



Part 3 – Groundwater Project Renewals: Water Level Monitoring

Frequently Asked Questions (FAQ)

Q. What is ‘water level monitoring’?

A. Water level monitoring is the measurement of groundwater elevation within an operational groundwater well, typically on an established schedule or frequency (e.g., daily). The static water level, or natural level of the piezometric surface within a well, generally represents the high-water level. The pumping level, or level of groundwater within the well during daily operations, generally represents the low-water level. Pumping level can vary depending on the pumping rate, duration of pumping, and seasonal hydrologic conditions.

Q. Which water level measurement, static or pumping, is most beneficial to collect?

A. Although it is important to identify your well’s static water level, a daily pumping level, or low-level measurement, will provide more valuable information regarding the impact that your withdrawal is having on the aquifer and potentially your well.

Q. What if I cannot collect daily low-water levels?

A. Although a low water level is preferred, it may not be convenient or possible depending on the timing of run cycles and equipment. Therefore, if a low level isn’t possible, the Susquehanna River Basin Commission (Commission) recommends that water level measurements be recorded at a consistent time each day.

Q. Why am I required to monitor water levels in my well?

A. The Commission has existing regulatory requirements in Part 806 of the Code of Federal Regulations requiring approved projects to monitor and report operational data. Specifically, 18 CFR § 806.30 prescribes requirements for water level monitoring, recording, and reporting. Beyond the regulatory requirement, water level monitoring assists in the day-to-day management of the resource and is helpful during the renewal process.

Q. Who is required to monitor water levels in their well(s)?

A. Every groundwater project with an approval from the Commission. This includes municipal or PWS projects and non-municipal projects such as commercial or industrial projects. Projects should be maintaining the collected data for the duration of the project. Additionally, these monitoring requirements for the collection and reporting of groundwater elevation data to the Commission are identified in all new approvals.

Q. Does the Commission provide guidance for how project sponsors can meet the regulatory requirements of 18 CFR § 806.30?

A. Yes, the Commission provides guidance for a project sponsor's groundwater elevation monitoring plan (GWEMP) to meet the Commission's regulatory requirements under 18 CFR § 806.30 under Policy 2020-02. The Commission's guidance for a GWEMP includes recommendations for water level monitoring methodologies such as frequency of water level data collection, calculation of groundwater elevations, and data collection record-keeping and reporting. The guidance document can be accessed using this link: <https://www.srbc.net/regulatory/policies-guidance/docs/metering-plan-groundwater-elevation-guidance-policy-2020-02.pdf>

Q. How often and where should water level data be recorded?

A. At least once daily and a daily log should be kept of your groundwater elevation measurements. This log can be in paper or electronic form. Often, this daily log is recorded using an automated computer-based database or system.

Q. When is the best time to collect a water level measurement?

A. Although any time of day is acceptable, staff encourage project sponsors to record the daily low and high water levels. These measurements are typically taken just prior to the pump's run cycle (off – highest level; static level) and just prior to the end of the pump's run cycle (on – lowest level; pumping level). Commission staff prefers that project sponsors report the low-water level.

Q. What are some acceptable ways to measure daily water levels?

A. Groundwater levels can typically be measured manually or electronically. Manual water levels can be collected using an electronic water level indicator or air line with a pressure gage. Electronic or automated water levels can be collected using a pressure transducer.

Q. What is the Commission's preferred water level measurement?

A. The Commission prefers that groundwater elevations be reported as feet above mean sea level (ft. AMSL). Depth to water (DTW) is also an acceptable measurement. All water level measurements should be collected from a fixed position that will not change. Please do not report the height of water above a transducer, pump, or air line, or any water column measurement. Because water column measurements are easily affected by moving or repositioning pumps, transducers, or other equipment, water column measurements are less reliable and less reproducible. Additionally, the reference point is often obscure or meaningless, which can affect data interpretation.

Q. How often and where should water level data be reported?

A. Project sponsors are required to submit daily water level or elevation data to the Commission on a quarterly basis via the Monitoring and Data Website (MDW). The MDW and MDW Support Information can be accessed using the following links: <https://services.srbc.net/reporting/> and <https://services.srbc.net/reporting/helpandsupport.aspx>. An additional benefit of submitting water level data to the Commission at the required interval is that the Commission's MDW will act as a backup data repository for your well source.

Q. What are some of the benefits to collecting and reviewing groundwater level measurements?

A. Water level measurements often can be a primary source of information about an aquifer's characteristics and impacts caused by a groundwater withdrawal, which can be useful to the Commission and a project when considering long-term sustainability of a groundwater source. Additionally, periodic review of water level data may indicate when a well, pump, or piping is failing and when maintenance is needed. Collecting and maintaining a record of routine water level data during ongoing withdrawals develops a valuable resource of operational water level data. The data are beneficial to the project to provide support for a request to renew the withdrawal approval and for ongoing, near real time evaluation of aquifer performance/conditions (drought levels), well performance, and pump performance.

Q. How does the Commission use submitted water level monitoring data?

A. The Commission uses the data primarily during renewals to evaluate ongoing influences within the aquifer, and potential impacts to other users or the environment. The data can be invaluable to the Commission to investigate and evaluate claims of impact or influence from the public or other users.

Q. Can routine collection and review of water levels help identify well issues?

A. Yes, routine review of collected water level data can assist in early detection of well integrity or construction issues, decreases in pump efficiency, piping failure or leaks, and potential influence or interference from other users. Recognition of symptoms can help in diagnosing and addressing these problems before they become an emergency or cause disruption in normal well operation.

Q. How frequently should a water level measurement be recorded when continuous monitoring equipment is being used?

A. The frequency can be variable and depends on the specifics of your system and how often the source is utilized. The Commission recommends that water level data be collected at 15-minute to 1 hour intervals, if able. Collection at higher frequencies may be needed during operational testing or monitoring periods to support the renewal application. Data collection at a higher frequency will fill available storage space more quickly and the capacity of the storage system should be considered when determining how much data to collect and store. Please be aware that data recording systems may over-write data, which could lead to a loss of data if not properly maintained or exported to another program. For ease of analysis, staff recommends periodically transferring data into a spreadsheet for graphing and as a backup to the primary storage method.

Q. What if we do not know the length or depth of the air line used to check water levels?

- A.** There are a couple of options depending on what is available to you:
1. Remove the air line, measure it, and return it to the well. Once the length of the air line is known, the reading from the pressure gage can be used to estimate the depth to water by subtracting the water column height from the length of the air line.
 2. If there is sufficient space, use a manual water tape to measure the depth to water. The measured depth to water is added to the water column height measured from the air line to determine the depth of the air line.

Please be aware that air lines occasionally develop leaks, which could affect the water column measurement. For this reason, it is important to measure the length of the air line during installation and periodically check for leaks or blockages and confirm proper operation of the air line using these methods. Air lines should maintain a constant pressure over several minutes, provided the water level in the well is not changing due to pumping or water level recovery. Air line pressures that are difficult to establish or maintain may indicate that a leak is present. Additionally, a water column height that is always the same, regardless of season or pumping conditions, may also indicate that a leak is occurring.

Q. I am not currently collecting groundwater level data, should I begin or resume monitoring?

A. The Commission strongly encourages projects that are not currently measuring and recording groundwater levels to begin or resume monitoring. Projects, at their request, may begin reporting water level data to the Commission to ensure the data is stored and available for later use. The collection of good operational data can supplant aquifer testing data, which will significantly reduce project costs and time demands during the groundwater renewal process.

Q. I would like to start tracking my water levels but need help setting up the spreadsheet.

A. Commission staff can assist projects in setting up spreadsheets for recording and maintaining water level data. Additionally, Commission staff can assist in creating water level graphs and teaching projects how to update the graphs.

Commission staff is available to assist a project sponsor with an assessment of a project's water level monitoring methods, data collection and maintenance, and water level data evaluation. If you have any questions please contact the Commission at (717) 238-0423. You can also direct questions to:

General Project Review Questions

- Todd Eaby, Manager Project Review: teaby@srbc.net

Groundwater Projects and PWSAP Questions

- Mike Appleby, Groundwater Supervisor: mappleby@srbc.net