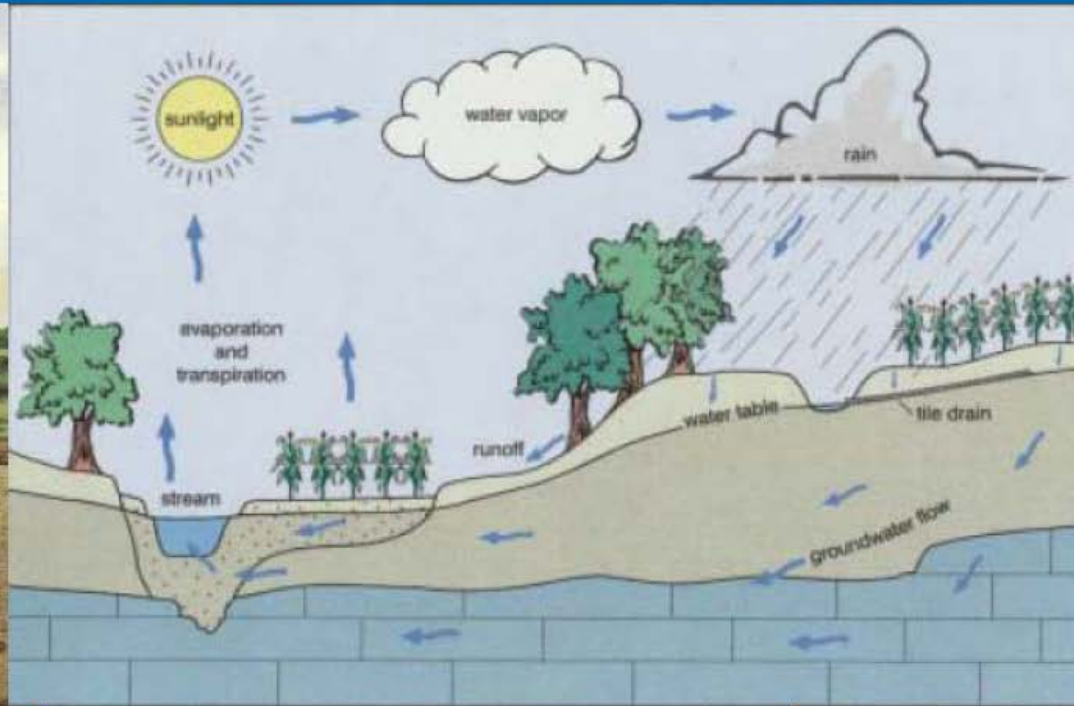
- Where the operation of a water well is adversely affected by pumping of an adjacent well
- Includes: reduction in well yields, deterioration in water quality, impaired well performance
- A water level change in of itself is not well interference

# Why is this a concern?

- Where the operation of a nearby well is demonstrated to be adversely effected, the holder of the Permit To Take Water (PTTW) is required to restore water supplies
- The potential for interference must be addressed prior to issuance of a PTTW

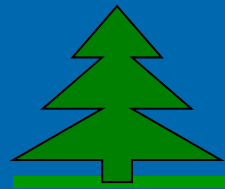
# Well Hydraulics and Water Level Response

- Municipal pumping removes water from an aquifer (bedrock or overburden)
- Pumping lowers the water level in and around the municipal well
- Lower water level induces groundwater to flow to the well (hydraulic gradient)
- Water removed from the aquifer causes a drop in water levels in the aquifer



© The Groundwater Foundation





Production Well

Residential Well 1

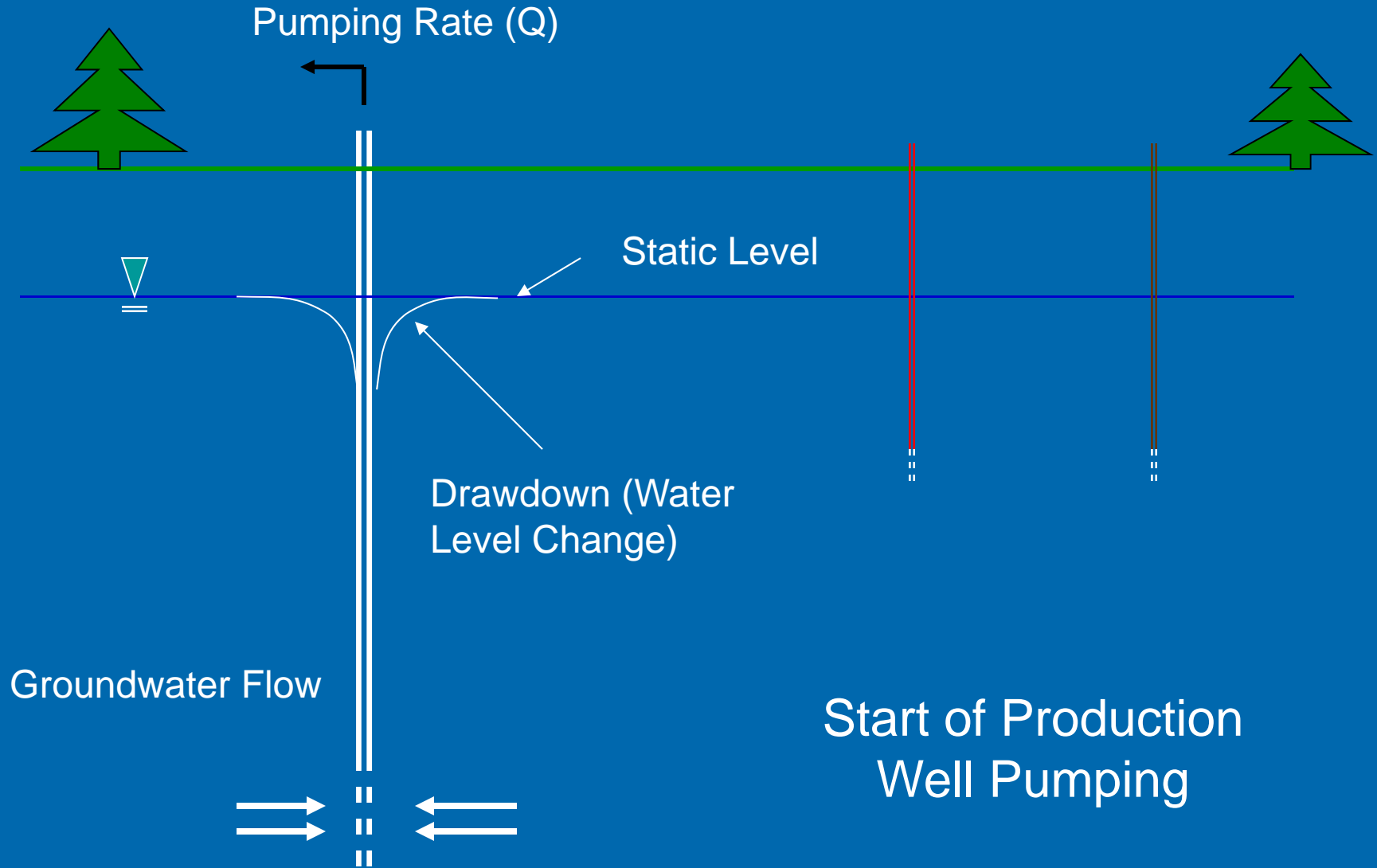
Residential Well 2

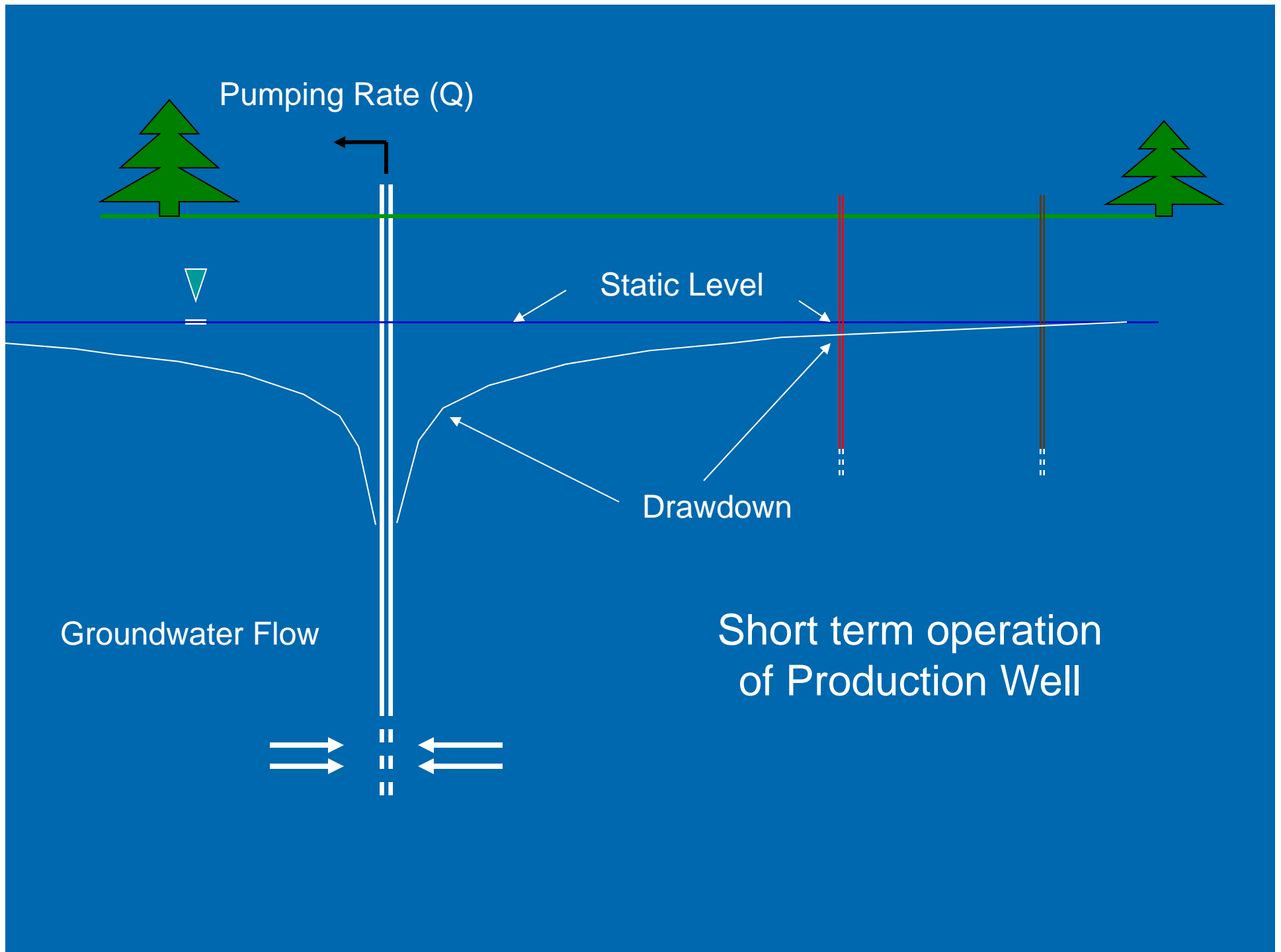
Water Table

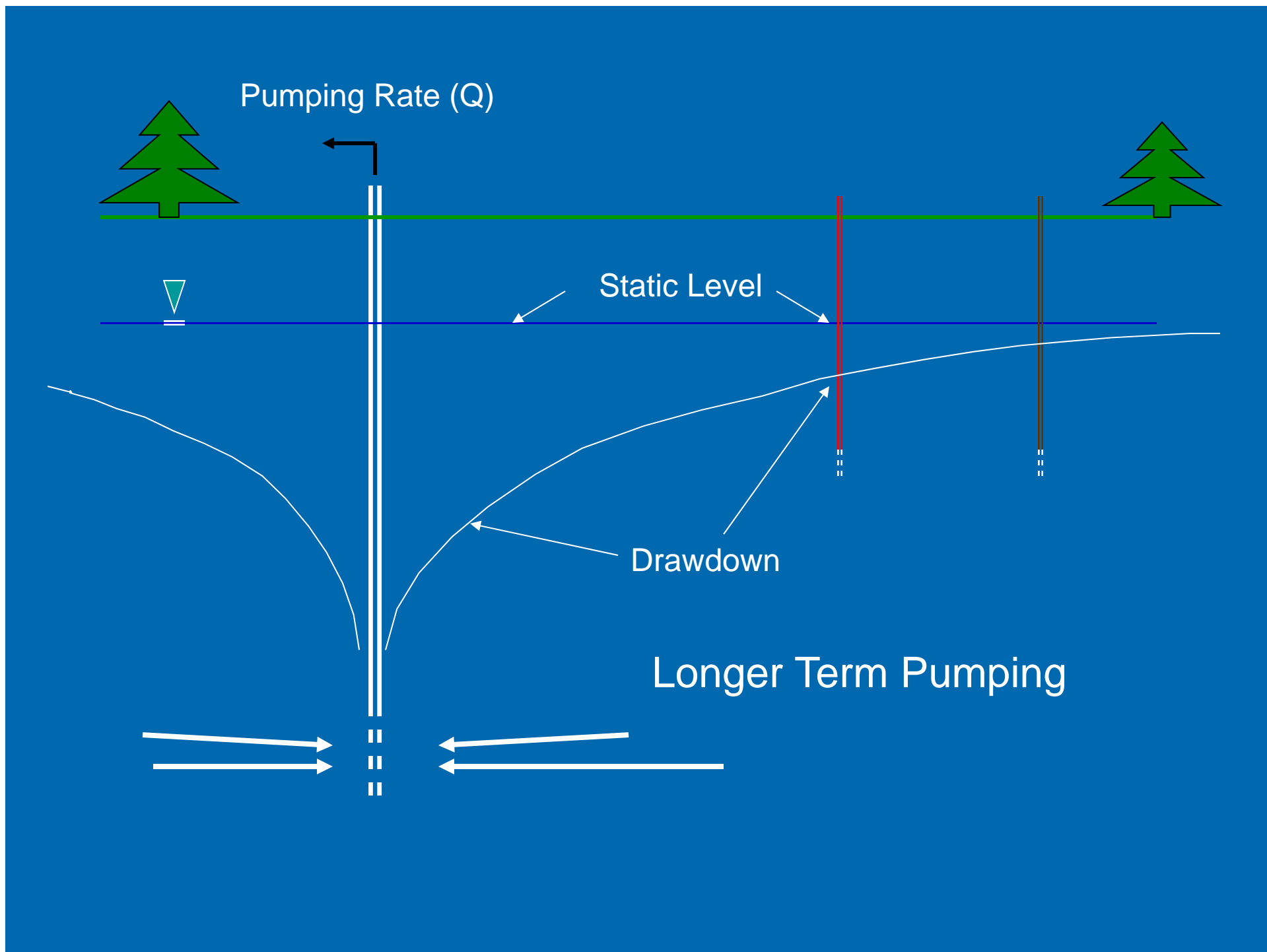


No Pumping – Static Conditions

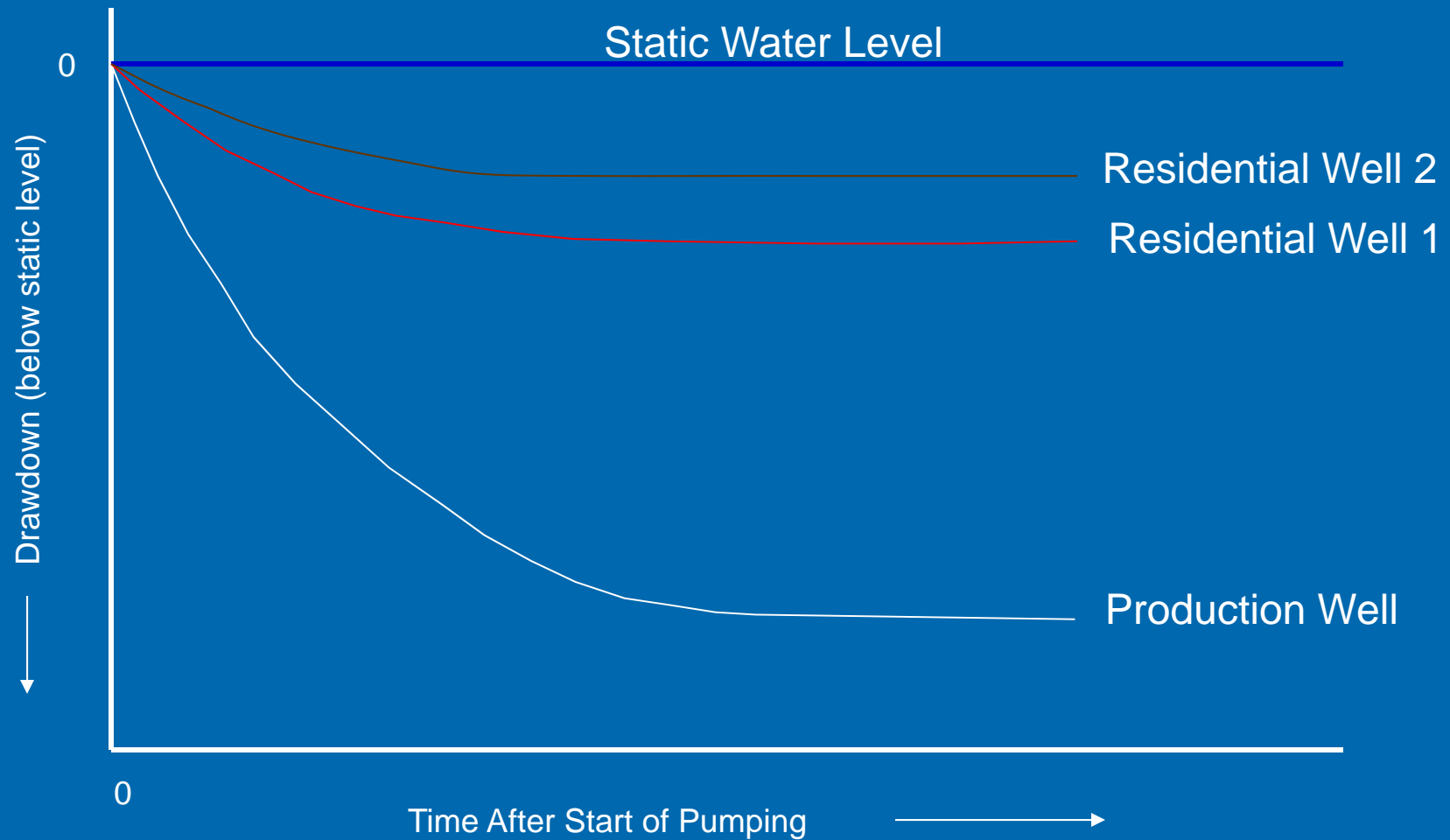




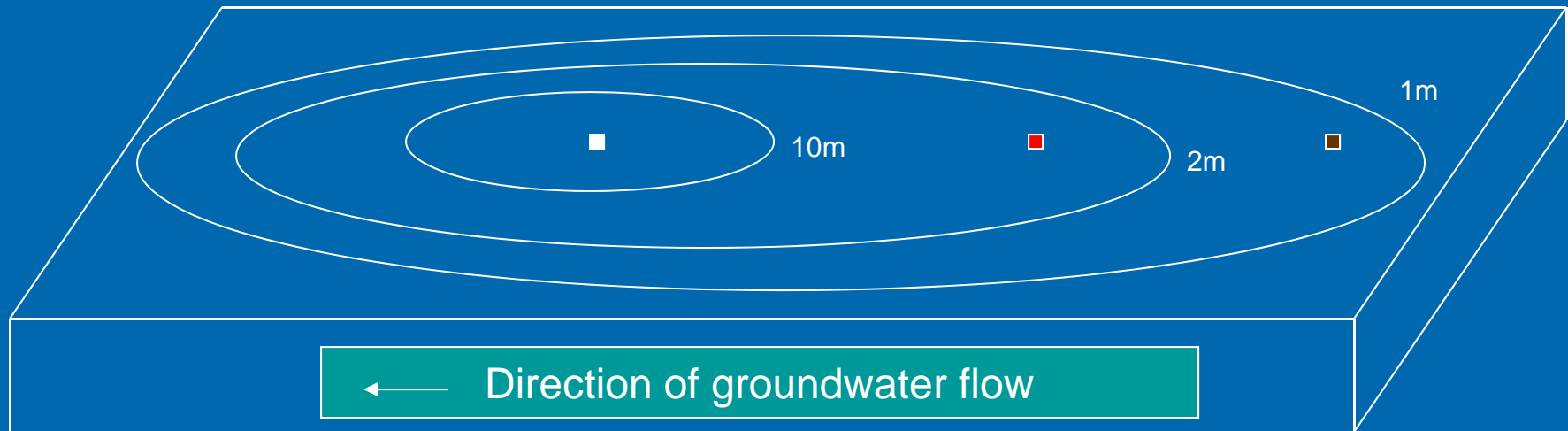




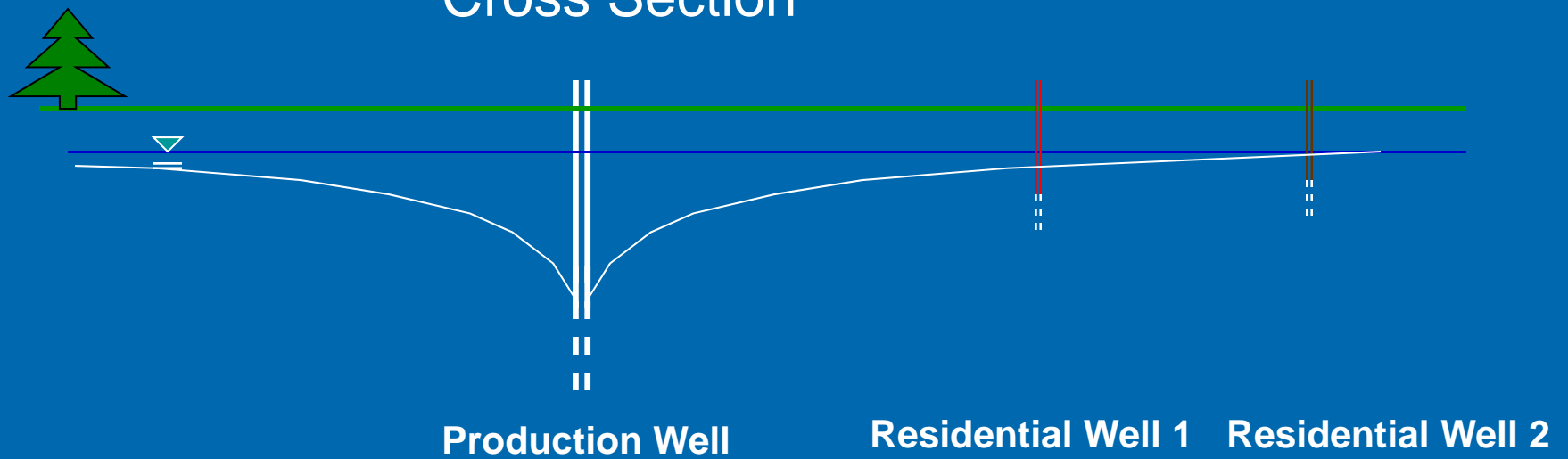
# Drawdown

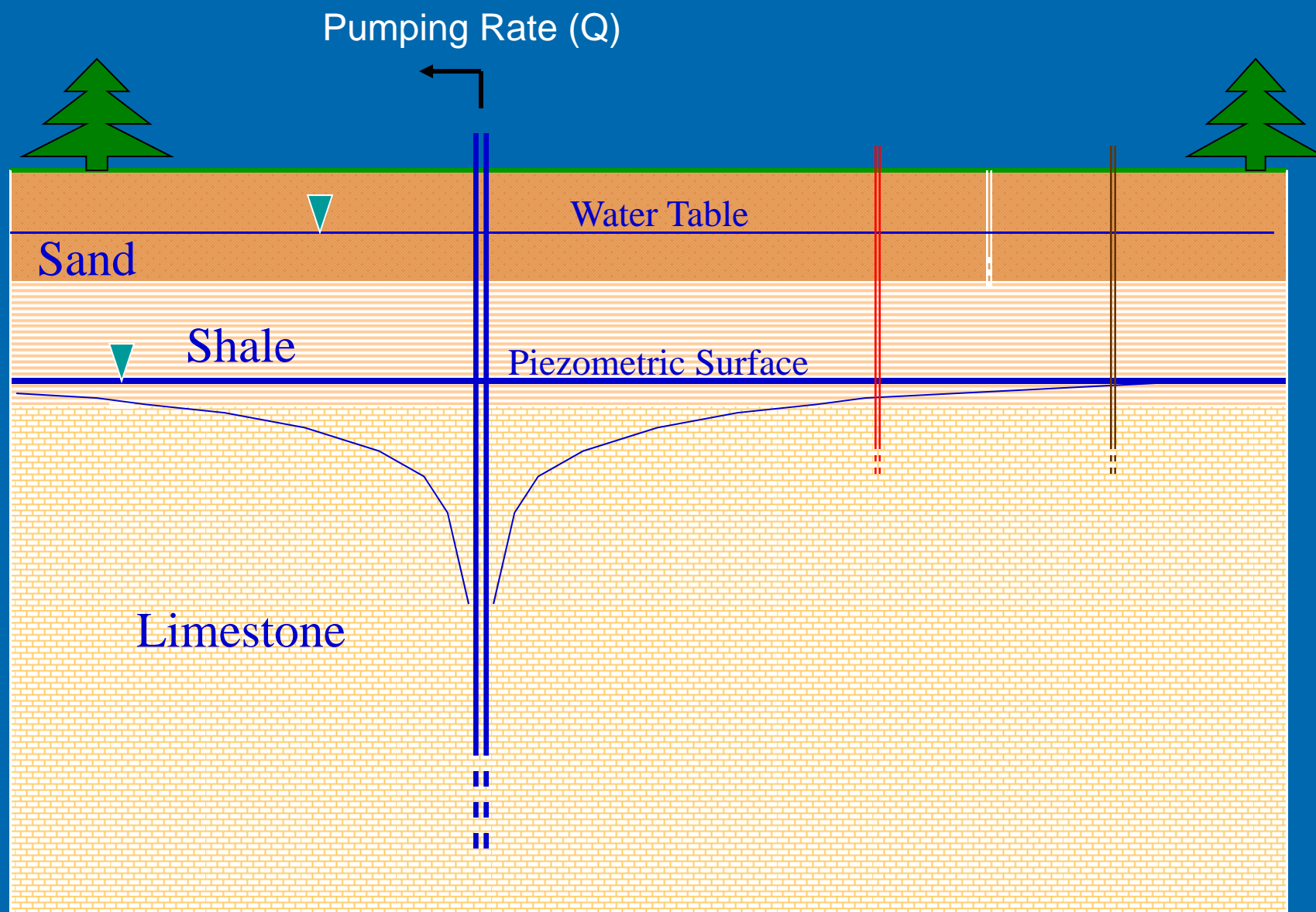


## Plan View




## Cross Section



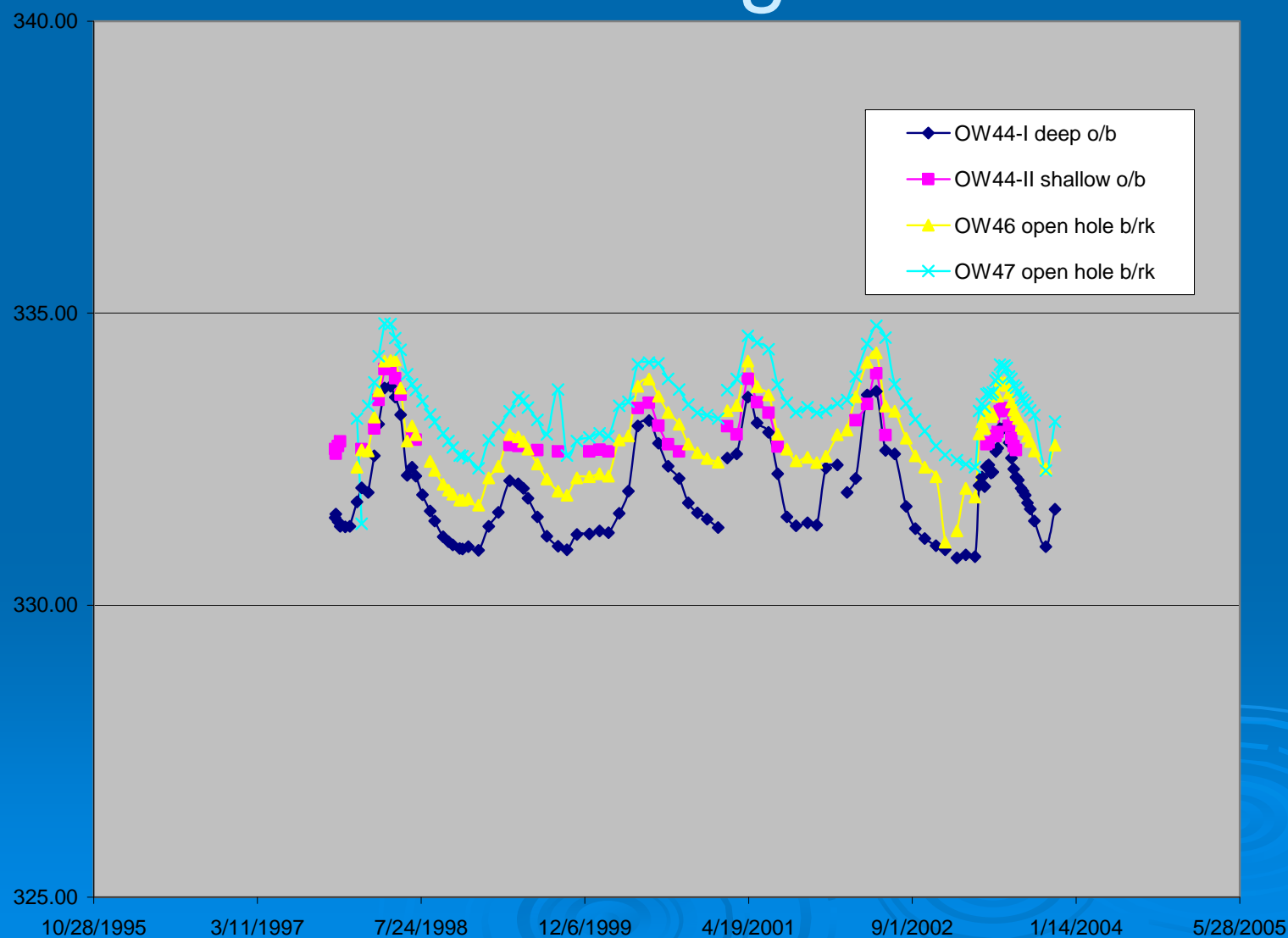


# Water Level Monitoring

- Water levels fluctuate with seasons and year to year
  - Magnitude of fluctuation depends on amount of recharge and porosity of aquifer
  - Operation of private well results in water level fluctuations
  - Operation of municipal well results in wider spread water level fluctuation
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- A decorative graphic in the bottom right corner of the slide, consisting of several concentric circles representing ripples on water, rendered in a lighter blue shade than the background.



# Seasonal fluctuations in bedrock monitoring wells



# Requirements of PTTW holder

- Each PTTW states that:

*“These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.”*

# Requirements of PTTW holder

- *“The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.”*

# Requirements of PTTW holder

- *“the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings”*
- *“or shall compensate such persons for their reasonable costs of doing so”*
- *“or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference”*

# Permits to Take Water

- City obligated to report, investigate and resolve well interference problems caused by municipal pumping
- Upon receipt of a well interference complaint Waterworks implements its *Standard Operating Procedure for the Resolution of Well Interference Complaints*
- Not all well interference complaints will be caused by municipal pumping

# Well Interference Complaints

- If City is responsible:
  - Drill new well;
  - Deepen existing well ;
  - Lower pump; or
  - Connect to municipal water system
- If City not responsible, report to MECP and well owner
- Committee to address complaints where well owner is not satisfied with City's actions

# Other Causes - well condition

- Broken pump
- Poor well maintenance
- Drought
- Increased demand
- Others
- City will investigate but repairs will be responsibility of well owner

# Other Causes - Drought

- Shallow wells susceptible to drought and seasonal low water levels
- Several years of drought can lower water levels by several metres
- Loss of several metres of water in a 10 to 15 m deep well is significant
- Municipal pumping, if it affects shallow wells, can make problems worse



# Well Capture Zones

- Well capture zone defines the area that provides groundwater to a well
- Larger than the drawdown cone
- Includes the recharge areas for the well
- Defined by computer models
- Well interference complaints outside of a drawdown cone are unlikely to be caused by municipal pumping

# Grounds



# Well Interference Complaint – Standard Operating Procedure

- Introduction
- PTTW requirements
- Investigation of well interference complaints
- Confirmed well interference complaints



# Well Interference Committee – Terms of Reference


- Purpose
- Membership
- Mandate
- Compensation
- Meeting Schedule
- Legal support

# City's Water Supply Projects

## ➤ Guelph South Groundwater Investigation

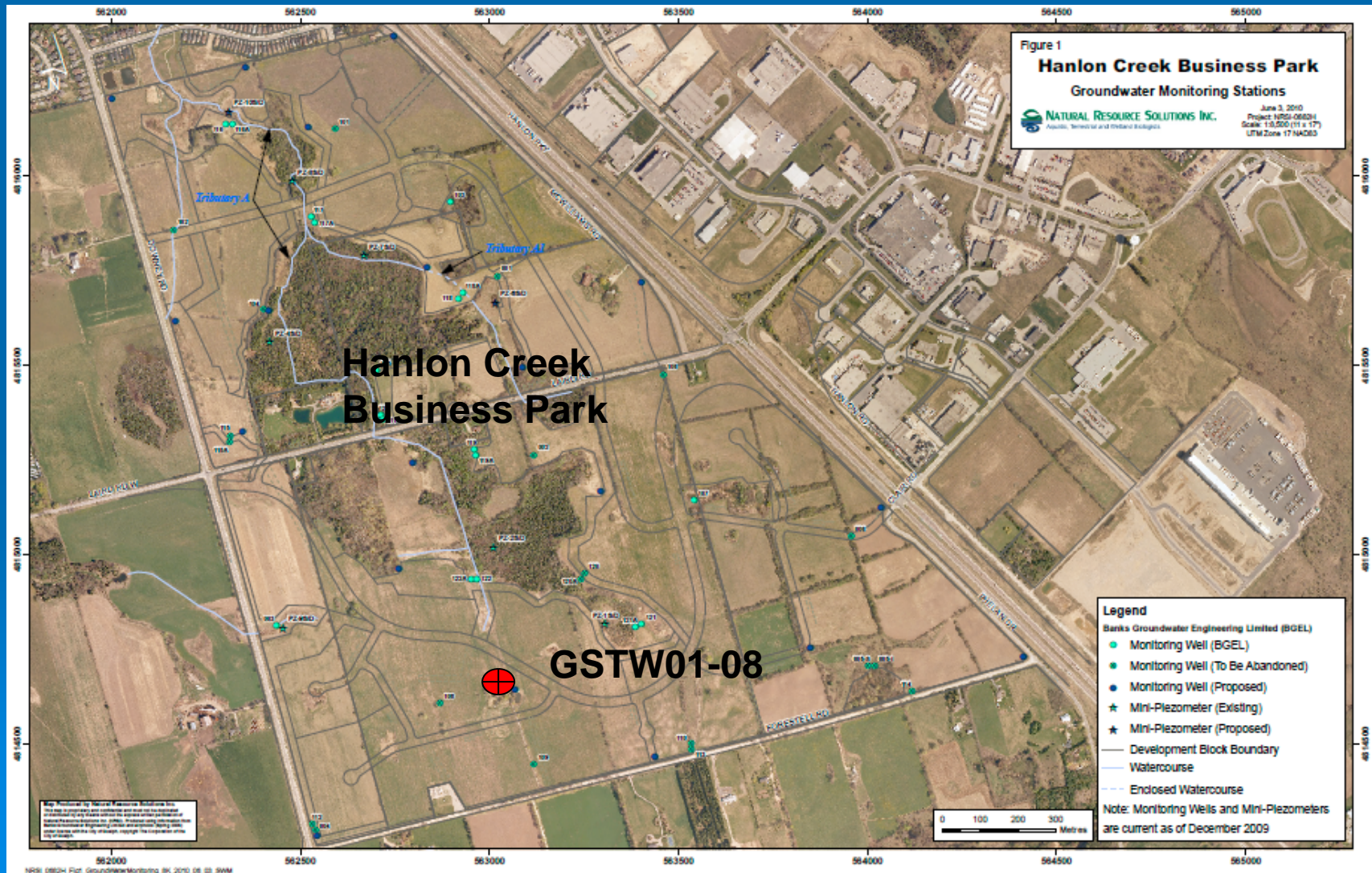
- Well survey
- Drilling program to enlarge a test well
- Installation of monitor wells
- 30 day pumping test with extensive monitoring

## ➤ Logan Well Investigation

- Well repairs
  - Monitor well construction
  - Pumping test
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- Decorative graphic of concentric circles representing water ripples, located in the bottom right corner of the slide.



# Guelph South Groundwater Supply Investigation

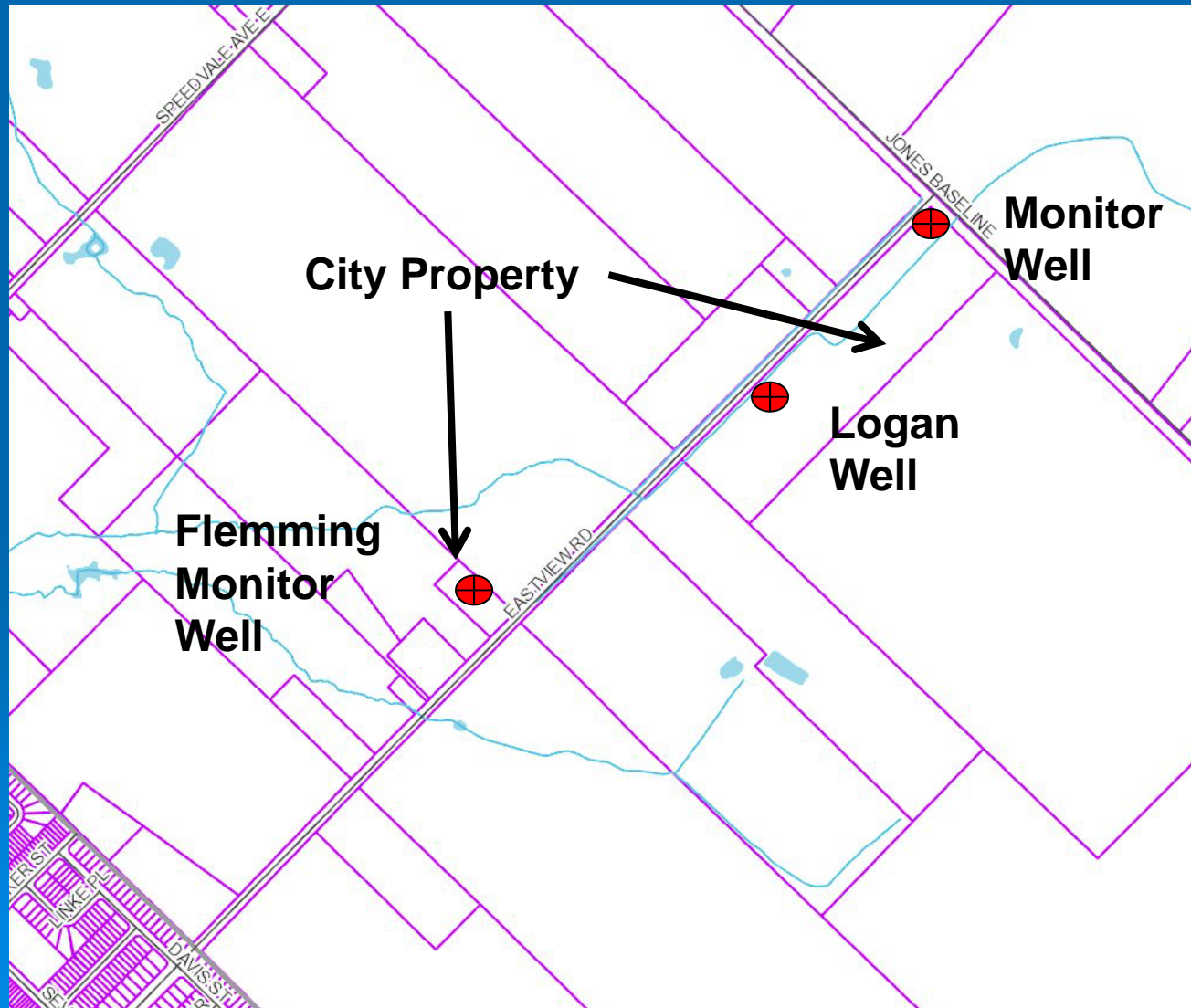




# Guelph South Groundwater Supply Investigation



# Logan Well Groundwater Supply Investigation





# Well Interference Committee

- *Comments?*
- *Questions?*

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| Standard Operating Procedure: Resolution of Well Interference Complaints<br>Total Pages: 4<br>File Name and Path: T:\SOPs\Supply\ Guelph Waterworks Resolution of Well Interference Procedure.doc |
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### ***A. Document Purpose and Description***

This document describes the City of Guelph's Standard Operating Procedure (SOP) to resolve well interference complaints.

### **B. Introduction**

The City of Guelph relies on groundwater and municipal water supply wells for its water supply. The municipal wells are distributed across the City and generally have been constructed into the bedrock.

Operation of the wells, may, from time to time and in specific locations, result in well interference complaints. Neighbouring well production may also decline due to other factors such as: reduced precipitation, well fouling and pump wear. Well interference is when the operation of one well causes an adverse effect on the operation of another adjacent well. Typically, well interference is noted as a significant drop in the water level of the adjacent well such that the well can no longer be operated on a sustained basis. Well interference can result in the adjacent well going dry or the water level in the well dropping below the intake of the pump in the well. It is a rare occurrence for well interference to also result in a significant change in water quality in an adjacent well.

It is the City's responsibility to investigate well interference complaints on adjacent, privately owned wells to determine if its wells are the cause; if the City's wells are the cause of the well interference, the City must take the appropriate actions to resolve the well interference.

### **C. Permits to Take Water**

The City operates its municipal supply wells under Permits to Take Water (PTTW) granted from the Ontario Ministry of the Environment (MOE). Each municipal well has a specific permit which governs the maximum permitted rate at which the well can be pumped and terms and conditions for the operation of the well.

## RESOLUTION OF WELL INTERFERENCE COMPLAINTS

Each PTTW states that:

*“These terms and conditions have been designed to allow for the development of water resources for beneficial purposes while providing reasonable protection to existing water uses and to public interests in water.”*

Furthermore the PTTW provides general conditions for well interference as follows:

### *3. Interference with Other Water Supplies*

*The Permit holder shall immediately notify the Director of any complaint arising from the taking of water authorized by this Permit and shall report upon any action which has been taken or is proposed with regard to such complaint.*

*For Ground-Water Takings, if the taking of water is forecast to interfere seriously, or is observed to interfere seriously with other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this Water taking, the Permit holder shall take such action as will make available to those affected a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of doing so or shall reduce the rate and amount of taking so as to prevent the forecast interference or alleviate the observed interference. Pending permanent restoration of the affected supplies, the Permit holder shall provide to those affected temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.*

Thus, the City is obligated by its permit to investigate interference complaints and where it is found to be responsible, take the appropriate actions to resolve the complaint.

## **D. Investigation of Well Interference Complaints**

Upon receipt of a well interference complaint, the City will investigate the complaint in a timely manner. In its investigation the City will consider the following information in order to understand and resolve the complaint:

- Details of the complaint – address/location, history of problem, nature of complaint
- Location of the well and proximity to existing municipal wells
- Condition and performance of private well pumping system
- Depth of the well and comparisons to depths of adjacent municipal wells

## RESOLUTION OF WELL INTERFERENCE COMPLAINTS

- Available water well records and pumping rates for the complaint well, adjacent municipal wells and other adjacent wells
- Geologic setting for the area
- Municipal pumping rates in the area
- Other relevant information of a hydrogeological nature

If necessary, the City will secure, at its own costs, the help of a well and pump contractor or professional geoscientist to complete the investigation. The results of this investigation will be used to assess the interference complaint and determine the potential or probable causes of the complaint. City information related to the pumping and operation of nearby municipal wells and hydrogeological information will be provided to the private well owner. The private well owner will also be informed by City staff of the City's obligations related to well interference and our PTTW and the role of the MOE in resolving well interference. All of the above information will be provided in a timely manner. Copies of all correspondence will be placed in the Waterworks well interference file.

The City will also inform the Guelph Office of the MOE of the interference complaint and copy the MOE any correspondence sent to the private well owner.

It is noted that not all well interference complaints will be the responsibility of the City. Well problems may occur for a variety of reasons including drought conditions, low water levels, pump or plumbing problems, well plugging or other problems. Of note are recent dry climatic conditions in Southern Ontario and an annual rainfall deficit that has resulted in well problems for a number of shallow groundwater wells. Therefore a thorough investigation is required to assess the cause of the well interference complaint.

### **E. Confirmed Well Interference Complaints**

If the results of the investigation identify an adverse impact on a well caused by the operation of a City municipal well, the City will take immediate action to rectify the situation. In the short term, an alternative supply of water will be provided. Long term remedial actions, which would be developed with the cooperation of the private well owner, may include but are not limited to:

- Lowering the intake of the well pump;
- Deepening or enlarging or replacing the well;
- Providing water treatment in conjunction with the above;
- Providing supplemental water storage (i.e. larger pressure tank);
- Providing a municipal water service; and
- Reducing the well water withdrawal rate.

## RESOLUTION OF WELL INTERFERENCE COMPLAINTS

The remedial action(s) selected will depend on the condition and construction of the existing well and pump, the overall cost of the action (capital and operational), and the well owner's preference. Remedial actions will be implemented in a timely manner.

The City will assume all costs of remediation; however, should the well owner wish to upgrade or enhance the system beyond its original condition, it may be done at his/her own cost.

In cases where the results of the investigations are uncertain but the City may bear some responsibility, the well owner shall be given the "benefit of doubt" and the City will work with the well owner to reach an equitable solution.

Even if the City is not responsible for causing well interference, the cost of investigating the complaint will be borne by the City.

The City will inform the MOE in writing upon resolution of the well interference complaint. Copies of all related documents will be placed in the City of Guelph Well Interference file.



## Terms of Reference – Well Interference Committee

**Purpose:** The purpose of a Well Interference Committee is to hear appeals on well interference complaints resulting from the City's groundwater taking and, where appropriate, recommend compensation to residents for well interference. An ancillary purpose is to provide opportunities for adjacent municipalities to consult with the City on well interference issues related to the City's groundwater taking.

**Membership:** The Well Interference Committee will be composed of representatives from the City and the adjacent municipalities most likely to be affected by well interference complaints. Membership could include the following:

City of Guelph Council (3)  
Township of Puslinch Council (1)  
Township of Guelph/Eramosa Council (1)  
Town of Milton Council (1)

A minimum of five members of the Committee are required to convene a meeting.

**Mandate:** It is the City's practice to resolve well interference complaints that are caused by the City's groundwater taking. City Staff will implement its Standard Operating Procedure (SOP) for the Resolution of Well Interference Complaints (attached) in response to notification of a well interference complaint. (Note: Upon the implementation of the Well Interference Committee, the SOP will be revised to incorporate the role of the Committee and the opportunity for the well owners to appeal to the Committee for compensation.)

According to the SOP, City staff will conduct an investigation of the complaint and, where the complaint is justified and the City is found to be responsible, will implement methods to resolve the well interference complaint and restore the affected water supply. Where the City conducts an investigation and the City is found not to be responsible for the well problem, the City will provide a letter report to the well owner summarizing the results of the investigation and why the complaint is not justified. The letter report will also inform the well owner of the role of the Well Interference Committee and the appeal procedure.

In some cases, a well owner may be dissatisfied with the resolution provided by the City or the compensation provided by the City. In these cases, the well owner could appeal to the Committee for additional compensation.

If the City receives written notification of an appeal of a well interference complaint, the City will provide a written response to the well owner providing the date, time and location for the next Committee meeting. The well owner will be invited to the meeting to present his/her appeal to the Committee.



Upon an appeal, the Committee will review available information provided by City staff on the well interference complaint. Information will include the following:

- Location of the well owner with respect to the nearest municipal well(s)
- Details of the complainant well including depth and water level in comparison to the municipal well details
- Details of municipal pumping in the area of the complaint
- Monitoring of water levels in the area, if available
- Details of the complaint
- If appropriate, details of the resolution of the well complaint and measures taken to date

The Chair for the Committee for each meeting would be derived from the municipality in which the complaint originates.

At the meeting, the Committee would hear information from the well owner on the nature of the appeal and the justification for compensation. City staff will be available to the Committee to answer questions and provide any requested information.

The Committee would vote on awards for compensation on the merits of the case presented to the Committee. The Chair would not vote on a Committee decision unless required to break a tie. Decisions of the Committee are final.

**Compensation:** Compensation will be provided to well owners where the City's groundwater taking prevents a well from providing an adequate water supply for the well owner. The preferred method to resolve well interference complaints is to connect the residence to the municipal water supply as this provides a long-term secure water source. Where a municipal water supply is not available, compensation would partially or fully cover the costs of a replacement water supply (i.e. lowering of the pump, deepening of the existing well or drilling of a new well as the case may require). Mitigative measures will attempt to ensure a permanent solution such that the potential for future well interference is minimized. Upgrades to the water supply beyond restoration of the existing system, if desired by the well owner, will be the responsibility of the well owner.

Compensation may also be awarded to cover the costs of a temporary water supply used during the repair of the well and if a new well is provided, to cover the cost of the abandonment of the old well. Wells not used or dry wells must be abandoned according to the Ontario Water Resources Act, Regulation 903 as amended. Compensation would not normally cover the future cost of operation and maintenance of the well and pumping system. The City may, at its discretion, undertake the necessary repairs to the well or have the well owner undertake the repairs and the City will provide reasonable compensation to the well owner. Any awards of compensation must be supported by receipts documenting costs associated with the restoration of the water supply system.

**Meeting Schedule:** The Committee will only convene a meeting in response to a complaint. Complaints must be received fourteen (14) days prior to a meeting date in order to convene a meeting for that date.



**Legal Support:** The City Solicitor will provide support to the Committee in the initial stages to provide legal advice on liability issues associated with the Committee, the replacement of water supplies and the abandonment of wells. A full and final release of the City and affected municipality of any outstanding claims will be required upon any compensation being granted by the Committee. The signing of a waiver form by the well owner may be required prior to restoration of the well to ensure the well owner accepts future responsibility for the well.