

Directions for Performing Physical/Chemical Tests at Euclid Creek - Kit 2

APPROACHING THE CREEK

- Safety is the primary concern. Never sample if it cannot be done safely
- On cold or rainy days refer to INCLEMENT WEATHER instructions in this manual for procedure modifications. Do not attempt to break through ice to collect water!
- Sites at bridge crossings allow easy sampling of creek water from above and good visibility of the creek and surroundings

COLLECTING A SAMPLE

- The water sampler is located in the green supply box
- Lower the sampling cup into a free flowing area of the creek deep enough to fill the cup, try not to trap bottom sediments, reel in the cup
- Collect enough water to fill Sediment Stick (procedure follows), complete tests or fill optional 1 liter Nalgene® bottle
- Water sample remaining in sampling cup is used for completing Ammonia, Phosphate, pH, and Conductivity measurements (procedures follow)

SEDIMENT STICK (TURBIDITY OR SUSPENDED SOLIDS)

- Fill the stick with stream water (keep adding water from the plastic beaker or other sample holding device until it is full)
- Empty water from the stick until you can just see the black dot at the bottom of the stick
- Record the height of the water in the stick on the data sheet to the nearest $\frac{1}{2}$ inch
- Dump out all of the water and repeat the process
- Record the second height on the data sheet
- Record the turbidity measurements from the attached chart (yellow sheet located in manual titled *Estimating Total Suspended Solids: TSS*)
- Empty the water from the stick

Measure turbidity again using the method on the next page

TURBIDITY using HACH DR/850 Colorimeter

- Turn on the colorimeter by pressing the EXIT/ 0 button
- Remove the cover from colorimeter
- Obtain the two sample cells marked **DI WATER** and **TURB/PO₄ SAMPLE**; the DI water sample cell will already have distilled water in it
- **Wipe** the outside of the **DI WATER CELL** with a lint-free paper towel (provided in kit) to remove any fingerprints and water droplets
- Place the **DI WATER CELL** into the hole in the colorimeter and place the cover on top of the sample to block out all of the light
- Press PRGM 9 4 ENTER
- The colorimeter should show SUSLD at the bottom of the screen
- Press ZERO
- The colorimeter should read 0 in a couple of seconds
- Remove the **DI WATER CELL** from the colorimeter
- Rinse the **TURB/PO₄ SAMPLE CELL** three times with creek water then fill to the 10 ml mark with creek water, using a clean plastic pipet if necessary
- **Wipe** the outside of the cell with a lint-free paper towel
- Place the **TURB/PO₄ SAMPLE CELL** in colorimeter and place cover on top
- Press READ
- Record the value on the data sheet
- Remove the **TURB/PO₄ SAMPLE CELL** from the colorimeter; set it aside, it will be used again later

Proceed immediately to the AMMONIA procedure on the next page

AMMONIA TEST PROCEDURE using HACH DR/850 Colorimeter

- Remove the cover of the colorimeter
- Turn the colorimeter on by pressing the **EXIT/ 0** button
- Press **PRGM 6 4 ENTER**; the colorimeter should show NH₄, NH₃-N, OR NH₃ on the bottom of the screen (these are the units of measure)
- Use two clean cells, they are marked **NH₄ BLANK** and **NH₄ SAMPLE**
- Rinse the **NH₄ BLANK CELL** three times with distilled water from the squirt bottle then fill to the 10 ml mark with distilled water from the squirt bottle, use clean plastic pipet if necessary
- Rinse the **NH₄ SAMPLE CELL** three times with creek water then fill to the 10 ml mark with creek water, using a clean plastic pipet if necessary
- Add the contents of 1 **AMMONIUM SALICYLATE** powder packet to each cell
- Cap each vial and shake each for 30 seconds
- Press **TIMER** and **ENTER**
- The first reaction will take 3 minutes, all of the solid will dissolve and the solutions will turn yellow
- After the 3 minute period has elapsed, add the contents of 1 **AMMONIUM CYANURATE** powder packet to each cell and cap and shake vigorously for 30 seconds. All of the powder will dissolve
- Press **ENTER**
- The second reaction will take 15 minutes and the **NH₄ SAMPLE** solution will turn green if ammonia is present

NOTICE: Tests for **Dissolved Oxygen, pH, and Conductivity** may be completed during the 15-minute waiting period. When working with other instruments, **listen for the beep** of the timer and complete the ammonia test immediately.

The remainder of the AMMONIA procedure is on the next page

AMMONIA TEST PROCEDURE using HACH DR/850 Colorimeter

- After the 15-minute period has passed, wipe the outside of both cells with a lint-free paper towel
- Place the ***NH₄ BLANK CELL*** into the colorimeter, place the cover over it and press **ZERO**; The colorimeter will now read 0
- Remove the ***NH₄ BLANK CELL*** and place the ***NH₄ SAMPLE CELL*** into the colorimeter, replace the cover and press **READ**
- Record the value and units of measure (NH₄, NH₃-N, OR NH₃) on the data sheet

Should the reading be **UNDERRANGE!** - record the value as **UNDERRANGE**

If the reading is **OVERRANGE!** - record it as **OVERRANGE** on the data sheet

Complete remaining tests.

DISSOLVED OXYGEN (DO) using HACH HQ 40d

- Attach the probe to the unit and secure the connection
- Turn on the meter by pressing the **⓪** button
- Lower or place the probe directly into the creek - if cord not long enough, immerse probe into collected sample
- Press the GREEN ("Read") button; when the meter has stabilized, the reading will be displayed in mg/L
- Write the dissolved oxygen concentration (mg/L O₂), temperature (°C) and atmospheric pressure (mmHg) values on the data sheet after the meter stabilizes
- Shut off the meter by pressing the **⓪** button

Disconnect the probe; store probe and meter in case

CONDUCTIVITY using ECTestr 11+ (tan-colored handheld meter)

- Obtain a fresh creek water sample
- Remove the tan cover from the bottom of the meter
- Turn on the meter by pressing the ON/OFF key; the MEAS indicator appears when the tester is in measurement mode
- Rinse the probe end with distilled water from the squirt bottle
- Immerse the probe end into the creek sample
- Use the probe end to give the creek sample a quick stir; now let the probe rest in the sample
- Record the value after the reading stabilizes; it may vary ± 10 units after it has stabilized; this is ok
- Shake off excess water from the probe and pat it dry with a lint-free paper towel
- Place the tan cover back on the bottom of the probe
- Turn meter off

Place the meter back into the case and continue on to next page

pH MEASUREMENT using HACH Pocket Pro+ (blue and grey-colored meter)

- Remove the clear plastic cap from the bottom of the pH meter
- Press to turn the tester on
- Rinse the sensor on the bottom of the meter (glass bulb) with distilled water from the squirt bottle
- Immerse the sensor of the meter in a least 1" of creek water sample
- Record the reading after the meter stabilizes (variation of ± 0.1 units is normal) on the data sheet
- Rinse the probe with distilled water from the squirt bottle
- Replace the clear plastic cap on the bottom of the probe

REACTIVE OR MONO PHOSPHATE using HACH DR/850 Colorimeter

- Locate the **TURB/PO₄ SAMPLE CELL** used in the Turbidity procedure; **wipe** the outside of the cell with a lint-free paper towel, and place it in the colorimeter
- Turn the colorimeter on, if it is not still on (**EXIT/ 0** button)
- Press **PRGM 7 9 ENTER**; the colorimeter should read **P, P₂O₅, OR PO₄** at the bottom of the screen (these are the units of measure)
- Place the cover over the cell
- Press **ZERO**
- Remove the cover and **TURB/PO₄ SAMPLE CELL**
- Remove the **TURB/PO₄ SAMPLE CELL** cap and add the contents of 1 foil Phosphate RGT (or PHOSVER 3) powder packet
- Recap the cell and shake vigorously for 30 seconds
- Note: not all of the powder will dissolve
- Press **TIMER** and **ENTER**
- The reaction will take 2 minutes and the solution will turn blue if phosphate is present
- After the 2 minute period wipe the outside of the cell with a lint-free paper towel
- Place the **TURB/PO₄ SAMPLE CELL** in the colorimeter, place the cover on top
- Press **READ**
- Record the value and the units of the measurement (listed as either **P, PO₄ OR P₂O₅** at the bottom of the screen) on the data sheet

*Should the reading be **UNDERRANGE!** - record the value as **UNDERRANGE***

*If the reading is **OVERRANGE!** - record it as **OVERRANGE** on the data sheet*

Continue on to next page

AFTER YOU HAVE COMPLETED ALL OF THE TESTS

- Make sure that all of the solutions in the sample cells (except the DI water cell) have been emptied into the waste bottle
- Rinse each cell with distilled water from the squirt bottle. Rinse each cell at least three times
- Complete the data sheets
- **Scan or take a photo and email the sheets to euclidcreekmonitors@gmail.com**
- Place completed sheet back in kit
- Place all trash into a plastic WASTE bag (do not place any packets into a regular trash container)
- Turn off all meters and the colorimeter
- Place all equipment and materials into their containers; you should have the following:
 - The *Plano* brand 'tackle box' with the colorimeter; chemical packets, lint-free paper towels and pH and conductivity meters
 - The light blue case with the dissolved oxygen meter/probe cable
 - The green case ('dry box') with the waste bottle, distilled water and squirt bottle; sample bottle, and plastic sampler beaker (on a string)
 - The turbidity stick and cap
 - The Instruction Manual you are currently reading!

Thank You for Participating!