Water Samples for Laboratory Analysis

Samples of water product will be analyzed and evaluated for bacteriological and chemical contamination by the DHSS laboratories. All samples for chemical analysis must be submitted as an official sample. Samples for bacteriological analysis may be submitted as an official or unofficial sample.

An official sample shall mean a sample specimen, which is collected by DHSS or LPHA staff, handled, transported and analyzed by DHSS or LPHA staff, with the results of such analyses becoming a permanent record of the Section for Disease Control and Environmental Epidemiology (DCEE) demonstrating compliance or noncompliance with DHSS laws and regulations.

Duties of BERL Staff

1. Receive laboratory reports.
2. Establish product standards.
3. Provide consultant and technical services, as needed.
4. Assist in the interpretation of results obtained from analyses performed by branch laboratories.
5. Collect and deliver samples to be analyzed by DHSS laboratories.

Duties of State Public Health Laboratory (SPHL)

1. Receive, handle and store samples in a manner that ensures their integrity and security.
2. Report results in a timely manner and in accordance with the established analytical methodologies used.
3. Provide technical advice and assistance regarding:
   - Sample or specimen collection and transport;
   - The need for testing or the proposed use of test results;
   - The appropriate use of tests and analyses;
   - The methods of analysis; and
   - The laboratory report.

Common Responsibilities of Local Public Health Agency

1. Collect and deliver samples to be analyzed by DHSS laboratories.
2. Provide consultant and technical services, as needed.
3. Assist in the interpretation of results obtained from analyses performed by branch laboratories.

Criteria for Water Sample Submission to the SPHL

1. In support of a request from the general public:
   - Individuals may obtain a sample kit from the DHSS or LPHA and collect the water sample themselves and submit to the SPHL. This is known as an unofficial sample and will only be tested for bacteriological agents.
   - Do not test Department of Natural Resources regulated water supplies.
2. In support of a routine or enforcement inspection of a regulated establishment:
   - Samples must be properly collected and submitted by DHSS or LPHA staff.
   - Samples must be properly transported and submitted with complete documentation.
3. In support of a food-borne disease outbreak investigation:
   - Investigation shall be coordinated by DHSS, Section for Disease Control and Environmental Epidemiology.
   - Samples must be properly collected and submitted by DHSS or LPHA staff. Sample collection and submission shall be coordinated through the Regional Epidemiology Specialist.
   - Samples must be properly transported and submitted with complete documentation.

Water Sampling Procedures (Bacteriological for potable/drinking water)

Only samples collected in bottles prepared by the SPHL and collected in accordance with the following steps will be accepted for analysis. *DHSS or LPHA staff, or a private individual can collect a water sample for bacteriological analysis.*

1. The sample should be taken from a smooth-nosed cold-water tap, if possible. Avoid collecting samples from leaking taps that allow water to flow over the outside of the tap or from frost-proof hydrants or hot-cold mixing faucets, since it is not practical to sterilize these fixtures.
2. Remove aeration devices and screens from faucet before sampling. Open the tap fully and let water run to waste for two (2) to three (3) minutes or until the service line has been thoroughly flushed.
3. Chemically disinfect the tap by thoroughly rinsing both the inside and outside of the tap with a 100 ppm solution of sodium hypochlorite (NaOCL). This solution can be made by mixing ¼ ounce (1.5 teaspoons) of household bleach with one gallon of clean water. If tap cleanliness is questionable, provisions should be made to allow the solution to remain in contact with the tap for up to fifteen (15) minutes or to increase the strength of the solution to ensure adequate disinfection.
4. Flush the tap for an additional two (2) or three (3) minutes then reduce to a gentle flow to permit filling the bottle without splashing.
5. DO NOT RINSE THE SAMPLING BOTTLE and KEEP BOTTLE CLOSED UNTIL IT IS TO BE FILLED. The bottles contain a chlorine neutralizer that is present in liquid or crystalline form. They are sterile and ready for use when shipped. A loose cap does not affect sterility. Some bottles have a plastic seal, which must be removed for the lid before use.

6. Grasp the cap along the top edge and remove. DO NOT TOUCH THE INSIDE OF THE CAP OR THE BOTTLE, AND DO NOT ATTEMPT TO CLEAN OR RINSE THE BOTTLE.
7. Hold the bottle so that water entering it will not come in contact with your hands. Allow water to flow smoothly from the tap and fill the bottle to the 100 ml line (or fill to the black line present on some bottles). SAMPLE WILL NOT BE TESTED IF THERE IS LESS THAN ½ INCH AIR SPACE IN THE BOTTLE.
8. Replace cap on bottle and tighten securely.

Shipment of Water Samples-Bacteriological

- Samples shall only be collected on Monday, Tuesday or Wednesday except in an emergency.
- Ship samples immediately after collection. This is important because samples should be in transit no more than 24 hours for best analytical results.
- To ensure shortest shopping time, samples may be carried directly to the laboratory, shipped by state courier or commercial carrier service (use first class postage). Samples received in the laboratory more than 30 hours after collection will not be tested.
- Samples should not be en route to the laboratory over a weekend or state holiday.

Water Sampling Procedures (Chemical for potable/drinking water)

Only samples collected in bottles prepared by the SPHL and collected in accordance with the following steps will be accepted for analysis. *Only DHSS or LPHA staff can collect a water sample for chemical analysis.*

New Well Series:

1. Must use a one (1) liter cubitainer.
2. The sample should be taken as close to the wellhead as possible.
3. It is not required to let the water run or to disinfect the tap prior to taking the sample.
4. DO NOT RINSE THE SAMPLING CUBITAINER and KEEP CUBITAINER CLOSED UNTIL IT IS TO BE FILLED.
5. The cubitainer comes collapsed for shipping purposes. When inflating the cubitainer take care not to contaminate the inside of the container. Remove the lid and allow the water to flow slowly into the cubitainer. This will typically cause the container to self-inflate. If not, gently pull on the outside corner of the cubitainer to inflate. DO NOT BLOW INTO THE CUBITAINER TO INFLATE.
6. Replace cap on cubitainer and tighten securely.

Nitrates: nitrate levels of ten (10) ppm shall not be used for drinking water.

1. Must use a one (1) liter cubitainer.
2. The sample can be taken anywhere along the distribution system.
3. It is not required to let the water run or to disinfect the tap prior to taking the sample.

4. DO NOT RINSE THE SAMPLING CUBITAINER and KEEP CUBITAINER CLOSED UNTIL IT IS TO BE FILLED.
5. The cubitainer comes collapsed for shipping purposes. When inflating the cubitainer take care not to contaminate the inside of the container. Remove the lid and allow the water to flow slowly into the cubitainer. This will typically cause the container to self-inflate. If not, gently pull on the outside corner of the cubitainer to inflate. DO NOT BLOW INTO THE CUBITAINER TO INFLATE.
6. Replace cap on cubitainer and tighten securely.

Shipment of Water Samples-Chemical

- Samples can be collected any day of the week.
- It is highly recommended to ship samples the same day of collection.
- To ensure shortest shopping time, samples may be carried directly to the laboratory, shipped by state courier or commercial carrier service (use first class postage).

Bacteriological Analysis For Drinking Water

Coliform Bacteria: Coliforms are a group of bacteria found in the intestines of humans and other animals. Coliforms also occur naturally in the soil, on vegetation and in surface waters (lakes and streams). Most members of the coliform group do not cause disease. When found in drinking water, coliform bacteria indicate that contamination of the water has occurred, and that other disease causing bacteria could also get into the water supply.

E.coli: *Escherichia coli (E. Coli)* is a member of the coliform group of bacteria and is found only in the intestines of warm-blooded animals, including humans. When found in drinking water, E. coli indicates the water has been contaminated with human or animal wastes. Possible sources of contamination include leaking septic systems, surface water leaking into the supply and runoff from agricultural lots.

Explanation of Laboratory Report

Total Coliform and *E. coli* **ABSENT**: Coliform and *E. coli* bacteria were not detected in the sample tested. Sample is considered SATISFACTORY for drinking water purposes.

Total Coliform **PRESENT**: Coliform bacteria were detected in the sample tested. Sample is considered UNSATISFACTORY for drinking water purposes. If coliform bacteria are present in the sample, it will then be analyzed for the presence of *E. coli.*

E. coli **PRESENT**: *E. coli* bacteria were also detected in the sample tested. Sample is considered UNSATISFACTORY for drinking water purposes. Presence of *E. coli* bacteria indicates fecal contamination of the water supply has occurred, therefore an increased risk to the health of those consuming the water may exist.

UNSATISFACTORY FOR TESTING: Each sample is considered on its own merits. Examples of samples that have to be rejected for analysis include:

- Samples that have been collected in improper containers;
- Samples that are received more than 30 hours after collection;
- Samples with detectable chlorine present;
- Sample quantity not sufficient;
- Sample bottle overfilled;
- Inaccurate or incomplete information on the accompanying sample form, or
- Sample collected from a source other than a drinking water supply.

If standard methodology for collection and maintaining sample integrity is not followed as explained on the sample collection instruction sheet the sample may be deemed unacceptable for testing.

If Water Sample Reported "UNSATISFACTORY FOR DRINKING"

The water supply should not be used for drinking or cooking purposes. Although unsatisfactory results do not conclusively confirm the presence of pathogenic (disease-causing) organisms in the water, this result should alert you to such a possibility.

Private Individual

If asked by the individual, the following information should be relayed:

1. To continue to use the water for drinking or cooking purposes, disinfect by:
   A. Boiling vigorously for one (1) full minute before use; or
   B. Chemically disinfect the water by adding two (2) drops (double the amount for cloudy or colored water) of regular household chlorine bleach (5.25 percent chlorine) to each quart of water used. Mix thoroughly and allow to stand for 30 minutes before use.
2. Check and correct any above-ground structural defect of the water supply that would allow surface water to enter the supply, such as defective seals, covers, surface drainage toward the well, etc.
3. Disinfect the water supply and distribution system by:
   A. Introducing the prescribed amount of disinfectant (chlorine) into the well.
   B. Opening all faucets in the distribution system and letting the water run until a distinct chlorine odor is noted. Flush toilets also.
   C. Turning off all faucets and allowing the water to stand in the system for at least four (4) hours. Preferably overnight.
   D. Opening the faucets and allowing the water to run until a suitable level of chlorine is reached (approximately 0.5 ppm) or until no chlorine odor is present.

In approximately five (5) to seven (7) days, resample the supply and submit it to the SPHL. An initial "Unsatisfactory" result should be followed up with two (2) consecutive "Satisfactory" samples taken on a weekly basis after disinfection of the water supply.

Regulated Establishments

See Section 4.0 Private Water, Subsection 4.2 Requirements for Operating Regulated Establishments-Boil Orders.

Inaccurate Results

- Inaccurate results may arise from an improper sampling point. A mixing-type faucet with an aerator, drain-back yard hydrant or frost-proof faucet may produce a questionable result due to contamination introduced at the point of collection. The sampling point should be a single cold-water faucet with the shutoff valve near the spout opening.
- Transit time greater than 30 hours from the time of collection may also affect results. Samples should be carried directly to the laboratory, shipped by state courier or commercial carrier service (use first class postage) to assure fast delivery.

Water Sampling Forms

DHSS Lab 10G-Official Drinking Water Analysis for Total Coliform and *E. coli* Bacteria

DHSS Lab 65 Chemical Water Analysis