U.S. Fish and Wildlife Service
Marquette Biological Station
3090 Wright Street
Marquette, Michigan 49855
U.S.A.

and

U.S. Fish and Wildlife Service
Ludington Biological Station
229 South Jebavy Drive
Ludington, Michigan 49431
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and

Fisheries and Oceans Canada
Sea Lamprey Control Centre
1219 Queen Street East
Sault Ste. Marie, Ontario P6A 2E5
Canada

INSTRUMENT OPERATING PROCEDURE

INSTRUMENT:

Fluorometer

MODEL:

Trilogy Laboratory Fluorometer

MANUFACTURER:

Turner Designs

PRECAUTIONS:

POTENTIAL INTERFERENCES

Use a clean cuvette for all readings. The Trilogy is sensitive; sample residue may cause errors.

Use a lense cleaning cloth when using plastic Methacrylate cuvettes.

Fluorescence is temperature sensitive; read the blank, standard, and all samples at the same temperature.

SAFETY

No special safety precautions

PROCEDURES:

I. Preparation of the Trilogy Fluorometer for use.

A. With the unit turned off insert the “green” optical module into the base for the sample adapter.

B. Turn on the On/Off switch located on the back of the Trilogy. Verify that the display becomes active, and shows the module selection screen.

C. Opt for the selected (green) module and touch “OK” on the confirming screen.

D. When the display indicates the “Home” screen, you are ready to use Trilogy in the Raw mode (measurements are relative), or calibrate Trilogy to make quantitative measurements.

II. Calibration of the Fluorometer.

A. With a known standard.

1. On the home screen touch “Calibrate” to begin a calibration sequence.

2. Select “Run New Calibration”.

3. Select the unit of measurement (PPB).

4. Insert the calibration “blank” and touch “OK”.

5. Enter the concentration for the first standard. If doing a multi-point calibration, use standards in order of increasing concentration.

6. Follow the screen prompt indicating that the standard should be inserted, then touch “OK”.

7. After the calibration is complete, either select “Proceed with Current Calibration” or select “Enter More Standards”, in which case, return to “5” above.

8. Save calibration for future use (optional).

9. Confirm successful completion of the calibration by measuring the previously used standard. The displayed concentration should equal the same value used in step “5” above. Optionally, the secondary standard now could be adjusted to give the same reading for future calibrations or accuracy checks.

B. Using the Secondary Solid Standard.

1. Measure a dye solution of known value (100 ppb standard) and note the Trilogy reading.

2. Place the secondary standard in the Optical Module, note the reading, and if necessary turn the adjustment screw to produce the same displayed concentration as in step 1. Turning the adjustment screw clockwise decreases the displayed concentration.

3. The secondary standard can now be used for future calibrations or to check the instrument for accuracy prior to measurement of unknown samples.

III. Analyzing unknown samples.

A. Samples are collected either through hand-sampling hand or more routinely through the use of automatic water samplers. Natural fluorescence is present in stream water, so the fluorescence of water from the site to be sampled (without Rhodamine) is measured first to provide a background reading. The background fluorescence (blank) is used for comparison to determine if Rhodamine dye is present or absent.

1. Place a properly filled, dry cuvette into the sample compartment. Close the lid and press "Measure Fluorescence". The Trilogy will measure the sample for six seconds and report the average reading for the sample.

2. The Trilogy reports data on the "Home" screen and displays the results for the 20 most recent measurements. If more than 20 readings are taken the oldest reading is overwritten. Calibration is normally performed with standards made with distilled water so the stream blank must be subtracted from the reported value to ensure accuracy.

MAINTENANCE:

A. Minimal maintenance is required or possible.
B. Fluorescence troubleshooting is available in Appendix A of the User's manual.

REFERENCE:

Trilogy Laboratory Fluorometer User's Manual
Trilogy Fluorometer Quick Start Guide

This procedure has been reviewed and approved by the undersigned representatives of the U.S. Fish and Wildlife Service and Fisheries and Oceans Canada.

REVIEWED/APPROVED Mike Simms DATE 05MAR2020
Program Manager (Canada)