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and

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

TECHNICAL OPERATING PROCEDURE

PROCEDURE TITLE:

Procedures for the Measurement of Dissolved Oxygen in Stream Water and Lentic Areas

APPLICABILITY:

Procedures apply to all measurements of dissolved oxygen conducted during stream treatments, toxicity tests, and lentic treatments.

PRINCIPLE:

Standard procedure for the measurement of dissolved oxygen in stream water and lentic areas.

SAMPLE COLLECTION AND PRESERVATION:

Dissolved oxygen measurements are made on site, or samples are transported in plastic bottles to the laboratory for immediate measurement. Sample bottles are completely filled; no air can be trapped under the lid.

EQUIPMENT REQUIRED:

YSI Model 55 dissolved oxygen meter
YSI Model Pro 20 dissolved oxygen meter
Thermo Scientific Orion Star A223 dissolved oxygen meter

POTENTIAL INTERFERENCES:

Chlorine, sulfur dioxide, nitric oxide, and nitrous oxide can bias readings by behaving like oxygen at the probe.

SAFETY:

No special safety procedures required.

DISPOSAL:

Measurements are made without use of reagents.

REAGENTS:

No reagents are required.

PROCEDURES:

I. Sample Collection

- A. Prior to treatment, dissolved oxygen measurements are taken, particularly when:
 - 1. Streams exhibit a high nutrient load or abundant aquatic vegetation, or have a history of low dissolved oxygen
 - 2. Lentic areas exhibit unseasonably elevated water temperatures or if dense aquatic vegetation is present, or in lentic areas that have been historically susceptible to nontarget mortality
- B. Sampling protocols are as follows:
 - 1. Dissolved oxygen measurements are conducted from stream water on site or samples are collected in plastic bottles. No air can be trapped under the lid of the sample bottle.
 - 2. Dissolved oxygen measurements in lentic areas are collected prior to treatment from four adequately spaced locations along the perimeter of the proposed application site as well as in the center of the plot. The measurements are taken at depths 20% of the total depth from the bottom and 20% of the total depth from the water's surface for a total of ten measurements.
- C. Measurements should be collected in mg/L. Treatments should not be conducted when the level of dissolved oxygen in the water is less than 4mg/L for warm water species and 6mg/L for cold water species. In the event that both cold and warm water species exist in the treatment area, then the dissolved oxygen concentration should be a minimum of 6 mg/L.

II. Measurement of Dissolved Oxygen

- A. IOP: 011.xB YSI Model 55 dissolved oxygen meter
- B. IOP: 011.xC YSI Model Pro dissolved oxygen meter
- C. IOP: 011.xD Thermo Scientific Orion Star A223 dissolved oxygen meter

III. Documentation

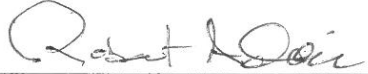
- A. Document the use of the dissolved oxygen meter in the instrument log book.

- B. Record results of the measurements on the Water Chemistry data form for stream water measurements or on the Granular Bayluscide Application form for lentic treatments.

REFERENCES:

YSI Model 55 Dissolved Oxygen Meter Manual
YSI Model Pro 20 Dissolved Oxygen Meter Manual
Thermo Scientific Orion Star A223 Dissolved Oxygen Meter Manual

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  DATE 1-17-13
Field Supervisor (U.S.)

REVIEWED/APPROVED  DATE Jan 16/13
Division Manager (Canada)