

# IOC Suite (Metals, Mercury, and Free Cyanide)

## SAMPLE COLLECTION PROCEDURE

### Reference Methods EPA 200.8, EPA 245.1, AND SM 4500-CN F

**Read instructions carefully.**

**Follow all instructions to avoid sample rejection.**

- **Safety concerns:**

**Caution!** Sample bottles contain chemicals. Open containers slowly and carefully. Do not rinse out containers.

- If you are collecting free cyanide samples at a **system utilizing a chemical oxidant** (including chlorine/chloramine, chlorine dioxide, manganese oxide, ozone, potassium permanganate, sodium permanganate, etc.) or otherwise using bottles with sodium arsenite preservative, the Minnesota Department of Health requires you to use safety glasses, protective sleeves, and gloves (Personal Protective Equipment or PPE).
- View [Safety Data Sheets](https://www.health.state.mn.us/communities/environment/envlab/sdsinformation.html) (<https://www.health.state.mn.us/communities/environment/envlab/sdsinformation.html>)

- **Sample bottle/preservative:**

- **IOC metals and mercury analysis:** 250 mL bottle and 2.5 mL of 20% Nitric Acid ( $\text{HNO}_3$ ) preservative
- **Free cyanide analysis at a system utilizing a chemical oxidant:** 500 mL bottle with 1.0 mL of 50 mg/mL Sodium Arsenite ( $\text{NaAsO}_2$ ) and 2.5 mL of 2.5N Sodium Hydroxide ( $\text{NaOH}$ )
- **Free cyanide analysis at systems not using a chemical oxidant:** 500 mL bottle and 2.5 mL of 2.5N Sodium Hydroxide ( $\text{NaOH}$ )

- **Shipping:**

- Ship within 3 days.

- **Sample locations:**

- Sample at the first sample tap following treatment (treated water).

- **Prior to collection:**

- At least 48 hours before sampling, remove ice packs from the sampling kit and freeze them.

**Sample collection procedure:**

1. Attach the pre-printed label to the bottle. If you do not have a pre-printed label, write the following information, using a ballpoint or permanent pen, on the generic bottle label: PWSID, PWS Name, and Location ID.
2. Remove any attachments from the sample tap.

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3. Turn on the cold water tap and run for 4 to 5 minutes, or until the water temperature has stabilized, whichever is longer.
  - a. If there is only one faucet handle, make sure it is in the cold water position.
4. Reduce the flow of the water so the stream is steady and the width of a pencil.
5. For IOC metals and mercury analysis:
  - a. Remove bottle cap and hold in hand. Do not touch the underside of the cap or the inside of the bottle.
  - b. Fill bottle to the shoulder. **DO NOT** overfill the container.
  - c. Remove bottle from flow and add the nitric acid preservative.
  - d. Screw the cap back on the bottle. Make sure the cap is on securely. Turn the bottle upside down to make sure the water does not leak.
  - e. Gently mix the sample by turning the bottle back and forth for 15 seconds.
6. For free cyanide analysis:
  - a. If you are collecting free cyanide samples at a **system utilizing a chemical oxidant** or using bottles with sodium arsenite, put on your PPE.
  - b. If your system uses a chemical oxidant, use the bottle containing sodium arsenite. If your system does not use a chemical oxidant, use the bottle without sodium arsenite.
  - c. Remove bottle cap and hold in hand. Do not touch the underside of the cap or the inside of the bottle.
  - d. Fill bottle to the shoulder. **DO NOT** overfill the container.
  - e. Remove bottle from flow and add the sodium hydroxide preservative.
  - f. Screw the cap back on the bottle. Make sure the cap is on securely. Turn the bottle upside down to make sure the water does not leak.
  - g. Gently mix the sample by turning the bottle back and forth for 15 seconds.
7. Replace any attachments that were removed from the faucet or sample tap.
8. Upon completion of sampling, immediately (within 15 minutes) place sample in cooler with frozen cooling material.

### **Complete the Chain-of-Custody form using a ballpoint or permanent pen:**

1. Name of the sample collector.
2. Date and Time collected (include a.m. or p.m.).
3. Field Number (if applicable).
4. Put your signature on the "Relinquished By" line, including date and time. The date and time are when the sample is put in the return mailer and sealed. If samples pass hands prior to packaging, both parties must sign, date, and time. The first party would put down the date and time of the transfer, and the second party would put down the date and time the sample is packaged.

### **Deliver samples to the laboratory:**

1. All sample containers must have cooling material present without evidence of sample freezing.

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2. Sample temperature requirements depend on when the lab receives the sample:
  - a. Received 0 - 24 hours after collection: frozen or partially frozen (i.e. containing some solids) cooling material must be present. The temperature of the cooling material must be less than the temperature of the sample(s).
  - b. Received more than 24 hours after collection: frozen or partially frozen cooling material must be present. The temperature of the samples must be between 0.0 and 6.0° C.
3. Dropping off samples in person:
  - a. Frozen or partially frozen cooling material must be present. Laboratory staff must confirm the state of the cooling material. The temperature of the cooling material must be less than the temperature of the sample(s). Temperature requirements listed above must be followed.
  - b. Physically hand cooler/container containing samples and cooling material to laboratory sample receiving staff. Do not leave sample containers at the sample dock unattended.
4. Shipping samples:
  - a. Make sure the completed Chain-of-Custody is in the shipping container.
  - b. Add enough fresh, frozen cooling material to the mailing container to maintain appropriate sample temperature as indicated above, with no evidence of freezing.
  - c. Ship to the Public Health Laboratory using the applicable address. Because of the temperature requirement, it is recommended to ship using **guaranteed** overnight shipping.

**If using courier service (Spee-dee, UPS, FedEx, etc.):**

Minnesota Department of Health  
Public Health Laboratory  
Environmental Sample Receiving  
601 Robert Street North  
Saint Paul, MN 55155-2531

**If using U.S. Postal Service – 1<sup>st</sup> Class:**

Minnesota Department of Health  
Public Health Laboratory  
Environmental Sample Receiving  
P.O. Box 64899  
Saint Paul, MN 55164-0899

If you have questions, call 651-201-4700, or email [health.drinkingwater@state.mn.us](mailto:health.drinkingwater@state.mn.us)

Minnesota Department of Health  
Drinking Water Protection  
651-201-4700  
[health.drinkingwater@state.mn.us](mailto:health.drinkingwater@state.mn.us)  
[www.health.state.mn.us](http://www.health.state.mn.us)

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