



Alcyon Lake

2018 Year End Water Quality Report

Pitman Environmental Commission

Pitman, NJ

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December 13th, 2018
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2018 Water Quality Report

Alcyon Lake

Introduction

In 2018, the Pitman Environmental Commission secured the services of SOLitude Lake Management to conduct a water quality monitoring program to investigate the water quality and phytoplankton community of Alcyon Lake. The program for 2018 consisted of three water quality sampling events during which the biologist tested the water for general water quality parameters and collected samples for phytoplankton and water chemistry analysis. Sampling was conducted by a Solitude Lake Management biologist via airboat or kayak.

The weather in 2018 at times, made for challenging lake management conditions. The winter was slightly below average overall with the exception of February, which included a day where the temperature was nearly 80°F. Early spring was quite a bit cooler than average until May, which was the 4th warmest recorded. This led to a rapid increase in water temperatures as well as plant and algae growth, which was continuously fueled by a warm summer that included a tie for the warmest August on record. (Figure 1, Rutgers Climate Lab). Precipitation was below average for the beginning of the year until February. From that point on precipitation was above average for the rest of the year with the exception of a dry period in the last few weeks of June. (Figure 2, Rutgers Climate Lab).

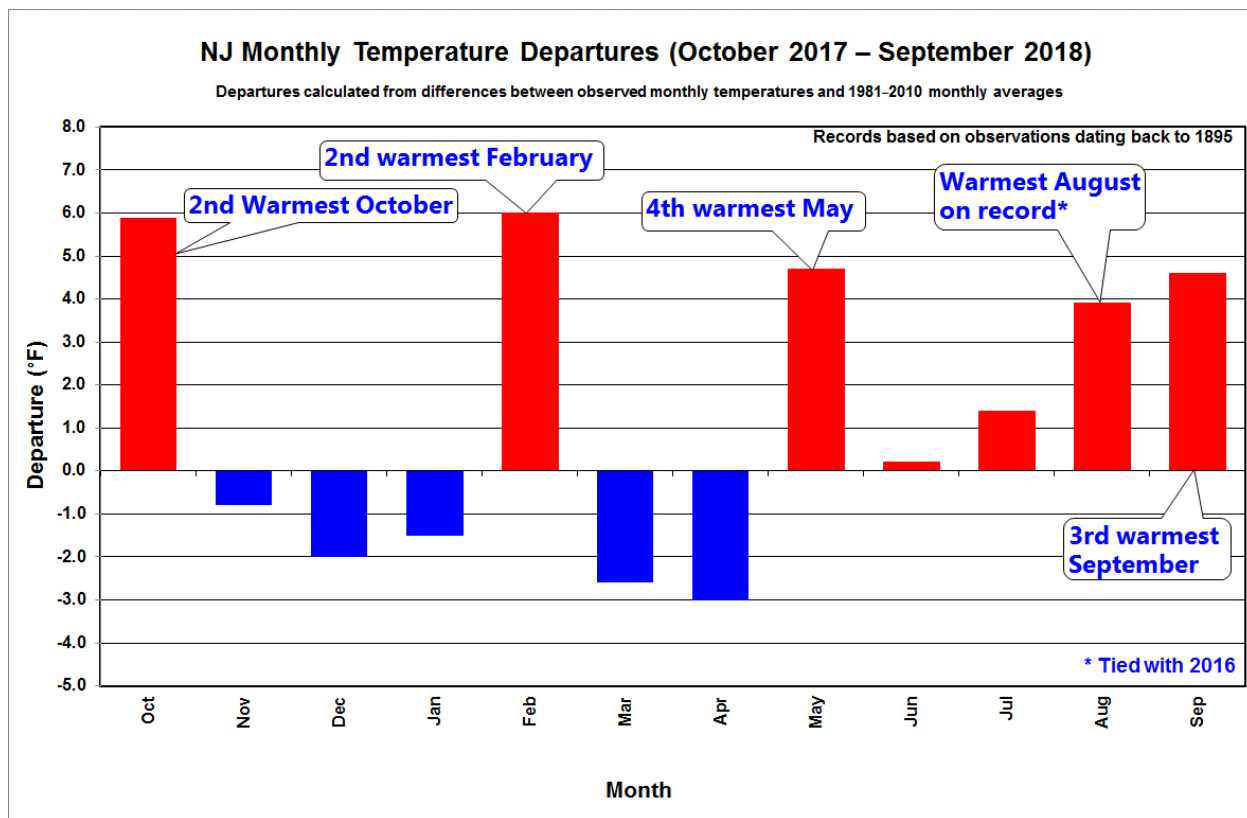


Figure 1 – 2018 Temperature Departures

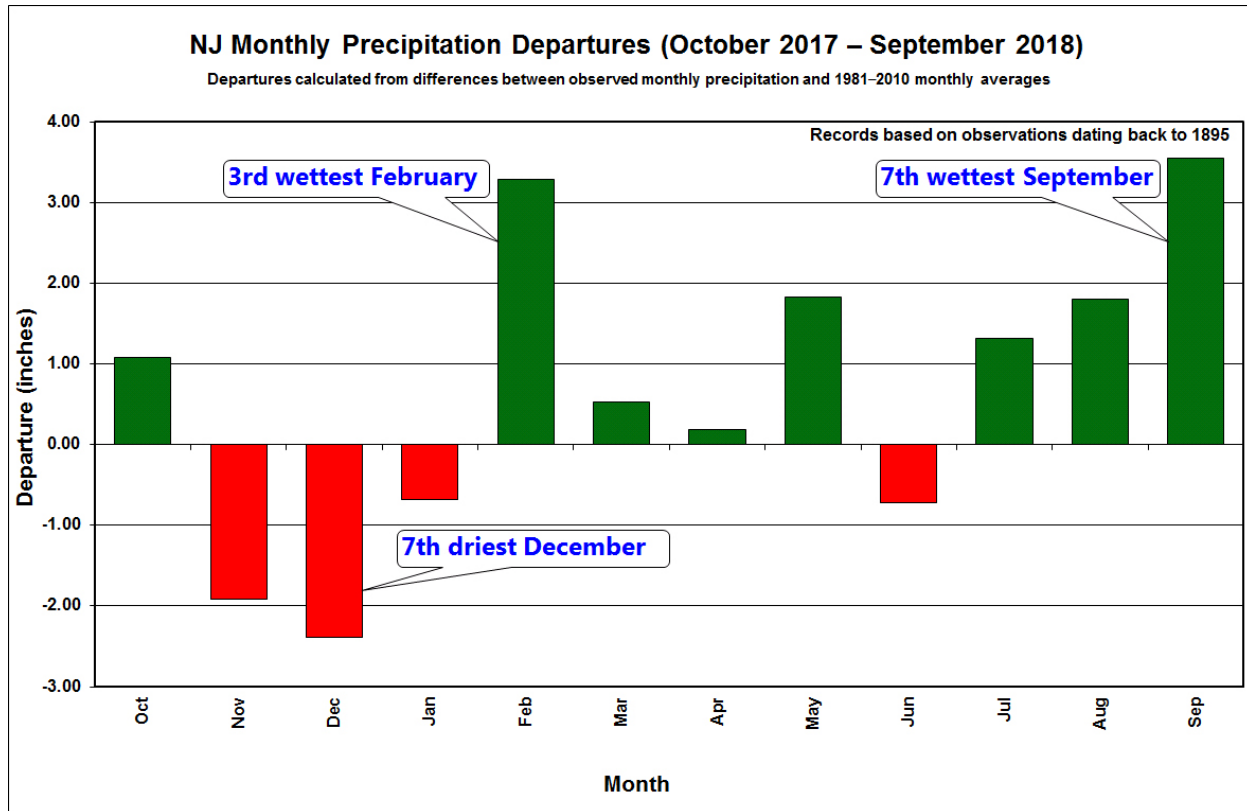


Figure 2 – 2018 Precipitation Departures

Water Quality Monitoring

Water quality monitoring took place on three dates (May 17th, July 17th, and August 30th) for all parameters. Sampling was conducted at two lake monitoring sites, the inlet station and outlet station (reference map in appendix). The inlet station was located near the primary inlet stream at the southern end of the lake. The outlet station was the deep water site located near the dam at the northern end. The parameters monitored included both *in-situ* parameters (temperature, dissolved oxygen, water clarity, pH, alkalinity, and total hardness) and chemistry parameters (nitrate, nitrite, turbidity, total phosphorus, ammonia, total suspended solids and conductivity). Chemistry samples were collected in clean plastic bottles, placed in a cooler on ice and transferred to a certified laboratory (Alpha Analytical Labs, Mansfield, MA) for analysis. The chemistry parameters were collected at both sites, in order to compare the results and determine if there are any excess nutrients entering the system from upstream. A temperature and dissolved oxygen profile was also collected every two feet through the water column at the outlet station utilizing a calibrated YSI model 550A meter. Descriptions of each water quality parameter are included in the appendix of this report.

Water Quality Results

Alcyon Lake – Inlet Station					
Parameters	Units	5/17/18	7/17/18	8/30/18	Limits
Temperature	°C	17.6	21.6	22.3	N/A
Dissolved Oxygen	mg/L	6.51	8.90	10.20	N/A
pH	SU	6.5	7.25	7.5	8.5
Alkalinity	mg/L	48	50	50	N/A
Total Hardness	mg/L	80	100	100	N/A
Water Clarity	feet	3.0	7.0 est.	10.0 est.	<3.0
Nitrate	mg/L	1.26	3.10	2.78	0.300
Nitrite	mg/L	0.020	0.020	ND	5.0
Turbidity	NTU	6.6	2.3	1.6	25.0
Conductivity	umhos/cm	290	410	440	500.0
Ammonia	mg/L	0.149	0.080	0.065	0.300
Total Phosphorous	mg/L	0.047	0.014	0.015	0.030
Total Suspended Solids	mg/L	ND	ND	ND	N/A
Total Phytoplankton	cells/mL	540	40	120	N/A

Table 1. WQR: Alcyon Lake - Inlet Station

ND = non-detect. Results highlighted in red exceed appropriate levels.

Alcyon Lake – Outlet Station					
Parameters	Units	5/17/18	7/17/18	8/30/18	Limits
Temperature	°C	19.5	28.3	28.6	N/A
Dissolved Oxygen	mg/L	5.45	8.58	10.20	N/A
pH	SU	6.5	8.5	9.25	8.5
Alkalinity	mg/L	40	56	44	N/A
Total Hardness	mg/L	60	120	60	N/A
Water Clarity	feet	3.0	6.0	8.0 est.	<3.0
Nitrate	mg/L	1.27	1.56	1.14	0.300
Nitrite	mg/L	0.030	0.020	ND	5.0
Turbidity	NTU	5.4	2.0	0.6	25.0
Conductivity	umhos/cm	300	410	370	500.0
Ammonia	mg/L	0.188	0.073	ND	0.300
Total Phosphorous	mg/L	0.050	0.011	0.009	0.030
Total Suspended Solids	mg/L	5.2	ND	ND	N/A
Total Phytoplankton	cells/mL	740	60	110	N/A

Table 2. WQR: Alcyon Lake – Outlet Station

ND = non-detect. Results highlighted in red exceed appropriate levels. Results highlighted in green indicate outlier.

Temperature and dissolved oxygen, which will be discussed again in the Lake Profile Description section, varied greatly throughout the season at both sites. Temperatures began lower in May, as expected due to cooler air temperatures, and later increased into July and August. However, the outlet station saw much higher numbers during these months than the inlet station. For example, in August the outlet station water temperature was 6.3°C higher than the inlet station. The water at the outlet station, in contrast to the inlet station, is more stagnant and receives more heat from the sun. The inlet station is constantly receiving cooler water from the stream, keeping its temperatures down. Dissolved oxygen at both stations saw an increase throughout the season. In August, increased levels of dissolved oxygen may be caused by the decomposition processes of plants and other organisms.

The pH at the inlet station ranged from 6.5 to 7.5, which are normal for freshwater lakes in the southern region of NJ. Similar readings were recorded at the outlet station in early May, however, in July and August the results were elevated; reaching a high of 9.25 in August. This is more than likely caused by increased plant or algal growth. However, on these dates, we did not observe elevated unicellular phytoplankton counts, so the increase was likely driven by production in the basin. Further testing is needed to confirm.

Total hardness at the outlet station varied greatly over the season, beginning and ending at 60 mg/L, but reaching a high of 120 mg/L in July. The typical range of freshwater lakes for this parameter falls between 4 and 100 mg/L, making the July reading an outlier. This may have been caused by increased runoff after a heavy rainfall event before the July sampling date. The inlet station remained consistent ranging from 80 to 100 mg/L, which is more typical. The surface water at both sites would be considered moderate for total hardness.

Alkalinity values were fairly consistent at both stations throughout the sampling events, ranging from 40 mg/L to 56 mg/L. The conductivity readings were also relatively consistent, ranging from 290 to 440 umhos/cm. Conductivity remained well under its respective threshold at both sites throughout the season.

Ammonia, nitrates, and nitrites are nutrients based on the chemical composition of nitrogen. These naturally occurring compounds, when influenced by human activity, can cause excessive plant and algae growth. For May and July, both nitrites and ammonia had readings below the corresponding threshold. In August, both parameters were not detected at either site except for a low reading of ammonia at the inlet station. Nitrates were more concerning, exceeding the appropriate limit of 0.300 mg/L for both sites at all three dates. Nitrate readings ranged from 1.14 mg/L all the way up to 3.10 mg/L. This may be an indication of fertilizer use in the watershed. Further monitoring is needed.

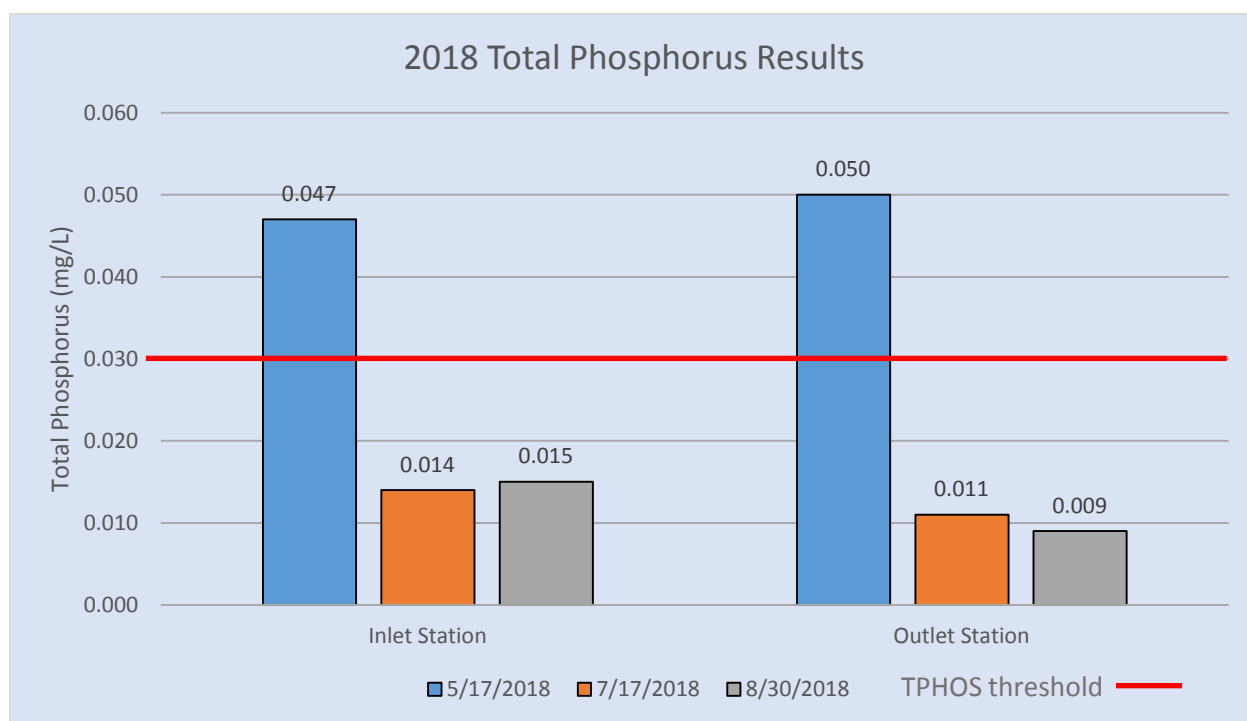


Figure 3. 2018 Total Phosphorous Results

Total phosphorus, when elevated, contributes to productivity of aquatic plant and algae growth. Both stations showed elevated total phosphorus levels in May, but decreased below the threshold in July and August. The elevated samples in May are probably typical for Alcyon Lake, but decrease later in the season due to dense plant growth. The plants use most of the available phosphorous, reflecting lower levels in July and August. With this in mind, we suspect the trophic status of the basin to be mesotrophic to eutrophic based more off of the May levels. Building a robust data set would further confirm this as well as additional testing of other parameters. A full-sized version of the total phosphorous chart can be found in the appendix.

Oligotrophic <0.012mg/L Very Good	Mesotrophic 0.012 - 0.024mg/L Good	Eutrophic 0.025 - 0.096mg/L Fair	Hypereutrophic >0.096mg/L Impoundments
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Table 3. Trophic Status Based on Phosphorus Values.

Water clarity increased throughout the season, beginning as low as 3.0 feet and reaching 10.0 feet in August. The May readings were 3.0 feet at both stations, which is considered poor. However, the July and August readings were both higher between 6.0 and 10.0 feet. This is considered excellent and well above the threshold. The lower water clarity in May could be the result of several different factors, such as the higher abundance of phytoplankton on this sampling event. Heavy rainfall events may have brought an excess of suspended sediment into the basin if they occurred close to this date.

Total suspended solids are naturally present within the water column with the potential to alter transparency readings as well as other parameters. A significant number of suspended particles within the water column can negatively impact biological processes. However, for Alcyon Lake, suspended solids were not detected throughout the majority of the season except for May with a reading of 5.2 mg/L at the outlet station. Turbidity, also directly related to total suspended solids and water clarity, was highest in May at 6.6 mg/L; however, overall readings were within the acceptable threshold for the season.

Lake Profile Description

Alcyon Lake – Outlet Station						
	5/17/2018		7/17/2018		8/30/2018	
Depth (feet)	Temp. (°C)	Dissolved Oxygen (mg/L)	Temp. (°C)	Dissolved Oxygen (mg/L)	Temp. (°C)	Dissolved Oxygen (mg/L)
0	19.5	5.45	28.3	8.58	28.6	10.20
2'	19.3	5.45	28.2	8.68	28.3	12.20
4'	18.2	4.16	27.9	8.40	25.3	11.80
6'	16.3	1.17	28.1	8.06	25.2	11.30
8'	15.7	0.40	25.4	1.50		

Table 4. 2018 Temperature and Dissolved Oxygen Profiles

In 2018, temperature and dissolved oxygen profiles were collected from the outlet station site utilizing a calibrated temperature/dissolved oxygen meter. During the first visit in May, surface water temperature was 19.5°C. The second visit in July the surface temperature rose to 28.3°C. On the final visit in August, the temperature was consistent at 28.6°C. Throughout the visits, the surface temperature increased by 8.8°C from May to June and was fairly consistent from

June to August (0.3°C difference). As discussed in the previous section, comparing the surface temperatures at each station, the outlet station had consistently higher temperatures. In comparison to the inlet station, which has cooler water flowing in from the stream.

The profile data on all three sampling dates revealed a well-mixed water column. Water temperatures and dissolved oxygen levels throughout the water column remained fairly consistent. According to the results, indications of weak stratification may be occurring from 6 feet and deeper based on May and July profiles. Due to the shallow depth of the lake, this likely indicates a polymictic basin. That is, when weak stratification sets in during the season, but high winds or heavy storm events cause a breakdown in stratification and water column mixing. This could possibly explain the elevated nutrient levels in May. Complete profile graphs are provided in the Appendix of this report.

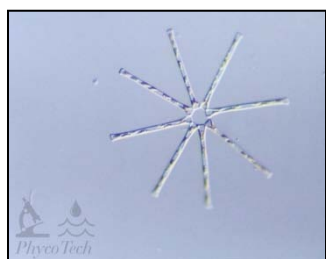
Phytoplankton Primer

Lakes typically contain three broad categories of phytoplankton (also sometimes referred to as algae). These include filamentous phytoplankton, macroscopic multi-branched phytoplankton (which appear similar to submersed plants), and unicellular phytoplankton. Each category shall be discussed in turn.

Filamentous phytoplankton are typically macroscopic (that is, visible with the naked eye), composed of long chains of cells that are attached to a substrate, typically the lake bottom, submersed or emergent vegetation, or rocks. This is called benthic filamentous algae (BFA), and rampant growth can become visible at the surface. As pieces of benthic filamentous algae break apart, it often floats on the surface as dense unsightly mats called floating filamentous algae (FFA). Typically, genera of green algae or blue-green algae develop into nuisance filamentous mats. Abundant nuisance growth of filamentous phytoplankton creates numerous negative impacts to a lake. These can include a decrease in aesthetics, a decrease in recreational uses, increased fishing frustration, and water quality degradation.

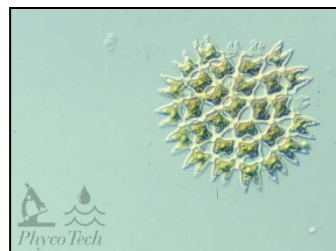
Macroscopic multi-branched phytoplankton appear to be submersed plants, especially when viewed in the water column. Physical examination reveals simple structures, no conductive tissue, and a lack of roots (instead having simplified rhizoids). Although typically only reaching heights of a few inches, under ideal conditions, this type of phytoplankton can reach lengths of several feet, and create a dense carpet on the bottom of a lake. Therefore, it typically does not reach nuisance levels in a lake, save for high use areas such as beaches and other popular swim areas. Since this phytoplankton occupies a similar ecological niche as submersed plants, it's often included in detailed and visual aquatic plant surveys. It provides numerous benefits to a lake system, including sediment stabilization, acting as a nutrient sink, providing invertebrate and fish shelter and habitat, and is one of the first to re-colonize a disturbed area. In the Northeast, muskgrass (*Chara* sp.) and stonewort (*Nitella* sp.) are two of the most common macroscopic multi-branched phytoplankton.

Unicellular phytoplankton are typically microscopic and consist of individual cells or colonies of cells suspended in the water column. At high enough densities (often called a bloom), they can impart a green or brown (and sometimes, even red) tint to the water column. Unicellular phytoplankton belongs to several taxonomic groups with density and diversity of these groups often varying due to seasonality. When unicellular phytoplankton density becomes elevated it can reduce water clarity (giving the water a “pea soup” appearance), and impart undesirable odors. Usually blue-green algae are responsible for these odors, but other groups or extremely elevated densities can impart them as well. In addition to decreased aesthetics, unicellular phytoplankton blooms can cause degradation of water quality, increase the water temperature (turbid water warms faster than clear water), and can possibly produce a variety of toxins (in the case of blue-green algae), depending on the type of genera present and environmental conditions. Numerous groups of unicellular phytoplankton are common in the Northeast, including diatoms, golden algae, green algae, blue-green algae, euglenoids, and dinoflagellates. Each group shall be discussed in turn.



Diatoms are ubiquitous as a group, and often possess a rigid silica shell with ornate cell wall markings or etchings. The silica shells settle to the bottom substrate after they die, and under ideal conditions can become stratified. Limnologists can then study historical (and possibly even ancient) population characteristics of diatoms. Some are round and cylindrical (centric) in shape, while others are long and wing-shaped (pennales). They are usually brown in color, and reach maximum abundance in colder or acidic water. Therefore, they tend to dominate in winter and early spring. Common diatoms in the Northeast include *Fragilaria*, *Cyclotella*, *Navicula*, and *Asterionella* (pictured).

Golden Algae are typically yellow or light brown in color. Cell size is usually small oval shaped with a partially empty area, but several genera create colonies of smaller cells. Most have two flagella, and some type of scales or a rigid coating that grants it a fuzzy appearance. However, a few filamentous forms are possible as well. They typically prefer cooler water, so they dominate in the late fall, winter, or early spring. They also tend to bloom at deeper (cooler) depths. They are common in low nutrient water, and numerous forms produce taste and odor compounds. Common golden algae in the Northeast include *Dinobryon* (pictured), *Mallomonas*, and *Synura*.



Green Algae are a very diverse group of unicellular phytoplankton. There is tremendous variability in this group which varies from family to family and sometimes even genus to genus. There are flagellated single cells, multi-cell colonies (some motile), filamentous forms and attached forms, typically with distinct cell shapes light green in color. Some prefer acidic waters, and others highly eutrophic (sewage) conditions. A green algae bloom usually occurs in water with high nitrogen levels. Green algae typically dominate in mid to late summer in the

Northeast. Common genera include *Chlorella*, *Scenedesmus*, *Spirogyra* and *Pediastrum* (pictured).

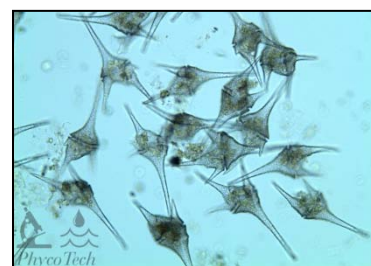
Blue-green algae are actually photosynthetic bacteria. Therefore, they tend to be small, simple in structure and lacking interior cell details. Blue-green algae are typically encased in a mucilaginous outer layer. Some genera are adorned with heterocysts, swollen structures capable of fixing nitrogen, a competitive advantage. These types tend to bloom in nitrogen-poor or eutrophic systems. Yet, blue-green algae are tolerant of a wide variety of water chemistries, and boast many oligotrophic forms as well. Blue-green algae often have gas vesicles which provide increased buoyancy another competitive advantage over other groups of phytoplankton, due to their propensity to shade out others by blooming at the surface. Numerous blue-green algae are documented taste and odor (T&O) producers, and under certain environmental conditions and high enough densities, can produce toxins dangerous to fish, livestock, and possibly humans. Blue-green algae typically dominate a lake system in late summer to early fall. Common blue-green algae that occur in the Northeast include *Anabaena* (pictured), *Aphanizomenon*, *Microcystis* and *Coelosphaerium*.



Euglenoids are typically motile with 0 to 3 (typically 2) flagella, one of which is longer. Euglenoids have plasticity of shape, and usually are grass green in color (although sometime they are clear or even red). Most forms have a distinct red “eyespot.” They are often associated with high organic content water, and eutrophic conditions. Common euglenoids that occur in the Northeast

include *Euglena* (pictured), *Phacus*, and *Trachelomonas*.

Dinoflagellates are very common in marine environments, in which they often cause toxic blooms. However, toxin production in freshwater genera is very rare. Dinoflagellates are typically single ovoid to spherical cells, but large compared to phytoplankton from other groups. They usually possess two flagella (one wrapped around the middle of the cell) which grant them rotation while they move through the water column.



Cellulose plates (armored dinoflagellates) are more common, but genera without cellulose plates (naked dinoflagellates) also occur. They generally prefer organic-rich or acidic waters, and can impart a coffee-like brown tint to the water at high enough densities. Common dinoflagellates in the Northeast include *Ceratium* (pictured) and *Peridinium*.

Phytoplankton Methods

During the water quality sampling events, a phytoplankton sample was collected at the surface of both the established sampling stations using a clean 1,000 ml HDPE or Nalgene plastic bottle. Immediately following collection, the bottle was placed in a dark cooler stocked with ice to chill

the sample. The sample was returned to SOLitude's laboratory for analysis within 24 hours. If the sample could not be examined within 24 hours, it was preserved using 0.5 mL of an iodine solution. A sub-sample was then sand filtered and microscopically examined at 100X magnification using a compound microscope. Using regionally appropriate taxonomic keys, the phytoplankton was identified to genus level and enumerated. The results are discussed below and associated full-size pie graphs are included in the Appendix of this report.

Phytoplankton Results

Phytoplankton Distribution – Inlet Station						
Phytoplankton Group	5/17/2018		7/17/2018		8/30/2018	
	Org./mL	%	Org./mL	%	Org./mL	%
Diatoms	50	9.26%	20	50.00%	50	41.67%
Golden Algae					10	8.33%
Green Algae	490	90.74%	20	50.00%	60	50.00%
Blue-green Algae						
Euglenoids						
Protozoa						
Dinoflagellates						
Total Organisms/mL	540	100%	40	100%	120	100%

Table 5. 2018 Phytoplankton Distribution – Inlet Station

At the inlet station in May, the phytoplankton density was considered moderate, the highest of the three sampling events. Phytoplankton diversity was also moderate. The inlet station was dominated by green algae, specifically the genus *Sphaerocystis*, accounting for 90.74% of the total algae found at this site. Traces of diatoms were also observed during this sampling event.

The July sampling resulted in a decreased abundance of phytoplankton at inlet station, and was considered low. The diversity followed the density decrease and was now also low. The assemblage was an even distribution of diatoms and green algae at trace amounts.

In August at the inlet station, the phytoplankton density increased slightly, but remained low. Diversity seemed to mirror the density yet again by slightly increasing but remaining low. Green algae accounted for 50% of the assemblage, making them the dominant group during this sampling event. Diatoms also had a significant presence at 41.67%. Trace amounts of golden algae were observed.

Phytoplankton Distribution – Outlet Station						
Phytoplankton Group	5/17/2018		7/17/2018		8/30/2018	
	Org./mL	%	Org./mL	%	Org./mL	%
Diatoms	190	25.68%	50	83.33%	50	45.46%
Golden Algae	10	1.35%				
Green Algae	540	72.97%	10	16.67%	30	27.27%
Blue-green Algae					30	27.27%
Euglenoids						
Protozoa						
Dinoflagellates						
Total Organisms/mL	740	100%	60	100%	110	100%

Table 6. 2018 Phytoplankton Distribution – Outlet Station

During the May sampling date, the outlet station had a presence of green algae which accounted for 72.97% of the assemblage. The remainder of the population consisted of diatoms along with trace amounts of golden algae. Both density and diversity were considered moderate at this time.

Like the inlet station, the July sampling event observed a large decrease in phytoplankton density and diversity at the outlet station. The majority of the assemblage was diatoms (83.33%) with the rest being green algae.

In August, the phytoplankton density increased slightly but remained low. Diversity increased to moderate. Diatoms were the most prevalent at 45.46% while the rest of the assemblage consisted of green algae and blue-green algae. While blue-green algae are generally the common group of concern when it comes to lake health, its low abundance observed at Lake Alcyon is considered non-problematic at this time.

Summary and Recommendations

In 2018, Solitude Lake Management conducted water quality monitoring at two locations within Alcyon Lake. The sampling events included measuring a temperature/dissolved oxygen profile (outlet station only), measurement of limnological parameters *in situ*, the collection of water chemistry samples, and the collection of phytoplankton samples. During our sampling events, in general there seemed to be a high amount of submersed aquatic vegetation. In order to gain a more accurate understanding of the density and species of plants, we recommend conducting an aquatic vegetation survey.

In 2014, a detailed aquatic plant survey was conducted, showing nuisance level densities of a variety of plants, some harmful invasive species. In particular, hydrilla (*Hydrilla verticillata*), a highly invasive submersed plant, was rampant throughout Alcyon Lake. It was present in 83% of the basin with 37% of that being at nuisance level densities. This alone is highly concerning and

should be reevaluated in a 2019 aquatic plant survey. Assessing the aquatic plant community will help establish the current structure of the community. A supplemental visual survey can be incorporated into the routine water quality sampling program, or it can include detailed mapping utilizing the Point Intercept Method of Aquatic Plant Sampling (developed by the ACOE and Cornell University) and GPS-referenced sampling locations. These results could then be used to alter our management strategies as needed. Additional information on these surveys can be obtained by contacting SOLitude Lake Management's office.

Results of water quality sampling were fairly consistent for total phosphorus, except for May. Total phosphorus was above the threshold at both sampling stations on that date. The results suggest that the high total phosphorous early in the season fueled the excessive aquatic plant growth, causing decreased levels in July and August. The results also indicate that in general the lake is a low pH, low alkalinity system, however the pH was noticeably higher in the July and August sampling events at the outlet station. Nitrate levels were also observed to be high at all sampling events at both sites. This is most likely due to runoff containing nitrogen-based fertilizers from residential lawns. This is a potential concern to the lake as high nitrate levels can cause excessive growth of plants and algae. This may be a contributing factor as to why the aquatic plant community appeared dense based on our field observations.

Continuing to collect baseline data is extremely beneficial as it can prove to be instrumental in detecting algal blooms or any anomalies that might cause deterioration of the lake. We also recommend adding another parameter, Chlorophyll a, which is a good indicator of algae abundance and productivity in aquatic environments. Chlorophyll a would help determine the TSI (Trophic State Index), which will provide more supportive data in determining the productivity of the basin.

Based on the collected data, Alcyon Lake supports a low abundance of nuisance phytoplankton. The phytoplankton analysis indicated that during sampling events, the planktonic algae community was generally at non-problematic densities with favorable composition. The specific genera of the phytoplankton found at Alcyon Lake, such as green algae, golden algae, and diatoms are considered ideal for a healthy lake system. There was a presence of blue-green algae at the outlet station in August. This was most likely encouraged by suitable conditions and stagnation of water from nuisance aquatic plants.

The current water quality monitoring program is well-designed, and provides suitable water quality data allowing for proactive management of the lake's environment and reduces the opportunity for the development of problematic situations. It is important to continue water quality monitoring on a regular yearly basis over the long-term to build a robust data set which could help biologists in creating more quantitative analysis and provide suitable management procedures.

Solitude Lake Management would like to take this opportunity to thank the Pitman Environmental Commission for allowing us to provide lake management consulting services. We look forward to working with you again through the 2019 lake management season.

Sincerely,

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Appendix

Sampling Location Map

Water Quality Parameters

Total Phosphorous Graph

Phytoplankton Distribution Graphs and Pie Charts

Phytoplankton Raw Data Sheets

Outlet Station Dissolved Oxygen and Temperature Profiles

Alpha Analytical Lab Results

2018 Water Quality Sampling Site Map



Alcyon Lake

Water Quality Site Map

Inlet Station is established in the center of the inlet.

Outlet Station is established near the dam.



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Water Quality Parameters

Temperature

Temperature, measured in degrees Celsius, is very important to aquatic biota. Several factors affect temperature in a lake system, including air temperature, season, wind, water flow through the system, and shade trees. Turbidity can also increase water temperature as suspended particles absorb sun rays more efficiently. Water depth also affects temperature. In general, deeper water remains cooler during the summer months. Temperature preferences vary among aquatic biota. Since water temperature typically varies between 5 °C and 30 °C during the season, most aquatic biota can flourish under this wide range of temperatures. Of more concern is thermal shock, which occurs when temperature rapidly changes in a short amount of time. Some aquatic biota can become stressed when temperature changes as little as 1-2 °C in a 24 hour period.

Dissolved Oxygen

Dissolved Oxygen is the measurement of the amount of oxygen freely available to aquatic biota in water. Several factors play a role in affecting the amount of dissolved oxygen in the water. These factors include temperature (warmer water holds less dissolved oxygen), atmospheric pressure (low pressure at higher altitude decreases the solubility of oxygen), mineral content of the water (can reduce the water's dissolved oxygen capacity), and water mixing (via wind, flow over rocks, or thermal upwelling increases dissolved oxygen in the water). In addition, an over abundance of organic matter, such as dead algae or plants causes rapid aerobic bacteria growth. During this growth, bacteria consume oxygen during respiration, which can cause the water's dissolved oxygen to decrease. Dissolved oxygen has a wide range, from 0 mg/L to 20 mg/L. To support diverse aquatic biota, 5-6 mg/L is minimally required, but 9-10 mg/L is an indicator of better overall water quality. Dissolved oxygen reading of below 4 mg/L is stressful to most aquatic organisms, especially fish.

Water Clarity

Transparency within the water column is measured with a Secchi disc and can provide an experienced biologist with a quick determination of a lake's water quality. In short, higher visibility indicates a cleaner (and healthier) aquatic system. Cloudy conditions could indicate nutrient rich sediments entering the lake or excessive algal blooms due to nutrient availability, leading to a degradation of water quality. Clear conditions allow greater light penetration and the establishment of a deeper photic zone. The photic zone is the depth of active photosynthesis carried out by plants and algae. A byproduct of photosynthesis is dissolved oxygen, required for use by higher aquatic organisms, such as zooplankton and fish.



Alkalinity

Alkalinity is the measure of the water's capacity to neutralize acids. A higher alkalinity can buffer the water against rapid pH changes, which in turn prevents undue stress on aquatic biota due to fluctuating pH levels. The alkalinity of a lake is primarily a function of the watershed's soil and rock composition. Limestone, dolomite and calcite are all a source of alkalinity. High levels of precipitation in a short amount of time can decrease the water's alkalinity. A typical freshwater lake has an alkalinity of 20-200 mg/L. A lake with a low alkalinity typically also has a low pH, which can limit the diversity of aquatic biota.

pH

The measurement of acidity or alkalinity of the water is called pH (the "potential for hydrogen"). Several factors can impact the pH of a lake, including precipitation in a short amount of time, rock and soil composition of the watershed, algal blooms (increase the pH), and aquatic plant decomposition (decreases the pH). A pH level of 6.5 to 7.5 is considered excellent, but most lake systems fall in the range of 6.0 to 8.5. Aquatic biota can become stressed if the pH drops below 6.0, or increases above 8.5 for an extended amount of time.

Most aquatic biota are adapted to specific pH ranges. When the pH fluctuates rapidly, it can cause changes in aquatic biota diversity. Immature stages of aquatic insects and juvenile fish are more sensitive to low pH values than their adult counterparts. Therefore, a low pH can actually inhibit the hatch rate and early development of these organisms.

Total Hardness

Hardness is a measure of dissolved salts in the water, usually calcium, but also magnesium and iron. Hardness is usually influenced by the rock and soil types of the watershed and the amount of runoff over these surfaces. Hardness can be measured for only calcium content (Hardness (Ca)), or for all three salts, called Total Hardness. Water with Hardness (Ca) less than 10 mg/L can only support sparse aquatic biota. Freshwater typically has a Hardness (Ca) level from 4 to 100 mg/L.

Conductivity

Conductivity is the measure of water's ability to conduct an electrical current, and is measured in umhos/cm, the higher the number of charged particles (ions) in the water, the easier for electricity to pass through it. Conductivity is useful in lake management by estimating the dissolved ionic matter in the water. In general for lakes, the lower the conductivity, the higher the quality of water (oligotrophic). A higher conductivity usually indicates an abundance of plant nutrients (total phosphorous and nitrate), or eutrophic conditions. Industrial discharge, road salt runoff, and septic tank leaching can increase conductivity. Distilled water has a

conductivity of 0.5 to 2.0 umhos/cm, while drinking water conductivity typically ranges from 50 to 1,500 umhos/cm. Conductivity below 500 umhos/cm is considered ideal in a lake system.

Nitrate

Nitrates are chemical compounds derived from nitrogen and oxygen. Nitrogen is needed by all plants and animals to make proteins needed for growth and reproduction. Nitrates are generated during plant and animal decomposition, from man-made sources, and from livestock and waterfowl sources. Man-made sources of nitrates include septic system leaching, fertilizer runoff, and improperly treated wastewater. Freshwater lake systems can potentially receive large nitrate inputs from waterfowl, specifically large flocks of Canada geese. An increase in nitrate levels can in turn cause an increase in total phosphorous levels. A nitrate level greater than 0.3 mg/L can promote excessive growth of aquatic plants and algae.

Nitrite

Nitrite, like nitrate, is a chemical compound derived from nitrogen and oxygen. Many of the sources of nitrite are similar for nitrate. These include nitrite generated during plant and animal decomposition, man-made sources (such as septic system leaching, fertilizer runoff, industrial discharge), and animal and waterfowl excretion. An elevated nitrite level can cause aquatic plants and algae to more efficiently utilize available phosphorous. In water, nitrites are usually quickly converted to nitrates and therefore nitrite levels are typically undetectable in water. A nitrite level 0.3 mg/L can promote excessive aquatic plant and algae growth. A nitrite level exceeding 5.0 mg/L can induce stress to warm water fish species and contribute to a reduced diversity of such aquatic biota.

Ammonia

Ammonia is a type of nitrogen compound used by plants and algae to support growth. Ammonia content in a body of water is influenced by decaying plants and animals, animal waste, industrial waste effluent, agricultural runoff, and atmospheric nitrogen gas transfer. A concentration exceeding 0.30 mg/L can promote excessive plant and algae growth. Elevated ammonia levels can increase nitrification, which in turn depletes the oxygen content of water. Extremely high ammonia levels can be toxic to aquatic biota (such as fish).

Total Phosphorous

Total phosphorous is a chemical compound derived from phosphorous and oxygen. Phosphorous is usually present in freshwater in low concentrations and is often the limiting nutrient to aquatic plant growth. However, man-made sources of phosphorous include septic system leaching, fertilizer runoff, and improperly treated wastewater. These phosphorous inputs usually enter a freshwater lake system during rain events and bank erosion.

A total phosphorous level greater than 0.03 mg/L can promote excessive aquatic plant growth and decomposition, either in the form of algal blooms or nuisance quantities of aquatic plants. This process is called eutrophication and when induced or sped up by man-made nutrient inputs, it is called cultural eutrophication. As a result of this excessive growth, recreational activities, such as swimming, boating, and fishing in the lake can be negatively impacted. In addition, aerobic bacteria will thrive under these conditions, causing a decrease in dissolved oxygen levels which can negatively impact aquatic biota such as fish.

Turbidity

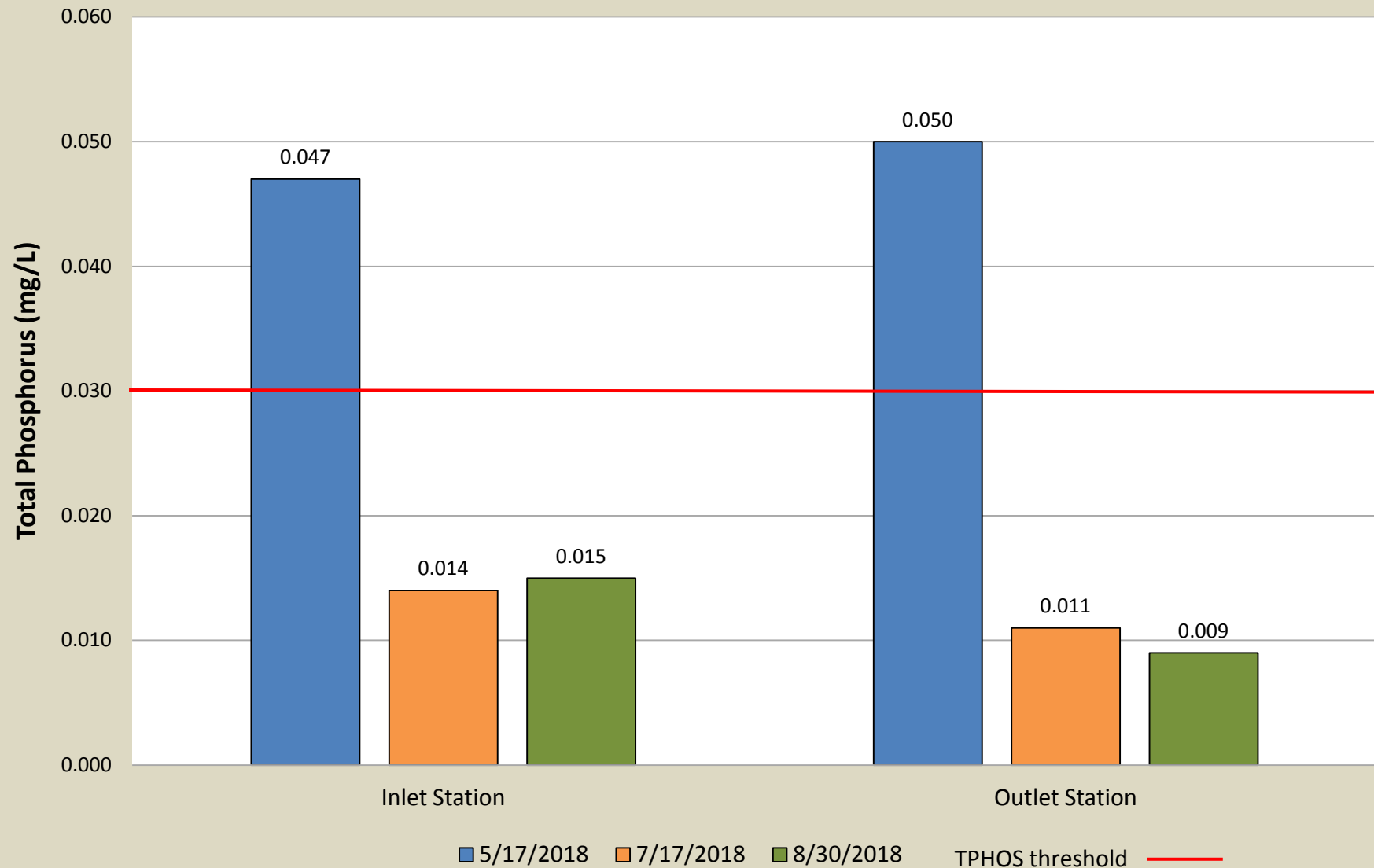
Turbidity is the measurement of lack of water clarity, and is measured in NTU. Suspended solids in the water column cause an increase in turbidity. Therefore, the lower the turbidity measurement, the clearer the water is. The leading sources of turbidity include soil erosion, waste discharge, urban runoff, flooding, dredging operations, increased flow rates, or algae blooms. An overabundance of bottom feeding fish, such as carp, can also increase turbidity due to constant grazing and disturbing of fine bottom sediments. A turbidity of 25 NTU or less is desirable for a lake. Ideal trout waters have a turbidity of 10 NTU or less, but most aquatic biota can be sustained in water with a turbidity of 50 NTU or less. Although a turbidity level of 5.0 NTU or greater is generally considered visible to the observer, there is some industry discussion on value of turbidity measurements in relation to aesthetics

Turbidity can affect a lake in many ways. These include temperature increases (as suspended particles absorb more sunlight), reduced light penetration (which reduces aquatic plant habitat in the littoral zone), and negative fish impacts. Negative impacts on fish population include suspended solids clogging and damaging fish gills, reduced clarity affecting the ability of predatory fish to locate food by sight, and inhibit proper egg and larval development.

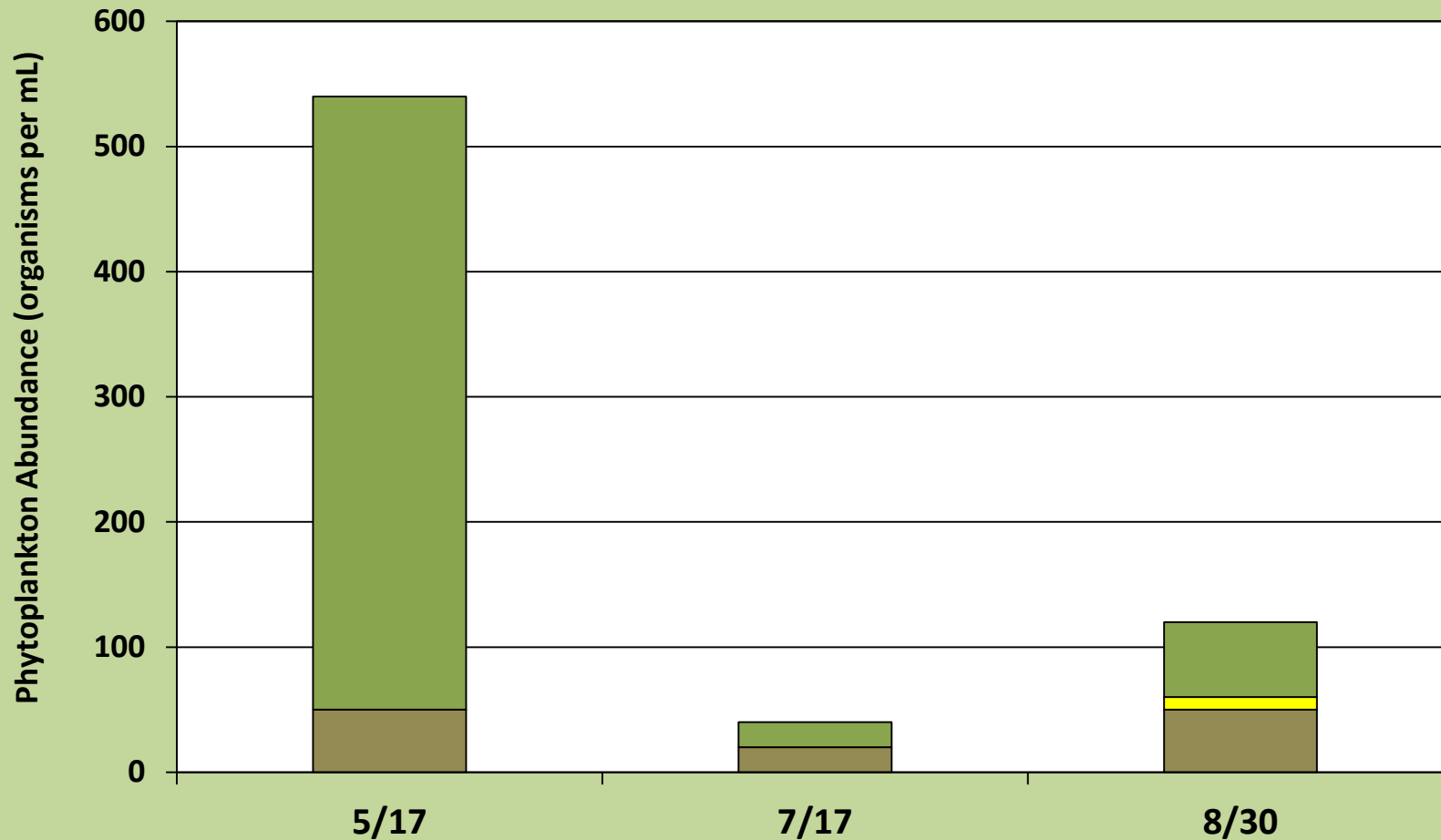
Total Suspended Solids

Total suspended solids refer to all of the particulate matter suspended in the water column. When these solids settle to the bottom of a water body (a process called siltation), they become sediments. There are two components that make up total suspended solids: inorganic and organic. The inorganic portion is usually considerably higher than the organic portion and includes silts, clays, and soils. Organic solids include algae, zooplankton, bacteria and organic debris. All these solids create turbid (or “muddy”) conditions. The geology and vegetation of a watershed affect the amount of suspended solids that enter a lake system. Most suspended solids originate from accelerated soil erosion from agricultural operations, logging activities, and construction activities. Another source is the disturbance of bottom sediments from dredging activities, grazing of bottom feeding fish, and recreational activities such as boating.

2018 Total Phosphorus Results

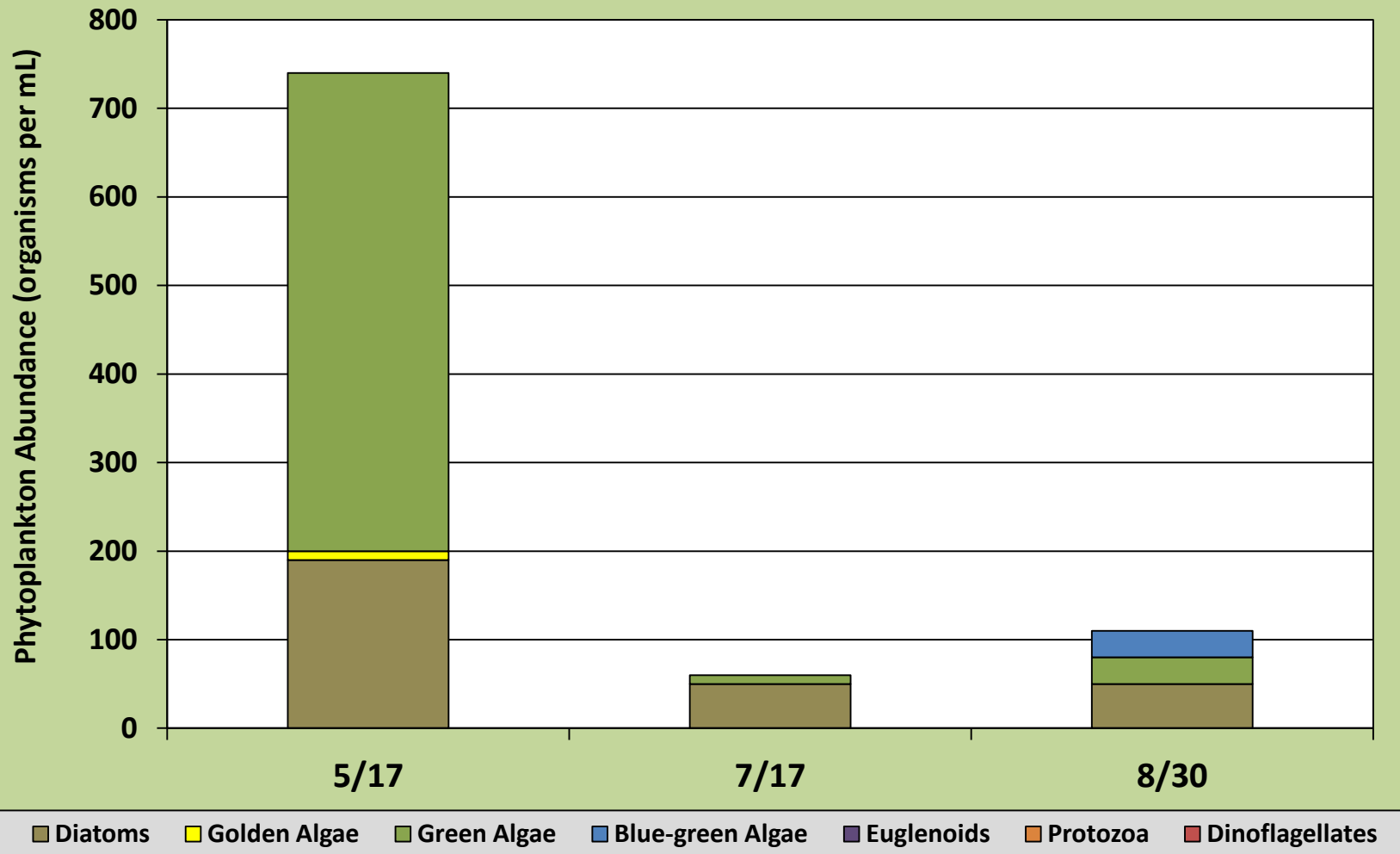


**Alcyon Lake: Inlet Station
Phytoplankton Abundance and Distribution
2018**

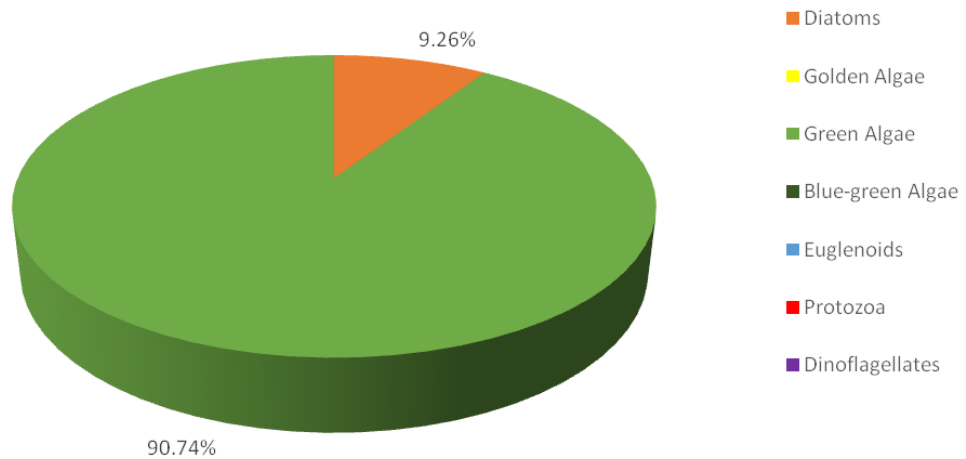


Diatoms Golden Algae Green Algae Blue-green Algae Euglenoids Protozoa Dinoflagellates

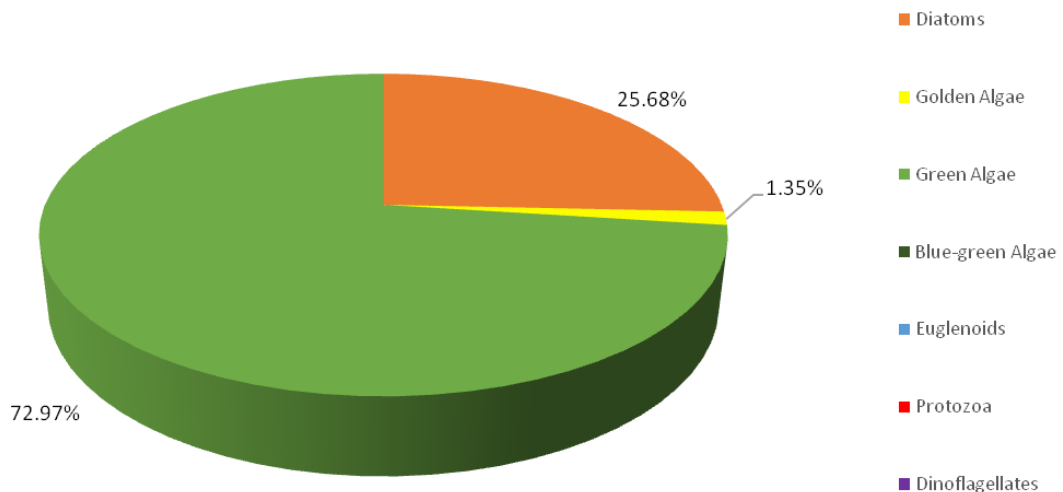
**Alcyon Lake: Outlet Station
Phytoplankton Abundance and Distribution
2018**



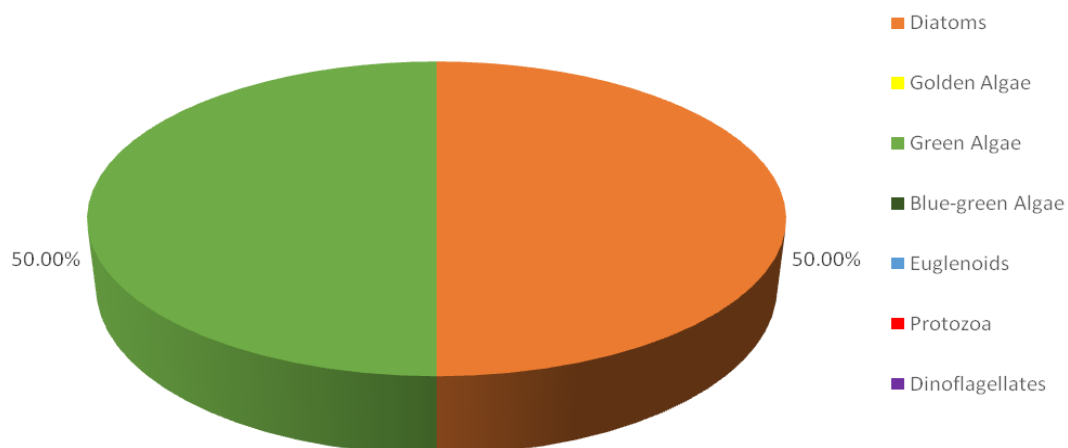
Phytoplankton Distribution
Alcyon Lake: Inlet Station
5/17/2018



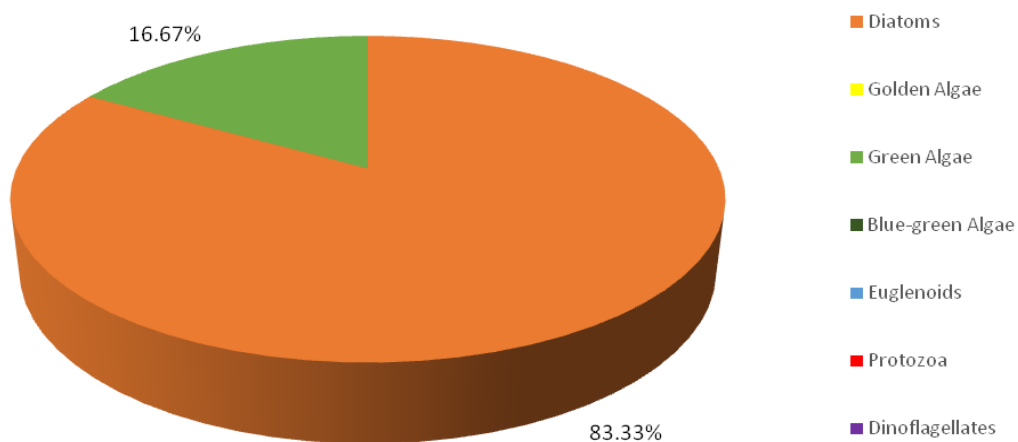
Phytoplankton Distribution
Alcyon Lake: Outlet Station
5/17/2018



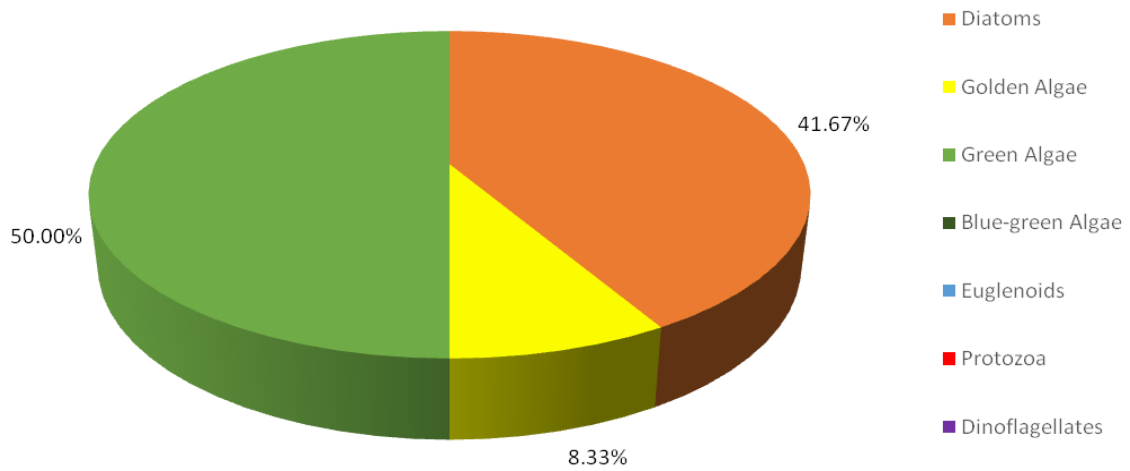
Phytoplankton Distribution
Alcyon Lake: Inlet Station
7/17/2018



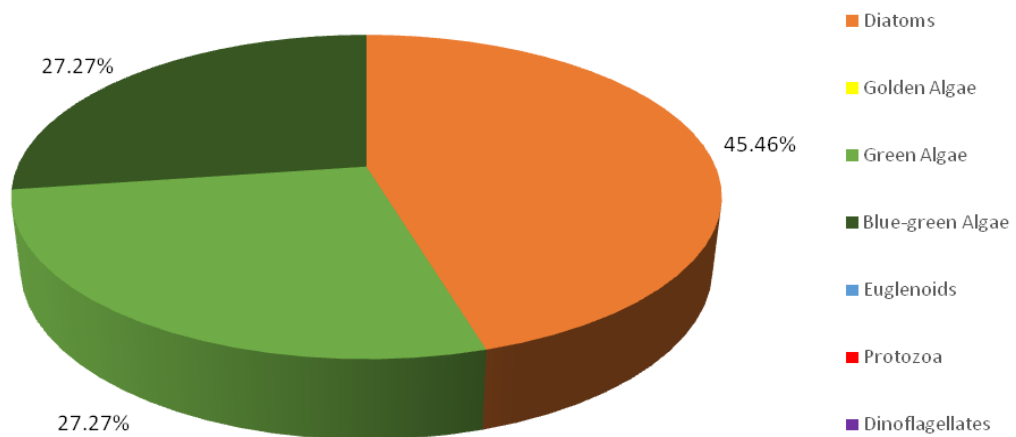
Phytoplankton Distribution
Alcyon Lake: Outlet Station
7/17/2018



Phytoplankton Distribution
Alcyon Lake: Inlet Station
8/30/2018



Phytoplankton Distribution
Alcyon Lake: Outlet Station
8/30/2018



MICROSCOPIC EXAMINATION OF WATER											
Sample from: Alcyon Lake											
Collection Date: 5/17/2018				Examination Date: 5/18/2018				Amount Examined: 200 ml.			
Site A: Inlet Station				Site B: Outlet Station				Site C:			
BACILLARIOPHYTA (Diatoms)	A	B	C	CHLOROPHYTA (Green Algae)	A	B	C	CYANOPHYTA (Blue-green Algae)	A	B	C
<i>Asterionella</i>		10		<i>Ankistrodesmus</i>	150	30		<i>Anabaena</i>			
<i>Cyclotella</i>	30	150		<i>Chlamydomonas</i>				<i>Anacystis</i>			
<i>Cymbella</i>				<i>Chlorella</i>				<i>Aphanizomenon</i>			
<i>Diatoma</i>				<i>Chlorococcum</i>				<i>Coelosphaerium</i>			
<i>Fragilaria</i>	10			<i>Closterium</i>	20			<i>Gomphospheria</i>			
<i>Melosira</i>				<i>Coelastrum</i>	50	220		<i>Lyngbya</i>			
<i>Navicula</i>	10	10		<i>Eudorina</i>				<i>Microcystis</i>			
<i>Nitzschia</i>				<i>Mougeotia</i>				<i>Oscillatoria</i>			
<i>Pinnularia</i>				<i>Oedogonium</i>				<i>Pseudoanabaena</i>			
<i>Rhizosolenia</i>				<i>Oocystis</i>				<i>Synechocystis</i>			
<i>Stephanodiscus</i>		20		<i>Pandorina</i>				<i>Agmenellum</i>			
<i>Stauroneis</i>				<i>Pediastrum</i>							
<i>Synedra</i>				<i>Phytoconis</i>				PROTOZOA			
<i>Tabellaria</i>				<i>Rhizoclonium</i>				<i>Actinophrys</i>			
<i>Cocconeis</i>				<i>Scenedesmus</i>		10					
CHRYSTOPHYTA (Golden Algae)	A	B	C	<i>Spirogyra</i>				EUGLENOPHYTA (Euglenoids)	A	B	C
				<i>Staurostrum</i>							
<i>Dinobryon</i>		10		<i>Sphaerocystis</i>	270	270		<i>Euglena</i>			
<i>Mallomonas</i>				<i>Ulothrix</i>		10		<i>Phacus</i>			
<i>Synura</i>				<i>Volvox</i>				<i>Trachelomonas</i>			
<i>Tribonema</i>				<i>Zygnema</i>							
<i>Uroglenopsis</i>				<i>Aulacoseira</i>							
								PYRRHOPHYTA (Dinoflagellates)	A	B	C
								<i>Ceratium</i>			
								<i>Peridinium</i>			
SITE	A	B	C	NOTES: This is the first sampling event of 2018. The algal density is considered to be moderate at both sites. Algal diversity is also considered to be moderate for both sites. The assemblage is dominated by a variety of green algae. Lesser amounts of diatoms were also observed. Golden algae were observed at site B only. Water clarity is considered to be poor to fair at each site.							
TOTAL GENERA:	7	10									
TRANSPARENCY:	3.0'	3.0'									
ORGANISMS PER MILLILITER:	540	740									

MICROSCOPIC EXAMINATION OF WATER											
Sample from: Alcyon Lake											
Collection Date: 7/17/2018				Examination Date: 7/18/2018				Amount Examined: 200 ml.			
Site A: Inlet Station				Site B: Outlet Station				Site C:			
BACILLARIOPHYTA (Diatoms)	A	B	C	CHLOROPHYTA (Green Algae)	A	B	C	CYANOPHYTA (Blue-green Algae)	A	B	C
<i>Asterionella</i>				<i>Ankistrodesmus</i>				<i>Anabaena</i>			
<i>Cyclotella</i>				<i>Chlamydomonas</i>				<i>Anacystis</i>			
<i>Cymbella</i>				<i>Chlorella</i>				<i>Aphanizomenon</i>			
<i>Diatoma</i>				<i>Chlorococcum</i>				<i>Coelosphaerium</i>			
<i>Fragilaria</i>				<i>Closterium</i>				<i>Gomphosphseria</i>			
<i>Melosira</i>				<i>Coelastrum</i>				<i>Lyngbya</i>			
<i>Navicula</i>	10	20		<i>Eudorina</i>				<i>Microcystis</i>			
<i>Nitzschia</i>				<i>Mougeotia</i>	20			<i>Oscillatoria</i>			
<i>Pinnularia</i>				<i>Oedogonium</i>				<i>Pseudoanabaena</i>			
<i>Rhizosolenia</i>				<i>Oocystis</i>				<i>Synechocystis</i>			
<i>Stephanodiscus</i>	10	30		<i>Pandorina</i>				<i>Agmenellum</i>			
<i>Stauroneis</i>				<i>Pediastrum</i>							
<i>Synedra</i>				<i>Phytoconis</i>				PROTOZOA			
<i>Tabellaria</i>				<i>Rhizoclonium</i>				<i>Actinophrys</i>			
<i>Cocconeis</i>				<i>Scenedesmus</i>							
CHRYSTOPHYTA (Golden Algae)	A	B	C	<i>Spirogyra</i>				EUGLENOPHYTA (Euglenoids)	A	B	C
				<i>Staurostrum</i>				<i>Euglena</i>			
<i>Dinobryon</i>				<i>Sphaerocystis</i>				<i>Phacus</i>			
<i>Mallomonas</i>				<i>Ulothrix</i>		10		<i>Trachelomonas</i>			
<i>Synura</i>				<i>Volvox</i>							
<i>Tribonema</i>				<i>Zygnema</i>							
<i>Uroglenopsis</i>				<i>Aulacoseira</i>							
								PYRRHOPHYTA (Dinoflagellates)	A	B	C
								<i>Ceratium</i>			
								<i>Peridinium</i>			
SITE	A	B	C	NOTES: Since the last sampling event, algal density decreased and is now considered low. Algal diversity also decreased and is now low. The assemblage consists of green algae and diatoms. Water clarity increased and is now considered good at both sites.							
TOTAL GENERA:	3	3									
TRANSPARENCY:	7.0' est	6.0'									
ORGANISMS PER MILLILITER:	40	60									

MICROSCOPIC EXAMINATION OF WATER

Sample from: Alcyon Lake

Collection Date: 8/30/2018

Examination Date: 8/31/2018

Amount Examined: 200 ml.

Site A: Inlet Station

Site B: Outlet Station

Site C:

BACILLARIOPHYTA (Diatoms)	A	B	C	CHLOROPHYTA (Green Algae)	A	B	C	CYANOPHYTA (Blue-green Algae)	A	B	C
<i>Asterionella</i>				<i>Ankistrodesmus</i>				<i>Anabaena</i>		30	
<i>Cyclotella</i>				<i>Chlamydomonas</i>				<i>Anacystis</i>			
<i>Cymbella</i>				<i>Chlorella</i>				<i>Aphanizomenon</i>			
<i>Diatoma</i>				<i>Chlorococcum</i>				<i>Coelosphaerium</i>			
<i>Fragilaria</i>		10		<i>Closterium</i>				<i>Gomphospheria</i>			
<i>Melosira</i>	10			<i>Coelastrum</i>		20		<i>Lyngbya</i>			
<i>Navicula</i>		30		<i>Eudorina</i>				<i>Microcystis</i>			
<i>Nitzschia</i>				<i>Mougeotia</i>				<i>Oscillatoria</i>			
<i>Pinnularia</i>	40			<i>Oedogonium</i>		10		<i>Pseudoanabaena</i>			
<i>Rhizosolenia</i>				<i>Oocystis</i>				<i>Synechocystis</i>			
<i>Stephanodiscus</i>				<i>Pandorina</i>				<i>Agmenellum</i>			
<i>Stauroneis</i>				<i>Pediastrum</i>							
<i>Synedra</i>		10		<i>Phytoconis</i>				PROTOZOA			
<i>Tabellaria</i>				<i>Rhizoclonium</i>				<i>Actinophrys</i>			
<i>Cocconeis</i>				<i>Scenedesmus</i>	50						
CHRYSTOPHYTA (Golden Algae)	A	B	C	<i>Spirogyra</i>				EUGLENOPHYTA (Euglenoids)	A	B	C
				<i>Staurostrum</i>				<i>Euglena</i>			
<i>Dinobryon</i>				<i>Sphaerocystis</i>				<i>Phacus</i>			
<i>Mallomonas</i>	10			<i>Ulothrix</i>				<i>Trachelomonas</i>			
<i>Synura</i>				<i>Volvox</i>							
<i>Tribonema</i>				<i>Zygnema</i>							
<i>Uroglenopsis</i>				<i>Quadrigula</i>							
				<i>Gloeocystis</i>	10			PYRRHOPHYTA (Dinoflagellates)	A	B	C
								<i>Ceratium</i>			
								<i>Peridinium</i>			
SITE	A	B	C	NOTES: Algal diversity increased at both sites since the last sampling event. Diversity continues to be low at site A, but is now considered to be moderate at site B. Algal density increased at each site but continues to be low. Site A continues to be dominated by green algae. Site B is now dominated by a mix of diatoms and blue-green algae. Trace amounts of golden algae were also observed at site A only. Water clarity increased at both sites as well. Clarity at site B continues to be good while site A is now considered to be excellent.							
TOTAL GENERA:	5	6									
TRANSPARENCY:	10.0' est	8.0' est									
ORGANISMS PER MILLILITER:	120	110									

Alcyon Lake



Date:	5/17/2018
Biologist:	E.M. & K.S.

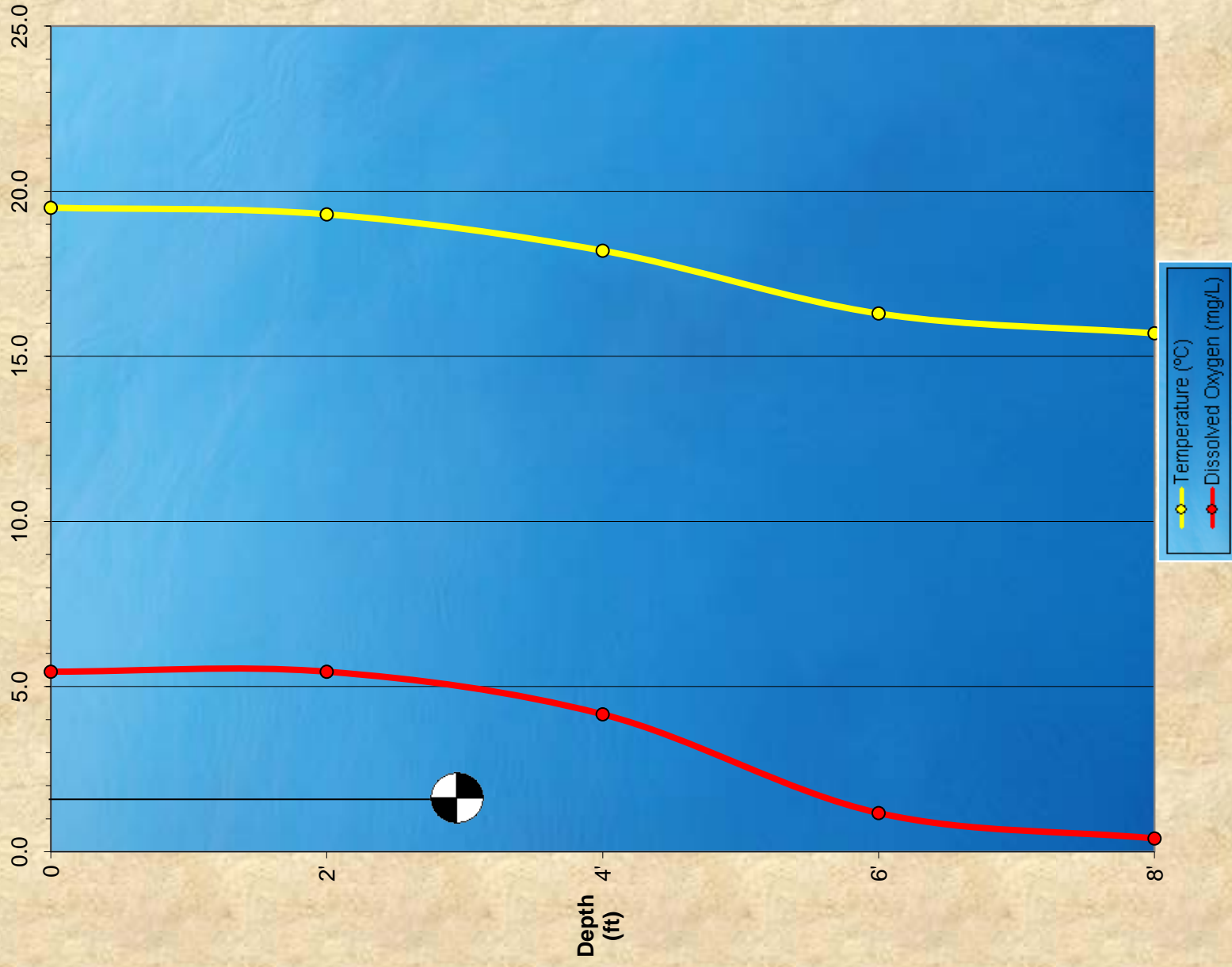
Site: B Lake Station

Depth (Feet)	Temp. (°C)	Dissolved Oxygen (mg/L)
0	19.5	5.45
2'	19.3	5.45
4'	18.2	4.16
6'	16.3	1.17
8'	15.7	0.40
10'		
12'		

Total Depth (ft):	N/A
Secchi (ft):	3.00
pH:	6.50

Notes:

Alcyon Lake Profile
Lake Station
May 17, 2018



Alcyon Lake



Date:	7/17/2018
Biologist:	K.S.

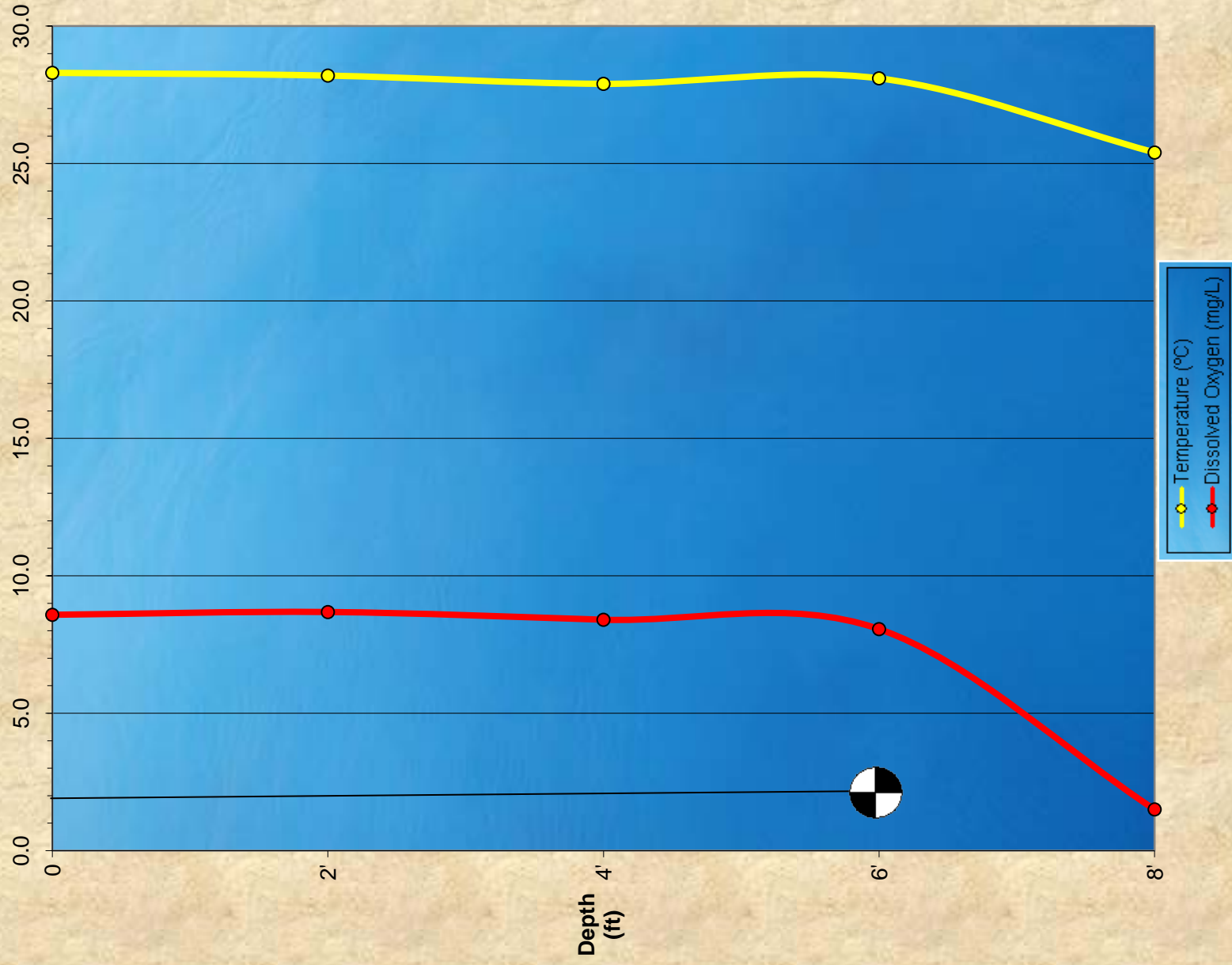
Site: B Lake Station

Depth (Feet)	Temp. (°C)	Dissolved Oxygen (mg/L)
0	28.3	8.58
2'	28.2	8.68
4'	27.9	8.40
6'	28.1	8.06
8'	25.4	1.50
10'		
12'		

Total Depth (ft):	N/A
Secchi (ft):	6.00
pH:	8.50

Notes:

**Alcyon Lake Profile
Lake Station
July 17, 2018**



Alcyon Lake



Date:	8/30/2018
Biologist:	K.S.

Site: B Lake Station

Depth (Feet)	Temp. (°C)	Dissolved Oxygen (mg/L)
0	28.6	10.20
2'	28.3	12.20
4'	25.3	11.80
6'	25.2	11.30
8'		
10'		
12'		

Total Depth (ft):	N/A
Secchi (ft):	8.0 est
pH:	9.25

Notes:

**Alcyon Lake Profile
Lake Station
August 30, 2018**





ANALYTICAL REPORT

Lab Number:	L1818320
Client:	Solitude Lake Management LLC 310 East Washington Ave. Suite C Washington, NJ 07882
ATTN:	Emily Mayer
Phone:	(908) 798-6956
Project Name:	ALCYON LAKE
Project Number:	ALCYON LAKE
Report Date:	05/24/18

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1818320
Report Date: 05/24/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1818320-01	INLET STATION	WATER	PITTMAN, NJ	05/17/18 11:15	05/18/18
L1818320-02	OUTLET STATION	WATER	PITTMAN, NJ	05/17/18 11:00	05/18/18

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1818320
Report Date: 05/24/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1818320
Report Date: 05/24/18

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

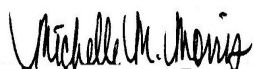
The analyses performed were specified by the client.

Nitrogen, Nitrate

L1818320-01 and -02: The sample was analyzed for Nitrite within the method required holding time. An aliquot of sample was then preserved and analyzed for Nitrate.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Michelle M. Morris

Title: Technical Director/Representative

Date: 05/24/18

INORGANICS & MISCELLANEOUS

Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1818320

Report Date: 05/24/18

SAMPLE RESULTS

Lab ID: L1818320-01

Client ID: INLET STATION

Sample Location: PITTMAN, NJ

Date Collected: 05/17/18 11:15

Date Received: 05/18/18

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Turbidity	6.6		NTU	0.20	0.06	1	-	05/19/18 02:38	121,2130B	MA
Specific Conductance @ 25 C	290		umhos/cm	10	10.	1	-	05/19/18 02:59	1,9050A	MA
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	05/23/18 12:00	121,2540D	JT
Nitrogen, Ammonia	0.149		mg/l	0.075	0.024	1	05/22/18 14:00	05/23/18 21:42	121,4500NH3-BH	AT
Nitrogen, Nitrite	0.020		mg/l	0.020	0.014	1	-	05/19/18 07:30	121,4500NO2-B	UN
Nitrogen, Nitrate	1.26		mg/l	0.100	0.032	1	-	05/22/18 23:29	121,4500NO3-F	MR
Phosphorus, Total	0.047		mg/l	0.010	0.003	1	05/23/18 09:15	05/23/18 13:17	121,4500P-E	SD



Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1818320

Report Date: 05/24/18

SAMPLE RESULTS

Lab ID: L1818320-02
 Client ID: OUTLET STATION
 Sample Location: PITTMAN, NJ

Date Collected: 05/17/18 11:00
 Date Received: 05/18/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Turbidity	5.4		NTU	0.20	0.06	1	-	05/19/18 02:38	121,2130B	MA
Specific Conductance @ 25 C	300		umhos/cm	10	10.	1	-	05/19/18 02:59	1,9050A	MA
Solids, Total Suspended	5.2		mg/l	5.0	NA	1	-	05/23/18 12:00	121,2540D	JT
Nitrogen, Ammonia	0.188		mg/l	0.075	0.024	1	05/22/18 14:00	05/23/18 21:33	121,4500NH3-BH	AT
Nitrogen, Nitrite	0.030		mg/l	0.020	0.014	1	-	05/19/18 07:30	121,4500NO2-B	UN
Nitrogen, Nitrate	1.27		mg/l	0.100	0.032	1	-	05/22/18 23:31	121,4500NO3-F	MR
Phosphorus, Total	0.050		mg/l	0.010	0.003	1	05/23/18 09:15	05/23/18 13:20	121,4500P-E	SD



Project Name: ALCYON LAKE

Lab Number: L1818320

Project Number: ALCYON LAKE

Report Date: 05/24/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1117465-1										
Turbidity	0.07	J	NTU	0.20	0.06	1	-	05/19/18 02:38	121,2130B	MA
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1118209-1										
Nitrogen, Ammonia	ND		mg/l	0.075	0.024	1	05/22/18 14:00	05/23/18 21:05	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1118415-1										
Nitrogen, Nitrate	ND		mg/l	0.100	0.032	1	-	05/22/18 21:17	121,4500NO3-F	MR
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1118417-1										
Nitrogen, Nitrite	ND		mg/l	0.020	0.014	1	-	05/19/18 07:31	121,4500NO2-B	UN
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1118538-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	05/23/18 12:00	121,2540D	JT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1118622-1										
Phosphorus, Total	ND		mg/l	0.010	0.003	1	05/23/18 09:15	05/23/18 12:54	121,4500P-E	SD

Lab Control Sample Analysis

Batch Quality Control

Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1818320

Report Date: 05/24/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1117465-2								
Turbidity	105		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1117466-1								
Specific Conductance	100		-		99-101	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1118209-2								
Nitrogen, Ammonia	90		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1118415-2								
Nitrogen, Nitrate	99		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1118417-2								
Nitrogen, Nitrite	100		-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1118622-2								
Phosphorus, Total	98		-		80-120	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1818320

Report Date: 05/24/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1118417-4 QC Sample: L1818320-02 Client ID: OUTLET STATION												
Nitrogen, Nitrite	0.030	0.1	0.130	100		-	-		85-115	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1818320

Report Date: 05/24/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1118417-3 QC Sample: L1818320-02 Client ID: OUTLET STATION						
Nitrogen, Nitrite	0.030	0.030	mg/l	0		20

Project Name: ALCYON LAKE**Lab Number:** L1818320**Project Number:** ALCYON LAKE**Report Date:** 05/24/18**Sample Receipt and Container Information**

Were project specific reporting limits specified?

NO

Cooler Information**Cooler** **Custody Seal**

C Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1818320-01A	Plastic 500ml unpreserved	C	7	7	2.6	Y	Absent		TURB-2130(2),NO3-4500(2),NO2-4500NO2(2),COND-9050(28)
L1818320-01B	Plastic 500ml H2SO4 preserved	C	<2	<2	2.6	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1818320-01C	Plastic 950ml unpreserved	C	7	7	2.6	Y	Absent		TSS-2540(7)
L1818320-02A	Plastic 500ml unpreserved	C	7	7	2.6	Y	Absent		TURB-2130(2),NO3-4500(2),NO2-4500NO2(2),COND-9050(28)
L1818320-02B	Plastic 500ml H2SO4 preserved	C	<2	<2	2.6	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1818320-02C	Plastic 950ml unpreserved	C	7	7	2.6	Y	Absent		TSS-2540(7)

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1818320
Report Date: 05/24/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Report Format: DU Report with 'J' Qualifiers



Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1818320
Report Date: 05/24/18

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1818320
Report Date: 05/24/18

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E,**

SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**
EPA 522.

Non-Potable Water


EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 NEW JERSEY CHAIN OF CUSTODY Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193		Service Centers Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105		Page 1 of 1		Date Rec'd in Lab 5/18/18		ALPHA Job # LK18320				
		Project Information Project Name: <u>Alcyon Lake</u> Project Location: <u>Pittman, NJ</u> Project # _____ (Use Project name as Project #) <input checked="" type="checkbox"/>		Deliverables <input type="checkbox"/> NJ Full / Reduced <input type="checkbox"/> EQUIS (1 File) <input type="checkbox"/> EQUIS (4 File) <input type="checkbox"/> Other		Billing Information <input checked="" type="checkbox"/> Same as Client Info PO # _____						
Client Information Client: <u>S.L.M.</u> Address: <u>810 E. Washington Ave Suite C, Washington, NJ</u> Phone: <u>908-856-0353</u> Fax: _____ Email: <u>EMayer@SolitudeLake.com</u>		Project Manager: <u>Emily Mayer</u> ALPHAQuote #: _____ Turn-Around Time Standard <input checked="" type="checkbox"/> Due Date: _____ Rush (only if pre approved) <input type="checkbox"/> # of Days: _____		Regulatory Requirement <input type="checkbox"/> SRS Residential/Non Residential <input type="checkbox"/> SRS Impact to Groundwater <input type="checkbox"/> NJ Ground Water Quality Standards <input type="checkbox"/> NJ IGW SPLP Leachate Criteria <input type="checkbox"/> Other		Site Information Is this site impacted by Petroleum? Yes <input type="checkbox"/> Petroleum Product: _____						
These samples have been previously analyzed by Alpha <input type="checkbox"/>		For EPH, selection is REQUIRED: <input type="checkbox"/> Category 1 <input type="checkbox"/> Category 2		For VOC, selection is REQUIRED: <input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> 8011		Other project specific requirements/comments: <u>Billing - MID</u> <u>Report results in mg/L</u> Please specify Metals or TAL.		ANALYSIS Total Phosphorus Total Suspended Solids Turbidity Ammonia Nitrate Nitrite Conductivity				
ALPHA Lab ID (Lab Use Only)		Sample ID		Collection Date Time		Sample Matrix		Sampler's Initials		Sample Filtration <input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)		Total Bottles
18320-01		Inlet Station		5/17/18 11:15		L		EM		<input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)		
02		Outlet Station		5/17/18 11:00		L		EM		<input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)		
										<input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)		
										<input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)		
										<input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)		
										<input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)		
										<input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)		
										<input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)		
										<input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)		
Preservative Code: A = None B = HCl C = HNO ₃ D = H ₂ SO ₄ E = NaOH F = MeOH G = NaHSO ₄ H = Na ₂ S ₂ O ₃ K/E = Zn Ac/NaOH O = Other		Container Code: P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle		Westboro: Certification No: MA935 Mansfield: Certification No: MA015		Container Type Preservative		P P P P P P P D A A D A A A		Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)		
Relinquished By:		Date/Time		Received By:		Date/Time						
<u>Emily Mayer</u>		<u>5/18/18 9:30</u>		<u>Daniel Santos AAL</u>		<u>5/18/18 09:30</u>						
<u>Daniel Santos</u>		<u>5/18/18 11:50</u>		<u>Daniel Santos AAL</u>		<u>5/18/18 18:45</u>						
<u>Daniel Santos AAL</u>		<u>5/18/18 23:30</u>		<u>u u u</u>		<u>5/18/18 23:30</u>						



ANALYTICAL REPORT

Lab Number:	L1827418
Client:	Solitude Lake Management LLC 310 East Washington Ave. Suite C Washington, NJ 07882
ATTN:	Emily Mayer
Phone:	(908) 798-6956
Project Name:	ALCYON LAKE
Project Number:	ALCYON LAKE
Report Date:	07/20/18

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1827418
Report Date: 07/20/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1827418-01	INLET STATION	WATER	PITTMAN, NJ	07/17/18 11:45	07/18/18
L1827418-02	OUTLET STATION	WATER	PITTMAN, NJ	07/17/18 11:30	07/18/18

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1827418
Report Date: 07/20/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1827418
Report Date: 07/20/18

Case Narrative (continued)

Report Submission

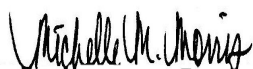
All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Nitrogen, Nitrate

L1827418-01 and -02: The sample was analyzed for Nitrite within the method required holding time. An aliquot of sample was then preserved and analyzed for Nitrate.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Michelle M. Morris

Title: Technical Director/Representative

Date: 07/20/18

INORGANICS & MISCELLANEOUS

Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1827418

Report Date: 07/20/18

SAMPLE RESULTS

Lab ID: L1827418-01
 Client ID: INLET STATION
 Sample Location: PITTMAN, NJ

Date Collected: 07/17/18 11:45
 Date Received: 07/18/18
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Turbidity	2.3		NTU	0.20	0.06	1	-	07/19/18 06:00	121,2130B	UN
Specific Conductance @ 25 C	410		umhos/cm	10	10.	1	-	07/19/18 05:30	1,9050A	MA
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	07/19/18 21:30	121,2540D	CW
Nitrogen, Ammonia	0.081		mg/l	0.075	0.024	1	07/19/18 12:58	07/19/18 22:47	121,4500NH3-BH	AT
Nitrogen, Nitrite	0.020		mg/l	0.020	0.014	1	-	07/19/18 04:50	121,4500NO2-B	UN
Nitrogen, Nitrate	3.10		mg/l	0.100	0.032	1	-	07/19/18 22:16	121,4500NO3-F	MR
Phosphorus, Total	0.014		mg/l	0.010	0.003	1	07/19/18 10:20	07/20/18 09:47	121,4500P-E	SD



Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1827418

Report Date: 07/20/18

SAMPLE RESULTS

Lab ID: L1827418-02

Client ID: OUTLET STATION

Sample Location: PITTMAN, NJ

Date Collected: 07/17/18 11:30

Date Received: 07/18/18

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Turbidity	1.7		NTU	0.20	0.06	1	-	07/19/18 06:00	121,2130B	UN
Specific Conductance @ 25 C	410		umhos/cm	10	10.	1	-	07/19/18 05:30	1,9050A	MA
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	07/19/18 21:30	121,2540D	CW
Nitrogen, Ammonia	0.073	J	mg/l	0.075	0.024	1	07/19/18 12:58	07/19/18 22:48	121,4500NH3-BH	AT
Nitrogen, Nitrite	0.020		mg/l	0.020	0.014	1	-	07/19/18 04:51	121,4500NO2-B	UN
Nitrogen, Nitrate	1.56		mg/l	0.100	0.032	1	-	07/19/18 22:17	121,4500NO3-F	MR
Phosphorus, Total	0.011		mg/l	0.010	0.003	1	07/19/18 10:20	07/20/18 09:48	121,4500P-E	SD



Project Name: ALCYON LAKE

Lab Number: L1827418

Project Number: ALCYON LAKE

Report Date: 07/20/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1137239-1										
Turbidity	0.10	J	NTU	0.20	0.06	1	-	07/19/18 06:00	121,2130B	UN
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1137317-1										
Phosphorus, Total	ND		mg/l	0.010	0.003	1	07/19/18 10:20	07/20/18 09:07	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1137333-1										
Nitrogen, Ammonia	0.026	J	mg/l	0.075	0.024	1	07/19/18 12:58	07/19/18 22:32	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1137488-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	07/19/18 21:30	121,2540D	CW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1137550-1										
Nitrogen, Nitrate	ND		mg/l	0.100	0.032	1	-	07/19/18 21:20	121,4500NO3-F	MR
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1137573-1										
Nitrogen, Nitrite	ND		mg/l	0.020	0.014	1	-	07/19/18 04:48	121,4500NO2-B	UN

Lab Control Sample Analysis

Batch Quality Control

Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1827418

Report Date: 07/20/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1137239-2								
Turbidity	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1137265-1								
Specific Conductance	101		-		99-101	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1137317-2								
Phosphorus, Total	95		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1137333-2								
Nitrogen, Ammonia	93		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1137550-2								
Nitrogen, Nitrate	103		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1137573-2								
Nitrogen, Nitrite	100		-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1827418

Report Date: 07/20/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1137239-3 QC Sample: L1827418-01 Client ID: INLET STATION						
Turbidity	2.3	2.2	NTU	4		13
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1137265-2 QC Sample: L1827418-01 Client ID: INLET STATION						
Specific Conductance @ 25 C	410	410	umhos/cm	0		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1137573-3 QC Sample: L1827418-01 Client ID: INLET STATION						
Nitrogen, Nitrite	0.020	0.020	mg/l	0		20

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Serial_No:07201817:48
Lab Number: L1827418
Report Date: 07/20/18

Sample Receipt and Container Information

Were project specific reporting limits specified?

NO

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1827418-01A	Plastic 500ml H2SO4 preserved	A	<2	<2	4.2	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1827418-01B	Plastic 500ml unpreserved	A	7	7	4.2	Y	Absent		NO3-4500(2),NO2-4500NO2(2),COND-9050(28)
L1827418-01C	Plastic 950ml unpreserved	A	7	7	4.2	Y	Absent		TSS-2540(7)
L1827418-02A	Plastic 500ml H2SO4 preserved	A	<2	<2	4.2	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1827418-02B	Plastic 500ml unpreserved	A	7	7	4.2	Y	Absent		NO3-4500(2),NO2-4500NO2(2),COND-9050(28)
L1827418-02C	Plastic 950ml unpreserved	A	7	7	4.2	Y	Absent		TSS-2540(7)

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1827418
Report Date: 07/20/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: DU Report with 'J' Qualifiers



Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1827418
Report Date: 07/20/18

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1827418
Report Date: 07/20/18

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**Revision **11**

Published Date: 1/8/2018 4:15:49 PM

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Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility**EPA 624:** m/p-xylene, o-xylene**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**EPA 300:** DW: Bromide**EPA 6860:** SCM: Perchlorate**EPA 9010:** NPW and SCM: Amenable Cyanide Distillation**SM4500:** NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:**Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E,****SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.****EPA 624:** Volatile Halocarbons & Aromatics,**EPA 608:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs**EPA 625:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.****EPA 522.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.**EPA 245.1 Hg.****SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

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ANALYTICAL REPORT

Lab Number:	L1834546
Client:	Solitude Lake Management LLC 310 East Washington Ave. Suite C Washington, NJ 07882
ATTN:	Emily Mayer
Phone:	(908) 798-6956
Project Name:	ALCYON LAKE
Project Number:	ALCYON LAKE
Report Date:	09/11/18

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1834546
Report Date: 09/11/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1834546-01	INLET STATION	WATER	NJ	08/30/18 12:50	08/31/18
L1834546-02	OUTLET STATION	WATER	NJ	08/30/18 12:45	08/31/18

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1834546
Report Date: 09/11/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1834546
Report Date: 09/11/18

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Nitrogen, Nitrate

L1834546-01 and -02: The sample was analyzed for Nitrite within the method required holding time. An aliquot of sample was then preserved and analyzed for Nitrate.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Amita Naik

Title: Technical Director/Representative

Date: 09/11/18

INORGANICS & MISCELLANEOUS

Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1834546

Report Date: 09/11/18

SAMPLE RESULTS

Lab ID: L1834546-01

Client ID: INLET STATION

Sample Location: NJ

Date Collected: 08/30/18 12:50

Date Received: 08/31/18

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Turbidity	1.6		NTU	0.20	0.06	1	-	09/01/18 03:14	121,2130B	UN
Specific Conductance @ 25 C	440		umhos/cm	10	10.	1	-	09/01/18 02:13	1,9050A	UN
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/01/18 11:10	121,2540D	JT
Nitrogen, Ammonia	0.065	J	mg/l	0.075	0.024	1	09/04/18 12:39	09/04/18 21:44	121,4500NH3-BH	AT
Nitrogen, Nitrite	ND		mg/l	0.020	0.014	1	-	09/01/18 04:27	121,4500NO2-B	UN
Nitrogen, Nitrate	2.78		mg/l	0.100	0.032	1	-	09/04/18 18:48	121,4500NO3-F	MR
Phosphorus, Total	0.015		mg/l	0.010	0.003	1	09/04/18 12:25	09/05/18 10:54	121,4500P-E	SD



Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1834546

Report Date: 09/11/18

SAMPLE RESULTS

Lab ID: L1834546-02

Client ID: OUTLET STATION

Sample Location: NJ

Date Collected: 08/30/18 12:45

Date Received: 08/31/18

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Turbidity	0.61		NTU	0.20	0.06	1	-	09/01/18 03:14	121,2130B	UN
Specific Conductance @ 25 C	370		umhos/cm	10	10.	1	-	09/01/18 02:13	1,9050A	UN
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/01/18 11:10	121,2540D	JT
Nitrogen, Ammonia	ND		mg/l	0.075	0.024	1	09/04/18 12:39	09/04/18 21:45	121,4500NH3-BH	AT
Nitrogen, Nitrite	ND		mg/l	0.020	0.014	1	-	09/01/18 04:27	121,4500NO2-B	UN
Nitrogen, Nitrate	1.14		mg/l	0.100	0.032	1	-	09/04/18 18:50	121,4500NO3-F	MR
Phosphorus, Total	0.009	J	mg/l	0.010	0.003	1	09/04/18 12:25	09/05/18 10:55	121,4500P-E	SD



Project Name: ALCYON LAKE

Lab Number: L1834546

Project Number: ALCYON LAKE

Report Date: 09/11/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1152873-1										
Turbidity	0.07	J	NTU	0.20	0.06	1	-	09/01/18 03:14	121,2130B	UN
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1152914-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/01/18 11:10	121,2540D	JT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1153293-1										
Phosphorus, Total	ND		mg/l	0.010	0.003	1	09/04/18 12:25	09/05/18 10:10	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1153307-1										
Nitrogen, Ammonia	ND		mg/l	0.075	0.024	1	09/04/18 12:39	09/04/18 21:16	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1153469-1										
Nitrogen, Nitrite	ND		mg/l	0.020	0.014	1	-	09/01/18 04:19	121,4500NO2-B	UN
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1153475-1										
Nitrogen, Nitrate	ND		mg/l	0.100	0.032	1	-	09/04/18 18:01	121,4500NO3-F	MR

Lab Control Sample Analysis

Batch Quality Control

Project Name: ALCYON LAKE

Project Number: ALCYON LAKE

Lab Number: L1834546

Report Date: 09/11/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1152871-1								
Specific Conductance	100		-		99-101	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1152873-2								
Turbidity	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1153293-2								
Phosphorus, Total	93		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1153307-2								
Nitrogen, Ammonia	92		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1153469-2								
Nitrogen, Nitrite	100		-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1153475-2								
Nitrogen, Nitrate	103		-		90-110	-		

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Serial_No:09111819:00
Lab Number: L1834546
Report Date: 09/11/18

Sample Receipt and Container Information

Were project specific reporting limits specified?

NO

Cooler Information

Cooler	Custody Seal
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1834546-01A	Plastic 500ml unpreserved	B	7	7	2.6	Y	Absent		TURB-2130(2),NO3-4500(2),NO2-4500NO2(2),COND-9050(28)
L1834546-01B	Plastic 500ml H2SO4 preserved	B	<2	<2	2.6	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1834546-01C	Plastic 950ml unpreserved	B	7	7	2.6	Y	Absent		TSS-2540(7)
L1834546-02A	Plastic 500ml unpreserved	B	7	7	2.6	Y	Absent		TURB-2130(2),NO3-4500(2),NO2-4500NO2(2),COND-9050(28)
L1834546-02B	Plastic 500ml H2SO4 preserved	B	<2	<2	2.6	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1834546-02C	Plastic 950ml unpreserved	B	7	7	2.6	Y	Absent		TSS-2540(7)

Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1834546
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GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: DU Report with 'J' Qualifiers



Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1834546
Report Date: 09/11/18

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



Project Name: ALCYON LAKE
Project Number: ALCYON LAKE

Lab Number: L1834546
Report Date: 09/11/18

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E,**

SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522.

Non-Potable Water


EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 NEW JERSEY CHAIN OF CUSTODY		Service Centers Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105		Page _____ of _____		Date Rec'd In Lab 8/31/18		ALPHA Job # L1834546																						
Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193		Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3286		Project Information Project Name: Acyon Lake Project Location: NJ		Deliverables <input type="checkbox"/> NJ Full / Reduced <input type="checkbox"/> EQuIS (1 File) <input type="checkbox"/> EQuIS (4 File) <input type="checkbox"/> Other		Billing Information <input checked="" type="checkbox"/> Same as Client Info PO #																						
Client Information Client: Solitude Lake Management Address: 310 E. Washington Ave Suite C, Washington, NJ 07882 Phone: 908-850-0303 Fax: Email: emayer@solitudelake.com		Project # (Use Project name as Project #) <input checked="" type="checkbox"/> Project Manager: Emily Mayer ALPHAQuote #: Turn-Around Time Standard <input checked="" type="checkbox"/> Due Date: Rush (only if pre approved) <input type="checkbox"/> # of Days:		Regulatory Requirement <input type="checkbox"/> SRS Residential/Non Residential <input type="checkbox"/> SRS Impact to Groundwater <input type="checkbox"/> NJ Ground Water Quality Standards <input type="checkbox"/> NJ IGW SPLP Leachate Criteria <input type="checkbox"/> Other		Site Information Is this site impacted by Petroleum? Yes <input type="checkbox"/> Petroleum Product:																								
These samples have been previously analyzed by Alpha <input type="checkbox"/>		For EPH, selection is REQUIRED: <input type="checkbox"/> Category 1 <input type="checkbox"/> Category 2		For VOC, selection is REQUIRED: <input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> 8011		Other project specific requirements/comments: Billing - MID Report results in mg/L Please specify Metals or TAL.		ANALYSIS <table border="1"> <tr> <th>Total Phosphorus</th> <th>Nitrate</th> <th>Nitrite</th> <th>Ammonia</th> <th>Total Suspended Solids</th> <th>Turbidity</th> <th>Conductivity</th> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </table>		Total Phosphorus	Nitrate	Nitrite	Ammonia	Total Suspended Solids	Turbidity	Conductivity	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Total Phosphorus	Nitrate	Nitrite	Ammonia	Total Suspended Solids	Turbidity	Conductivity																								
X	X	X	X	X	X	X																								
X	X	X	X	X	X	X																								
ALPHA Lab ID (Lab Use Only)		Sample ID		Collection Date Time		Sample Matrix		Sampler's Initials																						
34546 - 01 Inlet Station - 02 Outlet Station		8/30/18 12:50pm 8/30/18 12:45pm		L L		KS KS		X X																						
Preservative Code: A = None B = HCl C = HNO ₃ D = H ₂ SO ₄ E = NaOH F = MeOH G = NaHSO ₄ H = Na ₂ S ₂ O ₃ K/E = Zn Ac/NaOH O = Other		Container Code: P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle		Westboro: Certification No: MA935 Mansfield: Certification No: MA015		Container Type Preservative		Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)																						
Relinquished By: Emily Mayer D. Santos AAL		Date/Time 8/31/18 11:56 8-31-18 16:25 8/31/18 2300		Received By: D. Santos AAL D. Santos AAL		Date/Time 08-31-18 1156 8/31/18 1800 8/31/18 23.00																								