

## pH Testing For Clean Water Act Analysis

### Wastewater and Stormwater Compliance

pH testing for wastewater and stormwater permit compliance, whether by inspectors or for laboratory use, goes beyond just taking a measurement. There are numerous requirements for compliance testing, but having the right equipment is key. With a vast number of options available, choosing the right pH meter can be complicated. This document will break down meter options based on method requirements and meter capability for use in the field and compliance testing. It is the responsibility of the facility to decide what meter to purchase to meet permit and method requirements.

### Methods

For all permit compliance testing, DEQ requires the use of EPA-approved methods.\* For pH, the approved methods are:

- Standard Methods for the Examination of Water and Wastewater (SM)
  - SM 4500 H+ B -2000
  - SM 4500 H+ B -2011
- ASTM International (ASTM) - D1293-99 (A or B)

*Note: Methods specify regulatory essential quality control practices to meet compliance testing.*

### Right Tool for the Job

Before purchasing a meter, check the manufacturer's specifications to make sure the meter selected is appropriate for measuring and reporting data for compliance purposes. If the data produced by the selected meter does not meet those specifications, data submitted may not be accepted, putting the system at risk of being out of compliance. For compliance testing, pH analysis must address the following elements, and requires use of a meter that:

- Displays readings to a resolution of 0.1 standard units or less.
- Is calibrated using scientific grade pH buffer solutions.
- Is calibrated within  $\pm 15\%$  relative response factor for accuracy window, or  $< 0.5$  SI units.
- Displays the slope of the calibration, or displays other information needed for the sampler to calculate the slope.

*\* All Clean Water Act methods are listed in 40 CFR 136.3 and are referenced in the permit with the discharge limits.*



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## Examples

pH meters vary with many styles and options. The following are different types of meters available. Not all will meet the required specifications for reporting data.

### **Integrated probe handheld meters** (Cost < \$100)

This type of meter is designed to be used in the field.. It has a probe that is built into the instrument. The probe may or may not be replaceable. This type of meter is not typically used for compliance testing because the meters generally do not have the ability to display calibration history, slope and performance data.

### **Detachable probe handheld meters** (Cost < \$300)

This type of meter can be used in the field or the laboratory. It has a replaceable probe that attaches to the meter. If the probe is damaged, malfunctions, or no longer calibrates within specifications, it can be relatively inexpensive to replace. Most meters of this type produce the data to meet the specifications for reporting compliance data.

### **Bench top meters** (Cost > \$400)

Most laboratories elect to use a bench top meter. It is not designed to take to the field. This type of meter usually provides more accurate and precise data measurements and is capable of using ion specific electrode (ISE) probes for testing other than pH. Almost all meters of this type produce the data to meet the specifications for reporting compliance data.

		
Integrated Probe Handheld	Detachable Probe Handheld	Bench Top

DEQ's Laboratory Accreditation Program does not endorse any specific model or manufacturer, and the illustrations above are merely examples of meters.

## Additional Information

For further questions or assistance, please contact DEQ's Laboratory Accreditation Program.

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