

Standard Operating Procedure (SOP) 2.1.1.2

By personnel of the Coyote Creek Riparian Station

Collection of water samples with water displacement and water trapping devices for dissolved oxygen (DO) measurements

1.0 Sampling water with the “LaMotte Sampling bottle”

Water displacement sampling devices can be used to collect a water sample from the desired depth. They can be deployed with a line or on a pole. This SOP describes the use of a sampling device with an internal structure to hold a small bottle and get it filled without contact with air. The device described in this SOP, known as the “LaMotte Sampling Bottle”, is deployed on a line with a weight. Note that there are many variations on the same structure, and the picture provided in this SOP may reflect some but not all of the available designs.

To prepare the device for sampling, follow the following steps:

Step P1 Remove the peg-shaped stopper from the gray sampler lid. Lift the wire lid retainer up and away from sampler. Carefully remove the lid with inlet tube attached, sliding it up the rope bridle.

Step P2 Insert the (D.O.) collection bottle, with the cap removed, into the inner chamber of the sampler.

Step P3 Press the thermometer into the hole in the floor of the outer chamber and position the scale so it can be read through the clear sampler body.

Step P4 Replace the sampler lid, inserting the inlet tube into the D.O. collection bottle. Snap the wire retainer into the grooves on the lid. Press the stopper into the center hole in the lid.

Step P5 Attach the weights to the large snap ring at the bottom of the sampler. Clip the nylon line to the loop at the top of the rope bridle with the brass snap clamp.

To collect the sample, follow these steps:

Step C1 Submerge the sampling apparatus in an upright position with the lid 6-10 inches below the water surface.

Step C2 Use a quick jerk of the line to remove the stopper from the lid of the apparatus. Water will begin filling the D.O. collecting bottle, then it will overflow and fill the outer chamber, flushing about 5 volumes of the D.O. bottle without contact with air. As air is displaced from the small pore on the side of the outer chamber, bubbles will be observed rising to the surface. When the water sampler is filled, bubbles will no longer appear. Filling takes about one minute.

Step C3 Retrieve the sampling apparatus, either by using the hand-held-winder with steady hand motions, or by lifting it with the pole and guiding it to the bank. Decreasing water pressure prevents the exchange of air and water in the sample.

To process the sample and conduct measurement, follow this sequence:

Step M1 Without opening the sampling apparatus, read the temperature through the clear sampler body as soon as the apparatus is retrieved. Have at least two people verify the reading. Record the water temperature on the data sheet.

Step M2 Place the sampling apparatus on a flat surface. Release the wire lid retainer and remove the plastic lid with the inlet tube attached, sliding it up the rope bridle.

Step M3 Remove the D.O. collecting bottle from the inner chamber and carefully set aside for the D.O. test. Proceed to fix the sample immediately (see SOP-3.1.2 (DOW) in the CWT compendium).

Step M4 Remove the thermometer, and feel free to use the remainder of the water in the apparatus for the other measurements (e.g., pH, conductivity, and turbidity).

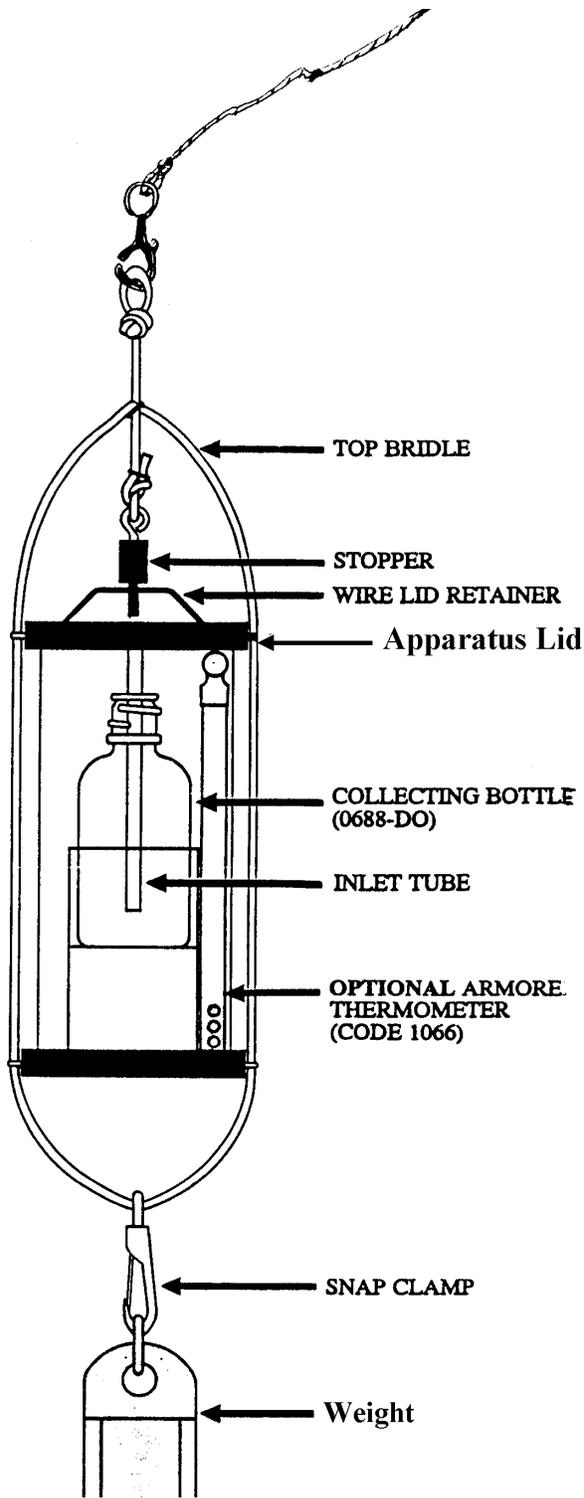


Figure 1: Schematic representation of the LaMotte sampling apparatus

2.0 Use of the Van Dorn sampler to collect water samples

The Van Dorn sampler is a water trapping device operated from a boat, bridge or dock, with a line and weight. It is sent to the desired depth in an “open” position held by a cocking mechanism, and snaps shut when the mechanism is triggered by impact of a “messenger”, i.e., a heavy cylinder, that is sent down the line. Van Dorn samplers are available in various sizes.

To use the sampler, take the following steps:

Step V1 Cock the water sampler open according to manufacturer’s instructions.

Step V2 Lower the sampling apparatus into the desired water depth below the water surface.

Step V3 Send the messenger down the rope to close the water sampler.

Step V4 Haul the water sampler to the surface.

To fill a dissolved oxygen sample bottle without contact with air, do the following:

Step F1 Place the tubing attached to the sampling device into the bottom of the D.O. bottle.

Step F2 Carefully release water into the D.O. bottle without adding air bubbles.

Step F3 Allow the D.O. bottle to overflow with approximately three times the volume of the D.O. bottle.

Step F4 Cap the D.O. bottle.

Note: There must not be any air bubbles in the D.O. bottle. If air is trapped in the D.O. bottle, discard the sample and fill the bottle again. The remainder of the water in the sampler can be used for other measurements (pH, conductivity, and turbidity).

3.0 Sources and Resources

This SOP was created by personnel of the Coyote Creek Riparian Station (CCRS 1993) and was later revised by Woodward Clyde Consultants (WCC 1996) and by SFEI (1996). It was refined for the Guidance Compendium by the Clean Water Team (CWT) implementing the Citizen Monitoring Program of the State Water Resources Control Board in 2000.

For an electronic copy, to find many more CWT guidance documents, or to find the contact information for your Regional CWT Coordinator, visit our website at www.swrcb.ca.gov/nps/volunteer.html

References

Coyote Creek Riparian Station (CCRS) 1993. The Santa Clara County Stream Inventory. Progress Report and Protocols prepared by CCRS, Alviso, CA. November.

San Francisco Estuary Institute (SFEI) 1996. Volunteer Monitoring Protocols. Guidance document prepared for the State Water Resources Control Board, Sacramento, CA.

Woodward-Clyde Consultants (WCC). 1996. Watershed Monitoring by Volunteers, FY 94-95 Pilot Study. Report prepared for the Alameda Countywide Clean Water Program, Hayward, CA, May.