



BASIC SWIMMING POOL GUIDE

Version 1.00
30th August 2007

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Table of Contents

1.	ROUTINE MAINTENANCE.....	1
1.1	NETTING.....	1
1.2	BRUSHING.....	2
1.3	SKIMMER BASKET.....	2
1.4	CLEANING THE PUMP BASKET.....	3
1.5	VACUUMING "ON FILTER".....	4
1.6	VACUUMING "TO WASTE".....	5
1.7	CLEANING A SAND FILTER.....	6
2.	ALGAE.....	6
2.1	WHY DOES ALGAE GROW?.....	7
2.2	PREVENTION OF ALGAE.....	7
2.3	TYPES OF ALGAE.....	8
2.4	ALGAECIDE.....	8
2.5	TYPES OF ALGAECIDES.....	8
2.5.1	<i>POLYMERIC ALGAECIDES</i>	8
2.5.2	<i>QUATERNARY ALGAECIDES</i>	8
2.5.3	<i>METALLIC ALGAECIDES</i>	9
2.6	BEGINNING STAGES OF ALGAE.....	9
2.7	HOW TO KILL GREEN ALGAE.....	9
2.8	ADDITIONAL INFORMATION ON ALGAE TREATMENT.....	10
3.	PH.....	10
3.1	TESTING PH.....	11
3.2	LOWERING PH.....	11
3.3	FACTORS THAT LEAD TO HIGH PH.....	12
3.4	PROBLEMS RESULTING FROM HIGH PH.....	12
3.5	RAISING PH.....	12
3.6	FACTORS THAT LEAD TO LOW PH.....	12
3.7	PROBLEMS RESULTING FROM LOW PH.....	13
4.	CHEMICAL NAMING.....	13
5.	FOAM.....	14
6.	CLOUDY WATER.....	14
6.1	CLARIFIER.....	15
6.2	ORGANIC WATER CLARIFIERS.....	15
6.3	ALUM WATER CLARIFIERS.....	15

1. Routine Maintenance

This is probably the most important section out of the whole document and key to keeping your pool looking good.

A routine maintenance schedule must be actively pursued in order to help achieve and maintain water chemistry. Initially, pool maintenance may seem complicated and time-consuming. But, once routine maintenance becomes an integrated part of your life as a pool owner, it will be very easy to maintain your pool. Furthermore, as you continually engage in pool maintenance, you will begin to develop an understanding of your personal pool needs.

Once your pool is clean, clear, blue, and sparkling, it becomes much easier to maintain. It is always easier to maintain a pool and prevent problems than it is to rectify problems. With far less time and effort, as well as money, you can maintain your pool and keep it inviting all season long. Due to varying bather loads from pool-to-pool and varying climates from region-to-region, Ozogen cannot provide a universal maintenance schedule. You must recognize your personal pool needs and you must budget your time in order to follow a routine maintenance schedule that works best for you and your pool. Ozogen will provide the necessary maintenance tasks that do need to be pursued. While it is not absolutely mandatory to follow these procedures step-by-step, the following is a well-recognized pool maintenance schedule, regardless of your region:

- Test water - but do not add chemicals until the maintenance schedule for that day is complete.
- Use your net(s) - remove all leaves and other large debris from the pool.
- Use your brush - remove dirt, or perhaps algae, stains, or scale from the pool walls and floor.
- Clean all baskets - for the skimmer(s) and the pump.
- Vacuum - remove any settled and remaining dirt, leaves or other debris from the pool.
- Clean the filter - if it is a sand filter or a DE filter, then backwash. If it is a cartridge filter, then rinse the individual pleated filter elements with a garden hose and a pressurized nozzle.
- Add the necessary chemical(s) - from the test(s) taken earlier that day.

You will have to create your own maintenance schedule. Ozogen does not want to tell you to do "this" on this day and "that" on that day. With your bather load and with your climate, routine maintenance is very individualized. Ozogen will provide an in-depth explanation of the various maintenance tasks, and you will have to create your own maintenance schedule, always compensating for climate and bather load.

1.1 Netting

There are two styles of standard pool nets:

- The deep leaf net (also called a leaf rake) has a wide opening and a deep net. This style of net is primarily used to reach leaves or large debris that have settled to the pool floor. The deep leaf net can also be used to skim leaves and debris off the surface of the water, but the skimmer net is best at performing this task.
- The skimmer net has a shallow net and is primarily used to remove leaves, grass clippings, debris, or insects that float on the surface of the water.

Regardless of the net used, leaves and debris must be removed from the pool for a number of reasons. A collection of leaves and debris on the pool floor very well may clog the main drain, which will restrict water circulation and filtration. Leaves and debris can also clog the skimmer basket(s), which will restrict water circulation. Leaves and debris will also absorb chlorine (or its alternative), rendering it less effective to keep up with the bacteria, living organisms, ammonia, and other contaminants that are constantly present in pool water. Leaves and debris may also contain algae spores, which can lead to an outbreak of algae. Leaves and debris can also clog vacuum equipment. It is best to net out as much of the larger leaves and debris as possible, and then vacuum the rest.

It is important to routinely net leaves and debris out of the pool. Netting literally takes 10 - 15 minutes, and should be done anytime a significant amount of leaves or other debris are present in the pool. Netting should be performed after any windstorm. Netting should be performed daily during autumn, and perhaps multiple times per day on any windy autumn day.

1.2 Brushing

Pool Brushes have either durable nylon bristles (to be used on any type of pool) or stainless steel bristles (to remove algae, stubborn dirt, stains or scale on concrete, gunite, shotcrete, or fiberglass pools).

Brushing is an extremely important, but often overlooked, task towards maintaining your pool. Brushing will remove microscopic matter from the pool walls and floor, suspend this matter in the water, where they will be killed by ozone and filtered out of the pool. NOTE: If the microscopic matter is too small and remains in the pool, you will need to add a Clarifier to coagulate these small particles into larger particles, where they will be trapped by the filter.

Always brush the pool from the walls to the floor, using a top to bottom brush technique. Start at the shallow end and brush towards the deep end. Brushing takes no more than 10 - 15 minutes of work, and should be accomplished at least twice per week (and perhaps more often if landscaping or construction are underway near your pool). You should also make sure to brush the day before vacuuming the pool. When you do this, make sure the pump and filter is operational for a couple hours after brushing so that the main drain and skimmer(s) can remove the recently brushed dirt and debris from the pool.

Brushing is the one of the easiest items of the maintenance schedule. If, however, brushing is neglected and favorable conditions should allow for an outbreak of algae, brushing will need to be done daily, and perhaps multiple times per day, and it will be time-consuming and labor-intensive. Therefore, make sure brushing is part of your routine maintenance schedule to avoid getting into a position as mentioned previously.

1.3 Skimmer Basket

At times, the pressure of your filter may be low, which will cause circulation to be poor. The first area to check is to make sure the water level in the pool is adequate. If not, fill the pool to the standard operating level (halfway up the skimmer). If the water level is adequate, check and clean the skimmer basket(s). Some pools have only one skimmer, while most pools have at least two skimmers. Here are the steps to clean your skimmer basket(s):

- Remove lid from the skimmer. This lid will be on your pool deck. If there is no lid to access the skimmer basket from the top, simply kneel down, stabilize yourself

on the deck, and remove the skimmer basket from the skimmer opening inside the pool. If you cannot access the skimmer basket from your pool deck and have to get it from the skimmer opening inside the pool, be careful not to fall into the pool.

- Remove the basket from the skimmer.
- Empty out all the contents.
- Spray the basket with a garden hose and nozzle.
- Put the basket back in the skimmer.
- (If you accessed the skimmer from the opening on your pool deck, put the lid back on the skimmer).

NOTE: For aboveground pools, you can remove the lid to the skimmer box that is mounted on the outside of the pool wall. Once removed, you will have easy access to the skimmer basket.

Notes:

- If there is more than one skimmer, repeat the process for all skimmers.
- If skimmer basket(s) are extremely full, it is a good idea to shut "off" the pump TEMPORARILY in order to remove the basket(s) from the skimmer(s) without damaging them.

1.4 Cleaning The Pump Basket

A pump basket will sit in the pump housing-the front part of the pump. Your pool will also have a skimmer basket in each of the skimmers. It is the job of these skimmer baskets to trap leaves and other debris so that they do not enter the plumbing. At times, though, some debris (particularly pine needles, dog hair, and other small debris) will escape the skimmer basket(s) and will enter the plumbing. If this occurs, it is the job of the pump basket to trap this debris before it enters the pump or filter, where real damage could occur. Like the skimmer basket(s), the pump basket has very fine passages that will trap dirt or debris, but allow water to pass through. The pump basket is usually positioned under a clear lid, so you can literally see if it contains any debris. You will have to monitor the pump basket daily and clean it out whenever needed. Follow these steps to clean your pump basket:

- Turn "off" the power to the pump temporarily.
- Remove the lid from the pump housing-the front part of the pump.
- Remove the basket from the pump.
- Empty out any contents.
- Spray the basket with a garden hose and nozzle.
- Put the basket back in the pump.
- Make sure the O-ring on the pump lid is in place. Approximately once per month, or as often as it is needed, put a lubricant on the O-ring. It will help seal the lid (to prevent the entrance of any air into the pump) and it will add to the life of your pump lid O-ring. Any pool professional can sell you the lubricant.
- Put the pump lid back on the pump.
- Turn the pump "on" immediately. The entire process FROM turning "off" the equipment TO turning it back "on" should take you no more than 1 minute.
- If pump does not start after approximately 1 ½ minutes, you need to prime the pump.

Notes:

- Do not assume skimmer basket(s) will catch all leaves or debris. Check the pump basket just as often as the skimmer basket(s), and when needed, clean all the baskets. Even if every basket had to be cleaned, the entire process would take you less than 5 minutes.
- It is a good idea to have an O-ring lubricant in stock.

1.5 Vacuuming "On Filter"

During a routine vacuum, with a manageable amount of dirt or debris in the pool, vacuum with the multiport on "filter." This will vacuum the dirt and debris to the filter where it will be trapped and permanently removed from the pool. Only clean water will return to the pool. Here are the steps:

- The night before you vacuum, brush the pool walls and floor.
- After brushing, allow the pump and filter to be operational for at least 2 hours. This will allow the main drain and skimmer(s) to remove the recently brushed and currently suspended dirt and debris. Then, turn "off" the pump overnight to allow any remaining dirt and debris to settle to the pool floor.
- The day of the vacuum, make sure the water level in the pool is to the standard operating water level-half way up the skimmer.
- Make sure the multiport is on the "filter" position. If for some reason it is not, with the pump still "OFF," move the multiport handle to "filter."
- Turn the pump back "on."
- Isolate the suction to the skimmer (or the designated vacuum line) that you will use for the vacuum. If you use a skimmer, close the valve for the main drain and the valve(s) for any other skimmer(s) that you will not be using for the vacuum. If you use a designated vacuum line, close the valves for the main drain and all skimmers.
- Install a telepole to your vac head.
- Install one end of the vacuum hose to the vac head.
- Allow the vac head (with one end of the vacuum hose and the telepole attached) to sink to the bottom of the pool in the deep end.
- Stretch the remaining vacuum hose along your pool deck.
- Where the vacuum hose meets the surface of the water, push the remaining vacuum hose from your deck downward (into the water) and inward (toward the wall). Only allow the end that will attach to your skimmer (or designated vacuum line) to be out of the water. This will eliminate air from the vacuum hose and fill it with water. Be careful not to fall into the pool.
- Once completely filled with water and primed, install the end of the vacuum hose into the skimmer (or designated suction line) that you will vacuum from. If you use your skimmer, Ozogen recommends that you purchase a vacuum seal plate to help hold in the suction.
- With the telepole, manoeuvre the vac head across the pool floor.

Notes:

- As you vacuum the pool, dirt and debris will get trapped in the filter. This, of course, will cause the pressure to rise within your pump. Monitor the pressure gauge if you have one or note the pressure of water returning to the pool. If the pressure is 8-10 psi above the standard operating pressure or the return flow appears to be slow, then clean the filter, regardless if you are still vacuuming or if you are complete by performing a backwash.
- Vacuum slowly. You do not want to stir up the dirt and debris from the floor.
- Some pool professionals will advise you to hold the end of the vacuum hose in front of a return jet in order to prime the hose (eliminate air and fill with water).

This is a good idea in theory. But, if dirt and debris is light, the water going from the return jet, through the vacuum hose, and out of the vac head could stir up this dirt and debris on the floor, clouding up the water, impairing visibility to effectively perform the vacuum. The objective when vacuuming is to have the dirt and debris settled on the floor-not stirred up and suspended in the water.

1.6 Vacuuming "To Waste"

Sometimes dirt and debris will be thick and heavy. If so, do not vacuum to "filter" because pressure will build up so quickly that you will spend more time cleaning the filter than you will vacuuming. Rather, bypass the filter and vacuum with the multiport on "waste" (or "drain"). Remember to turn the pump "off" when moving the multiport from "filter" to "waste" (or "drain"). Do not spend too much time vacuuming to "waste." When vacuuming to "waste," you will be sending the water to a waste-line, thus removing the water from the pool. Here are the steps:

- Raise the water level to the highest point of the pool. Fill the water level so high that you nearly overflow the pool.
- Make sure the multiport is on the "waste" (or "drain") position. If it is not, make sure to turn "off" the pump before moving the multiport handle.
- Once on "waste" (or "drain"), and with the heightened water level, turn the pump back "on."
- Isolate the suction to the skimmer (or the designated vacuum line) that you will use for the vacuum. If you use a skimmer, close the valve for the main drain and the valve(s) for any other skimmer(s) that you will not be using for the vacuum. If you use a designated vacuum line, close the valves for the main drain and all skimmers.
- Install the telepole to the vac head.
- Install one end of the vacuum hose to the vac head.
- Allow the vac head (with one end of the vacuum hose and the telepole attached) to sink to the bottom of the pool in the deep end.
- Stretch the remaining vacuum hose along your pool deck.
- Where the vacuum hose meets the surface of the water, push the remaining hose from your deck downward (into the water) and inward (toward the wall). Only allow the end that will attach to your skimmer (or designated vacuum line) to be out of the water. This will eliminate air from the vacuum hose and fill it with water. Be careful not to fall into the pool.
- Once completely filled with water and primed, install the end of the vacuum hose into the skimmer (or designated suction line) that you will use to vacuum. If you use your skimmer, Ozogen recommends that you purchase a vacuum seal plate to help hold in the suction.
- With the telepole, maneuver the vac head across the pool floor.
- Vacuum only until the water level drops just above the bottom of the skimmer (or just above the bottom of the designated vacuum line). Then stop; NEVER let the water level drop to or below the skimmer (or designated vacuum line). If you do allow the water level to get too low, air will get into the system which may cause you to lose prime or worse, which may cause your motor to overheat, become prematurely defective, and require a replacement, which is expensive.

Notes:

- When you vacuum to "waste" (or "drain"), it is a good idea to have a running garden hose in the skimmer that you are vacuuming from in order to help compensate for water that is lost through the waste-line during the vacuum. If you use a designated vacuum line, put the garden hose anywhere.

1.7 Cleaning a Sand Filter

If you have a sand filter, it will need to be backwashed when the pressure is 8-10 psi above the standard operating pressure or if your flow appears to be restricted, this is evident if your automatic pool cleaner is slow or the flow from your return pipe is weak. Here are the steps:

- Turn "off" the pump.
- Move the multiport handle from "filter" to "backwash".
- Turn "on" the pump.
- Allow the pump to backwash for 1 - 2 minutes. If your filter is equipped with a sight glass, backwash until the water in the sight glass turns from dirty to clean. When you backwash, you will sacrifice some of your pool water. Monitor the water level. If it gets low, add water until the water level is at least half way up the skimmer.
- After backwashing, turn "off" the pump.
- Move the multiport handle from "backwash" to "rinse".
- Turn "on" the pump.
- Rinse the sand for 30 - 60 seconds to assure that all dirt and debris has been eliminated from the fresh sand.
- Turn "off" the pump.
- Move the multiport handle from "rinse" back to "filter".
- Turn "on" the pump and operate as normal.

Notes:

- Poor water chemistry, as well as insufficient cleaning of the filter, can lead to problems with the sand. *Mudballs* may form due to poor water chemistry, particularly a high pH. If your water is high in pH, it will not be able to keep calcium in solution. This calcium will find its way into the filter. This calcium can attach to the sand and combine with hair, lint, and other debris (due to a poorly cleaned filter) and form the mudballs, which can again attach to other mudballs to form even larger mudballs, resulting in a blockage in the filter. This can further lead to calcification of the sand. Another potential problem is channeling. If water chemistry or filter cleaning are further neglected, channeling may occur, creating a trail through the sand. During filtration, water will pass through the filter, but the dirt and debris will make its way through the channel, never coming in contact with the sand, and will re-enter the pool. Monitor your water chemistry and clean your filter.

2. Algae

Algae is a major concern for pool owners. Algae is a one-celled plant that can grow in your pool if conditions are favorable.

2.1 Why Does Algae Grow?

The most common myth concerning algae growth in pools is that it is ONLY a result of low sanitizer. Although this is definitely a major cause of algae, it is not the single contributing factor.

Despite water treatment facilities, actual traces of algae may very well be present in the tap water that is used to fill your pool. Yet another contributing factor toward algae growth are millions of microscopic algae spores that are carried by wind, eventually falling into your pool, where they will grow into outbreaks of algae if conditions are favorable.

A few of these favorable conditions are environmental. Algae, like all plants, need light and food in order to survive and grow. Temperature, humidity, sunlight, and nutrients (food) foster algae growth. Temperature, humidity and sunlight are self-explanatory. Nutrients consist of lawn fertilizers and other industrial products that are carried by wind and blown into the pool. Nutrients also consist of certain minerals that are already present in water. Since water chemistry relies on some of these certain minerals to be present, they cannot simply be removed from the water.

Here is a possible sequence of events: Algae spores will blow into your pool, where they are supported by temperature, humidity and sunlight. The algae spores then consume various nutrients. From temperature, humidity and sunlight, as well as from nutrients, the once unnoticeable algae spores have now grown into actual algae.

In addition to these environmental factors, other factors, such as limited water circulation, poor filtration, a neglect of routine pool maintenance, heavy bather loads, a neglect of overall water chemistry, and of course, insufficient levels of sanitizer, also make conditions favorable for algae growth.

Algae is not harmful to swimmers. It just causes the appearance and integrity of your pool to suffer and occupies time to correct. If you do get algae, you are not alone; it has been seen in pools of some of the foremost authorities on pool care and maintenance. Rest assured, any algae can be killed, but not without a few days of continued effort and time. Therefore, it is best to begin with a discussion on the necessary steps to prevent algae growth. Prevention is better than cure.

2.2 Prevention of Algae

You cannot control temperature, humidity, and sunlight, and you can administer little control over nutrients in the water, especially since your pool needs certain minerals present in order to achieve water chemistry. But, you can control non-environmental factors, such as maintaining adequate water circulation, proper filtration, a routine maintenance schedule, an overall attention to water chemistry. Attention to these factors is your best defense in preventing algae.

But, here is some bad news: even with proper water chemistry, a demonstration of superior operational and maintenance procedures, the presence of some algae is still possible. There are just too many contributing factors for the presence of algae. Since algae growth is a slight possibility for trained pool owners and a real probability for other pool owners, Ozogen will provide treatments to kill algae. An initial piece of advice is that algae is far easier to prevent than it is to kill. But, should algae grow, another piece of advice is not to panic, algae is beatable.

2.3 Types of Algae

Although there are over 20,000 known varieties of algae, fortunately for pool owners, there are only three types commonly found in pools, green algae, mustard algae, and black algae.

Green algae is the most common variety of algae found in pools. Mustard algae and Black algae occur less frequently, but if either does occur, their removal is much more difficult. Unfortunately there are no miracle cures that will get rid of algae. Although some manufacturers of algaecides make this claim, let it be understood that there is NO chemical (algaecide) that you can add to the pool water, walk away, and expect the algae to disappear overnight. Each type (color) of algae requires its own treatment.

2.4 Algaecide

An "as-needed" chemical. If algae does occur, Algaecides are used to help kill algae. The majority of algaecides are liquid, but some types do come in granular form. Once you determine the type of algae (green algae, mustard algae, or black algae), you can purchase the appropriate algaecide and begin the proper treatment. Then read the instructions on the label to determine the amount to add, how it should be added (most manufacturers of algaecides recommend pouring it straight from the bottle), and other precautions. An algaecide alone will not kill algae. You will need to shock using additional sanitizer and engage in a demanding maintenance schedule, primarily brushing.

2.5 Types of Algaecides

There are three general categories for algaecides.

- **Polymeric Algaecides**
- **Quaternary Algaecides**
- **Metallic Algaecides**

2.5.1 POLYMERIC ALGAECIDES

(Polymers) contain a positive electrical charge, which is attracted to the negative electrical charge of algae. This is an excerpt from a Chemistry 101 lecture, but do not worry about the chemistry behind polymers. Rather, just understand that polymers will attach to algae in order to kill it. A drawback is that polymers also attach to dirt and debris found in pools, thus diluting the strength. This can be combated by brushing the pool, stirring up the dirt and debris, as well as the algae, allowing the ozone to kill it or to send it to the filter for removal from the pool. It can also be combated by adding slightly more than the recommended amount of the polymeric algaecide in order to compensate for any dirt or debris that still may be present. Polymers are most effective for killing green algae, as they attach and invade the weak outer shell of algae, then penetrate inside, smothering the algae's ability to live and grow. Polymers are fairly ineffective at killing mustard algae or black algae.

2.5.2 QUATERNARY ALGAECIDES

(Quats) are like polymers in that they contain a positive electrical charge, which is attracted to the negative electrical charge of algae. But, this positive electrical charge is really just a slight version of that of the polymers, rendering quats virtually ineffective and out of date. Quats can be effective at preventing algae growth, but they do cause the water to foam. Therefore, to help prevent algae, quats have been replaced by the

algistats, which do not foam. Today, you will have difficulty finding many pool professionals that sell quats. Quats should not be used on an ozone pool.

2.5.3 METALLIC ALGAECIDES

Contain copper. Although copper is superior at killing all varieties of algae, it is a mineral that is not desired in your pool, as it is corrosive. The presence of copper will dissolve metallic materials in your pool (walls, floor, hand rails, ladders, light fixtures, and equipment), which will discolor your pool water and may stain your pool walls or floor; or worse, may destroy your equipment. If a Metallic Algaecide is used, you will also need to add a Metal Sequestering Agent to the pool water within one week of applying the Metallic Algaecide in order to rid the pool water of the undesired copper. Metallic algaecides are most effective for killing harsh mustard algae or black algae.

2.6 Beginning Stages of Algae

In its initial stages, algae will feel like a (clear) slime, causing the pool walls, floor, and any steps to be slippery. At this stage, brushing the pool probably will remove the embryonic algae; you may want to add some algaecide just to make sure-it is ALWAYS better to be safe than sorry. If algae is not detected and treated in this initial stage, color will begin to take form. Typically, algae will start to grow in the corners of the shallow end of the pool, and near the steps, primarily because circulation is not as thorough in these areas. Another reason that algae initially grows in the shallow end of the pool is that water is cooler in deeper waters; sunlight (which fosters algae growth) is less able to penetrate the deeper waters. Although algae typically grows first in the shallow end of the pool, if not treated immediately, it very well could infest the entire pool within hours. Therefore, if preventative measures did not work, treatment must begin immediately.

NOTE: Green algae and Mustard algae will typically start to grow in the shallow end corners. Black algae, which will appear as black specs-resembling dirt-in its initial stage, will start to grow in any area of the pool, regardless of water depth.

2.7 How to Kill Green Algae

There are many treatment procedures offered for Green Algae. The following is just one of many treatment procedures available:

With an ozone pool, in most cases green algae can be removed by dropping a "Month Mate" tab into the weir basket and brushing the affected areas. If this does not work then follow the procedure below.

Day # 1:

- Brush the algae.
- Adjust the pH to close to 7.2, the low end of the ideal range.
- Add the required amount of a Polymeric Algaecide.

Day # 2:

- That morning, brush any algae that may remain on the pool walls, corners, floor, or steps.
- After brushing, allow the water to settle, and then vacuum the pool.
- Immediately after vacuuming the pool, clean the filter in order to maintain proper and effective circulation and filtration:

- Backwash the filter.
- That evening, brush the entire pool to make sure all algae is loose and floating where it will be killed by the algaecide and then sent to the filter for removal.

Day # 3 and beyond:

- Assuming that the algae is gone, monitor water chemistry, keep the pump operational for a sufficient amount of time, and engage in a routine maintenance schedule.

NOTE: If the algae is still present after 2-3 days, add more algaecide and shock the pool using a shock treatment available in your pool shop.

2.8 Additional Information on Algae Treatment

Even if you just shocked the pool the day before you noticed the clear slime, or actual algae itself, shock the pool again, *using twice the amount of the normal recommended application*. Do not allow swimming until the algae is gone. Any bather load and the possible introduction of swimmer wastes (such as perspiration, urine, saliva, or body oils) will tie up the sanitizer and shock, taking them away from their intended job of killing algae. Although the algaecide is credited for killing the algae, it is virtually ineffective without a sanitiser, brushing, *continual* water circulation, and proper filtration.

Regardless if you use our treatment procedures or those of your local pool professionals, just make sure that you do treat the algae. Too many pool owners hold off any treatment until they are absolutely, without-a-doubt, 100% sure it is algae. By this time, there very well may have been an algae bloom, infesting almost the entire pool. If you think that algae may be forming, immediately brush the entire pool and treat, regardless of when you last treated. Many times, brushing and low treatment levels are all that is ever needed to prevent algae, and nip the problem in the bud.

Again, please remember that the best treatment for algae is its prevention. It is better to have to do minimal amounts of work periodically than it is to have to do labor-intensive work everyday, and at times, numerous times throughout the day. This simple daily work will also result in not having to give up your pool for 2-10 days, depending on the type and severity of algae.

3. pH

Although it is not important to understand the chemistry of water, it is important for pool owners to understand whether pool water is acidic or alkaline in order to understand water chemistry.

Years ago, chemists developed a system to determine the relative acidity or alkalinity of (drinking) water. This system involves a scale - called the pH scale - that ranges from 1.0 - 14.0, with 7.0 being neutral (neither acidic nor alkaline).

- Any number below 7.0 represents an acidic condition of water (low pH).
- 7.0 is neutral
- Any number above 7.0 represents an alkaline condition of water (high pH).

Although 7.0 is considered "neutral" for drinking water, it is not ideal for pool water. The ideal pH range is 7.2 - 7.8, which is slightly alkaline. Therefore, for a swimming pool, the pH scale has to be revised:

- A pH level below 7.19 will be considered acidic (having a low pH)
- A pH level between 7.2 - 7.8 is ideal for a pool
- A pH level above 7.81 will be considered alkaline (having a high pH).

3.1 Testing pH

There are three ways to test for Ph: test strips, test kits or an electronic pH meter.

The use of test strips is really self-explanatory. Read the instructions on the bottle for all of the "how to" instructions. Most test strips will test for Alkalinity and the chosen sanitizer/disinfectant/oxidizer, as well as the pH. Here are steps to using test strips:

- Take out one test strip and then recap the bottle.
- Dip the test strip into the water (usually about 18" below the surface of the water).
- Hold the test strip out of the water for the required amount of time.
- Compare the colours of the test strip to the colours of the chart on the bottle to determine if the pH reading is low, in range, or high.
- If applicable, adjust the pH.

The use of test kits is also popular. Read the instructions on the test kit for all of the "how to" instructions. Some test kits will test for only pH and the chosen sanitizer/disinfectant/oxidizer, while other test kits add the capability to include Alkalinity, and perhaps certain other chemicals. Here is a discussion:

The reagent to test pH is called Phenol Red. Phenol red is a colorimetric test that is commonly a reagent, but a tablet is also available.

The most common application of phenol red is adding 5 drops of the reagent, or one tablet, to the sample. Again though, read the instructions on your test kit to make sure of the number and sequence of drops, or the number of tablets. Then twist/turn the test block back-and-forth (like you are turning a door knob). The sample will turn a shade of red. Simply match the red color of the water to the red color chart on the test block to determine your pH range.

The electronic pH meter is an electronic device that has a digital display and will display the pH of the water being measured when the sensor of the electronic meter is inserted into the water. These devices are typically expensive but they are extremely accurate if maintained and calibrated.

3.2 LoweringpH

If a pH test shows a pH level at 7.81 or higher, then the pH must be lowered. There are two chemicals to lower pH. The first is a granular product, which is typically packaged and sold as "pH Decreaser", "pH Down", or "pH Minus"(the product is also often also referred to by its scientific name, which is Sodium Bisulfate). The second is muriatic acid, which is a liquid. Before adding any type of pH decriaser, read the instructions on the label. Manufacturers will recommend varying amounts to add per liters of water, as well as recommend varying application procedures, some say to dilute the product in a bucket

of water and then pour it into the pool, while others say to broadcast it into the pool directly from the package.

You must simply test the water, determine how high the pH is above 7.8, and then read the instructions on the label to determine the proper amount of pH Decreaser or muriatic acid to add. If the pH of your pool is allowed to get too high, then you must lower the pH in increments, as all manufacturers will indicate a maximum amount of product that can be added at one time.

3.3 Factors That Lead to High pH

These factors can raise the pH of your pool water:

- Tap water in certain regions simply has a high pH.
- Overestimating the amount of pH Increaser or the amount of soda ash that is needed.
- Shocking the pool with Calcium Hypochlorite, with its pH value of 11.8, or shocking the pool with Lithium Hypochlorite, with its pH value of 10.8, will raise the pH value over time.
- A high Alkalinity reading.

3.4 Problems Resulting From High pH

If the pH of your pool is high, these problems will occur:

- Cloudy water.
- Scale formation on the pool walls, floor, plumbing and equipment.
- Short filler runs and overall poor filtration - primarily due to scale that is deposited inside the plumbing, which restricts water circulation.
- A greater potential for algae growth.
- Eye and skin irritation.

3.5 Raising pH

If a pH test shows a pH level at 7.19 or below, then the pH must be raised. There are two chemicals to raise pH. The first is granular product, which is typically packaged and sold as "pH Increaser", "pH Up", or "pH Plus" (the product is also often referred to by its scientific name, which is Sodium Carbonate). The second is Soda Ash, which is also granular. Manufacturers will recommend varying amounts to add per liter of water, as well as recommend varying application procedures, some say to dilute the product in a bucket of water and then pour it into the pool, while others say to broadcast it into the pool directly from the package.

You must simply test the water, determine how low the pH is below 7.2, and then read the instructions on the label to determine the proper amount of pH Increaser or soda ash to add. If the pH of your pool is allowed to get too low, then you must raise the pH in increments, as all manufacturers will indicate a maximum amount of product that can be added at one time.

3.6 Factors That Lead to Low pH

These factors can lower the pH of your pool water:

- Tap water in certain regions has a low pH.

- Overestimating the amount of pH Decreaser or the amount of muriatic acid that is needed.
- Using chlorine tablets, with its pH value of 2.8 - 3.0, or using bromine, with its pH value of 4.0, will lower pH over time.
- Using potassium peroxymonosulfate, with its low pH value of 2.3, will lower pH over time.
- High bather loads.
- Swimmer wastes, such as perspiration, urine, saliva, and other body oils.
- Dirt, debris or leaves that blow into the pool.
- The acidic level of rain will often lower pH.

3.7 Problems Resulting From Low pH

If the pH of your pool is too low, these problems will occur:

- Dissolved metallic parts of your pool (walls, floor, hand rails, ladders, light fixtures, and equipment). This could even lead to discolored water or stains on the pool walls and floor.
- Stained and etched concrete in concrete pools.
- Stained and etched plaster in gunite or shotcrete pools.
- Stained liner in vinyl-liner pools.
- Blistering or delamination of fiberglass in fiberglass pools.
- Minimizes the effectiveness of Alkalinity controlling chemicals.
- Eye and skin irritation

4. Chemical Naming

Some pool owners refer to chemicals by their "scientific name" while other pool owners refer to these same chemicals by the name they are "typically packaged and sold as."

The following table is a cross-reference:

Scientific Name	Typically packaged and sold as	
Hypochlorous Acid	Chlorine Gas	
Sodium Hypochlorite	Liquid Chlorine	
Dichlor*	Granular Chlorine	
Tichlor**	Chlorine Tablets	
Cyanuric Acid	Conditioner Stabilizer	
Calcium Hypochlorite	Shock (chlorine-based)	
Lithium Hypochlorite	Shock (chlorine-based)	
Potassium Peroxymonosulfate	Non-chlorine Shock	
Sodium Bisulfate***	pH pH Minus	Decreaser
Sodium Bicarbonate	Alkalinity Alkalinity Alkalinity Plus	Increaser Up
Sodium Carbonate	pH	Increaser

	pH pH Plus	Up
Calcium Chloride	Hardness Hardness Hardness Plus	Increaser Up
Algistat	Maintenance Preventative Algaecide	Algaecide
Algaecide	Varies due to types of algae *Consult your local pool professional	
Coagulant	Clarifier	
Flocculent	Clarifier Floc-and-Vac Drop-and-Vac	
Aluminium Sulphate	Alum (flocculent)	
Metal Sequestering Agent	Metal Stain and Scale	Out
<p>*The actual scientific name for Dichlor (Granular Chlorine) is Sodium dichloro-s-triazinetrione. **The actual scientific name for Trichlor (Chlorine Tablets) is trichloro-triazinetrione. ***Sodium Bisulfate lowers both pH and Alkalinity.</p>		

5. Foam

If the early signs of a water line (scum ring) are not noticed and treated, and products such as suntan lotions, underarm deodorants, women's makeup, as well as body oils and dirt, are allowed to build up, a foaming of the water-similar to dish soap or laundry detergent-will occur. This foam is not desired. If this is the cause of foam, the treatment is very easy. The initial step is to brush the walls at the surface where the water line (scum ring) appears. After brushing, add an enzyme cleaner to rid the water of the water line (scum ring). Additional foam will result. This foam is desired, it is a signal that the enzyme is eliminating the water line (scum ring) and breaking it down into water. Most of the foam will disappear after 1-2 hours. Any foam that remains can be eliminated by using a defoamer available at your local pool shop.

Also, remember that some types of algaecides (quaternary algaecides) will cause foam. Do not use any type of Quaternary Algaecide. They really do an inferior job of treating algae and they also cause unsightly foam. Very few pool professionals even sell quats. If you have used a quat and your water is foaming, add some defoamer, and then, properly dispose of the Quaternary Algaecide.

6. Cloudy Water

Cloudy water is usually caused for four reasons:

- Poor filtration, which is either the result of sporadic and insufficient water circulation or a dirty filter that needs to be cleaned.

- Poor water chemistry. Regarding water chemistry, a low chlorine (or its alternative) reading, neglect of shock, or a high reading in either pH, Alkalinity, Hardness, or a combination of any of these three *water balancers* could result in cloudy water.
- Environmental factors, such as rain and wind, along with other factors, such as trees hanging over the pool, lawn clippings, nearby construction, pets, and large human bather loads can also cause cloudy water, as they place additional demands on the chemicals.
- The presence of millions of microscopic particles (bacteria, dirt, and other microscopic debris) that are too small to be trapped by the filter, and remain suspended in the pool water.

6.1 Clarifier

If your circulation and filtration are adequate, and if your water chemistry is in range, then the cause for cloudy water is likely to be millions of suspended particles (bacteria, dirt and other microscopic debris) in your pool water. These particles are so small that they escape the filter. If this is the case with your pool, a Clarifier should be used to restore water clarity. Clarifiers are liquid. Read the instructions on the label to determine the amount to add, how it should be added (either diluted or broadcasted), and other precautions.

6.2 Organic Water Clarifiers

Organic water clarifiers are often referred to as "coagulants." Organic water clarifiers are positively charged, which attract to the negative electrical charge of the small particles (bacteria, dirt, and other microscopic particles). Once combined with the small particles, Organic clarifiers coagulate (bond) these small particles into larger particles so that they can be trapped in the filter, for permanent removal from the pool. Read the instructions on the label in order to determine the proper amount to add and how it should be added.

6.3 Alum Water Clarifiers

Alum water clarifiers are often referred to as "flocculents." An Alum water clarifier is more difficult to use than is an Organic water clarifier. Before an Alum clarifier can be added, the water level of the pool must be raised to its highest point. This will allow the pool to vacuumed straight to a waste-line (which is either plumbed in with your equipment or is manually installed). When the water level is raised, an Alum clarifier is added to the pool water. The Alum clarifier will form a gel-like adhesive that traps microscopic particles (bacteria, dirt, and other microscopic debris) as they suspend in water, forming larger particles. This process is called *flocculation*. After adding the Alum clarifier, you need to allow the pump to operate for approximately 4 hours. Then the pump is turned "off" overnight, allowing these now-larger particles to drop to the bottom of the pool. The next day, the larger particles will sit on the pool floor in a nice pile to be vacuumed out of the pool. The equipment is turned back "on". Then, you must vacuum these settled larger particles out through the waste-line until all the particles are removed from the pool. Within hours, your water clarity should be restored, as long as water chemistry and filtration remain adequate. Read the instructions on the label of the product in order to determine the proper amount to add and how it should be added.