

## **PLEASE READ BEFORE SAMPLING**

### **Sampling Protocol for *Giardia*, *Cryptosporidium* by Method 1623**

Sample filtered at sample site.

**This protocol satisfies sampling requirements for the following method:**

Method 1623: *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/FA; EPA 821-R-01-025. Method conducted by filtering at sample site with a Pall Envirochek™ HV capsule.

**The same filter can be processed as a combination of MPA and 1623 with processing modifications.**

#### **SAMPLING LOCATIONS AND TIMING**

**Raw Surface Water** should be sampled prior to any chemical addition. It is preferable to collect the sample after any presedimentation basins or recycled water additions, but only if no chemicals were added prior to this point. Sampling after recycle input should be taken after adequate in-line mixing. The main objective of raw water collection is to get a representative sample of the organisms entering the treatment system.

**Finished Surface Water** should be sampled before chlorination. If this is not possible, sodium thiosulfate must be injected to neutralize the chlorine (see page 3). Collect samples prior to post-treatment storage.

**Treatment Plant Evaluation based on MPA:** Raw water sampling should be initiated before finished water sampling. The amount of time between start of raw sampling and start of finished sampling should be equivalent to the detention time of the system. Finished water sampling should begin immediately after filters are put on line and encompass a full cycle run (or 24 hour period) including at least one backwash.

#### **SAMPLING PROCEDURE**

##### **1. Source water measurements**

- Run sample tap for 2-3 minutes to clear any in-line debris and allow turbidity to become uniform. Measure and record turbidity (**Required for Long Term 2 (LT2) clients**), temperature and pH of sample source.

##### **2. Flush equipment**

- Assemble clean sampling apparatus; **however, do not install capsule or limiting flow orifice.** Use the additional equipment if sampling chlorinated water.
- Ensure proper flow direction by checking arrows on meter and in/out indications on pressure regulator.
- Flush sampling apparatus for 3-5 minutes with the water being sampled. Allow water to flow through entire sampling apparatus (except for filter and limiting flow orifice).

##### **3. Adjust pressure**

- Attach the limiting flow orifice.
- Use pressure regulator to adjust water pressure to no more than **30 psi** for unchlorinated samples (and **19 psi** in the second gauge for samples requiring dechlorination).
  - **If sampling a chlorinated source, follow injector adjustments on page 3**

##### **4. Install capsule**

- Turn off water.
- Put on new latex gloves.
- Retain vinyl caps from capsule. Attach capsule with appropriate lengths of tubing. Orient the capsule with the large space at the inlet side of the unit. Secure with band clamps.

## 5. Begin Sampling

- Record date, time and initial meter reading. The meter's single digits unit is marked with an unchanging zero and is read from the red meter hand. The dial reads to tenths of gallons. (See picture on page 4)
- Discharge the residual air in the capsule using the vent valve by turning it in counter clockwise direction. When the filter housing is full of water, quickly close the vent valve. **Increase water flow rate to no more than 2 L/min (0.5 gal/min).**
- Monitor pressure gauge: no more than 30 psi for unchlorinated samples (and 19 psi at the second gauge for samples requiring dechlorination).
  - **If sampling a chlorinated source, follow the dechlorination step on page 3.**

## 6. Sample the following amounts

- **Field Sample analysis:** 10-50 L for raw waters; up to 1000 L for finished waters
- **For Matrix Spike analysis: (Required for LT2 clients)** a grab sample of equivalent volume as the associated field sample (within 10%) is collected and ship to CH Diagnostic for spiking and filtering at the laboratory. The 1623 Method states that a matrix spike should be performed with the 1<sup>st</sup> sample at each water source and every 20<sup>th</sup> sample thereafter.
  - Clients sampling 50L should field filter 40L through the HV Envirochek capsule followed by collecting an additional 10L grab sample. At the laboratory, the 10L carboy is spiked and then filtered through the associated 40L HV capsule so the total volume is 50L (or within 10% of the field sample).

If filter plugs before prescribed volume amount is attained, collection of less volume is permissible *for non-LT2 samples*. Samples designated for Grandfathering LT2 data, a minimum of 10 L, 2mL of packed pellet or 2 filters (whichever comes first) is required to be processed and analyzed. If plugging is anticipated, sampling may be conducted at a reduced flow rate to encompass a longer sampling period. Make a note on analysis request form if filter plugged.

## 7. End sampling

- Shut off water. Record stop date and time, final meter reading, turbidity and total volume sampled.
- Remove inlet hose from the water source while holding capsule in an upright position. Seal the inlet with vinyl cap. Never pour any water out of the upper chamber. While continuing to hold capsule in an upright position, disconnect the outlet hose. Leave remaining water in the capsule. Seal the outlet with vinyl cap.
- Place capsule into zip-loc bag.
- **Record sample name on bag with a waterproof marker.**
- Do not allow bag to touch any environmental surface before placing inside a second bag.
- Sample may be refrigerated at 2-5°C prior to shipping. **(LT2 samples arriving at CH Diagnostic should be no more than 10°C upon arrival)**
- **DO NOT FREEZE.** Freezing may compromise test results.
- Sample must be received at CHDiagnostic within 24 hours of sample collection.

## 8. Ship sample

**WRAP SAMPLE IN SOME FORM OF INSULATION** (e.g. bubble wrap). Wrap ice packs around filters (outside of bubble wrap) so that ice is **NOT IN DIRECT CONTACT** with filters. Place into insulated shipping container. **DO NOT USE DRY ICE.** If wet ice is used, please use extra Ziploc bags to prevent leakage. Please initial the type of analysis to be performed on CH Diagnostic Analysis Request form. Place completed Analysis Request form in zip-loc bag and ship with sample. Ship sample by **Priority Overnight** courier to CH Diagnostic.

## **9. Clean up**

Discard inlet hose. If using the same equipment for more than one sample, clean equipment by washing in hot water with detergent and bleach followed by hot water rinse and distilled water rinse, and air dry. Alternatively, return equipment borrowed from CHDiagnostic within 5 days of sampling/schedule date. Equipment may be shipped separately from the sample by regular ground courier.

### **ADDITIONAL PROCEDURES FOR CHLORINATED WATER SAMPLES**

#### **2% Sodium Thiosulfate Solution (make prior to sampling):**

Sodium thiosulfate pentahydrate is needed to dechlorinate the sample. Dissolve sodium thiosulfate from CHDiagnostic in 4 gallons of distilled water or sample water in a large sanitary container. (Alternatively, dissolve 3.14 grams sodium thiosulfate per 100 mL of distilled water or sample water to make a 2% solution. 10 mL of 2% sodium thio. solution is needed for each gallon of chlorinated water that is sampled).

#### **Injector Adjustments (make while adjusting pressure in step 3, page 1):**

Sample tap must supply water with at least 25 psi. If not, install 1-5 gal/min gas or electric pump after sample filter housing. Pump must be capable of producing at least 25 psi.

Adjust injector during 3-5 minute flush period by placing injector tubing with injector filter and weight into a large sanitary container filled with distilled water or sample water.

Use water bypass screw to adjust pressure on second pressure gauge to 19 psi, while pressure is no more than 30 psi on first pressure gauge.

Check for injection rate to be slowly and consistently drawing up water. Coarse adjustments may be made with water bypass screw. If injector has fine metering adjustment screw, use it to fine tune injection rate.

If there is no suction visibly drawing up the water, or if too much is flowing, make sure the first gauge has no more than 30 psi and adjust the water bypass screw further to increase or decrease the pressure differential between the two gauges. Greater differential between the first and second gauges increases the flow rate; a smaller differential decreases the flow rate.

#### **Dechlorination Step (performed during sampling in step 5, page 2):**

After injector adjustments have been made, monitor level of sodium thiosulfate solution which should go down slowly and consistently at about 10 mL per minute.

## EQUIPMENT

1. Inlet hose (washing machine hose)
2. Backflow preventor (BP) (not included)
3. Pressure regulator (PR)
4. Pressure gauge (PG)
5. Pall Envirochek™ HV capsule (E), clear tubing (0.5 in I.D.), clamps, appropriate fittings
6. Meter (M)
7. Limiting flow orifice (LFO)  
**Envirochek™ HV capsule:**  
 2 L/min (0.5 gal/min)

### Additional Equipment for chlorinated samples:

8. Large sanitary container (C) for Sodium thiosulfate
9. Injector (I) with:
  - a. water bypass screw (WBS)
  - b. (Optional) fine metering adjustment (FMAS)
  - c. tubing (T)
  - d. injector filter (IF)
  - e. porcelain weight (W)
10. Second pressure gauge

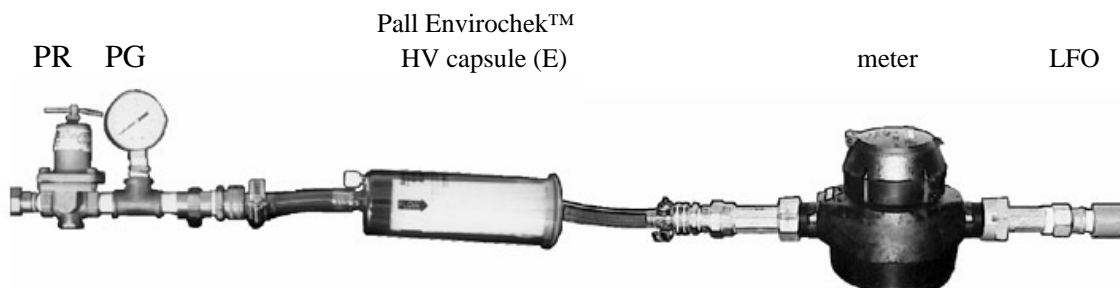
Example of a Meter Reading						
Meter Reading						
0	0	0	2	5	3	0
1,000,000 gallon mark	100,000 gallon mark	10,000 gallon mark	1,000 gallon mark	100 gallon mark	10 gallon mark	This digit remains zero, read the gallons from the red meter hand.
<b>This meter reads 2,530. If the red meter hand is between the 4 and 5, then it reads 2,534. The decimal place is demarcated by the small tic marks between the numbers going around the face of the meter.</b>						

Equipment on loan from CHDiagnostic is clean and ready to use.

*Otherwise, clean equipment thoroughly before use.*

## OTHER SUPPLIES

- (1) Turbidimeter
- (2) pH meter
- (3) Thermometer
- (4) Sanitary latex gloves
- (5) Heavy duty zip-loc 1 gallon freezer bags
- (6) Frozen ice packs and cooler for shipping
- (7) For chlorinated water: sodium thiosulfate and distilled water or sample water (see page 3)
- (8) For non-pressurized source: 2-4 Liter/minute gas or electric pump



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