

Sassafras Samplers Water Testing Procedures

A.) Using the black PLASTIC test kit, at the field site:

- 1.) Collect & “fix” three samples for Dissolved Oxygen testing.
- 2.) Fill plastic bottle with sample for meter tests.
- 3.) Take temperature readings.
 - Air
 - Water
- 4.) Complete field observation sheet.

B.) Using Colorimeter & collected samples from above test, analyze samples for:

- 1.) Nitrate-Nitrogen (NO₃-N)
- 2.) pH
- 3.) Ammonium-Nitrogen (NH₄-N)
- 4.) Phosphate
- 5.) Copper
- 6.) Turbidity

SMART Colorimeter testing procedures

1.) Prepare the Blank

- a.) Select a clean test vial (#0290). Using the plastic bottle of water collected above, fill test vial to 10 ml line.
- b.) Cap vial with the **YELLOW** cap. This is your BLANK sample for all tests, except TURBIDITY.

2.) Nitrate-Nitrogen test

Based on results from previous sampling, samples from certain test sites, as identified by the Riverkeeper® prior to each monthly sampling, will be diluted before reaction and analysis. The dilution will provide a numerical result for the test site rather than “overrange.”

Dilution procedure

- a.) Fill the titration tube used for the dissolved oxygen testing to the 5-mL line with the river sample.
- b.) Add distilled water up to the 25-mL line. The sample has now been diluted by 5x.
- c.) Continue with Reaction and analysis using this diluted sample.

Reaction and analysis procedures

- d.) Select the **Nitrate-N** test cube
- e.) Fill test tube #0898 to the **5 ml** line with sample water.
- f.) Add **Mixed Acid Reagent** #V-6278 to **10 ml** line.
- g.) Cap with blue plastic plug & invert **5** times. **Wait 2 minutes.**

- h.) After waiting, pour solution from above into a clean meter vial #0290. Using 0.1 gram spoon (#0699), add **2 spoons** of Nitrate Reducing Reagent (#V-6279).
- f.) Cap. Mix by inverting tube **50 – 60** times a minute for **4 minutes**. (Use a timer or clock with a second hand to accurately invert once per second.)
- g.) After mixing for 4 minutes, **wait 10 minutes** for the color to develop. **[NOTE – At the end of the waiting period an undissolved portion of Nitrate Reducing reagent may remain without affecting test results.]**

Prepare Meter for testing while waiting for color to develop in

Nitrate sample. **[Note - Meter has been pre-programmed to complete tests in a specific order. Meter runs on 9V battery, or AC adaptor.]**

- h.) Press **ON** button for 2 seconds to turn meter on. Press the * button to select start. Press * button again to select Testing Menu.
- i.) Select **Sequence 1** from test menu by using up or down arrows to direct * to Sequence 1. Press * button to start sequence 1.
- j.) The display will show, **064 Nitrate-N L**. Press * button to begin Nitrate-N test. The * will be on SCAN BLANK.
- k.) Select the BLANK sample vial with the **YELLOW** cap from Meter procedures step 1. Wipe vial with Kimwipe.
- l.) Insert cleaned BLANK vial into light chamber. Close light chamber lid. **PRESS *** button.
- m.) Display will read BLANK DONE. Remove BLANK vial with **YELLOW** cap and set aside. The * will be on SCAN SAMPLE.
- n.) Select reacted sample from **Reaction and Analysis step g**. Wipe reacted sample vial with Kimwipe. Insert cleaned vial into light chamber.
- o.) Close the light chamber lid. **PRESS *** button.
- p.) Record concentration value as ppm Nitrate-Nitrogen. **For samples which have been diluted, multiply the concentration value on the meter by 5 to account for the dilution.** Record calculated concentration value as ppm Nitrate-Nitrogen.
- q.) The * will be on NEXT TEST. Press the * Button. The display will show **075 PH PR**.

NOTE – Reacted Nitrate-Nitrogen sample contains Cadmium. Empty reacted vial into container marked **CADMIUM WASTE**. Fill vial half way with tap water and rinse measuring spoon in vial. Empty into **CADMIUM WASTE** bottle. Vial & spoon should be washed completely with other items at end of testing session.

3.) pH test

- a.) The * will be on SCAN BLANK.
- b.) Wipe BLANK vial with **YELLOW** cap with Kimwipe. Place cleaned vial in the light chamber. Close light chamber lid. **PRESS *** button.
- c.) Display will read BLANK DONE. Remove BLANK vial with **YELLOW** cap and set aside. The * will be on SCAN SAMPLE.

- d.) Rinse a clean test vial (#0290) with sample water.
- e.) Fill rinsed vial to the **10 ml** line with sample.
- f.) Select **pH** test cube.
- g.) Using pipet (0369), add **0.5 ml** of Phenol Red Indicator (#V-2304). Cap and mix.
- h.) Wipe vial with Kimwipe. Insert cleaned, reacted vial into meter.
- i.) Close light chamber lid. Press * button to SCAN SAMPLE. Record pH result.
- j.) The * will be on NEXT TEST. Press the * Button. The display will show **005 AMMONIA-N H.**

4.) Ammonium-N test

- a.) The * will be on SCAN BLANK.
- b.) Wipe BLANK vial with YELLOW cap with Kimwipe and place cleaned vial in the light chamber. Close light chamber lid. PRESS * button.
- c.) Display will read BLANK DONE. Remove BLANK vial with YELLOW cap and set aside. The * will be on SCAN SAMPLE.
- d.) Rinse a clean test vial (#0290) with sample water.
- e.) Fill rinsed vial to the 10 ml line with sample.
- f.) Select Ammonia-N test cube.
- g.) Add 8 drops of Ammonia Nitrogen Reagent #1 (V-4797) to vial. Make sure to hold upside down bottle vertically when adding drops.
- h.) Cap and mix. Wait 1 minute.
- i.) Use 1.0 ml pipet (#0354) and add 1.0 ml of Ammonia Nitrogen Reagent #2 (V-4798) to vial.
- j.) Cap and mix. Wait 5 minutes for color to develop.
- k.) After waiting 5 minutes, clean outside of vial with Kimwipe. Insert cleaned, reacted vial into light chamber.
- l.) Close light chamber lid. Press * button to SCAN SAMPLE.
- m.) Record result as Ammonia-N ppm.
- n.) The * will be on NEXT TEST. Press the * Button. The display will show **078 PHOSPHATE L.**

5.) Phosphate

- a.) The * will be on SCAN BLANK.
- b.) Wipe BLANK vial with YELLOW cap with Kimwipe and place cleaned vial in the light chamber. Close light chamber lid. PRESS * button.
- c.) Display will read BLANK DONE. Remove BLANK vial with YELLOW cap and set aside. The * will be on SCAN SAMPLE.
- d.) Rinse a clean test vial (#0290) with sample water.
- e.) Fill rinsed vial to the 10 ml line with sample.
- f.) Select Phosphate test cube.
- g.) Using 1.0 ml pipet (#0354), add 1.0 ml of Phosphate Acid Reagent (#V-6282). Cap & mix.
- h.) Using 0.1 gram spoon, add 1 measure of Phosphate Reducing Reagent (V-6283). Cap and shake until powder dissolves.

- i.) WAIT 5 Minutes for color to develop.
- j.) At the end of the wait time, wipe reacted vial with Kimwipe. Insert cleaned, reacted vial into light chamber.
- k.) Close light chamber lid. Press * button to SCAN SAMPLE.
- l.) Record result as Phosphate ppm.
- m.) The * will be on NEXT TEST. Press the * Button. The display will show 032 COPPER DCC.

6.) Copper

- a.) The * will be on SCAN BLANK.
- b.) Wipe BLANK vial with **YELLOW** cap with Kimwipe and place cleaned vial in the light chamber. Close light chamber lid. PRESS * button.
- c.) Display will read BLANK DONE. Remove BLANK vial with **YELLOW** cap and set aside. The * will be on SCAN SAMPLE.
- d.) Rinse a clean test vial (#0290) with sample water.
- e.) Fill rinsed vial to the **10 ml** line with sample.
- f.) Select **Copper 1** (#6446) reagent.
- g.) Add 5 drops of Copper 1 reagent (#6446) reagent, hold bottle vertically over test vial. Cap & mix. Solution will turn yellow if copper is present.
- h.) Wipe reacted vial with Kimwipe. Insert cleaned, reacted vial into light chamber.
- k.) Close light chamber lid. Press * button to SCAN SAMPLE.
- l.) Record result as **Copper** ppm.
- m.) The * will be on NEXT TEST. Press the * Button. The display will show **098 TURBIDITY**.

NOTE : The reaction may stain the tubes. Rinse the tubes thoroughly after each use.

7.) TURBIDITY

- a.) The * will be on SCAN BLANK
- b.) Wipe sealed vial with BLUE cap using a Kimwipe. This vial contains distilled water and will be the TURBIDITY blank.
- c.) Insert vial with BLUE cap into light chamber. Close light chamber lid. PRESS * button.
- d.) Display will read BLANK DONE. Remove vial with BLUE cap and set aside. The * will be on SCAN SAMPLE.
- e.) Rinse a clean test vial (#0290) with sample water.
- f.) Fill rinsed vial to the 10 ml line with sample water. Cap vial.
- g.) Wipe vial with Kimwipe. Insert cleaned, vial with sample water into light chamber.
- h.) Close light chamber lid. Press * button to SCAN SAMPLE.
- i.) Record result as TURBIDITY in FTU.
- j.) The display will show END OF SEQUENCE. The * will be on SHUT DOWN. Press the * Button. The meter will turn off.

TESTING with the meter is now complete.

Please follow separate instructions for testing **DISSOLVED OXYGEN**. Repeat test three times and record values as Oxygen in ppm.

**Thoroughly clean all testing equipment.
DO NOT use Detergent. Rinse with tap water and allow components to air dry.**

For additional supplies, please contact your Riverkeeper @ 410 708 3303.

Thank you!
for your assistance with monitoring the Sassafras River.