

## PEL Field Standard Operating Procedure

Field SOP for Use of pH Probe pH-CCWI-1 through 7**Meter description**

ID: PHEL-CCWI-3,6,7

Oakton pH bulb electrode, handheld "pen" style

Range 0 to 14 pH (low numbers are acidic, high numbers are alkaline and 7.0 is neutral)

Resolution 0.1 pH

Automatic Temperature Compensation

**How to Measure pH – Oakton pHTestr**

1. Remove cap and press ON/OFF button.
2. Dip electrode in stream\*, making sure the sensor is fully covered. Do not submerge the fat end of the meter in the stream. This is where the batteries are housed and the meter can be ruined if water penetrates this end.
3. Wait for reading to stabilize, and record. Allow up to two minutes for reading stabilization. To freeze display, press HOLD. Pressing HOLD again will release the value.
4. Press ON/OFF to turn off tester. It will automatically turn off after 8.5 minutes to conserve energy.
5. Rinse electrode with Deionized Water. Replace cap.

**\*ALTERNATIVE:** If crouching and sampling instream is uncomfortable, consider using a sample cup. Use either the bucket on a rope, a pole sampler, or the plastic measuring cup provided. Rinse your bucket/cup twice with sample water, then pull your final sample. Leave the pH probe in the sample for about 2 minutes and ensure a stable number. You may leave the EC meter, pH meter and thermometer in the sampling device at the same time. Gently stir the meter a bit and watch that the numbers are stable before recording the result. Indicate in the check box on the data sheet under "pH" if you used this technique instead of direct sampling.

**Trouble-shooting**

Error Messages:

ER1: Weak Batteries, replace batteries (three 1.V batteries, located under screw off cap on opposite end from the electrode)

ER2: Wrong or bad buffer value, or electrode is failing

OR: Over range, send sample back to lab for testing with high range probe or dilution.

Experiencing Drift: let the electrode fully dry.

Improve Performance: Clean electrode in alcohol rinse for 10-15 minutes.

**REMEMBER:** If the meter malfunctions or you get a suspicious result, tell staff and note it on the datasheet. pH needs to be tested "immediately", so it cannot be reliably retested back in the lab.

**What to expect**

- As temperature increases, pH decreases.
- Algae and calcium carbonate (limestone) increase pH.
- Acid rain, acid mine drainage, swamps (decomposing organic matter and root respiration), sulfur (applied to fruit crops), and excess carbon (global warming) decrease pH.

**Natural Levels**

- Rainwater pH is 5.6, so rain can decrease pH in the stream. Wintertime is sometimes accompanied by lower pH because of this.
- The State Water Board objective for pH is 6.5 to 8.5  $\mu\text{mhos/cm}$ , depending on the water body.
- Seawater pH is 7.5 to 8.4

**Laboratory SOP: Calibration Oakton pHTestr**

Calibration buffer: 7.00 Hach powder pillow, sodium phosphate, potassium phosphate  
10.00 Hach powder pillow, sodium carbonate, sodium bicarbonate

Calibration frequency: Calibrated in lab, not field, before and after each deployment or excursion from CCWI office.

Check to see if calibration is needed:

1. Open powder pillow with clippers. Add it to 50 mL of distilled water and shake until dissolved. Do this for both 7.0 (yellow) and 10.0 (blue).
2. Rinse electrode in deionized water, shake off excess water, then dip it into a container of 7.0 buffer.
3. Wait two minutes for stabilization, then record the reading in the calibration log.
4. Rinse electrode in deionized water, shake off excess water, then dip it into a container of 10.0 buffer.
5. Wait two minutes for stabilization, then record the reading in the calibration log.

If calibration is needed (the readings were not 7.0 and 10.0):

1. Rinse electrode in deionized water, shake off excess water, then dip it into a container of 7.0 buffer.
2. Press the CAL key. Wait one minute, then press the hold/ent key. The screen will flash 7.0, then the bottom number will begin roving from 4.0 to 10.0.
3. Rinse the electrode with deionized water, shake off excess water, then dip it into a container of 10.0 buffer.
4. Wait one minute, then press the hold/ent key. The screen will flash 10.0, then the bottom number will begin flash 4.0.
5. Press CAL key. This takes you out of calibration mode. We do not calibrate at 4.0 since most of our samples are above 7.0.
6. Turn the meter off, rinse with deionized water and replace cap.
7. Record actions in calibration log.
8. Disposal of used solution: Okay to pour down drain, flushing 10.0 buffer with water. Non-Reactive, non-flammable but do not expose to excessive heat (160 C releases toxic fumes), health hazards include moderate eye irritation.