

**Recommended Pumping Test Report Format**  
**For NYSDEC Water Withdrawal Permit Applications**  
December 2021

Department regulations ([6 NYCRR Part 601](#)) require that pumping test results be submitted with any Water Withdrawal Application for new or additional groundwater sources or for reassessment of previously permitted wells. In making its decision to grant or deny a permit or to grant a permit with conditions, the department must determine whether the quantity of supply will be adequate for the proposed use, the proposed project is just and equitable to all affected municipalities and their inhabitants with regard to their present and future needs for sources of potable water supply, and the proposed water withdrawal will be implemented in a manner to ensure it will result in no significant individual or cumulative adverse impacts on the quantity or quality of the water source and water dependent natural resources, including aquatic life. DEC's [Recommended Pumping Test Procedures for Water Withdrawal Applications](#) rely on a 72-hour pumping test to produce the accurate and complete information necessary for these determinations.

All items in Section 14 of the Recommended Pumping Test Procedures (listed below) should be addressed in a Pumping Test Report. If an applicant decides an item is inapplicable to a particular water withdrawal project, then the applicant is still to specifically address the item in the Pumping Test Report by describing it as “inapplicable” and providing the technical and/or legal rationale for that decision.

It is suggested that the following report format be used when submitting pumping test data in support of a requested groundwater withdrawal.

**Section I: General Description and History of Proposed Project**

Provide a brief description of the existing and/or proposed project including location, history of operation, water sources, water uses(s), and any additional available information establishing the context and rationale behind developing the new groundwater source. Identify existing water withdrawal permits (NYSDEC permit ID number or WWA number), if any. This information is vital in establishing the proposed operational context for the new source(s) with respect to the overall system.

**Section II: Submission of Data**

Data submitted in support of a requested groundwater withdrawal must include the following.

- A. **Raw pumping test data** (preferably in electronic format) including:
1. identification of tested well(s)
  2. identification of observation well(s)
  3. date, clock time, and elapsed time (minutes)
  4. measuring point (top of casing) elevation
  5. water level measurements including static water level
  6. calculated drawdown
  7. depth of pump intake
  8. pumping rate measurements of tested well(s)

When possible, superfluous data points should be reduced. For example, presenting

data points collected once per second or once per minute after the first hour unnecessarily clutters reports and spreadsheets and does not contribute to efficient analysis. However, any data exclusions should be noted and justified. Water level and drawdown data should be correlated in table format with elapsed time data.

- B. **The time scale** of these measurements should approximate the logarithmic scale, although the time between measurements should be increased later in the test. It is recommended that a spreadsheet file of this raw data be submitted in place of a written record.
- C. **Pre-test water levels** of the pumping well(s), observation wells, piezometers, staff gauges, surface water monitoring points.
- D. **Recovery** and other post-test water level measurements.
- E. **Pumping rate(s) of nearby wells** including times on and off, surface water level and stream flow measurements, rainfall and weather information.
- F. **Engineering diagrams** showing construction details (e.g. well casing, screen setting and casing stickup, etc.) and depths of pumping wells and observation wells.
- G. **Geologic logs** must be submitted. For potable water supplies, completed NYSDEC well registration reports must also be included. For bedrock wells the depth of primary fractures must be noted in the log.
- H. **Graphs, formulae, and calculations** used to estimate relevant aquifer properties (e.g., transmissivity, storage coefficient, specific capacity) and safe yield <sup>[1]</sup>. The analytical solution (e.g., Theis, Cooper-Jacob), methodology, and any relevant assumptions made in the analysis of aquifer parameters should be discussed.
- I. **A scaled site plan** showing:
  - 1. Water level elevation controls (e.g., top of casing);
  - 2. Grade elevation for all wells;
  - 3. The locations of staff gages and other water measuring points;
  - 4. The locations of pumping test discharge piping and discharge point;
  - 5. The location of nearby surface water bodies; and
  - 6. If applicable, the 100-year flood plain and elevation.
- J. **Coordinates** presented in either latitude and longitude (in degrees, minutes, seconds, tenths of second) or UTM's for all production wells and any observation wells which are to remain, preferably in NAD 1983 (specify the method and datum used to locate the wells).
- K. **A topographic map** showing the locations of existing or potential groundwater contamination threats. Delineation of a wellhead protection areas recommended.

### Section III: Analysis

Constant-rate pumping tests have long been established as an effective means of calculating aquifer properties relevant to assessing the sustainable safe yield of a specific

well. Although Sections 3.a and 3.b of NYSDEC [Recommended Pumping Test Procedures for Water Withdrawal Applications](#) provide specific conditions under which a determination of “stabilized drawdown” conditions can be made in the field, a formal analysis of time-drawdown data from the pumping test should be included in the Pumping Test Report to provide mathematical support of the conclusions drawn with regard to the nature of the target aquifer and the sustainability of the requested yield at the production well.

Analysis of the pumping test data and results should describe the methodology, references, assumptions made with regard to the target aquifer, selected analytical solution(s), and rationale. Results <sup>[1]</sup> for hydraulic conductivity, transmissivity, specific capacity, storativity, and sustainable yield should be summarized. All documentation submitted must be legible and professionally presented. Plans and maps should use shading, cross hatch patterns, symbology, and other visual tools such that features are readily distinguishable and remain readable when photocopied in black and white.

***Footnote:***

[1] Note for bedrock investigations -- transmissivity and storage calculations in bedrock aquifers may be misleading due to failure of the media to meet the assumptions necessary for carrying out such calculations. However, it may be legitimate to treat or simulate extensively fractured bedrock as an unconsolidated aquifer. These matters should be discussed in the Pumping Test Report. In addition, any de-watering of major fractures must be noted and the consequences discussed.