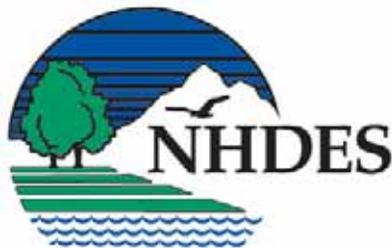


New Hampshire
Sample Collection & Preservation Manual
for Drinking Water



February 2011
N.H. Department of Environmental Services

New Hampshire
Sample Collection & Preservation Manual
for Drinking Water

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February 2011
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New Hampshire Sample Collection & Preservation Manual for Drinking Water

Chapter 1. Introduction

1.0 Introduction

This manual is specific to the taking of samples for the New Hampshire Drinking Water Program and for sample bottles provided by the New Hampshire Department of Environmental Services (NHDES) Laboratory Services Unit. Other New Hampshire (NH) accredited laboratories may use different sample containers and methods of analysis.

The intent of this guidance document is to provide the reader with a compilation of sampling instructions for many drinking water contaminants of concern. These instructions have been drawn from various EPA-approved methods of analysis and are presented in a consistent format for ease of use. This document itself does not impose legally binding requirements on states, authorized tribes or on the regulated community and does not substitute for Safe Drinking Water Act (SDWA) requirements and EPA regulations; however, it does adhere to these requirements and regulations.

1.1 Scope of manual

This document summarizes national guidelines and procedures for sampling ground water and surface water supplies for monitoring drinking water quality. Minimum standards for the collection of samples and the monitoring of drinking water are set by federal regulation. State regulations must be at least as stringent as federal regulations and may go beyond the minimum federal criteria.

This manual is not intended to be inclusive of all tests that may be required for monitoring drinking water quality. Should the Drinking Water and Groundwater Bureau (DWGB) require that a water system test for a parameter that is not included in this manual, contact your laboratory directly for any special instructions, and bottle or preservative requirements needed.

1.3 Arrangement of Manual

This manual is comprised of three chapters and an appendix. In this first chapter, an overview of the many aspects of sample collection is presented, along with some general guidance to make each sampling event safe for the sampler, representative of the sampling site, and in compliance with federal and state regulations.

Chapter two of the manual is a chart with color pictures of all the containers used by the NHDES Laboratory for sampling for the public drinking water test protocols. The chart also describes the containers, the preservatives added by the laboratory prior to sending them, and the maximum hold time for the test. Wherever the DWGB uses designated groupings (for example IOC or SOC) to associate a number of related tests, the manual tries to picture bottles for these groupings together to make it easier for samplers to identify them.

The third chapter includes detailed sample collection and preservation instructions for each of the biological and chemical substances for which public water supplies must test. Each standard operating procedure (SOP) is a stand-alone document that can be removed from the manual and taken to the field to provide step-by-step instructions to take a compliant sample. As with the sample bottles, if the DWGB has assigned a group (e.g. IOC or SOC) to a number of tests, the SOP provides instructions on how to collect samples for all of the tests in that grouping. SOPs for miscellaneous tests that may be required of a public water system are included at the end of Chapter three.

Some analytical methods can detect a long list of contaminants. To simplify the manual, only the method number may be included in the body of the document and the list of compounds is found in the appendix.

2.0 Water System Responsibilities

In general the water system owner is responsible for the following in terms of monitoring:

- performing field tests (if applicable)
- properly collecting all necessary samples in compliance with state and federal regulations
- properly completing sample paperwork using the most recent version of analysis request form
- submitting samples to accredited laboratories within allowable hold times
- collecting samples for confirmation (if required)

- notifying the laboratory that samples are for compliance purposes and if testing for any additional parameters is required by DWGB
- providing payment for analyses
- keeping records of sampling results

Although the water system owner may designate another party (such as the certified operator) to submit samples, it is ultimately the responsibility of the system owner to make sure the samples are taken properly and the results are submitted to the state program.

If samples are incorrectly collected or preserved, analyzed by unaccredited laboratories, submitted beyond appropriate holding times, submitted with incomplete or inappropriate paperwork, or taken from inappropriate sampling sites, then the samples will be deemed unacceptable and rejected. Failure to submit valid test results to the state program within the required compliance period because samples have been rejected for any reason, may result in a monitoring violation.

Samples received that do not meet sample receipt temperature requirements may be processed at the laboratory's discretion, but data will be qualified.

3.0 General Sampling Requirements

3.1 Sampler Requirements

3.1.1 In some states, only water supply program staff are authorized to collect compliance samples. Other states require that the sampler be certified. In NH, the only requirement is that the sampler follows all standard operating procedures.

3.1.2 Before collecting any samples, all samplers should receive thorough training in proper sampling protocol. This training should include segments on proper procedures for storage and filling of sample containers, handling of preservatives, safety protocols, cleaning of sampling and field equipment, disposal of excess preservatives, and packaging and shipping requirements.

3.1.3 Measuring devices, such as pH or conductivity meters, used for field monitoring must be maintained and calibrated daily, or as specified by the manufacturer, following the manufacturer's instructions. Probes must be washed with deionized water after each use and stored according to instructions. Other equipment items used to collect samples also must be rinsed with deionized water and kept clean between sampling events to prevent contamination of the samples.

3.1.4 Appropriate sample containers must be used. Generally, your laboratory will provide sample containers that have been specially prepared, depending on the end use (e.g. bacteria bottles are sterilized, metals containers are acid washed and bottles used for VOCs and SOCs are triple-rinsed with organic solvents). These containers should not be opened until the actual sampling event.

3.1.5 Field Reagent Blanks (FRB) for applicable Synthetic Organic Chemical (SOC) and Volatile Organic Compounds (VOC) methods are supplied with sample kits. A field blank is a preserved sample of lab pure water taken to the field under the same conditions as a real sample to determine if any environmental conditions, such as gasoline or refrigerant gases, contaminate the sample. Do not open the FRB bottles. The DES Laboratory analyzes FRBs for all VOC samples (Method 524.2). It analyzes FRBs for SOC Methods 504 and 547 (EDB/DBCP and glyphosate, respectively) whenever a target analyte is detected in the sample. If the analyte(s) found in the sample is not found in the FRB, a footnote will appear on the final report indicating that the “Results of the Field Reagent Blank are acceptable”; in this case, the public water system is not charged for the FRB analysis. However, if a target analyte is detected in the sample and is also found in the FRB, then the FRB results are reported to the drinking water program and the public water system is charged for the analysis of the FRB.

3.2 Laboratory Requirements

3.2.1 Only state principal laboratories or laboratories accredited by the state are allowed to perform compliance testing for microbiology, inorganic, organic, and radiochemistry parameters. Turbidity, chlorine residual, and pH monitoring are some exceptions to the laboratory certification requirements for performing analyses. Any person acceptable to the state can perform these tests.

3.2.2 State principal laboratories or laboratories accredited by the state should supply containers, preservatives, and any field reagent blanks for sampling. These containers, blanks, and preservatives must be free of contaminants at the detection levels of each parameter of interest.

3.3 Number and Frequency of Drinking Water Samples

The number of drinking water samples to be collected is determined by the DWGB. The public water system can check its Master Sampling Schedule (MSS) in advance about which analyses are required, when and where samples should be taken, and to obtain the necessary analysis request forms. This information is available on the DES OneStop website at: <http://www2.des.state.nh.us/DESOnestop/BasicSearch.aspx>. If the public water system does not have access to the internet, or has questions relative to sampling, call the DWGB at 603-271-0893.

Reduced frequency of testing is allowed for certain parameters. Check with the DWGB to see if a waiver can be obtained for those tests for your water system.

The federal drinking water regulations can be found in Section 40 of *The Code of Federal Regulations (CFR)*, Part 141 and Part 143. State regulations can be obtained from the DWGB or the DES Public Information Center (PIC) office.

3.4 Sampling Locations

The location for sample collection depends on:

- the water source
- analyses to be performed
- purpose of the testing
- regulatory requirements

Samples may be collected from the source prior to treatment, at the point of entry (before or after treatment), at the point of use (at the tap), or within the distribution system. For example, volatile organic compound (VOC) sampling is performed at the entry point of the distribution system. Lead and copper samples are taken at the point of use. The appropriate sampling point is determined by the State based on the criteria listed above.

The state may assign sampling sites for each type of test. In the absence of state approved sample sites, samples should be taken at an appropriate entry or distribution point to the system after treatment. The goal is to have a sample that is representative of the water delivered to the consumer.

3.5 Paperwork Submitted with Samples

Appropriate paperwork must accompany all samples to the laboratory. The DWGB requires specific information to identify the sample type, compliance period, where and when it was taken, and who collected and took responsibility for the sample prior to it being delivered to the laboratory. These pre-printed forms can be obtained at <http://www2.des.state.nh.us/DESOnestop/BasicSearch.aspx> or from the DWGB or NHDES Laboratory. As a reminder, the submittal of any paperwork that is incomplete or inaccurate may result in the rejection of the sample by either the DWGB or the laboratory.

3.6 Analytical Methods

When samples are submitted to accredited laboratories for analysis, the water system must notify the lab that the samples are for drinking water compliance purposes to ensure that appropriate methods are used and that the data are electronically transmitted to DWGB.

3.7 Sampling and Safety Tips to Help Meet Requirements

3.7.1 All samples should be taken at cold water faucets that are not threaded or swiveled. Also, faucet aerators and screens should be removed before taking samples. Anything attached to the end of the faucet, e.g. hoses, should be removed before taking samples.

3.7.2 Ice is not a packing material. Glass sample bottles should be wrapped in bubble wrap or other protective material to prevent breakage during shipping.

3.7.3 Chemical fumes from any source can potentially contaminate samples. Whenever sampling, the sampler should be conscious of his/her surroundings. For example, samples should not be taken in the vicinity of motor exhaust from any pump or vehicle

because it will contaminate them. Also, if sampling for volatile organic compounds (VOCs), it is not advisable to refuel vehicles either on the way to the site or while the samples are being transported to the lab.

3.7.4 Sample containers can become contaminated if the inside of the cap is touched or if the septum of a radon or VOC vial is reversed. All containers must be kept closed until ready for use.

3.7.5 It is highly recommended that safety eye protection and gloves be worn while collecting samples. Many of the chemicals used to preserve samples are highly acidic or caustic. They can cause severe burns to eyes, skin and clothing if they are splashed or spilled. Sometimes these chemicals are added to the samples in the field. However, they may already be in the “empty” containers when they are obtained from the lab. The gloves of choice (should be phthalate-free) are made from nitrile. Many other types of gloves contain phthalates, which can contaminate synthetic organic compound (SOC) samples. If collecting samples for SOCs without nitrile gloves, the sampler must remove all gloves and wash his/her hands before collecting the samples.

3.7.6 Water should be allowed to run for 4-5 minutes or until the water temperature has stabilized, whichever is longer, before the water samples are collected. A thermometer may be used to monitor the temperature.

3.7.7 A ballpoint pen or waterproof marker should be used when writing on sample container labels to reduce the bleeding of ink. If icing is required, samples should be placed on ice immediately after collection. Placing samples in zip lock plastic bags prior to icing helps with sample organization, avoids wet sample labels, and results in less confusion when the samples reach the laboratory.

3.7.8 Well pits, ditches, and below-ground pumping stations, pipe raceways and vault systems are extremely dangerous sources from which to collect samples. Before entering confined spaces of any type, samplers must comply with the requirements of 29 CFR 1910.146, Permit Required Confined Spaces. Specially trained samplers and backup teams are required when sampling in a confined space.

3.7.9 In general, preserved water samples are known environmental samples and are typically exempt from Department of Transportation (DOT) and International Air Transport Association (IATA) shipping requirements. However, these regulations must be observed when shipping the preservatives or pre-preserved bottles via ground or air. When mailing samples to the laboratory, place a “water sample” label on the package; samples that leak cause great consternation at the Post Office and for others that must handle the package.

3.7.10 Sample containers that have preservatives in them should be labeled accordingly. The specific chemicals should be identified. This applies to empty containers to which preservatives have been added before use as well as containers filled with sample.

3.7.11 The laboratory maintains Material Safety Data Sheets (MSDS) sheets for all preservatives used in the collection process. These are helpful in protecting the safety of samplers and in proper disposal of unused preservatives. Contact the lab at DESLab@des.nh.gov or 271-3445 for a copy of any MSDS.

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**Part 2. Sampling Containers, Preservatives,
and Hold Times**

NHDES Laboratory Sample Containers for Public Water Supplies

**All Inorganics and Organics Samples should be preserved between 0°C and 6°C.
All Microbiological Samples should be preserved at 10°C or lower. Do not freeze.**

TEST	CONTAINER		PRESERVATIVE IN BOTTLE	HOLD TIME
Bacteria		125mL plastic with sterile seal Must be filled at least 100mL	Sodium thiosulfate pellet	30 Hours
NO ₃ /NO ₂ (Nitrate/nitrite)		60mL plastic container	No preservation	48 Hours
Pb/Cu (Lead and Copper)		1000mL plastic	No preservation	14 Days (6 months once preserved in lab)

TEST	CONTAINER		PRESERVATIVE IN BOTTLE	HOLD TIME
IOC (Inorganic Compounds)		Metals	5mL conc HNO ₃ (to pH<2)	6 Months
		pH, sulfate, chloride, fluoride	No preservation	pH: ASAP Rest: 28 Days (New well- requires nitrate/nitrite: 48 hours)
		Cyanide -only if a new well or as required by DWGB	3 pellets NaOH (to pH>12)	14 Days
VOC (Volatile Organic Compounds) Non-chlorinated		2-40mL glass vials with Teflon septa and 1 Field Reagent Blank	<u>Nonchlorinated system:</u> 0.25mL 1:1 HCl	14 Days
VOC Chlorinated			<u>Chlorinated system:</u> 25mg ascorbic acid	14 Days

TEST	CONTAINER		PRESERVATIVE IN BOTTLE	HOLD TIME
SOC (Synthetic Organic Compounds)	Non-chlorinated System  Chlorinated System 	Method 525.2 2-1L amber glass bottles	<u>Nonchlorinated:</u> 2 mLs HCl, pH2 <u>Chlorinated:</u> 40mg sodium sulfite	14 Days
		Herbicides, Method 555	<u>Nonchlorinated:</u> 0.25mLs HCl, pH2	
		2-40mL glass vials with Teflon septa	<u>Chlorinated:</u> 4mg sodium sulfite	
		Carbamates, Method 531.2 1-40mL amber glass vial with Teflon septum	<u>Nonchlorinated:</u> 360mg potassium dihydrogen citrate	
			<u>Chlorinated:</u> 5mg sodium thiosulfate and 360mg potassium dihydrogen citrate	
		Glyphosate, Method 547 1-40mL glass vial with Teflon septum and 1 FRB shared with method 504	<u>Nonchlorinated:</u> 3mg sodium thiosulfate	
			<u>Chlorinated:</u> 3mg sodium thiosulfate	
		EDB/DBCP/Toxaphene/Chlordane Method 504 & 505 2-40mL glass vials with Teflon septa	<u>Nonchlorinated:</u> 3mg sodium thiosulfate	
	<u>Chlorinated:</u> 3mg sodium thiosulfate			

TEST	CONTAINER		PRESERVATIVE IN BOTTLE	HOLD TIME
Radiological		Gross Alpha, Uranium Public – 1 gallon plastic jug	No preservation	5 Days to preserve (6 months once preserved in lab)
		Radon 1-40mL glass vial with Teflon septum	No preservation	3 Days
Standard		White plastic jug with handle, labeled “sterile container” and nitrate bottle. Please consult the Lab for instructions.	No preservation	Bacteria: 30 Hours NO ₂ /NO ₃ : 48 Hours

TEST	CONTAINER		PRESERVATIVE IN BOTTLE	HOLD TIME
Fluoride		60mL plastic container	No preservation	28 Days
TTHM (Trihalo- methanes)		2-40mL glass vials with Teflon septa	3mg sodium thiosulfate	14 Days
HAA5 (Haloacetic acids)		2-60mL amber glass vials with Teflon septa	6mg ammonium chloride	14 Days
TOC (Total Organic Carbon)		2-40mL amber glass vials with Teflon septa	2 drops conc. H ₃ PO ₄ (to pH<2)	28 Days

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**Chapter 3. Individual Sampling Standard Operating
Procedures (SOPs)**

NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-BACTERIA

Used for: Total Coliform Rule (TCR) and Groundwater Rule (GWR)

Analytes: Total Coliform, E. coli

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM INSTRUCTIONS WITH LAB BEFORE SAMPLING. WASH HANDS.

1. **Sample Location:** A state-approved location. If one has not been designated or if a change in location needs to be made, follow instructions provided by the DWGB or contact them for more information prior to sampling.
2. **Sampling materials:**
 - Container:** Sterile plastic bottle with a minimum capacity of 125mL.
 - Preservative:** Sodium thiosulfate as powder or tablet; ice.
 - Other:** Labels and marker, and a thermometer - often used for temp stabilization.
3. **Safety Concerns:** None.
4. **Sample Collection Procedure:**
 - a. Remove aerator, screen, hose and strainer from the faucet.
 - b. If necessary, a lint free cloth dampened with bleach and water may be used to clean the faucet rim.
 - c. Turn on cold water tap at a medium flow and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow to eliminate splashing and air bubbles. The stream of water should be no greater than 1/8 inch in diameter.
 - d. Inspect bottle to ensure that there are no problems such as loose cap, cracked bottle, no preservative etc. If found, discard bottle and replace with new one.
 - e. Carefully remove cap. Do not put cap face down or put it in a pocket. Do not allow inside of cap or bottle to be touched by any object.
 - f. Do **NOT** rinse the bottle or remove the tablet in the bottom of the container. This is the preservative.
 - g. Fill container to just below neck of bottle, leaving an ample airspace. **Be sure bottle contains at least 100mLs of sample.**
 - h. Carefully replace cap on container and tighten securely.
 - i. Write the PWS ID, sampling location, and the date and time of collection on the sample container before it gets wet, using a permanent pen or marker.
 - j. Complete the pre-printed analysis request form.

SOP- BACTERIA
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5. **Shipping and handling:**

- a. Refrigerate at less than 10° C., but do not freeze sample. It is necessary to begin cooling the sample after collection and during transport.
- b. Keep samples in a clean closed cooler out of sunlight.
- c. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm. Please deliver samples for bacterial analysis by noon on Fridays or the day before a holiday.
- d. Maximum holding time is **30 hours**.

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP- NITRATE & NITRITE

Used for: **Chemical Monitoring**

Analytes: **Nitrate, Nitrite, Nitrate + Nitrite**

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED
CONFIRM INSTRUCTIONS WITH LAB BEFORE SAMPLING. WASH HANDS.

SPECIAL NOTE: If a sample contains chlorine, it cannot be analyzed for nitrite. Results from these samples will be reported as Nitrate + Nitrite.

1. **Sample Location:** A state-approved location. If one has not been designated, follow instructions provided by the DWGB or contact them for more information prior to sampling. For chlorinated systems, the sample should be taken from a tap before the chlorinator.
2. **Sampling Materials:**
 - Container:** Pre-cleaned 40 mL plastic bottle
 - Preservative:** Ice.
 - Other:** Labels, marker.
3. **Safety Concerns:** None.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until the water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove bottle cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of container or bottle threads to be touched by any object.
 - d. Fill bottle to shoulder; screw cap on securely.
 - e. Write the PWS ID, sampling location, and date and time of sample collection on the sample container.
 - f. Complete the pre-printed analysis request form.
5. **Shipping and Handling:**
 - a. Keep sample in closed cooler with ice at 4°C.
 - b. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm.
 - c. The maximum holding time to analysis is **48 hours**.

SOP- NITRATE & NITRITE

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-LEAD AND COPPER

Used for Lead and Copper Rule (LCR)

Analytes: Lead, Copper

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS.

1. **Sample Location:** State-approved locations.
2. **Sampling Materials:**
 - Container:** Pre-cleaned 1 liter plastic bottle.
 - Preservative:** None.
 - Other:** Labels and marker.
3. **Safety Concerns:** None.
4. **Sample Collection Procedure:**
 - a. Each first draw tap sample must have stood motionless in the plumbing system of the sampling site for at least six hours.
 - b. Remove bottle cap and turn on cold water.
 - c. Fill bottle to shoulder.
 - d. Screw cap on securely.
 - e. Write the PWS ID, sampling location, and date and time of sample collection on the sample container.
 - f. Complete the pre-printed analysis request form.
5. **Shipping and Handling:**
 - a. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm
 - b. The maximum hold time is **14 days**.

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-INORGANIC CHEMICALS (IOCs)

Used for: **Chemical Monitoring, IOC Group**

Analytes: pH, chloride, fluoride, sulfate, antimony, arsenic, barium, beryllium, cadmium, chromium, copper, hardness, iron, manganese, mercury, nickel, selenium, silver, sodium, thallium, zinc. **New sources include the above plus: cyanide, aluminum, and lead.**

READ INSTRUCTIONS CAREFULLY.

LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED
CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

SPECIAL NOTES:

Cyanide testing is no longer routinely required for Public Water Systems. It is only required for new sources or as determined by DWGB.

-Chlorinated systems must take cyanide samples from a tap before the chlorinator.

-If sampling for a new system, additional samples must be collected for bacteria analysis and nitrate, nitrite and nitrate + nitrite.

1. **Sample Location:** A state-approved location. If one has not been designated, follow instructions provided by the DWGB or contact them for more information prior to sampling. See Special Note above if cyanide is required.
2. **Sampling Materials:**
Containers: One pre-cleaned 500 mL square plastic bottle for metals, and one 500 mL plastic bottle for non-metals. If cyanide testing is necessary, a 100mL pear-shaped plastic bottle.
Preservatives: Ice; 5 mL of concentrated nitric acid added to metals container; no preservative in anion container. If cyanide testing is required, 3 pellets of sodium hydroxide added to cyanide container.
Other: Labels and marker.
3. **Safety Concerns:** Caution! Nitric acid is a strong acid and will cause burns. Sodium hydroxide is a strong base and will cause burns. Caution! "Empty" sample containers contain acid or base. Open them slowly and carefully.

SOP- INORGANIC CHEMICALS (IOCs)

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4. **Sample Collection Procedure:**

- a. Remove aerator and screen from faucet.
- b. Turn on cold water tap and run for 4 to 5 minutes or until the water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
- c. Remove bottle cap of container labeled IOC Non-Metals. Do not put cap face down or in pocket. Do not allow inside of cap, inside of container or bottle threads to be touched by any object.
- d. Fill bottle to shoulder.
- e. Screw cap on securely.
- f. Write the PWS ID, sample location and date and time of sample collection on the sample container.
- g. Repeat steps 4c through 4f with bottle labeled Metals.
- h. Repeat steps 4c through 4f with the bottle labeled Cyanide if cyanide testing is required.
- i. Complete the pre-printed analysis request form.
- j. If sampling for a new source, fill containers for bacteria and nitrate/nitrite following appropriate SOPs.

5. **Shipping and Handling:**

- a. Keep samples in closed cooler.
- b. Samples must be kept on ice at 4°C.
- c. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm
- d. The following table lists the maximum hold time for applicable parameters above.

Analyte	Holding Time	Analyte	Holding Time
pH	Analyze within 15 minutes	Metals	Preserved within 14 days; 6 months
Chloride	28 days	Mercury	28 days
Fluoride	28 days	Cyanide	14 days
Sulfate	28 days		

SOP- INORGANIC CHEMICALS (IOCs)

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-VOLATILE ORGANIC COMPOUNDS (VOCs)

Used for: Chemical Monitoring, VOC Group

Analytes: Method 524.2 List- see appendix

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

SPECIAL NOTE: If a VOC sample is to be taken from a tap after a chlorination system, notify lab so that you obtain vials with appropriate preservative.

1. **Sample Location:** A state-approved location. If one has not been designated, follow instructions provided by the DWGB or contact them for more information prior to sampling.
2. **Sampling Materials:**
 - Containers:** Two pre-cleaned 40-mL glass vials with Teflon septa per each sample site and 1 Field Reagent Blank for each delivery, carried to field and returned with samples.
 - Preservative:** Ice; for **non-chlorinated systems**- 0.25 mL of 1:1 Hydrochloric acid added to vials before shipment to the field; for **chlorinated** supplies- 25 mg ascorbic acid added to vials before shipment to the field and 1 vial of 1:1 hydrochloric acid for addition in the field as directed below.
 - Other:** Labels, marker, pH test strip paper, and field reagent blanks (do not open them).
3. **Safety Concerns:** Caution! Hydrochloric acid is a strong acid and will cause burns. Caution! "Empty" sample vials may contain acid. Open them slowly and carefully.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - d. **If you are certain that no chlorine is present, proceed to step 4e. If chlorine is present, go to 4k.**
 - e. Use vials marked preserved with 1:1 hydrochloric acid. Fill vial carefully until water is actually above the vial rim. (This will prevent the formation of an air pocket in the vial.) Gently tap the vial to dislodge any air bubbles.
 - f. Carefully hook the cap over the top of the vial, trying to match the threads. The Teflon side of the septum must be facing the sample (Teflon side is smooth and shiny).

SOP- VOLATILE ORGANIC COMPOUNDS (VOCs)

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- g. Screw cap on securely. Check for air bubbles by inverting the vial and gently tapping the cap. If bubbles are present, add more water. (Note: Samples with bubbles larger than a pea cannot be analyzed.)
 - h. Shake sample for one minute.
 - i. Write the PWS ID, sampling location, and date and time of sample collection on the sample vials.
 - j. Complete the pre-printed analysis request form.
 - k. **If chlorine is present in system, then use vials marked preserved with ascorbic acid** (these vials must be requested from lab at time of sample container pickup.)
 - l. Fill vial carefully until water is actually above the vial rim. (This will prevent the formation of an air pocket in the vial.) Gently tap the vial to dislodge any air bubbles.
 - m. Carefully add 2 drops of the provided 1:1 hydrochloric acid to the center of the water surface (i.e., to the meniscus). The acid will sink to bottom of vial, displacing 2 drops of sample.
 - n. Continue with steps 4f through 4j.
5. **Shipping and Handling:**
- a. Keep samples in closed cooler at 4°C away from direct light and solvent vapors.
 - b. Ice is not a packing material. To prevent breakage, wrap glass bottles in bubble wrap or other protective material.
 - c. If possible, deliver samples and Field Reagent Blank to lab the same day. Lab hours are M-F 8am to 4pm.
 - d. The maximum holding time is **14 days**.

** Please dispose of empty preservative vials properly; rinse container several times with clean water and place glass container in recycling bin or trash.

SOP- VOLATILE ORGANIC COMPOUNDS (VOCs)

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION
SOP-SYNTHETIC ORGANIC CHEMICALS (SOCs)

Used for: Chemical Monitoring, SOC Group

Analytes: Methods 504, 505, 525.2, 531.2, 547 and 555 Lists- see appendix

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

1. **Sample Location:** A state-approved location. If one has not been designated, follow instructions provided by the DWGB or contact them for more information prior to sampling.

2. **Sampling Materials:**

Containers: A total of 8 containers including: 2 pre-cleaned one-liter amber glass bottles with Teflon-lined caps and 6 pre-cleaned 40mL glass vials (one vial is amber) with Teflon-lined caps for each sampling site. Also, 1 Field Reagent Blank for each delivery, carried to field and returned with samples.

Preservatives: Ice; granular sodium thiosulfate, sodium sulfite, potassium dihydrogen citrate; and hydrochloric acid added to appropriate bottles. **For specific preservatives, refer to the sample container matrix at the end of this SOP.**

Other: pH test strip paper, markers, and labels.

3. **Safety Concerns:** Caution! "Empty" sample bottles contain special preservatives. Open them slowly and carefully. Caution! Hydrochloric acid is a strong acid and can cause burns.

4. **General Sample collection procedure:**
 - a. Refer to the sample container matrix for this method to correctly associate bottles and preservatives for either a **chlorinated** or **non-chlorinated** system.
 - b. Turn on cold water tap and run water for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. For each one liter bottle labeled Method-525.2: Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object. Do not rinse bottle. Fill bottle to shoulder. If chlorine is not present in the system, proceed to step 4e
 - d. If chlorine is present in the system, carefully add 2mLs of the 6N hydrochloric acid provided and check that the pH is 1-2.
 - e. Screw cap on securely.
 - f. Write the PWS ID, sampling location, and date and time of sample collection on the sample container.
 - g. For each of the 40mL vials: Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of vial or bottle threads to be touched by any object. Do not rinse vial. Fill vial carefully to just overflowing, but do not flush out the preservative. If chlorine is not present in the system, proceed to step 4i.

- h. If chlorine is present in the system, carefully add the correct acid preservative provided as specified in the table at the end of this SOP; check that the final sample pH is the value for the method.
 - i. Screw cap on securely. Check for air bubbles by inverting the vial and gently tapping the cap. If bubbles are present, add additional sample.
 - j. Write the PWS ID, sampling location, and date and time of sample collection on the sample container.
 - k. Complete the pre-printed analysis request form.
5. **Shipping and Handling:**
- a. Keep samples in closed cooler at 4⁰ C. away from direct light and solvent vapors.
 - b. Ice is not a packing material. To prevent breakage, wrap glass bottles in bubble wrap or other protective material.
 - c. If possible, deliver samples and the Field Reagent Blank to lab the same day. Lab hours are M-F 8am to 4pm.
 - d. The maximum hold time is **14 days**.

SOP- SYNTHETIC ORGANIC CHEMICALS (SOCs)

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**SYNTHETIC ORGANIC CHEMICALS (SOCs)
SAMPLE BOTTLES AND PRESERVATIVES**

NON-CHLORINATED SYSTEMS:

BOTTLE LABEL	# BOTTLES	PRESERVATIVE IN BOTTLE	PRESERVATIVE TO BE ADDED IN FIELD	STORAGE
Method 525	2x 1L amber glass bottles	2 mLs HCl pH 2	none	4 ⁰ C away from sunlight
Carbamates 531.2	1x 40mL amber glass vial	360mg potassium dihydrogen citrate	none	4 ⁰ C away from sunlight
Glyphosate 547	1x 40mL glass vial	3mg sodium thiosulfate	none	4 ⁰ C away from sunlight
Herbicides 555	2x 40ml glass vials	0.25 mLs HCl pH 2	none	4 ⁰ C away from sunlight
EDB/DBCP/Toxaphene	2x 40ml glass vials	3mg sodium thiosulfate	none	4 ⁰ C away from sunlight

1 Field Reagent Blank shared for Methods 547(Glyphosate) and 504 (EDB/DBCP).

CHLORINATED SYSTEMS:

BOTTLE LABEL	# BOTTLES	PRESERVATIVE IN BOTTLE	PRESERVATIVE TO BE ADDED IN FIELD	STORAGE
Method 525	2x 1L amber glass bottles	40 mg sodium sulfite	2 mLs HCl; pH1-2	4 ⁰ C away from sunlight
Carbamates 531.2	1x 40mL amber glass vial	5mg sodium thiosulfate and 360mg potassium dihydrogen citrate	none	4 ⁰ C away from sunlight
Glyphosate 547	1x 40mL glass vial	3mg sodium thiosulfate	none	4 ⁰ C away from sunlight
Herbicides 555	2x 40ml glass vials	4mg sodium sulfite	0.25 mLs HCl; pH 2	4 ⁰ C away from sunlight
EDB/DBCP/Toxaphene	2x 40ml glass vials	3mg sodium thiosulfate	none	4 ⁰ C away from sunlight

1 Field Reagent Blank shared for Methods 547(Glyphosate) and 504 (EDB/DBCP).

** Please dispose of empty preservative vials properly; rinse container several times with clean water and place glass container in recycling bin or trash.

SOP- SYNTHETIC ORGANIC CHEMICALS (SOCs)

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP- COMPLIANCE GROSS ALPHA

Used for: Chemical Monitoring, Compliance Gross Alpha

Analytes: Compliance Gross Alpha, Analytical Gross Alpha, Uranium

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES OF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS BEFORE SAMPLING.
WASH HANDS.

SPECIAL NOTES:

-For most NH public water supplies, Radiological analysis for the Safe Drinking Water Act includes testing for Gross Alpha, Radium, and, for new sources, Radon; see separate Radium and Radon SOPs. Uranium is analyzed by Metals method 200.8.

Compliance Gross Alpha = Analytical Gross Alpha - Uranium

1. **Sample Location:** A state-approved location. If one has not been designated, follow instructions provided by the DWGB or contact them for more information prior to sampling.
2. **Sampling Materials:**
 - Container:** One pre-cleaned 1-gallon plastic bottle. Lab will withdraw an aliquot for Uranium analysis.
 - Preservative:** None.
 - Other:** Labels and marker.
3. **Safety Concerns:** None.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - d. Fill bottle to the shoulder.
 - e. Screw cap on securely.
 - f. Write the PWS ID, sampling location, and date and time of sample collection on the sample container.
 - g. Complete the pre-printed analysis request form.
5. **Shipping and Handling:**
 - a. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm.
 - b. Gross Alpha samples must be preserved at the Lab within **5 days** of collection. Uranium samples must be preserved within **14 days** of collection. The maximum holding time is **6 months** once the sample is preserved.

SOP- COMPLIANCE GROSS ALPHA

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP- COMBINED RADIUM 226 AND 228

Used for: Chemical Monitoring, Combined Radium (226 and 228)
Analytes: Radium 226, Radium 228

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES OF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS BEFORE SAMPLING.
WASH HANDS.

SPECIAL NOTES:

-The DES Laboratory does not test for Radium. Special arrangements must be made with an accredited laboratory prior to sample collection; see website for list:

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/documents/accredradlabsmod.pdf>

1. **Sample Location:** A state-approved location. If one has not been designated, follow instructions provided by the DWGB or contact them for more information prior to sampling.
2. **Sampling Materials:**
 - Containers:** One pre-cleaned 1-gallon plastic bottle or two pre-cleaned 2-liter plastic bottles.
 - Preservative:** None.
 - Other:** Labels and marker.
3. **Safety Concerns:** None.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - d. Fill bottle to the shoulder.
 - e. Screw cap on securely.
 - f. Write the PWS ID, sampling location, and date and time of sample collection on the sample container.
 - g. Complete the pre-printed analysis request form.
5. **Shipping and Handling:**
 - a. If possible, deliver sample to lab the same day.
 - b. The maximum holding time is **6 months** once the sample is preserved.

SOP- RADIUM 226 AND 228

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-RADON

Used for: Chemical Monitoring, Radon

Analytes: Radon

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES OF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS BEFORE SAMPLING.
WASH HANDS.

SPECIAL NOTES: Radon is only required for new sources or as determined by DWGB.

1. **Sample Location:** A state-approved location. If one has not been designated, select an appropriate location which is representative of the distribution system.
2. **Sampling Materials:**
 - Container:** Pre-cleaned 40-mL glass vial with Teflon-lined septum.
 - Preservative:** None.
 - Other:** Labels and marker.
3. **Safety Concerns:** None.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - d. Fill vial carefully until water is actually above the vial rim. (This will prevent the formation of an air pocket in the vial.) Gently tap the vial to dislodge any air bubbles.
 - e. Carefully hook the cap over the top of the vial, trying to match the threads. The Teflon side of the septum must be facing the sample (Teflon side is smooth and shiny).
 - f. Screw cap on securely. Check for air bubbles by inverting the vial and gently tapping the cap. If bubbles are present, empty the vial and repeat sampling procedure, beginning with step 4d. (Note: Samples with bubbles cannot be analyzed.)
 - g. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.
 - h. Complete the pre-printed analysis request form.

SOP- RADON

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5. **Shipping and Handling:**

- a. Keep samples in closed cooler at 4°C away from direct light and solvent vapors.
- b. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm.
- c. The maximum holding time is **3 days**.

SOP- RADON

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-TOTAL TRIHALOMETHANES (TTHMs)

Used for: Disinfection Byproduct (DBP)

Analytes: Chloroform, Bromodichloromethane, Bromoform, Chlorodibromomethane, Total Trihalomethanes

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

1. **Sample Location:** A state-approved location. If one has not been designated, select an appropriate location which is representative of the distribution system.
2. **Sampling Materials:**
 - Containers:** Two pre-cleaned 40-mL glass vials with Teflon septa for each sampling site.
 - Preservative:** 3 mg of granular sodium thiosulfate added to bottles before shipment to the field; ice.
 - Other:** Labels, marker.
3. **Safety Concerns:** Caution! "Empty" sample bottles will contain special preservatives. Open them slowly and carefully.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - e. Use vials marked preserved with sodium thiosulfate. Fill vial carefully until water is actually above the vial rim. (This will prevent the formation of an air pocket in the vial.) Gently tap the vial to dislodge any air bubbles.
 - f. Carefully hook the cap over the top of the vial. The Teflon side of the septum must be facing the sample. (Teflon side is smooth and shiny).
 - g. Screw cap on securely. Check for air bubbles by inverting the vial and gently tapping the cap. If bubbles are present, add more water. (Note: Samples with bubbles larger than a pea cannot be analyzed.)
 - h. Shake sample for one minute.
 - i. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.
 - j. Complete the pre-printed analysis request form.

SOP- TOTAL TRIHALOMETHANES

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5. **Shipping and Handling:**

- a. Keep samples in closed cooler at 4°C away from direct light and solvent vapors.
- b. Ice is not a packing material. To prevent breakage, wrap glass bottles in bubble wrap or other protective material.
- c. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm.
- d. The maximum holding time is **14 days**.

SOP- TOTAL TRIHALOMETHANES

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-HALOACETIC ACIDS (HAA5)

Used for: Disinfection Byproduct (DBP)

Analytes: Monochloroacetic acid, Dichloroacetic acid, Trichloroacetic acid, Monobromoacetic acid, Dibromoacetic acid, Total Haloacetic acids

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

1. **Sample Location:** A state-approved location. If one has not been designated, select an appropriate location that is representative of the distribution system.
2. **Sampling Materials:**
 - Containers:** Two pre-cleaned 60-mL amber glass vials with Teflon septa for each sampling site.
 - Preservative:** 6 mg of granular ammonium chloride added to bottles before shipment to the field; ice.
 - Other:** Labels, marker
3. **Safety Concerns:** Caution! "Empty" sample bottles will contain special preservatives. Open them slowly and carefully.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - d. Fill each vial carefully until water is actually above the vial rim. (This will prevent the formation of an air pocket in the vial.) Gently tap the vial to dislodge any air bubbles.
 - e. Carefully hook the cap over the top of the vial. The Teflon side of the septum must be facing the sample. (Teflon side is smooth and shiny).
 - f. Screw cap on securely. Check for air bubbles by inverting the vial and gently tapping the cap. If bubbles are present, add more water. (Note: Samples with bubbles cannot be analyzed.)
 - g. Shake sample for one minute.
 - h. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.
 - i. Complete the pre-printed analysis request form.

SOP- HALOACETIC ACIDS

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5. **Shipping and Handling:**

- a. Keep samples in closed cooler at 4°C away from direct light and solvent vapors.
- b. Ice is not a packing material. To prevent breakage, wrap glass bottles in bubble wrap or other protective material.
- c. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm.
- d. The maximum holding time is **14 days**.

SOP- HALOACETIC ACIDS

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-TOTAL ORGANIC CARBON (TOC)

Used for: Disinfection Byproduct (DBP)

Analyte: Total Organic Carbon

READ INSTRUCTIONS CAREFULLY.

LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

1. **Sample Location:** A state-approved location. If one has not been designated, select an appropriate location which is representative of the distribution system.
2. **Sampling Materials:**
 - Containers:** Two pre-cleaned 40-mL amber glass vials with Teflon septa for each sampling site.
 - Preservative:** 2 drops of concentrated phosphoric acid H_3PO_4 , added to bottles before shipment to the field; ice.
 - Other:** Labels, marker.
3. **Safety Concerns:** Caution! "Empty" sample containers contain phosphoric acid which is a strong acid and will cause burns. Open them slowly and carefully.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - e. Fill vial carefully until water is actually above the vial rim. (This will prevent the formation of an air pocket in the vial.) Gently tap the vial to dislodge any air bubbles.
 - f. Carefully hook the cap over the top of the vial. The Teflon side of the septum must be facing the sample (Teflon side is smooth and shiny).
 - g. Screw cap on securely. Check for air bubbles by inverting the vial and gently tapping the cap. If bubbles are present, add more water. (Note: Samples with bubbles cannot be analyzed.)
 - h. Shake sample for one minute.
 - j. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.
 - k. Complete the pre-printed analysis request form.

SOP- TOTAL ORGANIC CARBON (TOC)

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5. **Shipping and Handling:**

- a. Keep samples in closed cooler at 4°C away from direct light and solvent vapors.
- b. Ice is not a packing material. To prevent breakage, wrap glass bottles in bubble wrap or other protective material.
- c. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm.
- d. The maximum holding time is **28 days**.

SOP- TOTAL ORGANIC CARBON (TOC)

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP- INITIAL WATER QUALITY PARAMETERS

Used for: Lead and Copper Rule- Initial Water Quality Parameters (LCRWQP)

Analytes: Alkalinity, Calcium, Copper, Lead, Ortho-phosphate, pH, Silica, Specific Conductance

READ INSTRUCTIONS CAREFULLY.

LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

SPECIAL NOTE:

Ortho-phosphate and silica testing are only required for Public Water Systems that are using these methods in their treatment processes.

1. **Sample Location:** A state-approved location. If one has not been designated, select an appropriate location which is representative of the distribution system.
2. **Sampling Materials:**
 - Containers:** One pre-cleaned 500mL square plastic bottle for metals, one 500mL plastic bottle for inorganic chemicals and physical tests, and one 250mL brown plastic bottle for ortho-phosphate.
 - Preservatives:** Ice; 5mL of concentrated nitric acid added to metals container, no preservative in IOC-non metals or ortho-phosphate containers. If ortho-phosphate testing is required, the sample must be field filtered through a 0.45 µm filter.
 - Other:** Labels, marker.
3. **Safety Concerns:** Caution! Nitric acid is a strong acid and will cause burns. Open containers slowly and carefully.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove bottle cap of container labeled IOC-Non metals. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - d. Fill bottle to the shoulder.
 - e. Screw cap on securely.
 - f. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.

SOP- INITIAL WATER QUALITY PARAMETERS

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- g. Repeat steps 4c through 4f with bottles labeled Metals.
- h. Repeat steps 4c through 4f with ortho-phosphate bottle if testing is required.
- i. Complete the pre-printed analysis request form.

5. **Shipping and Handling:**

- a. Keep samples in closed cooler at 4°C.
- b. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm.
- c. The following table lists the maximum hold time for applicable parameters above.

Analyte	Hold Time	Analyte	Hold Time
Metals	Preserved within 14 days; 6 months	pH	Analyze within 15 minutes
Specific Conductance	28 days	Ortho-phosphate	48 hours; 6 months if frozen within 48 hours
Alkalinity	14 days		

SOP- INITIAL WATER QUALITY PARAMETERS

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP- MISCELLANEOUS INORGANIC COMPOUNDS AND PHYSICAL TESTS

Used for: **Chemical Monitoring, Disinfection Byproducts or as needed by a Public Water Supply or DWGB**

Analytes: Alkalinity, Chlorine (Total and Free), Chlorine Dioxide, Color, Conductivity, Odor, pH, Surfactants (foaming agents), Total Dissolved Solids, Turbidity

READ INSTRUCTIONS CAREFULLY.

LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

SPECIAL NOTE: The NHDES Laboratory does not test for Chlorine Dioxide, Color, Odor, or Surfactants. Special arrangements must be made with a laboratory prior to sample collection.

1. **Sample Location:** A state-approved location. If one has not been designated, select an appropriate location which is representative of the distribution system.
2. **Sampling Materials:**
 - Container:** Generally a 250mL or 500mL plastic container.
 - Preservative:** Ice
 - Other:** Labels, marker.
3. **Safety Concerns:** None.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - d. Fill bottle carefully to the shoulder.
 - e. Screw cap on securely.
 - f. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.
 - g. Complete appropriate analysis request form.

SOP- MISCELLANEOUS INORGANIC COMPOUNDS AND PHYSICAL TESTS

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5. **Shipping and Handling:**

- a. Keep samples in closed cooler at 4°C away from direct light.
- b. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm.
- c. The following table lists the maximum holding time for applicable parameters above.

Analyte	Maximum Holding Time	Analyte	Maximum Holding Time
Alkalinity	14 days	Odor	24 hours
Chlorine (Total & Free)	Analyze within 15 minutes	pH	Analyze within 15 minutes
Chlorine Dioxide	Analyze within 15 minutes	Total Dissolved Solids	7 days
Color	48 hours	Surfactants	48 hours
Conductivity	28 days	Turbidity	48 hours

SOP- MISCELLANEOUS INORGANIC COMPOUNDS AND PHYSICAL TESTS

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP- MISCELLANEOUS ANIONS AND INORGANIC DISINFECTION BY-PRODUCTS

Used for: **Chemical Monitoring, Disinfection Byproducts or as needed by a Public Water System or DWGB**

Analytes: **Bromate, Bromide, Bromite, Chlorate, Chlorite, Fluoride, Ortho-phosphate, Sulfate**

READ INSTRUCTIONS CAREFULLY.

LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

SPECIAL NOTE: The NHDES Laboratory does not test for Bromate, Bromide, Bromite, Chlorate, or Chlorite. Special arrangements must be made with a laboratory prior to sample collection.

1. **Sample Location:** A state-approved location. If one has not been designated, select an appropriate location which is representative of the distribution system.
2. **Sampling Materials:**
 - Container:** Generally a 250mL or 500mL plastic or glass container (opaque for chlorite).
 - Preservatives:** Ice; 0.1mL of 5% EDTA solution per 100mL for bromate (subject to method used) and chlorite.
 - Other:** Labels, marker.
3. **Safety Concerns:** None.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - d. If sampling for bromate, chlorate or chlorite, add 0.1mL of 5% EDTA solution per 100mL sample. If the sample is collected from a treatment plant employing chlorine dioxide, the sample must be sparged with an inert gas (helium, argon, nitrogen) prior to addition of the EDTA preservation at the time of sample collection.
 - e. Fill bottle carefully to the shoulder.
 - f. Screw cap on securely.
 - g. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.
 - h. Complete appropriate analysis request form.

SOP- MISCELLANEOUS ANIONS AND INORGANIC DISINFECTION BYPRODUCTS

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5. **Shipping and Handling:**

- a. Keep samples in closed cooler at 4°C away from direct light
- b. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm.
- c. The following table lists the maximum holding time for applicable parameters above.

Analyte	Holding Time
Bromate, Bromide, Chloride, Fluoride, Sulfate	28 days
Chlorite	14 days
Ortho-phosphate	48 hours; 6 months if frozen within 48 hours

SOP- MISCELLANEOUS ANIONS AND INORGANIC DISINFECTION BYPRODUCTS
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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP- MISCELLANEOUS SYNTHETIC ORGANIC CHEMICALS

Used for: Chemical Monitoring

Analytes: Dalapon, Diquat, Endothall

READ INSTRUCTIONS CAREFULLY.

LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

SPECIAL NOTE: To obtain proper containers and preservatives, notify the Laboratory in advance if any of these parameters are required.

1. **Sample Location:** A state-approved location. If one has not been designated, select an appropriate location which is representative of the distribution system.
2. **Sampling Materials:**
 - Containers:** Refer to the sample container and preservative matrix on page 2 of this SOP
 - Preservatives:** Ice; refer to page 2 of this SOP
 - Other:** Labels, marker.
3. **Safety Concerns:** None.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from the faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove container cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of bottle or bottle threads to be touched by any object.
 - d. Fill bottle carefully to the shoulder.
 - e. Screw cap on securely.
 - f. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.
 - g. Complete appropriate analysis request form.

SOP- MISCELLANEOUS SYNTHETIC ORGANIC CHEMICALS

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5. **Shipping and Handling:**

- a. Keep samples in closed cooler at 4°C away from direct light
- b. If possible, deliver sample to lab the same day. Lab hours are M-F 8am to 4pm.
- c. The maximum holding time is **14 days**.

BOTTLE LABEL	# BOTTLES	PRESERVATIVE IN BOTTLE	PRESERVATIVE TO BE ADDED IN FIELD	STORAGE
Dalapon	2x 60mL amber glass vials	6mg ammonium chloride	none	4°C away from sunlight
Diquat	1L amber HPDE (plastic) bottle	If chlorinated system- 100mg sodium thiosulfate	For biologically active samples, add sulfuric acid to pH <2	4°C
Endothall	2x 1L amber glass bottle	If chlorinated system- 80mg sodium thiosulfate	none	4°C away from sunlight

SOP- MISCELLANEOUS SYNTHETIC ORGANIC CHEMICALS
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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-SPECIFIC ULTRAVIOLET ABSORBANCE (SUVA)

Used for: Disinfection Byproduct (DBP)

Analytes: UV254, Dissolved Organic Carbon (DOC)

READ INSTRUCTIONS CAREFULLY.

LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.

CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.

WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

SPECIAL NOTES: The NHDES Laboratory does not test for SUVA. Special arrangements must be made with a laboratory prior to sample collection.

1. **Sample Location:** A state-approved location. The UV254 and DOC samples used to determine a SUVA value must be taken at the same time and at the same location. SUVA must be determined on water prior to the addition of disinfectants/oxidants.
2. **Sampling Materials:**
 - Containers:** Four 40 mL amber glass vials with Teflon lined septa (2 for each analysis)
 - Preservatives:** Ice or refrigeration above 0°C and less than 6°C from time of collection to analysis and protect samples from light. DOC samples must be filtered in the field and preserved with sulfuric acid or phosphoric acid to pH <2; the alternative is to deliver cold samples to the lab for filtration and acid preservation within 48 hours of collection.
 - Other:** Field filters, labels and marker.
3. **Safety Concerns:** Caution! "Empty" sample containers contain sulfuric or phosphoric acid which are strong acids and will cause burns. Open them slowly and carefully.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until the water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove bottle cap and rinse bottle with sample. Do not put cap face down or in pocket. Do not allow inside of cap, inside of container or bottle threads to be touched by any object.
 - d. Fill the sample bottle and replace the cap.
 - e. Repeat steps 4c through 4d for each of remaining three sample vials.
 - f. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.
 - g. Complete appropriate analysis request form.
5. **Shipping and Handling:**
 - a. Ship in a cooler with ice to avoid excessive bacterial or algal growth.
 - b. Deliver samples to lab the same day if possible at a time acceptable to lab.
 - c. The maximum holding time is **48 hours** for SUVA; **28 days** for DOC once acidified.

SOP- SPECIFIC ULTRAVIOLET ABSORBANCE (SUVA)

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-ASBESTOS

Used for: Chemical Monitoring

Analyte: Asbestos

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED.
CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

SPECIAL NOTES: The NHDES Laboratory does not test for Asbestos. Special arrangements must be made with an accredited laboratory prior to sample collection.

1. **Sample Location:** A state-approved location. If one has not been designated, follow instructions provided by the DWGB or contact them for more information prior to sampling. Avoid threaded faucets and swivel faucets.
2. **Sampling Materials:**
Containers: Two pre-cleaned 1-liter polyethylene or glass bottles.
Preservative: Ice
Other: Labels and marker.
3. **Safety Concerns:** None.
4. **Sample Collection Procedure:**
 - a. Remove aerator and screen from faucet.
 - b. Turn on cold water tap and run for 4 to 5 minutes or until the water temperature has stabilized, whichever is longer. Then reduce flow so that stream of water is no greater than 1/8 inch in diameter.
 - c. Remove first bottle cap. Do not put cap face down or in pocket. Do not allow inside of cap, inside of container or bottle threads to be touched by any object.
 - d. Fill both bottles to the shoulder.
 - e. Replace container cap securely.
 - f. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.
 - g. Complete appropriate analysis request form.
5. **Shipping and Handling:**
 - a. Ship in a cooler with ice to avoid excessive bacterial or algal growth.
 - b. Deliver samples to lab the same day if possible at a time acceptable to lab.
 - c. The maximum holding time is **48 hours**.

SOP- ASBESTOS

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NEW HAMPSHIRE'S DRINKING WATER SAMPLE COLLECTION & PRESERVATION

SOP-DIOXIN

Used for: Chemical Monitoring

Analyte: Dioxin

READ INSTRUCTIONS CAREFULLY.
LAB MAY REJECT SAMPLES IF ALL INSTRUCTIONS ARE NOT FOLLOWED!
CONFIRM SCHEDULING AND INSTRUCTIONS WITH LAB BEFORE SAMPLING.
WASH HANDS. WEAR SAFETY GLASSES AND CLEAN NITRILE GLOVES.

SPECIAL NOTE: The DES Laboratory does not analyze for dioxin. Special arrangements must be made with an accredited laboratory prior to sample collection.

1. **Sample Location:** A state-approved location. If one has not been designated, select an appropriate location which is representative of the distribution system
2. **Sampling Materials:**
 - Containers:** Two 1-liter amber glass bottles with teflon-lined caps for each sample.
Seek specific instructions from lab performing the analysis before sampling.
 - Preservatives:** Ice; sodium thiosulfate; sulfuric acid
 - Other:** Labels and marker.
3. **Safety Concerns:** Caution! Sulfuric acid is a strong acid and will cause burns.
Caution! "Empty" sample vials may contain acid. Open them slowly and carefully.
4. **Sample Collection Procedure:**
 - a. Caution: The slightest contamination will invalidate the sample.
 - b. Remove aerator and screen from the faucet.
 - c. Turn on cold water tap and run for 4 to 5 minutes or until water temperature has stabilized, whichever is longer. Then reduce flow to eliminate splashing and air bubbles. The stream of water should be no greater than 1/8 inch in diameter.
 - d. Carefully remove cap. Do not put cap face down or put it in a pocket. Do not allow inside of cap or bottle to be touched by any object.
 - e. Fill bottle to shoulder, leaving room for preservatives and mixing.
 - f. Screw cap on securely.
 - g. Write the PWS ID, sampling location, and date and time of the sample collection on the sample container.
 - h. Complete appropriate analysis request form.

SOP- DIOXIN
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5. **Shipping and Handling:**

- a. Keep samples in closed cooler with ice or ice packs at 4°C. from time of sampling until receipt at lab. Holding time is **1 year** if kept at 4°C and in the dark.
- b. Deliver samples to lab the same day if possible at a time acceptable to the lab.
Special instructions may be provided by lab performing the analysis.
- c. Ice is not a packing material. To prevent breakage, wrap glass bottles in bubble wrap or other protective material.

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New Hampshire Sample Collection & Preservation Manual for Drinking Water

APPENDIX- Analyte Lists by EPA Method

The analytes listed below for each method are those reported by the NHDES Laboratory. Those analytes that are regulated by the EPA for the Safe Drinking Water Act or by the State are in **bold** print.

These lists are presented so that samplers can know which method to request should a detection be found during compliance monitoring. In the case of a detection of a SOC parameter, it is not necessary to repeat the entire SOC test; this can save the public water system time and money.

Method 524.2 Volatile Organic Compounds (VOC)	
1,1,1,2-Tetrachloroethane	Chlorobenzene
1,1,1-Trichloroethane	Chloroethane
1,1,2,2-Tetrachloroethane	Chloroform
1,1,2-Trichloroethane	Chloromethane
1,1-Dichloroethane	Dibromochloromethane
1,1-Dichloroethene	Dibromomethane
1,1-Dichloropropene	Dichlorodifluoromethane
1,2,3-Trichlorobenzene	Diethyl ether
1,2,3-Trichloropropane	Diisopropyl ether (DIPE)
1,2,4-Trichlorobenzene	Ethyl-t-butyl ether (ETBE)
1,2,4-Trimethylbenzene	Ethylbenzene
1,2-Dibromo-3-chloropropane (DBCP)	Hexachlorobutadiene
1,2-Dibromoethane (EDB)	Isopropylbenzene
1,2-Dichlorobenzene	Methyl-t-butyl ether (MTBE)
1,2-Dichloroethane	Methylene Chloride
1,2-Dichloropropane	Naphthalene
1,3,5-Trichlorobenzene	Styrene

1,3,5-Trimethylbenzene	Tetrachloroethene
1,2-Dichlorobenzene	Tetrahydrofuran (THF)
1,3-Dichloropropane	Toluene
1,4-Dichlorobenzene	Total Xylenes
2,2-Dichloropropane	Trichloroethene
2-Butanone (MEK)	Trichlorofluoromethane
2-Chlorotoluene	Vinyl Chloride
2-Hexanone	cis-1,2-Dichloroethene
2-Methoxy-2-methylbutane (TAME)	cis-1,3-Dichloropropene
4-Chlorotoluene	m/p-Xylene
4-Methyl-2-pentanone (MIBK)	n-Butylbenzene
Acetone	n-Propylbenzene
Benzene	o-Xylene
Bromobenzene	p-Isopropyltoluene
Bromochloromethane	sec-Butylbenzene
Bromodichloromethane	t-Butanol (TBA)
Bromoform	t-Butylbenzene
Bromomethane	trans-1,2-Dichloroethene
Carbon disulfide	trans-1,3-Dichloropropene
Carbon tetrachloride	

Method 504.2 EDB/DBCP	
1,2-Dibromo-3-chloropropane (DBCP)	1,2-Dibromoethane (EDB)

Method 505	
Chlordane	Toxaphene

Method 525.2 Semivolatile Organic Compounds	
2,2',3',4,6-Pentachlorobiphenyl	Dibenz(a,h)anthracene
2,2',3,3',4,4',6-Heptachlorobiphenyl	Dieldrin
2,2',3,3',4,5',6,6'-Octachlorobiphenyl	Diethyl phthalate
2,2',4,4'-Tetrachlorobiphenyl	Dimethyl phthalate
2,2',4,4',5,6'-Hexachlorobiphenyl	Endrin
2,3-Dichlorobiphenyl	Endrin aldehyde
2,4,5-Trichlorobiphenyl	Fluoranthene
2-Chlorobiphenyl	Fluorene
2-Methylnaphthalene	Heptachlor
4,4'-DDD	Heptachlor epoxide
4,4'-DDE	Hexachlorobenzene
4,4'-DDT	Hexachlorocyclopentadiene
Acenaphthene	Indeno(1,2,3-cd)pyrene
Acenaphthylene	Isophorone
Alachlor	Lindane
Aldrin	Methoxychlor
Anthracene	Metolachlor
Atrazine	Metribuzin
Benzo(a)anthracene	Naphthalene
Benzo(a)pyrene	Pentachlorophenol

Benzo(b)fluoranthene	Phenanthrene
Benzo(g,h,i)perylene	Propachlor
Benzo(k)fluoranthene	Pyrene
Bis(2-ethylhexyl) phthalate	Simazine
Butachlor	Trifluralin (Treflan)
Butyl benzyl phthalate	alpha-Chlordane
Chrysene	gamma-Chlordane
Di(2-ethylhexyl) adipate	trans-Nonachlor
Di-n-butyl phthalate	

Method 531.2 Carbamates	
3-Hydroxy-Carbofuran	Carbaryl
Aldicarb	Carbofuran
Aldicarb Sulfone	Methomyl
Aldicarb Sulfoxide	Oxamyl (Vydate)

Method 547 Glyphosate	
Glyphosate	

Method 555 Herbicides	
2,4-D	Dinoseb
Acifluoren	Picloram
Dicamba	Silvex (2,4,5-TP)