

## 13. ANALYTICAL METHODS REQUIREMENTS

### Water Temperature – Data Logger Method

#### Apparatus

StowAway TidbiT by Onset

Range: -20°C to +50°C, accuracy  $\pm 0.4$  ° C at 21.1° C, resolution 0.1°C

Optical Base Station and TidbiT Coupler by Onset

BoxCar Pro software

PVC housing/rebar for deployment

#### Procedure

1. Connect the Optic Base Station to the host computer using the appropriate interface cable (CABLE-PC-3.5).
2. Place the TidbiT onto the Coupler attached to the Optic Base Station
3. Open BoxCar Pro, go to 'logger' menu, select 'launch'
4. Launch choosing the triggered launch, set for 15 minute intervals, select start and end dates (Green LED light will flash when launched)
5. After the TidbiT has been launched, remove from the Coupler
6. Deploy TidbiT suspended in a PVC pipe that allows stream water to flow through but prevents solar radiation to penetrate. The PVC pipe will be attached to a rebar stake sunk into the stream bed.
7. At the end of deployment, reconnect the logger to the TidbiT Coupler attached to the Optical Base Station
8. Open BoxCar Pro, go to 'logger' menu, select 'readout'.

#### Quality Control

StowAway TidbiT logger will be calibrated using a NIST certified thermometer before and after deployment. Readings will be compared for two different temperature solutions within the 0°C to 40°C range. Results will be recorded in the laboratory analysis logbook. If calibration readings taken after sampling vary from those taken prior to sampling by more than the accuracy objectives specified in Table T-2 test results will be recorded in field and lab logbooks, but will not be entered into the project data system and additional field sampling may be scheduled.

### Orthophosphate: Filtration Procedure

**Equipment:** Filled 250ml sample bottle, 30 ml syringe, filter holder with filter and cap, two 30ml sample vials with lids, 200 ml of distilled water.

1. Record the vial numbers on data sheet.
2. Make sure the filter holder is securely attached to the syringe.
3. Remove the cap from the filter holder and the plunger from the syringe.
4. Fill the syringe completely with distilled water, insert the plunger until it snaps in and press the plunger down until all water is expelled. Repeat this process four times to filter 100 ml of distilled water. This process will flush out any contaminants that may be on the filter.

5. From the 250ml sample bottle, rinse the syringe, and plunger 3 times with sample water. Be sure to mix sample between each rinse.
6. Mix the 250ml bottle of sample water and then completely fill the syringe from the bottle by pouring the water into the syringe.
7. Insert the plunger a small amount into the syringe, until it snaps in.
8. Holding the syringe upright, press the plunger down to filter about 5ml of sample water into the first sample vial to rinse. Also rinse the cap.
9. Filter 22-25ml into the first 30ml sample vial and securely cap the vial. Do not overfill the sample vial. When the sample is frozen, it will expand and may work the cap off if it is too full.
10. Refill the syringe by removing the plunger, mixing the bottle of sample water, then pouring the sample water into the syringe.
11. Replace the plunger, rinse the second vial and cap with filtered water, and then fill the second vial with 22-25 ml of filtered sample water. Securely cap the second vial. If you have trouble pressing down the plunger due to excessive turbidity in your sample, go to "Replacing the Filter" procedure below.
12. Check to make sure you recorded the vial numbers on your data sheet.
13. Return vials to the freezer in the lab as soon as possible.

### **REPLACING THE FILTER**

If the sample is very turbid and you are unable to force any more sample water through the filter, then you should change the filter. New filters should be handled with forceps.

1. If you are in the middle of filling a vial, place the cap on the vial so it doesn't spill while you are changing the filter.
2. Unscrew the filter holder from the syringe and expel all remaining water in syringe. Place the syringe in a clean spot.
3. Hold the filter holder with both hands and grip the ridged parts. Twist counter clockwise to unscrew the assembly.
4. Remove the used filter. You may need to lightly tap the filter holder on a hard surface to dislodge the filter if it is stuck in the inlet side.
5. Using forceps place the new filter on top of the stainless steel support screen.
6. Place the O-ring on top of the filter.
7. To insure a proper seal, hold level while connecting the two halves of the filter holder. Screw the halves together tightly.
8. Screw the filter holder back onto the syringe.
9. Remove plunger and fill the syringe completely with distilled water, insert the plunger until it snaps in, press the plunger down until all water is expelled. Repeat this process four times to filter 100 ml of distilled water. This process will flush out any contaminants that may be on the filter. Go back to step 10 above and proceed with filtering into the 30 ml vial.