

# OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from the **Ossipee Lake System (Lake Ossipee, Lower Danforth Pond, Broad Bay, Leavitt Bay, and Berry Bay)**, the program coordinators have made the following observations and recommendations.

Thank you for your continued hard work sampling the deep spots of these five waterbodies this year. As you know, conducting multiple sampling events each year enables DES to more accurately detect water quality changes. Keep up the good work!

If your monitoring group's sampling events this year were limited due to not having enough time to pick-up or drop-off samples at the Limnology Center in Concord, please remember the Plymouth State University Center for the Environment Satellite Laboratory is open in Plymouth. This laboratory was established to serve the large number of lakes/ponds in the greater North region of the state. This laboratory is inspected by DES and operates under a DES approved quality assurance plan. We encourage your monitoring group to utilize this laboratory next summer for all sampling events, except for the annual DES biologist visit. To find out more about the Center for the Environment Satellite Laboratory, and/or to schedule dates to pick up bottles and equipment, please call Janet Towse or Adam Baumann, laboratory managers, at (603) 535-3269.

## FIGURE INTERPRETATION

- **Figure 1 and Table 1:** Figure 1 in Appendix A shows the historical and current year chlorophyll-a concentration in the water column. Table 1 in Appendix B lists the maximum, minimum, and mean concentration for each sampling year that the lake, pond, and bays have been monitored through VLAP.

Chlorophyll-a, a pigment found in plants, is an indicator of the algal abundance. Because algae are usually microscopic plants that contain chlorophyll-a, and are naturally found in lake ecosystems, the chlorophyll-a concentration measured in the water gives an estimation of the algal concentration or lake productivity.

**The median summer chlorophyll-a concentration for New Hampshire's lakes and ponds is 4.58 mg/m<sup>3</sup>.**

#### Ossipee System 2007 Chlorophyll-a Data

	<b>2006 Annual Mean Result (mg/m<sup>3</sup>)</b>	<b>Comparison to NH Median</b>	<b>Comparison to Similar Lake Median</b>
<b>Lake Ossipee</b>	2.22	Less than	Less than
<b>Lower Danforth Pond</b>	2.21	Much less than	Much less than
<b>Broad Bay</b>	2.51	Less than	Slightly less than
<b>Leavitt Bay</b>	2.04	Much less than	Much less than
<b>Berry Bay</b>	1.92	Much less than	Much less than

The mean annual chlorophyll-a concentration was **highest** at the **Broad Bay (2.51 mg/m<sup>3</sup>)** deep spot and **lowest** at the **Berry Bay (1.92 mg/m<sup>3</sup>)** deep spot. The mean chlorophyll concentration at the **Lake Ossipee, Lower Danforth Pond, and Leavitt Bay** deep spots was **similar**.

#### Ossipee System Historic Chlorophyll-a Data

	<b>Sampling Period</b>	<b>Visual Analysis Trend</b>
<b>Lake Ossipee</b>	2003 - 2007	Relatively Stable (ranging from 1.57 to 3.0 mg/m <sup>3</sup> )
<b>Lower Danforth Pond</b>	2003 - 2007	Variable (ranging from 2.21 to 4.53 mg/m <sup>3</sup> )
<b>Broad Bay</b>	1990 - 2007	Slightly Variable (ranging between approx. 1.23 - 3.46 mg/m <sup>3</sup> )
<b>Leavitt Bay</b>	1990 - 2007	Increasing (ranging from 1.07 to 3.24 mg/m <sup>3</sup> , but overall worsening)
<b>Berry Bay</b>	2003 - 2007	Relatively Stable (ranging from 1.92 to 2.94 mg/m <sup>3</sup> )

Overall, visual inspection of the historical data trend lines for **Lake Ossipee** and **Berry Bay** show a **relatively stable** in-lake chlorophyll-a trend since monitoring began in **2003**. Visual inspection of the historical data trend line for **Lower Danforth Pond** shows a **variable** in lake chlorophyll-a trend since **2003**. After 10 consecutive years of sample collection, we will be able to conduct a statistical analysis of the historical data to objectively determine if there has been a significant change in the annual mean chlorophyll-a concentration since monitoring began at these three deep spots.

Visual inspection of the historical data show that the **Broad Bay** mean annual chlorophyll-a concentration has *fluctuated slightly*, but has *not significantly increased or decreased*, since monitoring began in **1990**.

Visual inspection of the historical data shows that the **Leavitt Bay** chlorophyll-a concentration has *increased slightly (meaning worsened)*, but has *not significantly increased or decreased*, since monitoring began in **1990**.

While algae are naturally present in all lakes, an excessive or increasing amount of any type is not welcomed. In freshwater lakes, phosphorus is the nutrient that algae typically depend upon for growth in New Hampshire lakes. Algal concentrations may increase as nonpoint sources of phosphorus from the watershed increase, or as in-lake phosphorus sources increase. Therefore, it is extremely important for volunteer monitors to continually educate all watershed residents about management practices that can be implemented to minimize phosphorus loading to surface waters.

- **Figures 2a and 2b and Tables 3a and 3b:** Figure 2a in Appendix A shows the historical and current year data for transparency without the use of a viewscope and Figure 2b shows the current year data for transparency with the use of a viewscope. Table 3a in Appendix B lists the maximum, minimum and mean transparency data without the use of a viewscope and Table 3b lists the maximum, minimum and mean transparency data with the use of a viewscope for each year that the lake has been monitored through VLAP.

Volunteer monitors use the Secchi disk, a 20 cm disk with alternating black and white quadrants, to measure how far a person can see into the water. Transparency, a measure of water clarity, can be affected by the amount of algae and sediment in the water, as well as the natural color of the water. **The median summer transparency for New Hampshire's lakes and ponds is 3.2 meters.**

#### Ossipee System 2007 Non-Viewscope Transparency Data

	<b>2007 Annual Mean</b>	<b>Comparison to NH Median</b>	<b>Comparison to Similar Lake Median</b>
<b>Lake Ossipee</b>	4.05	Slightly greater than	Slightly greater than
<b>Lower Danforth Pond</b>	4.75	Much greater than	Slightly greater than
<b>Broad Bay</b>	4.30	Slightly greater than	Less than
<b>Leavitt Bay</b>	4.31	Slightly greater than	Less than
<b>Berry Bay</b>	4.38	Greater than	Slightly less than

The **2007** non-viewscope transparency annual means were the **increased, meaning improved** over the 2006 annual means for each of the five deep spots. It is likely that dry weather conditions reduced the amount of stormwater runoff, which reduced the amount of sediment and organic material entering the system, led to the increased transparency.

The current year data (the top graph) show that the transparency at each deep spot was also measured with the viewscope on each sampling event. The transparency measured with the viewscope was generally **greater than** the transparency measured without the viewscope. As discussed previously, a comparison of the transparency readings taken with and without the use of a viewscope shows that the viewscope typically increases the depth to which the Secchi disk can be seen into the lake, particularly on sunny and windy days. We recommend that your group measure Secchi disk transparency with and without the viewscope on each sampling event.

It is important to note that viewscope transparency data is not compared to a New Hampshire median or similar lake median. This is because lake transparency has not been historically measured by DES with a viewscope. At some point in the future, the New Hampshire and similar lake medians for viewscope transparency will be calculated and added to the appropriate graphs.

### Ossipee System Historic Transparency Data

	Sampling Period	Visual Analysis Trend
<b>Lake Ossipee</b>	2003 - 2007	Variable, but overall decreasing (worsening)
<b>Lower Danforth Pond</b>	2003 - 2007	Slightly variable
<b>Broad Bay</b>	1990 - 2007	Decreasing (worsening)
<b>Leavitt Bay</b>	1990 - 2007	Decreasing (worsening)
<b>Berry Bay</b>	2003 - 2007	Variable

Visual inspection of the historical data trend line (the bottom graph) shows a **variable** transparency trend for **Lake Ossipee, Lower Danforth Pond, and Berry Bay**.

As previously discussed, after 10 consecutive years of sample collection at the **Lake Ossipee, Lower Danforth Pond, and Berry Bay** deep spots, we will be able to conduct a statistical analysis of the

historical data to objectively determine if there has been a significant change in the annual mean transparency since monitoring began.

Overall, the statistical analysis of the historical data for **Broad Bay** shows that the non-viewscope transparency has **significantly decreased** (meaning **worsened**) on average by **approximately 3.004 percent** per year during the sampling period **1990 to 2007**. Please refer to Appendix E for the statistical analysis explanation and data print-out.

Overall, the statistical analysis of the historical data for **Leavitt Bay** shows that the non-viewscope transparency has **significantly decreased** (meaning **worsened**) on average by **approximately 2.279 percent** per year during the sampling period **1990 to 2007**. Please refer to Appendix E for the statistical analysis explanation and data print-out.

Typically, high intensity rainfall causes sediment-laden stormwater runoff to flow into surface waters, thus increasing turbidity and decreasing clarity. Efforts should continually be made to stabilize stream banks, lake shorelines, disturbed soils within the watershed, and especially dirt roads located immediately adjacent to the edge of tributaries and the lake. Guides to best management practices that can be implemented to reduce, and possibly even eliminate, nonpoint source pollutants, are available from DES upon request.

- **Figure 3 and Table 8:** The graphs in Figure 3 in Appendix A show the amount of epilimnetic (upper layer) phosphorus and hypolimnetic (lower layer) phosphorus; the inset graphs show current year data. Table 8 in Appendix B lists the annual maximum, minimum, and median concentration for each deep spot layer and each tributary since the lake has been sampled through VLAP.

Phosphorus is typically the limiting nutrient for plant and algae growth in New Hampshire's lakes and ponds. Excessive phosphorus in a lake can lead to increased plant and algal growth over time. **The median summer total phosphorus concentration in the epilimnion (upper layer) of New Hampshire's lakes and ponds is 12 ug/L. The median summer phosphorus concentration in the hypolimnion (lower layer) is 14 ug/L.**

**Ossipee System 2007 Deep Spot Epilimnetic Phosphorus Data**

	<b>2007 Epilimnetic Annual Mean (ug/L)</b>	<b>Comparison to NH Median</b>	<b>Comparison to Similar Lake Median</b>
<b>Lake Ossipee</b>	9.5	Slightly less than	Slightly greater than
<b>Lower Danforth Pond</b>	12.0	Approximately equal to	Greater than
<b>Broad Bay</b>	11.2	Slightly less than	Slightly greater than
<b>Leavitt Bay</b>	8.1	Slightly less than	Slightly greater than
<b>Berry Bay</b>	9.0	Slightly less than	Slightly greater than

The mean annual epilimnetic total phosphorus concentration was the **highest** total phosphorus concentration measured at **Lake Ossipee**, **Lower Danforth Pond** and **Broad Bay** since monitoring began.

**Ossipee System 2007 Deep Spot Hypolimnetic Phosphorus Data**

	<b>2007 Hypolimnetic Annual Mean (ug/L)</b>	<b>Comparison to NH Median</b>	<b>Comparison to Similar Lake Median</b>
<b>Lake Ossipee</b>	7.2	Less than	Approximately equal to
<b>Lower Danforth Pond</b>	9.6	Less than	Less than
<b>Broad Bay</b>	7.0	Less than	Less than
<b>Leavitt Bay</b>	6.1	Much less than	Much less than
<b>Berry Bay</b>	6.4	Much less than	Much less than

The mean annual hypolimnetic phosphorus concentrations was the **lowest** total phosphorus concentration measured **Lower Danforth Pond** and **Berry Bay** since monitoring began.

**Ossipee System Historic Epilimnetic Phosphorus Data**

	<b>Sampling Period</b>	<b>Visual Analysis Trend</b>
<b>Lake Ossipee</b>	2003 – 2007	Slightly increasing, meaning slightly worsening (ranging from 6 to 9.5 ug/L)
<b>Lower Danforth Pond</b>	2003 – 2007	Variable (ranging from 8 to 12.3 ug/L)
<b>Broad Bay</b>	1990 – 2007	Variable (ranging between approx 3 and 11.2 ug/L)
<b>Leavitt Bay</b>	1990 – 2007	Variable (Ranging between approx 3 and 12 ug/L)
<b>Berry Bay</b>	2003 – 2007	Slightly increasing, meaning slightly worsening (increasing from 6.5 to 9.5 ug/L)

Overall, visual inspection of the epilimnetic historic phosphorus data for **Lower Danforth Pond**, **Broad Bay**, and **Leavitt Bay** shows a

*variable* trend, and for **Lake Ossipee** and **Berry Bay** shows a *slightly worsening* trend since monitoring began.

### Ossipee System Historic Hypolimnetic Phosphorus Data

	Sampling Period	Visual Analysis Trend
<b>Lake Ossipee</b>	2003 – 2007	Relatively stable (ranging from 7 to 9 ug/L)
<b>Lower Danforth Pond</b>	2003 – 2007	Variable (ranging from 9.6 to 24.3 ug/L)
<b>Broad Bay</b>	1990 – 2007	Variable (ranging from 4.0 to 11.0 ug/L)
<b>Leavitt Bay</b>	1990 – 2007	Variable (ranging from 4.0 to 14.0 ug/L)
<b>Berry Bay</b>	2003 – 2007	Relatively stable (ranging from 6.4 to 10 ug/L)

Overall, visual inspection of the hypolimnetic historic phosphorus data shows a *variable* trend for **Lower Danforth Pond**, and a *relatively stable* trend for **Lake Ossipee** and **Berry Bay** since monitoring began.

As previously discussed, after 10 consecutive years of sample collection at the **Lake Ossipee**, **Lower Danforth Pond**, and **Berry Bay** deep spots, we will be able to conduct a statistical analysis of the historical data to objectively determine if there has been a significant change in the annual mean epilimnetic and hypolimnetic phosphorus concentration since monitoring began.

Overall, the statistical analysis of the historical data shows that the phosphorus concentration in the epilimnion (upper layer) and the hypolimnion (lower layer) has *not significantly changed* since monitoring began. Specifically, the **Broad Bay** epilimnetic phosphorus concentration has *fluctuated between approximately 3 and 11.2 ug/L*, and the **Leavitt Bay** epilimnetic phosphorus concentration has *fluctuated between approximately 3 and 12 ug/L*. The **Broad Bay** hypolimnetic phosphorus concentration has *fluctuated between approximately 4 and 11 ug/L*, and the **Leavitt Bay** hypolimnetic phosphorus concentration has *fluctuated between approximately 4 and 14 ug/L* since **1990**. Please refer to Appendix E for the detailed statistical analysis explanation and data print-out.

One of the most important approaches to reducing phosphorus loading to a waterbody is to continually educate watershed residents about the sources of phosphorus in a watershed and how excessive phosphorus loading can negatively affect the ecology and the recreational, economical, and ecological value of lakes and ponds.

### TABLE INTERPRETATION

➤ **Table 2: Phytoplankton**

Table 2 in Appendix B lists the current and historical phytoplankton species observed in the lake. Specifically, this table lists the three most dominant phytoplankton species observed in the sample and their relative abundance in the sample.

A biologist visit was not conducted in **2007**; therefore plankton samples were not collected.

➤ **Table 2: Cyanobacteria**

Cyanobacteria can reach nuisance levels when phosphorus loading from the watershed to surface waters is increased and favorable environmental conditions occur, such as a period of sunny, warm weather.

The presence of cyanobacteria serves as a reminder of the lake's delicate balance. Watershed residents should continue to act proactively to reduce nutrient loading to the lake by eliminating fertilizer use on lawns, keeping the lake shoreline natural, re-vegetating cleared areas within the watershed, and properly maintaining septic systems and roads.

In addition, residents should also observe the waterbodies in September and October during the time of fall turnover (lake mixing) to document any algal blooms that may occur. Cyanobacteria have the ability to regulate their depth in the water column by producing or releasing gas from vesicles. However, occasionally lake mixing can affect their buoyancy and cause them to rise to the surface and bloom. Wind and currents tend to "pile" cyanobacteria into scums that accumulate in one section of the waterbody. If a fall bloom occurs, please collect a sample in any clean jar or bottle and contact the VLAP Coordinator.

➤ **Table 4: pH**

Table 4 in Appendix B presents the in-lake and tributary current year and historical pH data.

pH is measured on a logarithmic scale of 0 (acidic) to 14 (basic). pH is important to the survival and reproduction of fish and other aquatic life. A pH below 6.0 typically limits the growth and reproduction of fish. A pH between 6.0 and 7.0 is ideal for fish. The

median pH value for the epilimnion (upper layer) in New Hampshire's lakes and ponds is **6.6**, which indicates that the surface waters in the state are slightly acidic. For a more detailed explanation regarding pH, please refer to the "Chemical Monitoring Parameters" section of this report.

### Ossipee System 2006 pH Data

	Mean Epilimnetic pH	Mean Hypolimnetic pH
<b>Lake Ossipee</b>	6.67	6.70
<b>Lower Danforth Pond</b>	6.62	6.75
<b>Broad Bay</b>	6.62	6.74
<b>Leavitt Bay</b>	6.61	6.66
<b>Berry Bay</b>	6.52	6.44

Overall, the mean pH among the five deep spots ranged from **6.44 (Berry Bay)** to **6.75 (Lower Danforth Pond)** in the hypolimnion and from **6.52 (Berry Bay)** to **6.67 (Lower Ossipee)** in the epilimnion, which means that the water is *slightly acidic*.

Due to the presence of granite bedrock in the state and acid deposition received from snowmelt, rainfall, and atmospheric particulates, there is not much that can be feasibly done to effectively increase lake pH.

#### ➤ **Table 5: Acid Neutralizing Capacity**

Table 5 in Appendix B presents the current year and historical epilimnetic ANC for each year the lake has been monitored through VLAP.

Buffering capacity (ANC) describes the ability of a solution to resist changes in pH by neutralizing the acidic input. The median ANC value for New Hampshire's lakes and ponds is **4.9 mg/L**, which indicates that many lakes and ponds in the state are at least "moderately vulnerable" to acidic inputs. For a more detailed explanation about ANC, please refer to the "Chemical Monitoring Parameters" section of this report.

The Acid Neutralizing Capacity (ANC) in the epilimnion (the upper layer) at the five deep spots, ranged from **4.8 mg/L (Lake Ossipee)** to **8.0 mg/L (Lower Danforth Pond)**, which is *less than* the state median and indicates that the surface water at each deep spot is *moderately vulnerable* to acidic inputs.

#### ➤ **Table 6: Conductivity**

Table 6 in Appendix B presents the current and historical

conductivity values for tributaries and in-lake data. Conductivity is the numerical expression of the ability of water to carry an electric current, which is determined by the number of negatively charged ions from metals, salts, and minerals in the water column. The median conductivity value for New Hampshire's lakes and ponds is **40.0 uMhos/cm**. For a more detailed explanation, please refer to the "Chemical Monitoring Parameters" section of this report.

The mean epilimnetic conductivity at the deep spots ranged from **39.85 uMhos/cm (Lake Ossipee)** to **49.86 uMhos/cm (Lower Danforth Pond)**, which is *approximately equal to* the state median.

Overall, the **2007** conductivity results for the five deep spots were *lower than* has been measured *during the past few years* (excluding 2006). It is likely that the dry weather conditions reduced the watershed runoff to the system in **2007**. Watershed runoff from significant wetfall events can increase nutrient loading from potential pollution sources in the watershed such as agriculture, development, septic systems, and road salting.

The epilimnetic conductivity has *gradually increased* at the **Broad Bay** and **Leavitt Bay** deep spots since monitoring began in **1990**. Typically, increasing conductivity indicates the influence of pollutant sources associated with human activities. These sources include failed or marginally functioning septic systems, agricultural runoff, and road runoff which contains road salt during the spring snow-melt. New development in the watershed can alter runoff patterns and expose new soil and bedrock areas, which could also contribute to increasing conductivity. In addition, natural sources, such as iron and manganese deposits in bedrock, can influence conductivity.

We recommend that your monitoring group conduct a shoreline conductivity survey of the lakes to help identify the sources of conductivity.

*To learn how to conduct a shoreline or tributary conductivity survey, please refer to the 2004 special topic article, which is posted on the VLAP website at [http://www.des.nh.gov/wmb/vlap/2004/documents/Appendix\\_D.pdf](http://www.des.nh.gov/wmb/vlap/2004/documents/Appendix_D.pdf) or contact the VLAP Coordinator.*

➤ **Table 7a and Table 7b: Total Kjeldahl Nitrogen and Nitrite+Nitrate Nitrogen**

Table 7a in Appendix B presents the current year and historical Total Kjeldahl Nitrogen and Table 7b presents the current year and historical nitrite and nitrate nitrogen. Nitrogen is another nutrient that is essential for the growth of plants and algae. Nitrogen is

typically the limiting nutrient in estuaries and coastal ecosystems. However, in freshwater, nitrogen is not typically the limiting nutrient. Therefore, nitrogen is not typically sampled through VLAP. However, if phosphorus concentrations in freshwater are elevated, then nitrogen loading may stimulate additional plant and algal growth. Please refer to the “Chemical Monitoring Parameters” section of this report for a more detailed explanation.

➤ **Table 8: Total Phosphorus**

Table 8 in Appendix B presents the current year and historical total phosphorus data for in-lake and tributary stations. Phosphorus is the nutrient that limits the algae’s ability to grow and reproduce. Please refer to the “Chemical Monitoring Parameters” section of this report for a more detailed explanation.

*Tributary sampling was not conducted through VLAP during the summer of 2003, 2004, 2005, 2006 or 2007. Consequently, DES cannot discuss the tributary data for the **Lake Ossipee System**.*

It would be best to sample the tributaries in the spring during snow-melt and during rainstorms to determine the quality of water that flows into each waterbody.

➤ **Table 9 and Table 10: Dissolved Oxygen and Temperature Data**

Table 9 in Appendix B shows the dissolved oxygen/temperature profile(s) collected during **2007**. Table 10 in Appendix B shows the historical and current year dissolved oxygen concentration in the hypolimnion (lower layer). The presence of dissolved oxygen is vital to fish and amphibians in the water column and also to bottom-dwelling organisms. Please refer to the “Chemical Monitoring Parameters” section of this report for a more detailed explanation.

An annual biologist visit was not conducted in **2007**. Therefore, a dissolved oxygen and temperature profile was not collected.

➤ **Table 11: Turbidity**

Table 11 in Appendix B lists the current year and historical data for in-lake and tributary turbidity. Turbidity in the water is caused by suspended matter, such as clay, silt, and algae. Water clarity is strongly influenced by turbidity. Please refer to the “Other Monitoring Parameters” section of this report for a more detailed explanation.

The deep spot turbidity was **relatively low** this year, which is good news.

However, we recommend that your group sample the pond and any surface water runoff areas during significant rain events to determine if stormwater runoff contributes turbidity and phosphorus to the pond.

*For a detailed explanation on how to conduct rain event sampling, please refer to the 2002 VLAP Annual Report special topic article, which is posted on the VLAP website at [http://www.des.nh.gov/wmb/vlap/2002/documents/Appndxd\\_monitoring.pdf](http://www.des.nh.gov/wmb/vlap/2002/documents/Appndxd_monitoring.pdf), or contact the VLAP Coordinator.*

➤ **Table 12: Bacteria (*E. coli*)**

Table 12 in Appendix B lists the current year and historical data for bacteria (*E. coli*) testing. *E. coli* is a normal bacterium found in the large intestine of humans and other warm-blooded animals. *E. coli* is used as an indicator organism because it is easily cultured and its presence in the water, in defined amounts, indicates that sewage **may** be present. If sewage is present in the water, potentially harmful disease-causing organisms **may** also be present.

Bacteria sampling was **not** conducted during **2007**. If residents are concerned about sources of bacteria such as failing septic systems, animal waste, or waterfowl waste, it is best to conduct *E. coli* testing when the water table is high, when beach use is heavy, or immediately after rain events.

➤ **Table 13: Chloride**

Table 13 in Appendix B lists the current year and the historical data for chloride sampling. The chloride ion (Cl<sup>-</sup>) is found naturally in some surfacewaters and groundwaters and in high concentrations in seawater. Research has shown that elevated chloride levels can be toxic to freshwater aquatic life. In order to protect freshwater aquatic life in New Hampshire, the state has adopted **acute and chronic** chloride criteria of **860 and 230 mg/L** respectively. The chloride content in New Hampshire lakes is naturally low, generally less than 2 mg/L in surface waters located in remote areas away from habitation. Higher values are generally associated with salted highways and, to a lesser extent, with septic inputs. Please refer to the “Chemical Monitoring Parameters” section of this report for a more detailed explanation.

Chloride sampling was **not** conducted during **2007**.

- **Table 14: Current Year Biological and Chemical Raw Data**  
Table 14 in Appendix B lists the most current sampling year results. Since the maximum, minimum, and annual mean values for each parameter are not shown on this table, this table displays the current year “raw,” meaning unprocessed, data. The results are sorted by station, depth, and then parameter.
  
- **Table 15: Station Table**  
As of the spring of 2004, all historical and current year VLAP data are included in the DES Environmental Monitoring Database (EMD). To facilitate the transfer of VLAP data into the EMD, a new station identification system had to be developed. While volunteer monitoring groups can still use the sampling station names that they have used in the past and are most familiar with, an EMD station name also exists for each VLAP sampling location. Table 15 in Appendix B identifies what EMD station name corresponds to the station names you have used in the past and will continue to use in the future.

#### **DATA QUALITY ASSURANCE AND CONTROL**

##### **Annual Assessment Audit:**

An annual biologist visit and assessment audit was not performed in **2007**.

***Please contact the VLAP Coordinate early in 2008 to schedule your annual biologist visit!***

##### **Sample Receipt Checklist:**

Each time your monitoring group dropped off samples at the laboratory this summer, the laboratory staff completed a sample receipt checklist to assess and document if your group followed proper sampling techniques when collecting the samples. The purpose of the sample receipt checklist is to minimize, and hopefully eliminate, future re-occurrences of improper sampling techniques.

Overall, your monitoring group performed ***very well*** while collecting samples on the annual biologist visit this year! Specifically, the members of your monitoring group followed the majority of the proper field sampling procedures. However, the biologist did identify a few aspects regarding sample collection that the volunteer monitors could improve upon, as follows:

- **Sample bottle volume:** Please fill each sample bottle up to the neck of the bottle where the bottle curves in. This will ensure that the laboratory staff will have enough sample water to conduct all of the necessary tests.

Please be careful to not overflow the small brown bottle used for phosphorus sampling since this bottle contains acid. If you do accidentally overflow the small brown bottle, please rinse your hands and the outside of the sample bottle and make a note of this on your field sampling sheet. The laboratory staff will put additional acid in the bottle in the laboratory to preserve the sample.

### USEFUL RESOURCES

*Acid Deposition Impacting New Hampshire's Ecosystems*, DES fact sheet ARD-32, (603) 271-2975 or [www.des.nh.gov/factsheets/ard/ard-32.htm](http://www.des.nh.gov/factsheets/ard/ard-32.htm).

*Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials*, DES Booklet WD-03-42, (603) 271-2975.

*Best Management Practices for Well Drilling Operations*, DES fact sheet WD-WSEB-21-4, (603) 271-2975 or [www.des.nh.gov/factsheets/ws/ws-21-4.htm](http://www.des.nh.gov/factsheets/ws/ws-21-4.htm).

*Biodegradable Soaps and Water Quality*, DES fact sheet BB-54, (603) 271-2975 or [www.des.nh.gov/factsheets/bb/bb-54.htm](http://www.des.nh.gov/factsheets/bb/bb-54.htm).

*Canada Geese Facts and Management Options*, DES fact sheet BB-53, (603) 271-2975 or [www.des.nh.gov/factsheets/bb/bb-53.htm](http://www.des.nh.gov/factsheets/bb/bb-53.htm).

*Cyanobacteria in New Hampshire Waters Potential Dangers of Blue-Green Algae Blooms*, DES fact sheet WMB-10, (603) 271-2975 or [www.des.nh.gov/factsheets/wmb/wmb-10.htm](http://www.des.nh.gov/factsheets/wmb/wmb-10.htm).

*Erosion Control for Construction in the Protected Shoreland Buffer Zone*, DES fact sheet WD-SP-1, (603) 271-2975 or [www.des.nh.gov/factsheets/sp/sp-1.htm](http://www.des.nh.gov/factsheets/sp/sp-1.htm).

*Freshwater Jellyfish In New Hampshire*, DES fact sheet WD-BB-5, (603) 271-2975 or [www.des.nh.gov/factsheets/bb/bb-51/htm](http://www.des.nh.gov/factsheets/bb/bb-51/htm).

*Impacts of Development Upon Stormwater Runoff*, DES fact sheet WD-WQE-7, (603) 271-2975 or [www.des.nh.gov/factsheets/wqe/wqe-7.htm](http://www.des.nh.gov/factsheets/wqe/wqe-7.htm).

*IPM: An Alternative to Pesticides*, DES fact sheet WD-SP-3, (603) 271-2975 or [www.des.nh.gov/factsheets/sp/sp-3.htm](http://www.des.nh.gov/factsheets/sp/sp-3.htm).

*Iron Bacteria in Surface Water*, DES fact sheet WD-BB-18, (603) 271-2975 or [www.des.nh.gov/factsheets/bb/bb-18.htm](http://www.des.nh.gov/factsheets/bb/bb-18.htm).

*Lake Foam*, DES fact sheet WD-BB-4, (603) 271-2975 or [www.des.nh.gov/factsheets/bb/bb-5.htm](http://www.des.nh.gov/factsheets/bb/bb-5.htm).

*Lake Protection Tips: Some Do's and Don'ts for Maintaining Healthy Lakes*, DES fact sheet WD-BB-9, (603) 271-2975 or [www.des.nh.gov/factsheets/bb/bb-9.htm](http://www.des.nh.gov/factsheets/bb/bb-9.htm).

*Low Impact Development Hydrologic Analysis*. Manual prepared by Prince George's County, Maryland, Department of Environmental Resources. July 1999. To access this document, visit [www.epa.gov/owow/nps/lid\\_hydr.pdf](http://www.epa.gov/owow/nps/lid_hydr.pdf) or call the EPA Water Resource Center at (202) 566-1736.

*Low Impact Development: Taking Steps to Protect New Hampshire's Surface Waters*, DES fact sheet WD-WMB-16, (603) 271-2975 or [www.des.nh.gov/factsheets/wmb/wmb-17.htm](http://www.des.nh.gov/factsheets/wmb/wmb-17.htm).

*Proper Lawn Care In the Protected Shoreland, The Comprehensive Shoreland Protection Act*, DES fact sheet WD-SP-2, (603) 271-2975 or [www.des.nh.gov/factsheets/sp/sp-2.htm](http://www.des.nh.gov/factsheets/sp/sp-2.htm).

*Road Salt and Water Quality*, DES fact sheet WD-WMB-4, (603) 271-2975 or [www.des.nh.gov/factsheets/wmb/wmb-4.htm](http://www.des.nh.gov/factsheets/wmb/wmb-4.htm).

*Sand Dumping - Beach Construction*, DES fact sheet WD-BB-15, (603) 271-2975 or [www.des.nh.gov/factsheets/bb/bb-15.htm](http://www.des.nh.gov/factsheets/bb/bb-15.htm).

*Shorelands Under the Jurisdiction of the Comprehensive Shoreland Protection Act*, DES fact sheet SP-4, (603) 271-2975 or [www.des.nh.gov/factsheets/sp/sp-4.htm](http://www.des.nh.gov/factsheets/sp/sp-4.htm).

*Soil Erosion and Sediment Control on Construction Sites*, DES fact sheet WQE-6, (603) 271-2975 or [www.des.nh.gov/factsheets/wqe/wqe-6.htm](http://www.des.nh.gov/factsheets/wqe/wqe-6.htm).

*Swimmers Itch*, DES fact sheet WD-BB-2, (603) 271-2975 or [www.des.nh.gov/factsheets/bb/bb-2.htm](http://www.des.nh.gov/factsheets/bb/bb-2.htm).

*Through the Looking Glass: A Field Guide to Aquatic Plants*, North American Lake Management Society, 1988, (608) 233-2836 or [www.nalms.org](http://www.nalms.org).

*Weed Watchers: An Association to Halt the Spread of Exotic Aquatic Plants*, DES fact sheet WD-BB-4, (603) 271-2975 or [www.des.nh.gov/factsheets/bb/bb-4.htm](http://www.des.nh.gov/factsheets/bb/bb-4.htm).

*Watershed Districts and Ordinances*, DES fact sheet WD-WMB-16, (603) 271-2975 or [www.des.nh.gov/factsheets/wmb/wmb-16.htm](http://www.des.nh.gov/factsheets/wmb/wmb-16.htm).