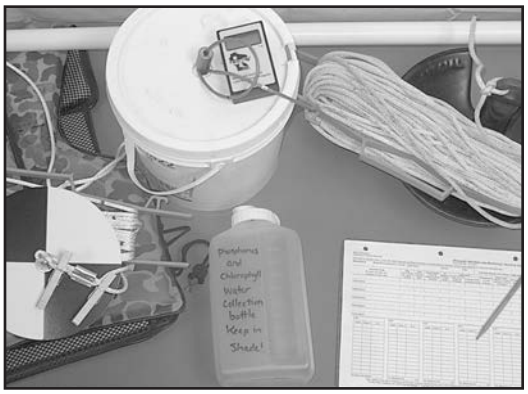
4. CHEMISTRY MONITORING:

Phosphorus and Chlorophyll

Before you start sampling, be sure to read the following pages to familiarize yourself with the equipment and the procedures that you will be using. *All of the procedures that you will follow in sampling your lake are done for specific reasons. It is very important that you follow the sampling procedures exactly as they are laid out in the following pages to ensure good, consistent, high quality data. The following pages will provide you with sufficient background on the design of the equipment and proper procedures to use.*



DNR PHOTO

Please remember to keep all sampling equipment and chemicals out of the reach of children. Many of the chemicals you will be using are hazardous (see Appendix 1). After sampling, it is very important to rinse and thoroughly air dry all of the equipment that you used.

What Equipment Will You Need?

At your training session, your CLMN regional coordinator will outline and provide the equipment that you will need to successfully monitor your lake. If you are participating in the CLMN as a chemistry volunteer you will receive the same equipment that a Secchi volunteer uses to determine water clarity. In addition, you will also receive equipment and chemicals for your water chemistry (phosphorus and chlorophyll) analysis. This list includes everything that you will need while you are on and off the lake.

- ☑ Manual
- ☑ Lake map with sampling site marked
- ☑ Integrated water sampler
- ☑ A large plastic tub containing: 1000 ml flask, filter cup, pump and tube, squirt bottle (to be filled with distilled water that *you* provide), water collection bottle, filter membrane, 250 ml graduated cylinder, sulfuric acid vial, "acid added" stickers, safety goggles and gloves, and mailing tape.
- ☑ Life jacket (you provide)
- ☑ Anchor and rope (you provide)
- ☑ Field data sheets
- ☑ Pencil
- ☑ 3 trays of ice cubes (you provide)

The following supplies will be provided to you by the CLMN to send your collected water samples to the State Laboratory of Hygiene for analysis:

- ☑ Styrofoam® mailer
- ☑ 250 ml bottle for the phosphorus sample
- ☑ Zip-lock bag for phosphorus bottles
- ☑ Chlorophyll tube and baggies for ice cubes
- ☑ Data forms
- ☑ Chlorophyll sample stickers
- ☑ Phosphorus sample stickers
- ☑ State Laboratory of Hygiene labslip
- ☑ Merchandise return labels for mailers
- ☑ Priority mail stickers

How Do You Prepare to Sample?

The Day Before You Sample

The day before you are planning to sample your lake, you should always check to see that your equipment is in good condition. Make sure you have three trays of ice cubes available and your squirt bottle is filled with distilled water. Distilled water can be purchased at your local grocery store but be sure it is labeled "*distilled* water" **not** "*drinking* water" or "*pure* water". **Sampling early in the week (e.g., Monday through Wednesday) is advised as it allows your samples to arrive at the State Laboratory of Hygiene (WSLH) when someone is at the lab to process them.**

The Day You Sample

On the day you plan to sample, complete the top portion of your field data sheet by filling in the Waterbody # (or WBIC) and Station #. Before you launch your boat, make sure you have an anchor, sufficient gas, and personal flotation devices in your boat.

Sampling Overview

Water Sampling

To collect water samples for phosphorus and chlorophyll analysis, you will use one of two types of water samplers—either an integrated water sampler or a Van Dorn sampling bottle. Your lake needs to be at least 10-feet deep in order to use the integrated water sampler. Shallow lakes less than 10 feet in depth will usually be assigned a Van Dorn sampling bottle.

The integrated water sampler is a six and a half-foot PVC pipe that serves as a collection tube. At the bottom of the tube is a PVC ball that acts as a water-locking mechanism. To take your sample, slowly lower the tube vertically into the water to the tape mark (a depth of six feet), using the rope to lower and raise your integrated sample will help to avoid contamination. After lifting the tube, you will have collected an *integrated* sample that is a *mix* of water from the surface to six feet deep in the water column (0-6 feet). The water in the integrated sampler will be released when the integrated sampler is placed on top of the water collection bottle. The ball will be displaced by the bar on the neck of the water collection bottle, releasing the water. Contamination can occur if you touch the end of the integrated sampler or if it lies in the bottom of your boat and touches oil or gas. Please keep your integrated water sampler clean. The collection end should be rinsed with distilled water prior to storing. The water sample in the water collection bottle will be used to fill your WSLH phosphorus sample bottle. The remainder of the water in the water collection bottle will be used for your chlorophyll analysis. When the sampler is not in use, it is very important to store the sampler upside down to dry; this will prevent the growth of algae and bacteria which could contaminate future samples.

Some volunteers collect the water sample for phosphorus and chlorophyll analysis at a depth of three feet with the Van Dorn sampling bottle. The Van Dorn sampling bottle is different type of sampler than the integrated sampler. The Van Dorn sampling bottle is a plastic collection bottle with rubber stoppers at each end. This type of sampler is able to collect water at a specific depth—not a mix of water from multiple depths like the integrated sampler. When the Van Dorn sampling bottle is lowered into the lake, water will enter the plastic bottle. Once the sampler is at the appropriate depth, a brass "messenger" is dropped down the line to snap the sampler closed with the water sample inside.

Phosphorus Sampling

As discussed above, the water you collect for your phosphorus sample will be analyzed by WSLH. Since phosphorus can be measured in very small amounts, it is important that "clean" sampling techniques be used. *Be careful not to touch the inside of the WSLH sample bottles or caps or the water as it is being drained from the sampler into the bottle as your fingers may have phosphorus residue on them.* Phosphorus contamination can come from a variety of sources, including soap, dishwashing detergents, or lawn fertilizers. To further reduce possible contamination, make sure the sample bottle caps rest upside down as you fill the bottles.

Before mailing your phosphorus sample to WSLH for analysis, it must be preserved (or "fixed") by adding sulfuric acid. Once the acid is added, the sample is stabilized. Remember to always wear your safety goggles and gloves when handling sulfuric acid to prevent injury to your hands or eyes. Long pants and shoes will protect your legs and feet. Flush any spilled acid with water (see Appendix 6 for further detail on sulfuric acid).

Chlorophyll Sampling

Your chlorophyll samples should be collected once during the last two weeks of June, July, and August. Since there is little algal growth in early spring, there is no need to sample chlorophyll until June. The integrated water sampler will collect a sample from 0-6 feet of the water column. This depth contains algae that are representative of species that live in the upper layers of the water column. After collecting your sample, transfer the water to your water collection bottle. Algae will continue to grow in sunlight so be sure to place the water collection bottle in a cool, shady spot after collection. Process your samples on shore and out of direct sunlight.

The amount of water that you will filter is dependent on your Secchi reading the day you collect the water samples. The Secchi depth is one way to estimate the concentration of algae in the water. The deeper you can see the Secchi disk, the greater the likelihood of fewer algae in the water. The shallower the Secchi disk reading, the more algae is present. An exception are lakes with turbid or naturally stained water. Since there is a proportional relationship between Secchi depth and the amount of chlorophyll present, the deeper the Secchi reading, the more water you will have to filter to collect enough algae to measure (see table on page 46). Once you have determined the volume of water that you will need to filter, pour that volume from the water collection bottle into your graduated cylinder for a precise measurement.

The upper cup of the filtering apparatus should not be used to measure the volume of water you need to filter. Do not touch the filter paper with your fingers. The oil on your skin may degrade the chlorophyll in the samples. Use the tweezers provided to place the filter on and to remove the filter paper from the filtering device. After the water has been filtered to extract the algae, the filtered water may be discarded. Only the residue on the filter paper will be analyzed. After you are done filtering, the filter paper sample must be kept in the freezer until you send it to the WSLH to be analyzed.

Phosphorus sample collected with 2 weeks of ice off. Phosphorus and chlorophyll sample collected the last 2 weeks of June, last 2 weeks of July and the last 2 weeks of August.

ON LAKE PROCEDURES

How to Collect Water Samples

Integrated Water Sampler

The integrated water sampler is used to collect the water sample for phosphorus and chlorophyll analysis on lakes that are deeper than ten feet. Chemistry volunteers collecting water samples on lakes less than ten feet in depth will use a Van Dorn sampling bottle.

STEP 1. Before using the integrated sampler rinse with lake water three times. Fill the sampler with lake water and empty the water out of the top of the sampler. This will clean out any dirt or dust that may have gotten in the sampler.

STEP 2. Rinse the water collection bottle and cap with lake water three times. Always place the cap top side down to prevent contamination of the inside of the cap.

STEP 3. While holding onto the rope, lower the collection end (bottom) of the sampler tube vertically into the water column until the water level reaches the six-foot mark on the sampler. Raise the sampler out of the water.

STEP 4. Drain the integrated water sampler by touching the collection end of the sampler to the rod in the neck of the water collection bottle. Water will drain from the integrated water sampler tube into the water collection bottle.

STEP 5. Keep your water sample in a cool place and out of direct sunlight until you return to shore. A cooler is an ideal place to keep it. Algae in the lake water will continue to grow if the bottle remains in the sun.

STEP 6. Rinse your integrated sampler with distilled water after use and stored topside down. This will prevent algal growth between the ball and the collection end of the sampler.

DNR PHOTOS

Do not handle any food, drink, sunscreen or insect repellent until after samples have been collected!

Before you start processing the sample(s), be sure to read the following pages to familiarize yourself with the equipment and the procedures that you will be using. *All of the procedures that you will follow in sampling your lake are done for specific reasons. It is very important that you follow the sampling procedures exactly as they are laid out in the following pages to ensure good, consistent, high quality data. The following pages will provide you with sufficient background on the design of the equipment and proper procedures to use.*

ON SHORE PROCEDURES

Before you begin processing your water samples and preparing them for the State Laboratory of Hygiene, here is a quick checklist to make sure that you have everything you will need.

- ☑ Manual
- ☑ Field Data Sheets
- ☑ State Laboratory of Hygiene slip for your phosphorus and chlorophyll samples
- ☑ Pencil
- ☑ Safety gloves
- ☑ Safety goggles
- ☑ Phosphorus sample sticker
- ☑ Chlorophyll sample sticker
- ☑ "Acid added" stickers (optional)
- ☑ Three trays of ice cubes (you provide)
- ☑ Styrofoam® mailer kit
- ☑ Ziploc® bags
- ☑ Packaging tape
- ☑ Merchandise return label and priority mail stickers
- ☑ Magnetic Filter Funnel (2 pieces)
- ☑ Chlorophyll tube
- ☑ Hand pump with plastic tubing
- ☑ 500 or 1000 ml plastic flask
- ☑ 250 or 500 ml graduated cylinder
- ☑ Membrane filters
- ☑ Test tubes
- ☑ 1 Filter forceps and 1 regular forceps
- ☑ Paper towels (you provide)
- ☑ Squeeze bottle filled with distilled water (you provide distilled water)
- ☑ Acid vial
- ☑ Phosphorus sample
- ☑ Water sample in the 2-quart water collection bottle

ON SHORE PROCEDURES

Phosphorus Sample Preparation

Be sure to wear long pants and shoes while processing samples to avoid getting acid on yourself and be sure to put on your gloves and safety goggles before beginning your phosphorus sample preparation!

STEP 1. To prepare your phosphorus sample, remove the cap from your 250 ml State Laboratory of Hygiene bottle. Place cap topside down to prevent contamination. Gently mix the water in the water collection bottle and pour the water from the water collection bottle into the 250 ml bottle. Fill to the neck. Avoid touching the mouth of the water collection bottle and the phosphorus bottle lip to prevent contamination.

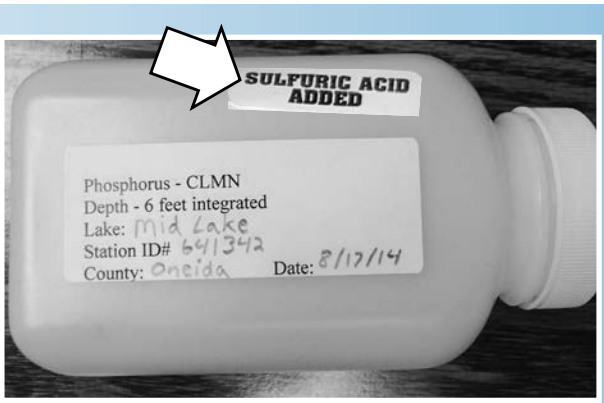
STEP 2. Remove the sulfuric acid vial from your kit.

STEP 3. Uncap your phosphorus bottle and empty contents of one acid vial into your phosphorus sample. Preservation by acid inhibits bacterial growth for a limited period of time.

Always place the cap topside down to prevent contamination.

STEP 4. Replace lid on acid vial and the cap on your phosphorus sample. Mix your sample by inverting the bottle several times.

Attach a completed label with the name of your lake, station id number, county, and date. Don't forget to mark on your bottle that it is preserved with H_2SO_4 (sulfuric acid), or as an option, attach the acid-added sticker to your bottle.



DNR PHOTOS

STEP 5. When you are done adding the sulfuric acid, rinse and dispose of the used vials in the garbage. Store unused vials out of the reach of children!

STEP 6. Refrigerate phosphorus sample until ready to mail.

ON SHORE PROCEDURES

Chlorophyll Sample Preparation

Since light can cause the algae to grow and alter your sample, this on shore procedure for preparing your chlorophyll sample should be conducted in the shade and out of direct sunlight.

STEP 1. Place all the parts of your chlorophyll filtering equipment at your work area.

STEP 2. Attach the plastic tubing of the hand pump to the spout of the 500 or 1000 ml plastic flask.

STEP 3. Insert the stopper of the filtering cup into the flask. You may want to moisten the stopper first to ensure a good seal.

STEP 4.

Squirt a small amount of distilled water on the black filter base **before** placing the membrane filter on it (see Step 5). This will help to hold the membrane filter in place until you can place the magnetic cup on top of it (see Step 6).

DNR PHOTOS

ON SHORE PROCEDURES

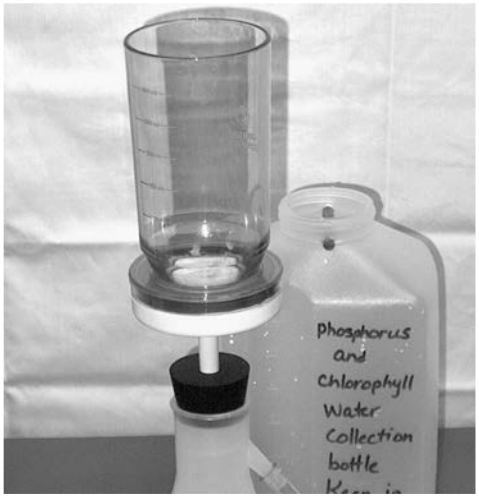
Chlorophyll Sample Preparation (continued)

STEP 5. Use the tweezers to pick up one membrane filter and place it on the center of the filter cup base (i.e. the black screen). Note that filters are white and the divider sheets are blue. Make sure you use a white filter and not a blue divider sheet!

Note: Never touch the filter with your fingers! Always use tweezers when removing it from the Ziploc® bag or when placing it on the black screen.

DNR PHOTOS

STEP 6. Carefully place the magnetic cup on top of the filter base. Be sure that the filter does not move! If the filter moves, wrinkles, or tears, remove the filter cup and discard the torn/wrinkled filter. Repeat steps 4 and 5 with a new filter.



DNR PHOTO

STEP 7. Using the table on the right, look up the Secchi depth you measured earlier in the day. Use this to determine the volume of water that you need to filter to obtain your chlorophyll sample. Please be aware that this amount may change each time you sample. In general, the better the water clarity (i.e. deep Secchi depth), the fewer algae there are in the water, and the more water you need to filter in order to collect enough algae for analysis.

Volume of water to filter as determined by Secchi depth.

Secchi Depth (ft)	Volume of Water to Filter (ml)
Less than 1	50
1 to 1.5	100
Greater than 1.5	200

ON SHORE PROCEDURES

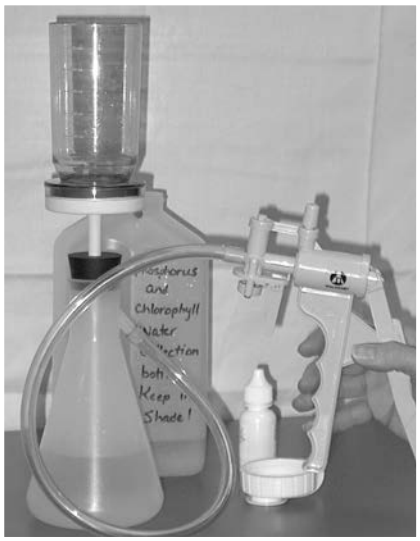
Chlorophyll Sample Preparation (continued)

STEP 8. Take out the plastic water collection bottle filled with water for your chlorophyll sample, and gently mix the water in the bottle. Fill your 250 ml graduated cylinder with the appropriate volume of water needed to filter your sample (Refer to step 7). *Note that although the upper cup of the filtering apparatus can be used to measure water volume, it is not an accurate measuring device and should **not** be used to measure the volume of water you need to filter.*

STEP 9. To begin filtering, pour some of the measured water from the graduated cylinder into the filter apparatus. You don't want to pour the full amount into the filter cup all at once. If your lake contains lots of algae or sediment, the filter will become clogged and you will not be able to empty the filter cup easily.

If the filter becomes clogged, try to filter the remaining water from the filter cup. You should remove the used filter using the filter forceps and place it in the chlorophyll tube provided by the WSLH. Put a new filter on the magnetic filter cup apparatus, replace the cup and continue to filter. You can send more than one filter successfully. **OR:** Try to filter as much water from the cup as possible and record only the amount of water you were able to filter.

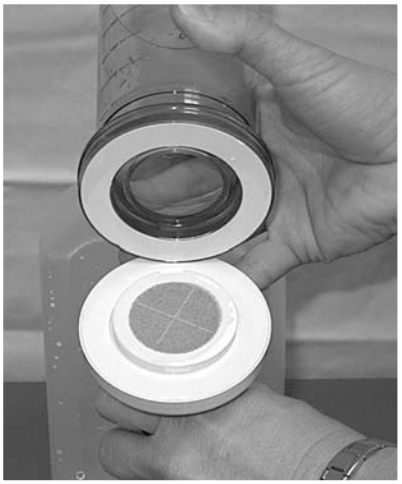
STEP 10. Squeeze the hand pump to move the water through the filter. Once all the water has been filtered, wash down the sides of the graduated cylinder and filter cup with distilled water to ensure that all of the algae are washed onto the filter paper.



DNR PHOTOS

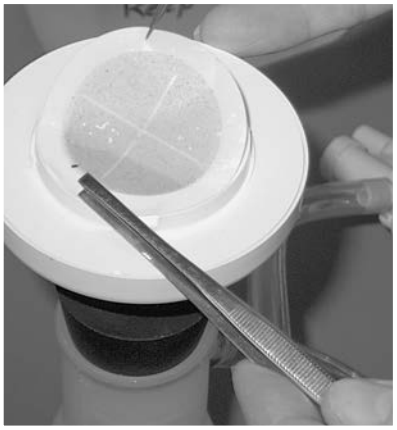
ON SHORE PROCEDURES

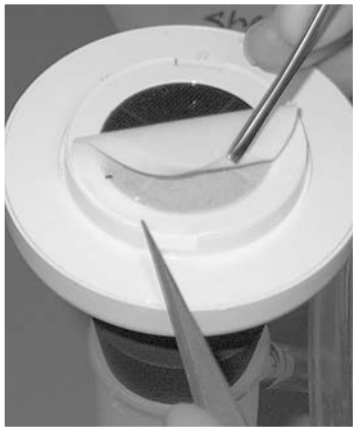
Chlorophyll Sample Preparation (continued)

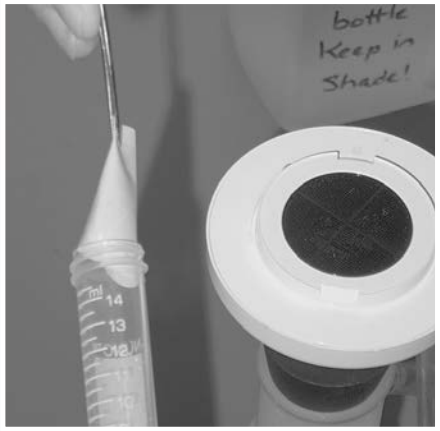


STEP 11. After you have filtered the appropriate volume of water, separate the filter apparatus by removing the top cup from the filter base.

STEP 12. Using tweezers, place the filter into the chlorophyll tube that came in the mailer from the WSLH. If the filter tears while you are removing it, it is okay to place it in the tube. Make sure that the algae that is on the filter does not get lost during transfer to the tube.

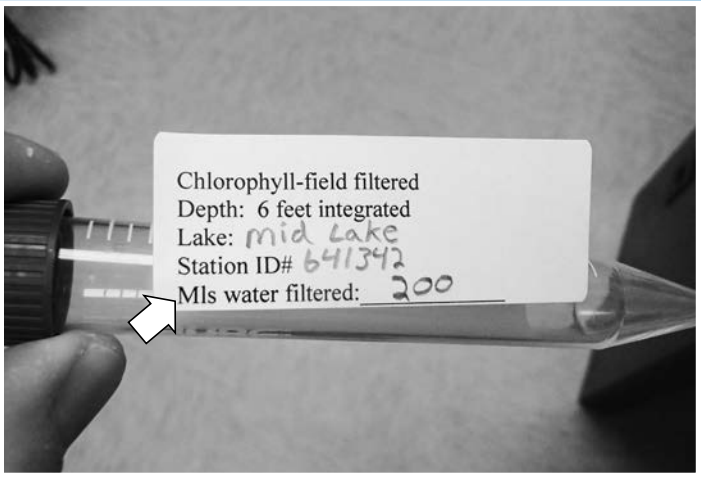






STEP 13. Fill out the chlorophyll label and place it on the tube containing your chlorophyll sample. Be sure to include the volume filtered (mls) on the label. Your station id number should be written on the label.

STEP 14. Don't forget to write the volume of water that you filtered for your chlorophyll sample on your lab slip.



DNR PHOTOS

IT IS BEST TO MAIL YOUR SAMPLE ON THE DAY YOU COLLECT IT. But, if it has to be mailed the next day, place your chlorophyll sample in the freezer until you're ready to mail it!

How to Fill Out Your Lab Sheet

When filling out your lab sheet, please make sure the following information listed is completed.

- ☑ ***Date***
- ☑ ***Time***
- ☑ ***Collected By Name***
- ☑ ***Telephone***
- ☑ ***Email Address***
- ☑ ***Depth of Sample***
  (3 feet or 0-6 feet)
- ☑ ***Chlorophyll - a mls of water filtered***

Mailing Your Samples

For the lab to get an accurate analysis of the phosphorus and chlorophyll in your lake, your samples must be handled and shipped properly. Try to collect your samples early in the week so that you are able to put them in the mail on a Monday, Tuesday, or Wednesday. You want your samples to reach the WSLH by Friday so they do not sit in the post office over the weekend. If you collect your samples on a Friday, Saturday, or Sunday put your chlorophyll sample in the freezer and keep your phosphorus sample in the refrigerator until you are able to mail them on Monday. ***Do not put your phosphorus sample in the freezer!*** Keep in mind that the sooner the lab is able to analyze your samples, the more accurate your results will be. The following steps are an efficient way to make sure that your samples are packaged properly and prepared to ship to the State Laboratory of Hygiene safely.

MAILING YOUR SAMPLES

STEP 1. Complete the laboratory data sheet for your phosphorus and chlorophyll samples. All information must be complete for the lab to analyze the samples.

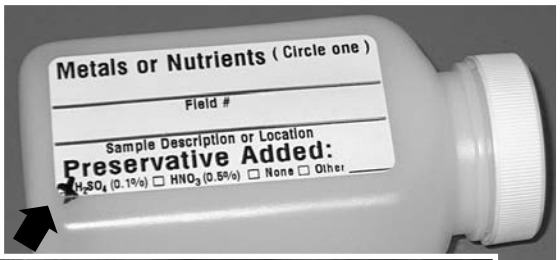
STEP 2. Gather all the materials you will need to mail your samples: Styrofoam® mailer, completed lab sheet, merchandise return label (mailing label), three trays of ice cubes, one sandwich-size Ziploc® bag, 2 one-gallon Ziploc® bags, and Priority Mail® stickers.

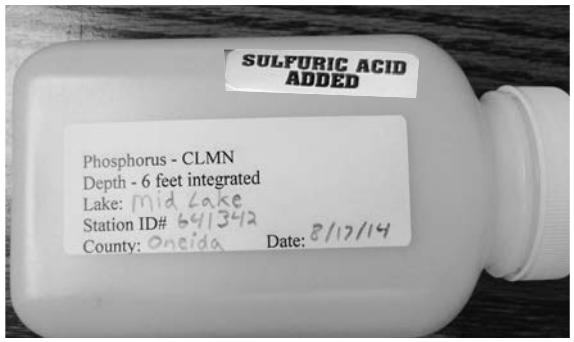
DNR PHOTOS

STEP 3. Prepare to mail your chlorophyll sample by making sure that the chlorophyll sticker is filled out completely and attached to the tube. Don't forget to include the volume of water that you filtered! Put your chlorophyll filter tube in the gallon Ziploc® bag.

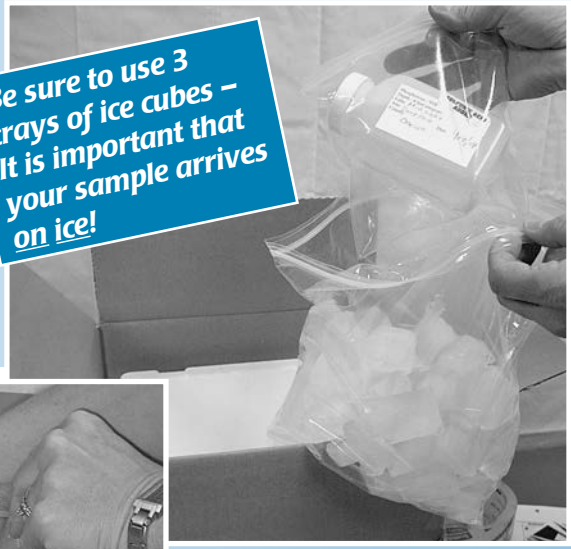
MAILING YOUR SAMPLES (continued)

STEP 4. Prepare to mail your phosphorus sample by making sure that your sample was preserved with sulfuric acid. Attach the completed label with the name of your lake, station id#, county, and date. Don't forget to mark on your bottle that it is preserved with H_2SO_4 (sulfuric acid), or as an option, attach the acid-added sticker to your bottle.



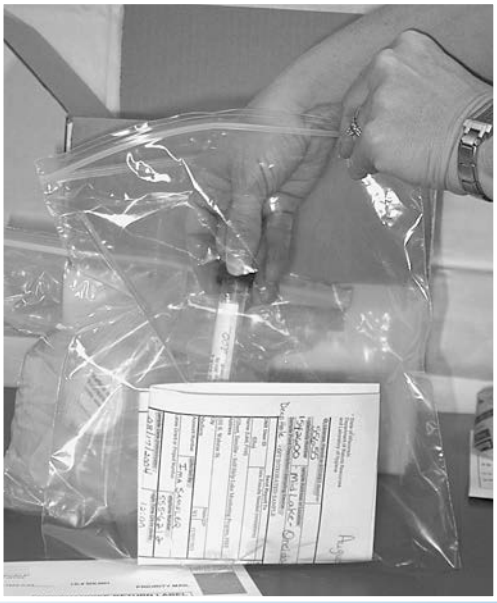


STEP 5. Place your phosphorus sample in the sandwich-size Ziploc® bag, seal the bag, and then put it in a one-gallon Ziploc® bag with three trays of ice cubes. Make sure this bag is sealed tightly or it will leak. If this bag leaks during mailing, the Post Office will not deliver it to the lab and your sample will be ruined.



Be sure to use 3 trays of ice cubes – It is important that your sample arrives on ice!

STEP 6. Put your completed lab sheet in the one-gallon Ziploc® bag with your chlorophyll tube. Seal the bag.



DNR PHOTOS

NOTE: Always mail the lab slip with your samples!

MAILING YOUR SAMPLES (continued)

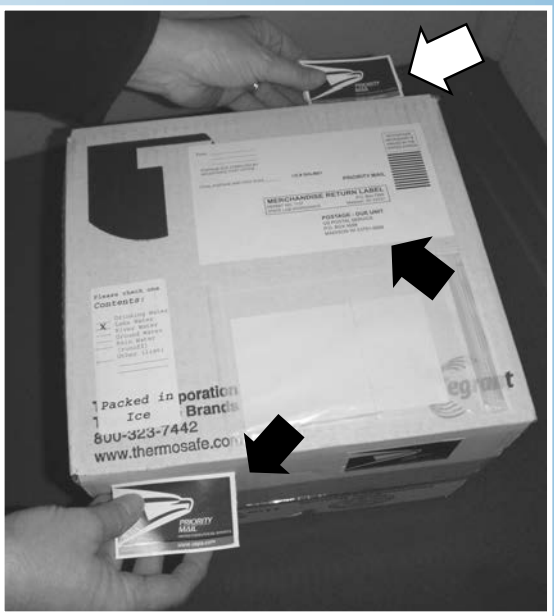
STEP 7. Place your bagged phosphorus sample containing the ice in the Styrofoam® mailer. Then place the bagged lab sheet with your chlorophyll sample and tube in the inside of the Styrofoam® mailer. Make sure that the chlorophyll sample is against the ice in the bag with your phosphorus sample!

STEP 8. Gently fold the bagged lab sheet over the ice, close the Styrofoam® lid, and tape the cardboard mailing box shut.

STEP 9. Tape once around the cardboard sleeve. Attach the 4 inch x 6 inch white merchandise return label to the top of the mailer. Attach *one* priority mail sticker to the top of the package and *one* to the bottom. The mailer card should have your postal address on one side. The other side should be **BLANK**. You want the blank side facing out when the sample is sent to the WSLH.

STEP 10. Put your samples in the mail with your regular outgoing mail or at the post office. The mailing label is postage paid, so you will not need any stamps.

STEP 11. Once the WSLH has received your samples, they will send you a new mailer to use for your next collection of samples.



DNR PHOTOS

Quality Assurance Sampling Protocol

In 2007, the Citizen Lake Monitoring Network implemented procedures to document the accuracy and precision of the field data collected by volunteers. These procedures are a way to look at natural variability and sampling error. The protocol that was designed mimicked the Quality Assurance/Quality Control (QA/QC) methods used by the Wisconsin Department of Natural Resources (Wisconsin DNR) water quality staff.

Approximately ten percent of the total phosphorus (TP) and chlorophyll stations are randomly selected each year to participate in collection of QA/QC samples. The Wisconsin DNR asks volunteers who are chosen to participate to collect two additional phosphorus samples – a field blank and a duplicate (also called a replicate) sample. Volunteers also collect a duplicate chlorophyll sample.

The phosphorus field blank is prepared using deionized water – this water is provided to the volunteer and comes from the State Lab of Hygiene (WSLH). Deionized water is ultra pure. The blank phosphorus sample that the volunteer submits should be a "clean" sample – there should be no nutrients in it (which means your equipment is clean and does not have residual phosphorus). The blank sample is processed the same way that you process your regular phosphorus sample except that you are using deionized water instead of lake water. The QA/QC procedures are meant to "mimic" the collection procedures that are used in phosphorus collection and processing.

Before going out in the field, you will prepare your blank sample by rinsing your Van Dorn or integrated sample with deionized water, and then placing deionized water in your integrated sampler or Van Dorn sampling bottle. This water will then be placed in the water collection bottle that you normally use. From the water collection bottle the water sample goes to a "phosphorus bottle" – the same kind you use to mail your water sample to the WSLH. This water sample is preserved with sulfuric acid. Ideally, when analyzed by WSLH, the sample will have no detectible phosphorus. If the blank sample does contain phosphorus it could be that your equipment contains residual amounts of phosphorus or that the sampling technique is faulty – for instance, phosphorus could show up in a blank sample if you used your finger to release the ball of your integrated sampler to release water. The field blank also tests laboratory processing once the sample arrives at the WSLH.

The duplicate phosphorus sample is taken from the same site, at the same time, using the same method as your normal phosphorus sample. The only difference is that you will use a separate water collection bottle for each sample collected using your integrated sampler. Your CLMN regional coordinator provides an extra water collection bottle for you to use. The original and duplicate samples are independently analyzed in the same manner. The duplicate sample can be used to detect both the natural variability in the environment and that caused by your collection method in the field.

(continued on next page)

The duplicate chlorophyll sample is taken from the same site, at the same time, using the same method as your normal chlorophyll sample. The original and duplicate samples are independently analyzed in the same manner. The duplicate sample can be used to detect both the natural variability in the environment and that caused by your collection method in the field.

If you are asked to participate in the QA/QC project you will be contacted by your CLMN regional coordinator who will explain the procedures and will provide you with the following:

Field Blank Sample – Total Phosphorus

Materials Provided by Your CLMN Regional Coordinator

- ☑ A container of deionized water. There will be enough water to rinse your integrated sampler or Van Dorn sampling bottle and fill it once and enough to rinse your collection bottle.
- ☑ An additional phosphorus bottle (250 ml).
- ☑ A phosphorus label for the bottle that says BLANK. You will fill out the rest of the label.
- ☑ A lab slip for the BLANK sample. Please fill out the lab slip.
- ☑ A vial of sulfuric acid to preserve the BLANK sample.

How to Collect Your BLANK phosphorus sample

Please prepare this sample on land or on the boat prior to collection of your regular samples.

- ☑ Use the deionized water provided to rinse your integrated sampler or Van Dorn sampling bottle (which ever you normally use to collect your water samples).
- ☑ Dump the rinse water out the top of the integrated sampler or drain the Van Dorn sampling bottle like you normally do.
- ☑ Rinse the water collection bottle with deionized water and dump the rinse water out. Do not rinse the water collection bottle with lake water like you normally do.
- ☑ Fill the integrated sampler or Van Dorn sampling bottle with the deionized water provided to you by pouring it in through the top of the sampler to approximately the 6-foot tape mark.
- ☑ Drain the water from the integrated sampler or Van Dorn sampling bottle into the water collection bottle (like you normally do).
- ☑ Fill a 250-ml "phosphorus" bottle with the water from the water collection bottle.
- ☑ Add a vial of sulfuric acid to the sample to preserve it.
- ☑ Fill out and attach the label that reads BLANK.
- ☑ Refrigerate sample until ready to mail.

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Field Duplicate Sample – Total Phosphorus only
Materials Provided by Your CLMN Regional Coordinator

- ☑ One additional phosphorus bottle (250 ml).
- ☑ Extra zip lock bag for phosphorus bottle.
- ☑ Extra label for bottle that says DUPLICATE (be sure to fill out the rest of the label).
- ☑ Extra lab slip, this will be for the DUPLICATE phosphorus **and** chlorophyll sample. (Please fill out the lab slip).
- ☑ Extra sulfuric acid vial for DUPLICATE phosphorus sample.
- ☑ If you sample more than one site, you may need an additional mailer.

Field Duplicate Sample – Chlorophyll –
Materials Provided by Your CLMN Regional Coordinator

- ☑ An additional chlorophyll mailing tube.
- ☑ Additional chlorophyll filter.
- ☑ Extra zip lock bag for the DUPLICATE chlorophyll tube and DUPLICATE and BLANK lab slip.

How to Collect Your DUPLICATE Phosphorus and Chlorophyll Samples

These will be collected while you are out on the lake doing your normal water collection.

- ☑ Rinse integrated sampler or Van Dorn sampling bottle and water collection bottle as you normally do.
- ☑ Collect lake water with your integrated sampler or Van Dorn sampling bottle as you normally do.
- ☑ Empty water into the normal 2-quart water collection bottle to use for the phosphorus and chlorophyll sample.
- ☑ Collect a second water sample with your integrated sampler or Van Dorn sampling bottle and empty into the new water collection bottle that was provided to you.
- ☑ Process the samples from the first water collection bottle on shore.
- ☑ Refrigerate the phosphorus sample and freeze the chlorophyll sample until you are ready to mail them.
- ☑ Rinse all equipment with distilled water before processing the second set of samples.
- ☑ On shore, fill a second 250-ml bottle (phosphorus bottle) and preserve as you normally would. Place the completed DUPLICATE phosphorus label on the bottle. Refrigerate sample until ready to mail.
- ☑ On shore, filter the appropriate amount of water from the second sample and process the second chlorophyll sample. Place in a separate tube and place the completed DUPLICATE chlorophyll label on the tube. Freeze the sample until you are ready to mail.

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How to Ship Your Regular, BLANK, and DUPLICATE Phosphorus and Regular and DUPLICATE Chlorophyll Samples

- ☑ You will have **3** lab slips (one for the BLANK phosphorus sample, one for your regular phosphorus and chlorophyll samples, and one for the DUPLICATE phosphorus and chlorophyll samples).
- ☑ Put your regular chlorophyll tube and regular lab slip in one plastic zip lock bag.
- ☑ Put your DUPLICATE chlorophyll tube and the DUPLICATE and BLANK lab slips in the second zip lock bag.
- ☑ Place your regular phosphorus, Duplicate phosphorus, and Blank phosphorus sample each in their own small zip lock bag and seal.
- ☑ Add ice to your large ice bag and put all three phosphorus samples into this bag and seal.

You will be mailing a total of three phosphorus samples and two chlorophyll samples. Each phosphorus bottle will be in its own small zip lock bag. These three will be placed in the ice bag. Two separate zip locks (each containing a chlorophyll tube and lab slip(s)) should be placed in the cooler. Put one on each side of the bag containing the ice cubes with the chlorophyll tube against the ice.

After the samples are analyzed by the WSLH the results of the QA/QC study will be published on the CLMN website. If there are specific problems with a volunteer sample, he/she will be contacted by the CLMN regional coordinator and together they will work to resolve the problem.

NOTES