**DO/T Protocol (Draft)**

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**A. Overview**

Dissolved oxygen (DO) is a measure of the amount of oxygen gas present in the water. The amount of oxygenation in water is a key factor in determining the health levels of a body of water, as oxygen levels reveal key elements about the water, such as the amount of decomposed biomass (decomposition fixes oxygen, causing a reduction in the oxygenation levels of a body of water).

DO can be measured using a DO meter, such as the YSI ProODO DO meter. Once properly calibrated, the instrument measures the percent of dissolved oxygen in the water (100% is approximately equivalent to fully-saturated water). The instrument also measures the temperature of the water; temperature and DO levels are both proportional to the depth of the water. The procedure below describes how to operate the instrument - please see the operation manual for further information.

**B. Materials Needed**

1. Calibration:

* YSI ProODO
* Distilled water
* Air stone
* Sodium sulfite
* white tape

2. Measurement:

* YSI ProODO
* waterproof notebook/paper
* waterproof pen
* paddleboat or kayak
* GPS/depthfinder device (Lowrance HDS5 GPS Unit)

**C. Procedure**

1. Calibration:

(DO calibration is only needed approximately once per testing season; barometric pressure must be calibrated before each testing session.)

1. Turn on the meter, ensuring that the DO meter is fully charged. Replace the batteries if necessary.
2. Remove the protective cap from the sensor probe.
3. Following the procedure in the manual for two-point dissolved-oxygen-in-water calibration, prepare a 0% DO mixture by dissolving 8-10 mg sodium sulfite (NaSO3) in 500 mL of distilled water, mixing thoroughly. The solution may take up to 60 min. to become oxygen-free.
4. Prepare a fully saturated solution by aerating 500 mL of water using an air stone until the water is fully saturated with DO. This may take up to 60 min. or more.
5. Place the sensor into the zero DO solution (from step 3).
6. Press **Calibration (CAL)** on the device.
7. Highlight **DO** and press enter.
8. Highlight **Zero** and press enter.
9. Wait for the temperature and DO% values under “Actual Readings” to stabilize, then press enter to **Accept Calibration**.
10. Place the sensor into the fully aerated solution (from step 4).
11. Highlight **DO%** for the second calibration point and press enter to continue with the next point at full saturation.
12. After calibrating the device, properly dispose of the two solutions.
13. Ensure that the meter’s cable is properly calibrated by marking off 1-m intervals with white tape.
14. Turn off the unit, and replace the protective cover on the sensor probe.

2. Measurement:

1. Calibrate the barometric pressure on the device using the local barometric pressure (standard barometric pressure reported by local weather services must be adjusted for elevation - see manual for more information).
2. Ensure that the depth finder sensor is properly attached to the boat (see GPS SOP for further information).
3. Arrive to the desired testing site in the kayak or paddleboat.
4. Record site number, date, and time.
5. Remove the protective covering from the probe, and turn on the meter.
6. Lower the meter into the water, using the tape markings on the cable to control depth.
7. Beginning at a depth of 1-m, record the DO% and temperature after waiting for the readings to stabilize (15-30 seconds).
8. Record % and temperature at 1-m intervals, until the depth of the site is reached (the depth can be determined using the GPS’s depth finder). Do not let the meter reach the bottom of the lake (if the depth is 6.4 m, then measure down to the 6-m depth).
9. When the data is collected, carefully draw the meter up out of the water, shake out any excess water, and proceed to the next testing site.
10. Repeat the steps above for all testing sites.
11. When completely finished, turn off the device and replace the protective cover.