

pH Standard Operating Procedure Template

Facility Name: _____

Facility Location: _____

Facility Laboratory Certification ID No.: _____

At the facility utilizing this SOP, the following procedures shall be followed for the analysis of all pH measurements:

1. The analytical method to be utilized for this pH measurement shall follow Standard Methods 4500-H⁺ B. **(If you choose another one of the approved method options, i.e. ASTM or USGS, identify the method of choice.)**
2. A copy of the certified laboratory facility NJDEP Certification shall be available and visible at the facility at all times.
3. The individual at the certified facility, who has been identified as the “supervisor”, shall have had at least three (3) months experience in performing pH analyses.
4. The individual at the certified facility, who has been identified as the “supervisor”, who may also be the “quality assurance office”, shall do the pH testing. In the event that other staff members do the pH testing, they shall do it under the supervision of the supervisor / quality assurance officer.
5. The pH testing equipment shall conform to N.J.A.C. 7:18-3.3(a)3 as follows:
 - a. The equipment used shall be operated in accordance with manufacturer’s instructions. ***A copy of the manufacturer’s instructions shall be attached at all times to this SOP and be readily available within the certified laboratory.***
 - b. The accuracy of the equipment shall be within ± 0.05 pH units.
 - c. The scale readability of the equipment shall be within ± 0.05 pH units.
 - d. The electrodes of the pH testing equipment shall be rinsed with reagent water after each reading.
 - e. All samples shall be stirred during the measurement at a constant rate. This can be accomplished by manually stirring or “swirling” the sample container during measurement or by the use of a stir bar and a stirrer.
 - f. The pH testing equipment, including testing electrodes, shall be stored in accordance with manufacturer’s recommendations.
 - g. The meter shall be capable of temperature compensation.

Meter Used (Model and serial number): _____

Electrode (Model and serial number if available): _____

pH calibration buffers used:

Calibration buffer #1 _____

Calibration buffer #2 _____

Calibration check buffer used: _____

6. All pH meters shall be calibrated each day of use as follows:

- a. Calibration shall be made with fresh aliquots of two standard pH buffers bracketing the value to be measured (typically pH buffers 4.0 and 10.0). These calibration buffers must be within ± 0.05 of true value.
 - b. After calibration with two standard pH buffers, a standard mid-range pH buffer with pH within the calibration range (typically pH buffer 7) shall be measured without any control adjustments to check the calibration. This mid-range third buffer check must be within ± 0.1 accuracy or the calibration must be repeated. If the meter displays a value for the slope of the instrument, this value should be recorded as a useful troubleshooting tool. The acceptable range for the slope value is 90-100%.
 - c. All calibration and check data shall be recorded on a pH analysis sheet or in a bound notebook, which includes the signature of analyst, the times of all calibrations and checks, the results of the calibration, and date.
 - d. When the pH meter is in use for longer than 3 hours, the pH of the third buffer shall be checked once every three hours. If the pH differs by more than ± 0.2 pH units from the standard buffer value, the meter shall be recalibrated. All pH buffer calibration aliquots (the small volume used specifically for calibration) shall be discarded after each use.
7. Duplicate samples shall be analyzed on 5% samples (one in twenty samples) or on a monthly basis. For an onsite laboratory which is only required to report pH on a quarterly basis, at least one sample must be duplicated during the quarter. The results of the original sample and the duplicate must be recorded.
 8. The pH SOP shall be updated whenever necessary to reflect any changes in the procedures used. All revisions require the signature of the laboratory manager, supervisor or quality assurance officer. Each revision shall be designated by number and effective date.
 9. The laboratory at the pH testing location shall keep a copy of this SOP in the immediate bench area of personnel engaged in pH testing, along with a copy of the pH testing equipment manufacturer's instructions.
 10. Discard expired buffers (any buffer older than the expiration date on the container). The expiration date of all buffer containers must be present on the container, as well as the date received and the date first opened (for anything other than a single-use container).
 11. PEN is to be used, NOT PENCIL. NO WHITEOUT is to be used. Any errors recorded shall be single-lined (ex: ~~error~~), dated, and initialed.
 12. Records of calibration shall be maintained at the facility for a minimum of five years and must be available for review during an onsite visit of the laboratory.
 13. If custody of the samples is passed among more than one individual (for example, if one laboratory employee takes the sample, then passes it along to another who conducts the pH analyses), then the attached Chain-of-Custody Form MUST be used, and retained with pH sampling documentation.
 14. Expired buffers shall not be used and must be discarded (any buffer older than the expiration date on the container). The expiration date of all buffer containers must be present on the container, as well as the date received and the date first opened.
 15. The following information must be retained as part of the raw data records generated during testing:
 - a. pH calibration records as detailed in Item 7.c above.

- b. Sample identification and time of sample collection.
- c. Identification of the sampler and the analyst (initials).
- d. Time of sample analysis.
- e. pH results reported in standard units (s.u.).
- f. The results of the required duplicate testing (quality control).

Sample Chain of Custody Form

Date: _____

Sample location: _____

Samples Taken by (Printed Name): _____

Samples Taken by (Signature): _____

Chain of Custody Transmittal Record

<i>Sample ID</i>	<i>Date Sampled</i>	<i>Time Sampled (include am/pm)</i>	<i>No. of Sample Containers</i>	<i>Type of Sample Containers (e.g., glass jar)</i>
Sampled by:		Date / Time:		
Relinquished by:		Date / Time:		
Received by:		Date / Time:		