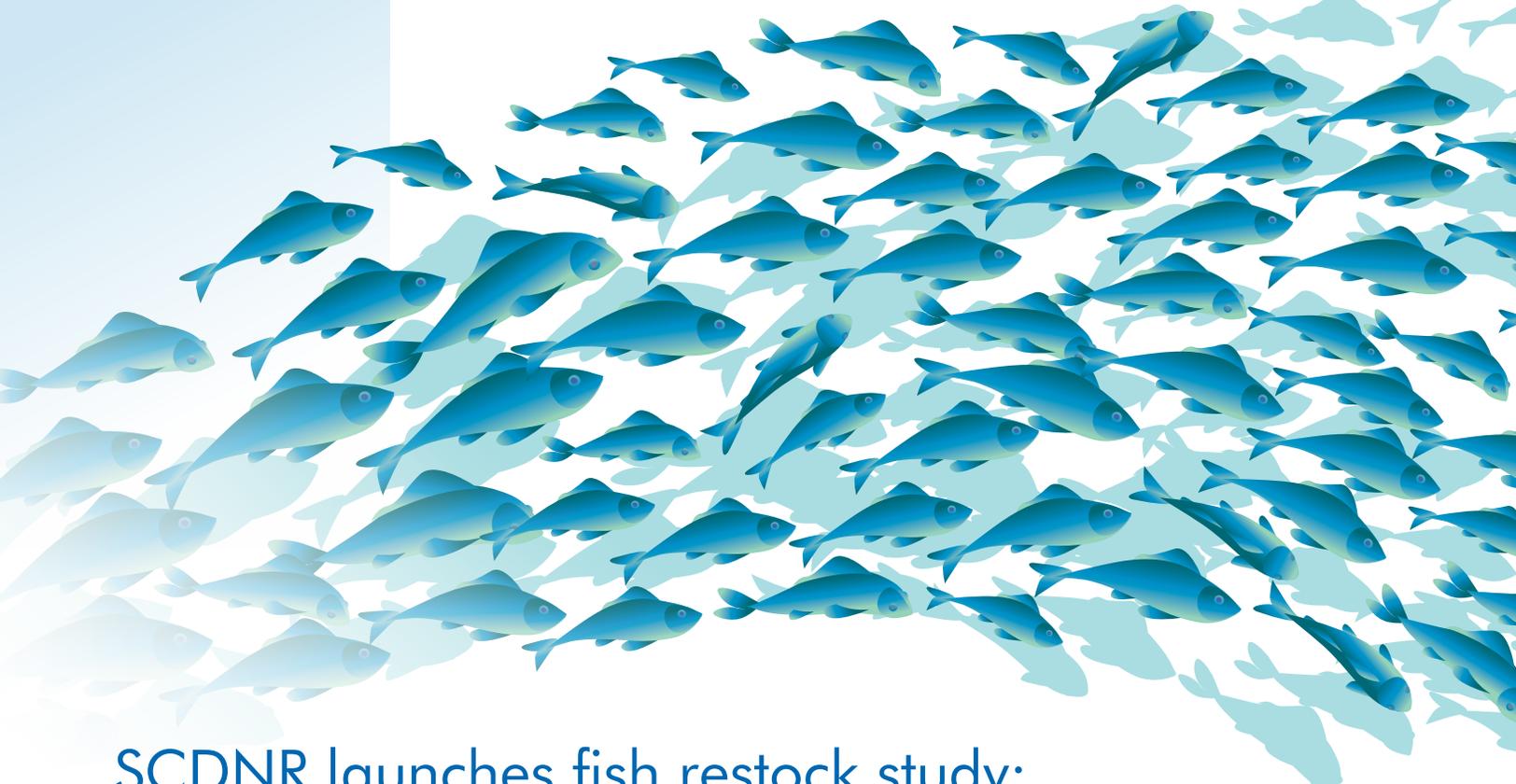




GREAT WATER HEALTHY LAKES

CHOOSE TAP | SPARTANBURG WATER



SCDNR launches fish restock study:

RESEARCHERS WILL USE SAMPLES, INFO GATHERED TO DETERMINE NEXT STEPS

A study to determine the need for a potential fish restocking effort on two of Spartanburg Water’s reservoirs began this month.

During the week of September 10th, officials with the South Carolina Department of Natural Resources conducted the first phase of an assessment on Lake Bowen and Municipal Reservoir #1. A team of biologists was collecting samples that will help the agency calculate a restocking rate following a major fish loss that occurred on both reservoirs last May.

The primary gamefish population most affected by the fish loss included the bluegill and redear varieties of sunfish, more commonly known as bream.

“The idea behind the sampling will be to determine the relative abundance of gamefish, with focus on species and sizes most impacted by the fish loss,” according to a statement from SCDNR. “This sampling should give us some idea of stocking rate needed.”

Samples were collected by a process known as “electrofishing,” which injects a minor electrical charge into the water that temporarily stuns fish so that they can be collected and safely returned to the water with little stress or injury. Electrofishing is the safest and most effective method for these kinds of assessments.

“As this process continues, we’re committed to sharing information about the partnership and keeping our community informed about what they might see as we get closer to a potential fish restock,” Ken Tuck, Spartanburg Water’s Director of Water Treatment said.

In August, officials from both Spartanburg Water and SCDNR met to discuss improved communication efforts and explore new partnership opportunities, including the proposed restocking effort.

CONTINUED INSIDE >>>



MIB Returns—but not for long:

ALGAECIDE SUCCESS FOLLOWING IMPROVEMENTS IN STRATEGY, APPROACH

Methyl-Isoborneol, also known as MIB, is a pesky but familiar character that Spartanburg Water's team has gotten to know quite well over the past few years. Many will remember MIB as the culprit of taste-and-odor challenges that lasted for nearly six months in 2015. While harmless, this algae byproduct can produce an earthy, musty smell and flavor in drinking water.

Since that time three years ago, Spartanburg Water has made significant strides in advancing our algae-reduction strategy, investing more than \$20 million in new technologies that help reduce the impact of algae blooms that produce MIB and other species that can also grow in drinking water reservoirs, like Geosmin.

In late June, our lab began noticing a distressing trend: MIB was beginning to spike at higher-than-expected levels, based on the sampling locations that our team was monitoring.

Since 2016, following the installation of an oxygenation system—a cutting-edge invention that delivers a constant feed of oxygen through a strategically placed piping system along the bottom of the lake—Spartanburg Water had been successful in warding off any major spikes in MIB.

But, with the added power of new technology that allows our team to get a better diagnostic view at the watershed, the water quality experts in our lab verified the challenge before us: By the last week of June, MIB was registering at nearly 130 parts per trillion in Lake Bowen, and also seemed to be migrating into Municipal Reservoir—close to the R.B. Simms Water Treatment Facility.

Not every person can detect MIB, but those with sensitive taste buds can begin to taste and smell it in their water at about 15 parts per trillion.

“We knew that we had to act—fast,” said Ken Tuck, Director of Water Treatment.

But what caused the sudden spike? In water bodies, algae blooms that create taste-and-odor producers—like MIB—typically grow as the result of a combination of factors: prolonged hot weather, a lack of rain and high levels of nutrients, including phosphorus and nitrogen, in the watershed runoff.

“The oxygenation system being deployed is a best-practice in the preventative strategies needed to cut MIB off at its actual source—the algae that create it,” Tuck said. “But it’s only one tool in our toolbox.”

The next step: Algaecide—and, specifically, Algimycin: a familiar medicine that helped Spartanburg Water combat its first bout with MIB in 2015. It was prescribed by Dr. John Rodgers, a professor at the Clemson School of Agriculture. Understandably, even when armed with solid research and expert advice, Spartanburg Water was cautious—especially following an unexpected fish loss in May that coincided with the use of Current, a different algaecide that is a best practice tool in the treatment of Geosmin.

Trained and licensed applicators began their work before dawn on July 12 and 13, treating portions of Lake Bowen with a very low dose of Algimycin. The company performing the applications, Aqua Services, continued their work on Municipal Reservoir Number One on July 27.

The result? The algaecide worked: By the end of July, sample results indicated that MIB was “not detectable” in either reservoir. And, according to Tuck, there have been no recurrences of the taste-and-odor producer for the remainder of the summer months.

“This algaecide has been thoroughly tested for safety for non-target species such as fish. The concentration and prescription that I developed for Spartanburg Water’s use are not toxic to fish.”

But, like any other medicine, Dr. Rogers said, it must be administered by a trained professional.

“Those warning labels for algaecide can be scary because they highlight the risks from encountering the undiluted form of the product,” he said. “Even warning labels for over-the-counter medicine can be frightening when you read them. I’ve been doing this work for many years, and our team stands behind the safety of the algaecides that we use.”

Water quality and safety are the number one factors in determining the best algae-reduction methods, Tuck said.

“We want our customers and the entire community of people who enjoy the lake and rely on it for drinking water to know that it is safe,” he said. “Our goal is reliability—because that’s what our mission challenges us to do: Be reliable. This method, and this product, are widely used across the country in the reduction of taste-and-odor-causing algae because they work, and they work well.”

The challenges associated with ecosystem balance—and lake management—are not unique to Spartanburg Water, Dr. Rodgers said. Recent reports of algae blooms have underscored the importance of studying the underlying causes for the frequency with which they’re occurring across the country.

“This is targeted algae management,” he said. “To take what we’ve learned

so that the people of Spartanburg and this region can have the quality drinking water that they've become accustomed to. Spartanburg Water is doing an amazing job with managing their water resources."

But, Tuck said, the utility learns from its mistakes.

"The loss of fish in May inspired us to learn from that challenge," he said.

"We didn't expect it, and we will stop at nothing to make sure it never happens

again. Can we make improvements? Yes, and I'm very encouraged by the success of the algae reduction work in July. The improvements we made are working, and we'll build onto that success and keep moving forward."

HOW MUCH ALGAECIDE DOES SPARTANBURG WATER USE IN THE RESERVOIRS? IS IT SAFE?

Algaecide is safe to deploy in the treatment of algae in drinking water reservoirs and is specifically designed for that purpose, according to the Environmental Protection Agency, which regulates its use.

The active ingredient in algaecide applications is copper, but at an extremely low amount.

For drinking water reservoirs, the applied metallic copper must not exceed 1 ppm (part per million). One part per million is the equivalent of:

- A single granule of sugar in 263 sugar cubes
- A single piano key among 11,363 pianos
- A single second in 11 ½ days
- A single kernel in 1,250 ears of corn

All algaecide applications in 2018 have been made in low-dose concentrations well below the maximum allowance of copper. To learn more and see the data, visit spartanburgwater.org/datapoints.

WHAT IMPROVEMENTS HAVE BEEN MADE IN THE ALGAECIDE APPLICATION PROCESS?

When dealing with algae in a drinking water reservoir, a robust and comprehensive monitoring strategy is the key to detection, strategy and success. Our team employed a refined management strategy, in consultation with scientists, experts and watershed specialists, to perform an algaecide application in July.

- We identified taste-and-odor producers and locations and focused on those locations to determine the best method and approach for algaecide applications
- We organized lakes into management sections based on water quality factors
- We monitored weather for optimum application conditions
- We examined water quality parameters in advance of any algaecide use
- We targeted specific algae and taste-and-odor producers at the lowest effective concentration of algaecide





Pause for Relief:

RESET PERIOD OFFERS CHANCE TO PERMIT STRUCTURES BELOW SPARTANBURG WATER'S PROPERTY LINE

Have you ever just wanted to hit the pause button when you needed a little more time to take care of something important? Now you have the opportunity to do just that when it comes to any structures that are on Spartanburg Water's property. All you have to do is call our staff and say this simple phrase: "Let's Press Pause."

The Pause Program is scheduled to begin October 1, 2018, and continue through December 1, 2019. During this 14-month period, adjacent property owners may request to "Press Pause" and establish a baseline of permits for the improvements below the 827' Spartanburg Water property line. Our staff will work with each property owner to review and establish a baseline of permits, licenses and/or agreements. All existing improvements, semi-permanent or permanent structures, as of October 1, 2018, in good condition, will receive an authorization from Spartanburg Water.

This one-time program is open to every adjacent property owner living around Lake Bowen with property abutting the 827' MSL contour and applies to currently constructed and existing permanent or semi-permanent structures located below the 827' MSL contour, on Spartanburg Water property (as of July 31, 2018).

During the "Pause" timeframe from October 1, 2018 through December 1, 2019 (14 months), adjacent landowners may request a review of Spartanburg Water files to ensure that all permits, licenses and agreements have been filed and reflect the current owner. Once an adjacent homeowner requests a "Pause Review", the staff will review the records directly with the property owner and the Spartanburg Water staff will issue permits for all existing improvements, semi-permanent or permanent structures

located below the 827 property line. The adjacent homeowner will be responsible for paying all applicable fees associated with additional permits, licenses and agreements that are issued during this period.

So, what's the bottom line? During the "pause," Spartanburg Water will issue the appropriate paperwork to bring all properties up to date and establish a baseline for future improvements.

If you don't know if your property has an encroachment or lacks a permit in the current homeowner's name for an existing dock and other structures, please let us know you want to participate in this

program. We will check our files and let you know what is necessary and provide you with the application. A call to the Watershed Staff at 864-598-2240 or an email that includes your name, address and a phone number to reach you will also work. Please send those to: jonmorgan@spartanburgwater.org or visit spartanburgwater.org/pause to learn more.

Note: *All planned or future investments below the 827' MSL contour will be subject to the rules and regulations in place at the time they are identified.*

WHAT ITEMS ARE INCLUDED IN THE "LET'S PRESS PAUSE?"

- Sea walls, in good condition
- Docks, in good condition
- Sitting areas
- Planters
- Boat ramps, in good condition
- Playground equipment and structures
- Fire Pit Structures*
- Walkways
- Occupied residences
- Decks
- Garages
- outbuildings
- Retaining Walls
- Benches
- Lawn furniture
- Picnic tables
- Flagpoles

- Beaches
- Recirculating fountains
- Fences, in good condition
- * *Portable Fire Pits will be eligible for permitting in a program similar to irrigation permits, which will be introduced in the Spring of 2019.*

INCENTIVE: GET A 25% DISCOUNT ON PAPERWORK FEES WHEN YOU PAUSE

To spread out the workload on the Spartanburg Water staff, adjacent property owners will be encouraged to sign up early for the program through an incentive program that will provide a 25% discount on any fees for additional permits, licenses or agreements identified below the 827' Contour Line. This early sign up period will be from October 1, 2018 through March 30, 2019.

The 827' Contour Line, Explained:

SOME FREQUENTLY ASKED QUESTIONS ABOUT SPARTANBURG WATER'S SHORELINE

WHAT IS THE 827' MSL CONTOUR LINE?

- It is the elevation above Mean Sea Level (MSL) that constitutes the property line for Spartanburg Water around the entire circumference of Lake Bowen.
- The Lake Bowen reservoir was created in 1960 to be a drinking water source for the Spartanburg community. Between 1958 and 1961, Spartanburg Water System purchased property along the South Pacolet River up to the 827' MSL contour line.
- Many people are familiar with establishing a property boundary through meets and bounds, but using a MSL elevation is a more common method when bodies of water and flood levels are identified.

WHY DOES IT MOVE?

- Unless the physical condition of the land changes, either through erosion or grading, the original property line for Spartanburg Water at Lake Bowen does not move. The 827' MSL contour was established by professional survey at the time Spartanburg Water purchased the parcels of property that makes up Lake Bowen (circa 1958-1961). This was accomplished using the "Sea Level Datum of 1929," the standard for all surveys during that time period.

WHAT IS THE "DATUM OF 1929" AND WHAT DOES IT MEAN TO ME?

Sea Level Datum of 1929 (from Wikipedia)

- The Sea Level Datum of 1929 was the vertical control datum established for vertical control surveying in the United States of America by the General Adjustment of 1929. The datum was used to measure elevation (altitude) above, and depression (depth) below mean sea level (MSL).
- Since the Sea Level Datum of 1929 was a hybrid model, it was not a pure model of mean sea level, the geoid, or any other equipotential surface. Therefore, it was renamed the National Geodetic Vertical Datum of 1929 (NGVD 29) in 1973. NGVD 29 was superseded by the North American Vertical Datum of 1988 (NAVD 88), based upon an equipotential definition and a readjustment, although many cities and U.S. Army Corps of Engineers projects with established data continued to use the older datum.
- The 827' MSL contour line serves as the property line for Spartanburg Water-owned property, which was plotted using the Sea Level Datum of 1929. This was the Datum used by Spartanburg Water to acquire/purchase all of the original property that was purchased around Lake Bowen (circa 1958 – 1961). Additionally,

the Sea Level Datum of 1929 would be used as the basis for determining the location of the Spartanburg Water property line today.

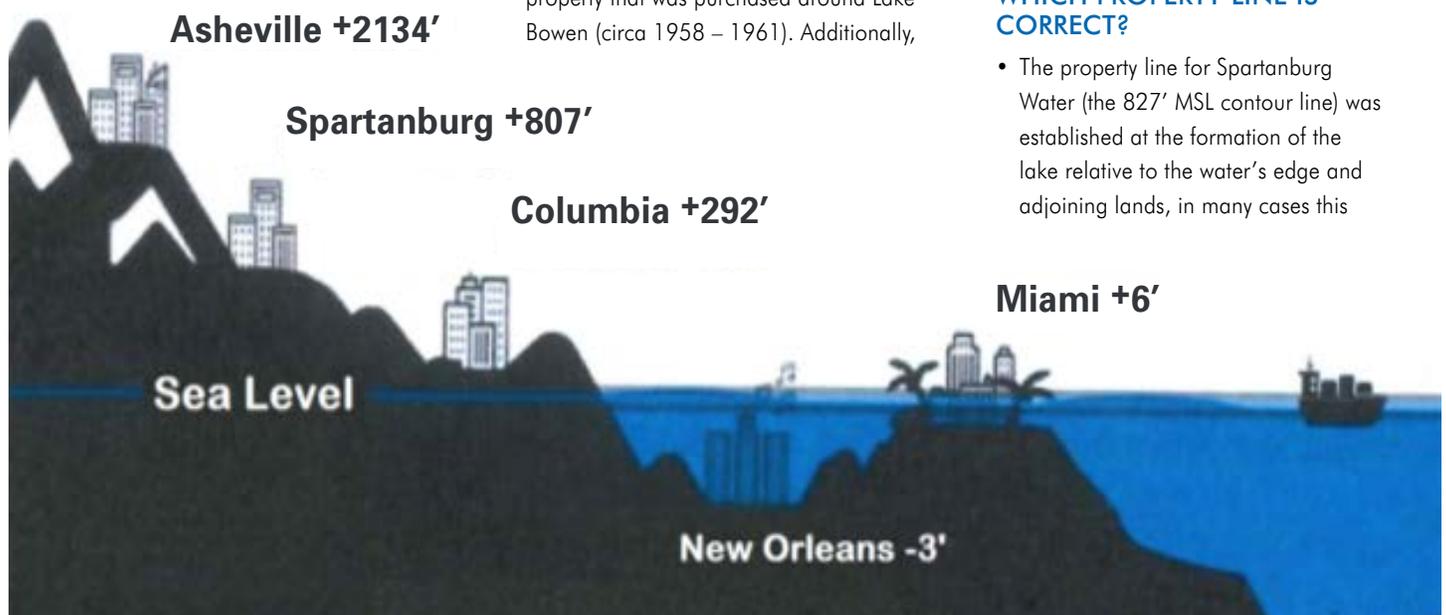
- When using the Sea Level Datum of 1929 as the basis for establishing the 827' MSL contour line, the property line for Spartanburg Water does not move unless the surface of the land has been altered by mechanical excavation or large-scale erosion.

HAVEN'T THERE BEEN CHANGES AND MODIFICATIONS TO SURVEYING DATUM SINCE 1958?

- The Sea Level Datum of 1929 was renamed the National Geodetic Vertical Datum of 1929 (NGVD 29) in 1973, it was superseded by the North American Vertical Datum of 1988 (NGVD 88). However, when determining the location of a property boundary that was established prior to the NGVD 88 it is critical that the datum used in the original land transfer be used. Using only the NGVD 88 datum to determine the 827' MSL contour line as it was established in 1958, could lead to erroneous findings.

MY DEED AND PLAT SHOW A PROPERTY LINE OTHER THAN THE MSL 827' CONTOUR LINE. WHICH PROPERTY LINE IS CORRECT?

- The property line for Spartanburg Water (the 827' MSL contour line) was established at the formation of the lake relative to the water's edge and adjoining lands, in many cases this





was completed prior to the creation of the adjoining residential lots. In some instances surveyors working specifically for an adjoining landowner will identify a property line connecting the lower lot property pins to create a lower (lake side) property line. If the plat with a lower property line is in conflict with the 827' MSL, the 827' MSL will prevail as the property line for Spartanburg Water, even if the other plat is recorded on public record. Spartanburg Water has original documentation that demonstrates the formation of the 827' MSL contour line as the boundary for Spartanburg Water.

- In the event you as an adjoining landowner have a need to survey your property, it is critical to make sure the independent surveyor locates and confirms the accurate location of the 827' MSL contour line using the NGVD 29 datum. Relying on the accuracy of existing data (historical plats and deed descriptions) or using the NAVD 88 datum may lead to errors and an inaccurate survey.

WHAT IF MY HOUSE OR A PORTION OF MY HOUSE IS BELOW THE 827' MSL CONTOUR LINE?

- When someone places anything on property they do not own, it is viewed as an encroachment. Spartanburg Water addresses all encroachments when they are identified. To address existing residential structure encroachments, Spartanburg Water has created an Encroachment Agreement. This agreement when executed by both Spartanburg Water and the adjoining landowner gives the landowner an easement that allows the encroachment to remain in place "as-is." The adjoining landowner can maintain, repair and enjoy continued access to the encroachment.
- However, Spartanburg Water will not allow additional construction or renovations that increases the size of the encroachment in any way.

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"This is a great step forward in the renewal of our watershed, and the renewal of a great partnership," said Sue G. Schneider, Spartanburg Water's Chief Executive Officer. "The challenges we've faced have renewed our commitment to be a good partner, and to focus on the great opportunities before us."

MORE ON FISH RESTOCKING STRATEGY FROM ROSS SELF, SCDNR FISHERIES CHIEF

"Following the release of the May 14-15, 2018 Lake Bowen and Municipal Reservoir #1 fish kill report by the South Carolina Department of Natural Resources (DNR), DNR and Spartanburg Water have initiated a series of meetings intended to ensure communications are improved and processes are established to reduce the chance of future fish mortalities associated with herbicide applications.

"Spartanburg Water has already implemented modifications to their herbicide application methods following the May 14-15 event and have successfully employed these new methods to apply herbicide with no additional fish losses.

"DNR is in the process of developing an evaluation protocol to assess the current condition of fish populations in Lake Bowen and Municipal Reservoir #1.

"The results of this assessment will be used to determine what restocking efforts are appropriate.

"Spartanburg Water and DNR will continue to work together to ensure the lakes are managed appropriately and continue to provide quality recreational opportunities for the public, while protecting our natural resources."

Changes for the better:

LISTENING, LEARNING AND THE PATH FORWARD

If there's one thing that we can all agree on, it's this: Change is hard. Spartanburg Water is dealing with difficult changes in the ecosystem, and those changes have challenged us to improve the way that we communicate with you, and all of our stakeholders.

Beyond the creation of this newsletter, our team has also made a commitment to provide more frequent updates about any lake management activities that may have an impact on you and your neighbors. Through the additional feedback that we've collected during the past few months, we launched a series of informational meetings that allowed us to start a new dialogue that will help us work together to protect water quality, ensure safety on the lakes, and recognize the important role that you play in the protection of the ecosystem.

These meetings have also lead to more changes—but the good kind. Our team took your questions, feedback and recommendations and used them to make improvements to our permitting process.

We heard you, loud and clear. You wanted a permitting process that was easy to follow and understand. These are the changes we made:

- Simplified Application Process: now, you only have to file one application—regardless of the number of permits requested.
- The permit application turnaround time has been reduced, in most cases, to less than two weeks.
- Our Private Structure Permit has been replaced with a simplified Land Access Permit. This standardizes the process for both Lake Bowen and Lake Blalock property owners.
- Dock maintenance that involves minor components of the structure can be performed without a permit but will require a Marine Structure Notification Form to be submitted. Examples of minor components includes the following: resurfacing of the dock, walkways, handrail installation, maintaining cables or floats, etc.
- Emergency dock repair that requires immediate mitigation may be done in advance of notification.
- Property owners, with permitted docks, desiring to add an unattached Personal-Watercraft Lift or Boat Lift will not be required to submit a drawing by a professional engineer. However, an application for permit is required for approval prior to installation.
- Only property owners of a Type "C" dock desiring to make any changes to the structural portion, including the installation of an attached Personal-Watercraft Lift or Boat Lift, will be required to submit an approved stamped drawing.

These changes were made through a partnership with you. Please get in touch with our team if you have any questions.

