DETERGENTS

AND YOUR LAKE

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Major contributors to this brochure were Lake Cochituate Watershed Association volunteers:

Joseph B. Alpers
Ella May Crane

Production was coordinated by Robert S. Wenstrup.

THE MASSACHUSETTS CONGRESS OF LAKES AND PONDS ASSOCIATIONS, INC.

The Massachusetts Congress of Lakes and Ponds Associations, Inc. (MCOLAPA) is an active organization working to vigorously support legislation to clean up lakes and ponds in the Commonwealth. The Congress provides citizen leadership in designing efforts to curb pollution in Massachusetts waters.

In September of 1979, the newly formed state-wide Massachusetts Congress of Lakes and Ponds Association, Inc. held an annual meeting at Worcester Polytechnical Institute. During the meeting, an Executive Committee was elected and project priorities were determined.

The Massachusetts Congress of Lakes and Ponds Associations, Inc. has two purposes as stated in its by-laws:

(1) To perform all acts appropriate to a non-profit, scientific, literary, and educational organization dedicated to the promotion and development of environmental quality standards essential for satisfactory life styles and conditions in the natural community, and

(2) To preserve the aesthetic, recreational, and commercial values of lakes and properties through the maintenance and improvement of such environmental factors as watershed ecology, water quality, lake water levels, shoreline, woodland management, agricultural soils practices, recreational and residential building standards, and related influences, such as water and boating safety.

Membership in the Congress is welcome and viewed as essential in assuring that the water quality issues on lakes and ponds are addressed on a state-wide as well as an individual level. More detailed information on the Massachusetts Congress of Lakes and Ponds Associations, Inc. is available by contacting Mr. Carl Peterson, President, P.O. Box 312, Westminster, MA 01473.

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PURPOSE AND USE OF THIS BROCHURE

This brochure describes the danger to our lakes from the use of detergents containing phosphate. It explains why our society has moved from old-fashioned soaps to phosphate-based detergents. We see how phosphate makes its way from individual septic systems into streams and lakes, and how, once in natural waters, phosphate promotes the growth of algae and the deterioration of waters. It presents advice on alternatives to these chemicals that are damaging our environment. It explains how to switch safely from phosphate-containing detergents to locally available products with little or no phosphate content (see Tables).

CASE STUDY: LAKE COCHITUATE

The Lake Cochituate Watershed area (all of the land which drains downhill into the lake) contains about 17.4 square miles in parts of Natick, Framingham, Wayland, Sherborn, and Ashland. The lake itself, located in Framingham, Natick, and Wayland covers over 600 acres.

Lake Cochituate consists of three major ponds (North, Middle, and South) separated by the Mass. Pike to the north and Route 135 to the south. From 1848 to 1931, this beautiful, sprawling lake provided Metropolitan Boston with drinking water through a complex eighteen-mile aqueduct system. In 1931, the Metropolitan District Commission (MDC) made Lake Cochituate a standby reservoir, by then a small supplement to the newer Wachusett and later Quabbin Reservoir systems. Finally, in 1947, the MDC transferred Lake Cochituate to what was then called the Massachusetts Conservation Department, freeing the shoreline and waters for general recreational use. Cochituate State Park has become a most complex and heavily used State Park.

As a result of a century of water supply usage, the lake's immediate shoreline has been protected from development. The 27 miles of sand and gravel shoreline, which are backed with thickly wooded stands of pine, oak, birch, and maple are, however, deceiving. Behind this narrow screen of green is the major reason for concern for the lake's future: extensive residential and commercial land development.

The impact on the lake of the rapid development of all the towns in the watershed has been severe, due to the introduction of nutrient wastes. Preservation of Lake Cochituate as a prime recreational resource demands a change in the practices that have led to the present state.

DETERGENT PHOSPHATES AND THE ENVIRONMENT

WHAT IS THE PROBLEM?

Lake Cochituate has suffered from increasing blooms of algae. Filamentous algae are choking Snake Brook in Wayland and Natick; floating mats of this material are threatening the Wayland Town Beach on North Pond. Heavy nutrient burdens entering from Beaver Dam Brook, Pegan Brook and Course Brook have spawned severe algal blooms in South and Middle Ponds. In addition, phosphates and nitrates released from heavy residential development in the watershed have supplied enormous food supplies for algal growth. The nutrients enter from the lake perimeter from storm drains, by transport through soil and through the lake tributaries.

Among the most serious of the pollutants are phosphate compounds occurring in detergents. To keep our clothes a little whiter we have been making our lake a whole lot greener. It's time to examine what we're doing and reorganize our priorities.

The process by which the lake becomes damaged is called *eutrophication*. This is a biological term (literally "good nourishing") which refers to the fact that algae and aquatic plants proliferate when overfertilized, to the detriment of most fish and recreational activities. *Cultural* or manmade eutrophication, resulting from the enrichment of water with nutrients derived from human activities, converts a pristine lake to one which is weed- and algae-clogged in years or decades; whereas the natural process of eutrophication would require thousands of years to come about in the absence of people, or perhaps would never take place.

WHAT ARE PHOSPHATES AND HOW DO THEY DAMAGE LAKES AND STREAMS?

Phosphate is a fully oxidized form of phosphorus - the form that occurs most commonly in natural compounds. It is one of the many chemicals necessary for life, along with carbon, nitrogen, sulfur, and several dozen others. Phosphate is part of some of the most important biological materials. It appears, for example, in genetic material responsible for heredity as well as in energy transferring compounds. Without phosphate, living things could not survive, because they would have no energy for their on-going metabolism, and no DNA for reproducing their own kind.

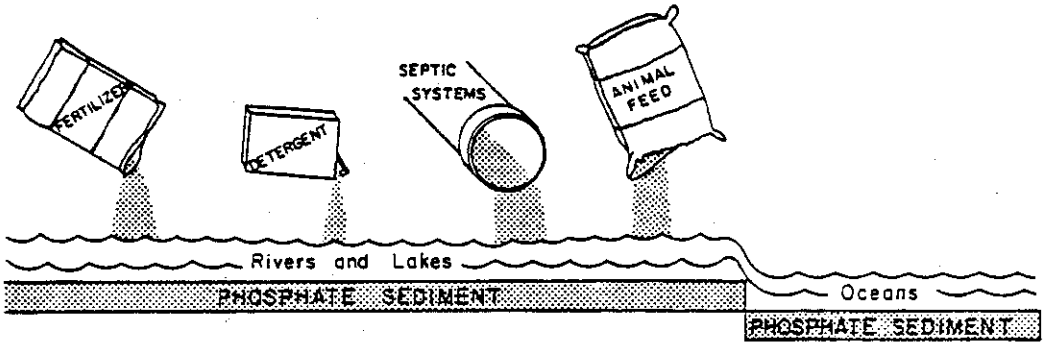
Phosphates contain phosphorus. The simplest phosphate has a single phosphorus atom and four oxygens. Sodium tripolyphosphate, a complex phosphate with three phosphorus atoms, is used most often in laundry detergents. Other types of phosphate with varying numbers of phosphorus atoms, appear in automatic dishwashing detergents.

Phosphorus is probably the most critical supplemental ingredient for the growth of algae and aquatic weeds in lakes and streams. There is usually a deficiency of phosphorus relative to other nutrient elements, and the overall rate of plant growth is limited by the supply of phosphorus. In certain environments nitrogen (and sometimes carbon) becomes the limiting nutrient, because the level of phosphate pollution is already so immense.

Algae may grow as single microscopic cells, or in great floating mats or as rooted aquatic plants. Usually a few forms predominate in any given setting. The algae grow vigorously when fertilized by nutrients. Then, when they decompose under the influence of bacteria, oxygen is consumed in great amounts, with resulting damage to fish and other oxygen-requiring forms of life in the water.

Eventually, the water becomes less and less hospitable for fish, aquatic plant growth takes over, and what was previously a lake has become a marsh. The lake dies.

PHOSPHATES IN WATER



WHAT IS THE BEHAVIOR OF PHOSPHATE IN SOIL?

When phosphates are released into the soil from septic systems, they may be picked up by living organisms, such as bacteria or plants, or they may react with minerals, or pass into groundwater.

In lime-rich soils, phosphate produces precipitates with poor solubility, such as calcium phosphate. In other soils, phosphates may react with iron or aluminum, depending on local conditions. Eventually, the soil becomes loaded with the precipitated phosphate compounds, and the phosphate passes freely into the groundwater. This is an unattractive development, since it means that the septic system is not functioning well and that the phosphate will now be entering into streams and lakes to promote eutrophication. *Thus, limiting the amount of phosphate that enters a septic system helps prolong the effective life of a leaching field while it protects the environment.*

In *cultivated* soils, phosphorus is one of the elements most commonly depleted by the growing crops, so it is a major component of fertilizers. Fertilizers are thus an important source of phosphate in soil and in groundwater. They will be more fully discussed in another brochure in this series.

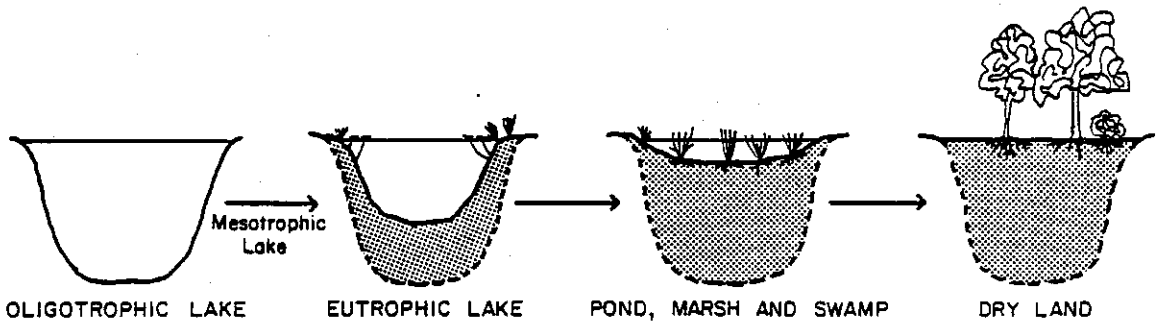
OUR PHOSPHATE RESOURCES ARE BEING TRANSFERRED TO THE BOTTOM OF THE SEA

Most American lakes are now receiving such burdens of phosphate primarily from detergents as to cause significant eutrophication. Over the past decade, the quantity of phosphate used in detergents has been steadily mounting. It is estimated that the phosphate from detergents in 1970 accounted for half of the phosphate in municipal sewage.

The phosphate content of natural waters is higher in winter, when photosynthesis is low. In spring and summer, it is drastically diminished due to uptake by

plant life, especially algae. When algae die in the late fall and winter, the phosphate they contain is deposited at the bottom, where it constitutes a reservoir. The story is the same in oceans as in smaller bodies of water although less visible. In fact, the earth's phosphorus is steadily finding its way to the bottom of the sea. It is not being recycled, except to a very small extent through harvested fish life. Although the world supply is considered adequate for hundreds of years, this is not a limitless resource.

STAGES OF EUTROPHICATION



WHAT QUANTITIES OF PHOSPHATE ARE INVOLVED? HOW MUCH IS THE INDIVIDUAL CITIZEN CONTRIBUTING TO THE PROBLEM?

The average person contributes about four pounds of phosphorus (about twelve pounds of phosphate) into waste water each year, including the phosphate in human toilet waste as well as that in detergents (the figure also includes eac person's "share" in the wastes of agriculture and livestock production). Phosphorus can generate 500 times its own weight in algae or other plants; hence the four pounds from each citizen can produce a ton of plant "biomass." While phosphorus, as we have noted, is an important limiting factor for plant growth, it is about 100 times more concentrated in sewage effluent than in natural lake water. Thus, when sewage finds its way to natural water, the biomass potential is immensely amplified.

As we have noted, phosphate from detergents now accounts for over half of the phosphate in municipal sewage. More importantly, that is the half about which we have some options. Human refuse will always contain phosphate. Our cleaning agents could be rid of this material. This part of the problem can be eliminated at the source.

THE COMPOSITION OF DETERGENTS

WHAT IS A DETERGENT AND HOW IS IT DIFFERENT FROM SOAP?

Old fashioned soap is made by the action of alkali (lye) on animal fats and plant oils. The fatty acid molecule in soap has two distinct ends, one attracted to the water, the other attracted to the oily dirt. These actions cause the dirt to be loosened. Soap molecules surround and suspend the dirt particles in the water.

Detergents are synthesized mostly from petroleum products and some inorganic matter. They are composed of surfactants, builders, and fillers. The one essential ingredient is the *surfactant*, the true cleansing agent. The surfactant is a wetting agent that encourages water to penetrate (by lowering its surface tension) so that soil is loosened from fabrics. *Builders* are ingredients with little or no cleaning power of their own, which make the surfactant perform better. Builders tie up minerals dissolved in water that interfere with the efficiency of the surfactant. These objectionable minerals include magnesium and iron, and most important of all, calcium. The most common builders are phosphate compounds.

Phosphate compounds also function to create and maintain proper alkalinity, or high pH; and to remove dirt particles by keeping them suspended in the wash water. *Fillers* are inexpensive ingredients that dilute the product, making it easier to measure out appropriate quantities, and thereby reducing the overall selling price per pound. Detergents also contain small amounts of artificial brighteners and perfumes that make the product appear more effective and attractive. *The present problems, it must be emphasized, arise entirely from the phosphate or builder component.*

WHY INCLUDE "BUILDERS" IN DETERGENTS? WHY IS IT NECESSARY TO TIE UP CALCIUM?

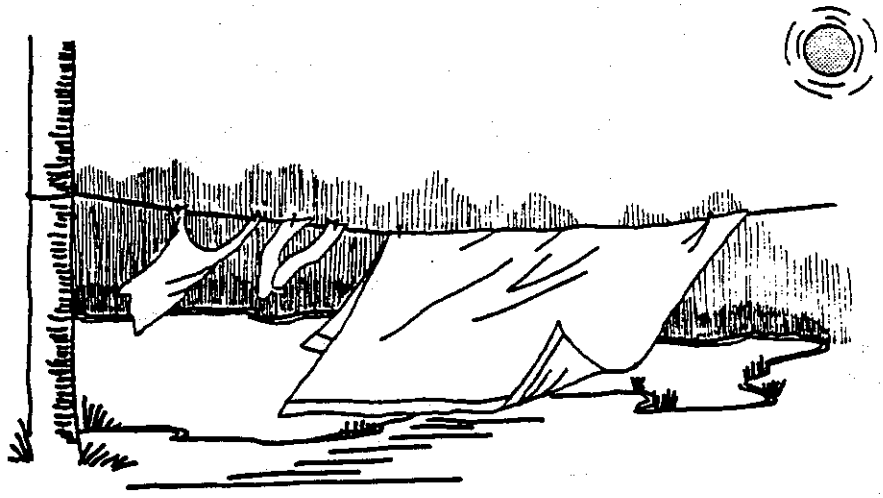
Water containing a lot of calcium compounds is called "hard." When calcium combines with soap, the resulting "calcium soap" is a scummy substance, the "ring" in the bathtub, and so forth. This material may even become deposited on the fabrics being washed. Phosphates are added to detergents to prevent this problem by removing the free calcium compounds from solution. Here in Massachusetts, the water is relatively soft.

WHY NOT GO BACK TO SOAP? ARE WE OBLIGED TO USE DETERGENTS ALTOGETHER?

We can go back to soap, but it's not that simple. Today's washing machines and detergents have been developed together. It would require effort to redesign both. Also, it's not the major cleansing agent (the surfactant) which is giving the problem, but the phosphate builder (The surfactants are bio-degradable and do not adversely affect the environment. However, they are petroleum-derived, which may soon give other problems; such as shortages or price increases).

The detergent industry in fact claims that there aren't enough fats and oils available to produce the quantities of soap we would need. The industry also points out that old-fashioned soaps are now unacceptable to the American homemaker, especially in regions of "hard" water.

In the soft water, however, granulated soap plus washing soda, which contains no phosphate, can be effective, particularly in cleaning laundry made of natural fibers.



PHOSPHATES ARE BEING USED IN CONJUNCTION WITH OTHER NEW TECHNOLOGIES

In powdered laundry detergents, the surfactant or main cleaning agent is only 15-20% by weight, while the phosphate or builder is 30-70%. This is usually as sodium triphosphate (STP). In dishwasher detergents, other forms of phosphate are used, which comprise about 12% of the total weight. In contrast, light duty detergents (liquids for doing dishes or delicate fabrics by hand) usually contain no phosphate.

To a large extent, the presence of phosphate is associated with automation. Where hand rubbing is used, phosphate is rarely necessary.

Synthetic fibers are generally more resistant than natural ones to the removal of grime. People of generations past did not seem to be plagued by "ring around the collar," even using ordinary laundry soap, and often in hard water areas. In this sense, one technology has led to the need for another: the development of synthetic fibers has led to the need for cleaning agents that will take care of these hard-to-clean synthetic fabrics.

Phosphate in our laundries has resulted from: 1) the arrival, since World War II of automated clothes washers used by virtually every U.S. household, 2) new cleaning products to match the performance of these machines, and 3) the introduction of harder-to-clean synthetic fabrics.

In response to the growing opposition to phosphorus, many detergents manufacturers are now using alternative builders such as silicates and carbonates, to remove calcium. In the tables of this brochure, many of the powdered laundry detergents listed as "no phosphate" contain these chemicals, which are not harmful to the environment. These are the ones to use!

DOES THE PHOSPHATE PROBLEM HAVE ANYTHING TO DO WITH THE FOAMING THAT WAS A PROBLEM IN THE 1960's?

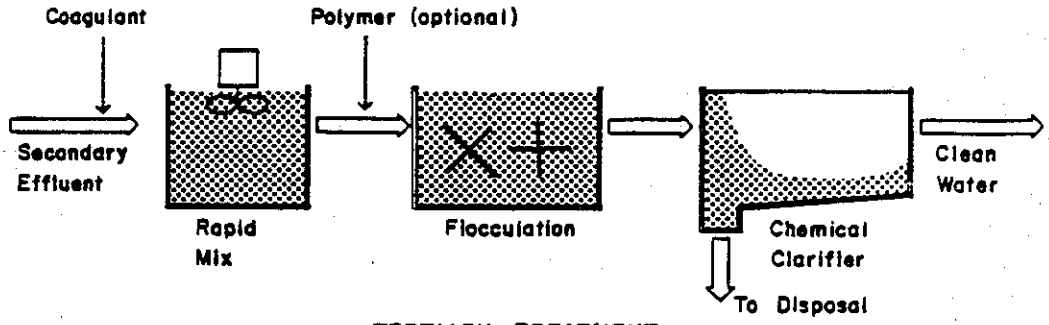
No. Detergent phosphate is the cause of eutrophication difficulties, but the problem of the '50's and '60's was a separate one, involving the surfactant components. Surfactants used at that time did not break down easily when the water in which they occurred was cycled back to the environment. Therefore they tended to accumulate as unsightly foam in streams and lakes all over the world.

When the federal government banned non-biodegradable detergents in 1965, all companies quickly marketed detergents in which the surfactants were *biodegradable*, that is, capable of breaking down to simpler materials that reentered the environment without apparent harm. The foam problems has been almost totally eradicated. We should repeat, however, that the *phosphate* problem is a separate concern.

ELIMINATING PHOSPHATE FROM OUR LAKES AND STREAMS

WHAT METHODS CAN BE USED TO REDUCE THE AMOUNT OF PHOSPHATE IN SEWAGE THAT IS AVAILABLE TO ENTER LAKES AND STREAMS?

There are methods for removing phosphate from wastewater at a sewage treatment plant before the water is released to the environment. This "tertiary treatment" process is expensive and very few communities can afford it. This is, of course, the approach most encouraged by the detergent industry (Some major companies have studied how to avoid phosphates in their products altogether).

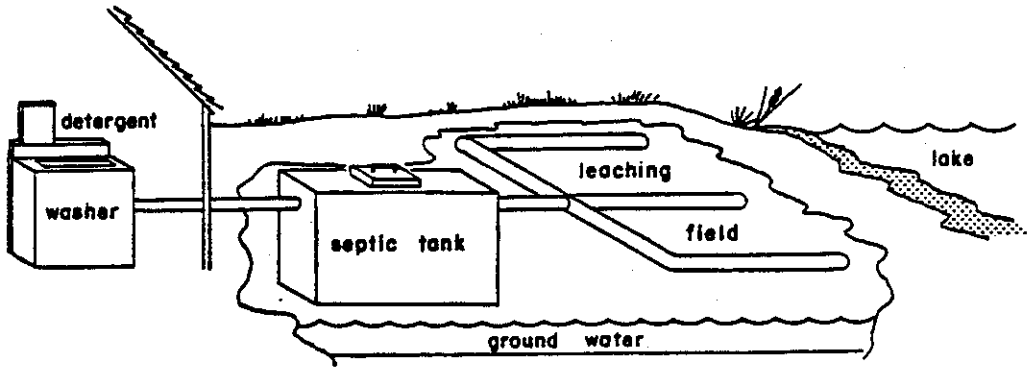


TERTIARY TREATMENT

PHOSPHORUS REMOVAL

There are good reasons for approaching the detergent problem as separate from the sewage treatment problem. First, simply eliminating phosphate from detergents would result in an immediate 50% reduction of phosphate in virtually all municipal wastes. Secondly, it would result in a substantial reduction of treatment costs at sewage treatment plants. Thirdly, removal of phosphate from detergents would eliminate 50% of the phosphate delivered to groundwater from isolated dwellings and small communities without municipal sewers.

The phosphate from individual septic systems which exceeds the binding capacity of the soil eventually finds its way to the groundwater and into streams and lakes. Some sections of the towns bordering on Lake Cochituate are connected to the MDC sewer system, but most dwellings are serviced by septic systems and cesspools. *Hence, for the Lake Cochituate region and others relying on septic systems, it is especially important to avoid phosphate-containing detergents.*



WHAT ALTERNATIVES TO PHOSPHATE ARE POSSIBLE?

Nobody *needs* to use phosphate-containing detergents; products without phosphate are available and effective. Most phosphate-free detergents contain "washing soda" (sodium carbonate) or sodium silicate as complexers for calcium. These builders have no adverse effects on the environment but can be caustic to eyes and hands, so manufacturers directions should be closely followed. It is anticipated that a substitute for phosphate will be found that will be effective even in hard water areas.
Our local water is not "hard"; neither is washing without phosphate. Available non-phosphate detergents in powder and liquid form do an excellent job in the removal of grime from synthetic fabrics even in cold water (consult the Tables in this brochure to identify these products).

In addition, if one desires to use soap plus washing soda (a water softener that removes calcium scum) it is still an effective combination for cleaning fabrics made of natural fibers (cotton, linen, silk, wool). *But if you switch from detergents to soap and washing soda, white clothes may yellow unless all detergent residue is removed.* This is accomplished by soaking in hot water containing four tablespoons of washing soda before the first washing. Better yet, let the clothes soak in this overnight.

For the relatively soft water, use one cup of granulated soap (Ivory Flakes or Ivory Snow, Duz Laundry Soap, or Instant Fels Soap) and 1/3 cup of washing soda in top-loading machines. In front-loading machines, use 1/2 cup of soap and 1/8 to 1/4 cup washing soda. Hot water improves cleaning, but for some fine fabrics and colored washables, warm water may be preferable. Add the soap and washing soda to the water, allowing it to dissolve and to soften the water before adding the clothes. For difficult stains and heavy soils, pretreat with any of the following methods: a paste made of soap powder and a small amount of water, a phosphate-free liquid detergent, a phosphate-free laundry presoak, or phosphate-free soil-and-stain remover (consult Tables to identify these products). Liquid or powdered bleach will help to brighten your whites and colorfast clothes, and to remove many difficult soils. Fabric softener is not needed, as soap leaves clothes naturally soft.

Automatic dishwasher detergents are particularly high in phosphate content. A mixture of washing soda with dishwater detergent is an effective cleaning agent and works well in automatic dishwashers.

HOW ABOUT LEGISLATION?

The legal route to a better environment is difficult, although resolution of the foaming problem proved that it can work. Phosphates have already been banned in some areas. With the Great Lakes in mind, Canada limited the phosphate content in detergents to 8.7% phosphorus (25% phosphate) in 1970, and then to 2.2% phosphorus (7% phosphate) in 1973. In this country, a number of states including Indiana, New York, and Michigan have acted to *ban* the sale of phosphate-containing detergents. Legislation limiting the phosphorus in heavy duty detergents to 8.7% has prevailed in Connecticut, Florida, and Maine.

A bill has been filed in the Massachusetts legislature by the Executive Office of Environmental Affairs that would prohibit sale of phosphate-containing laundry detergents. It would restrict dishwasher detergents to 8.7%. This bill has not been reported out of committee as of this writing. Protection of our lake still depends, therefore, on the vigilance of informed citizens.

GUIDE TO AVAILABLE PRODUCTS

The accompanying tables show the phosphate content in *grams per use* according to the manufacturer's specifications on the package. The lower this value, the less the product will contribute to the pollution and eutrophication of our watershed. Products with no phosphate (or low phosphate) are widely available. We hope you will use these tables to select products that will be harmless to water bodies.

POWDERED LAUNDRY DETERGENTS AND SOAPS WITH LITTLE OR NO PHOSPHATE

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
AJAX (total color)	Colgate-Palmolive		no phosphate
ARM & HAMMER	Church & Dwight		no phosphate
DUZ LAUNDRY SOAP	Procter & Gamble		no phosphate
FINAST (all purpose blue)	First Nat'l Stores		trace
FINAST (cold water)	First Nat'l Stores		trace
FINAST (heavy duty)	First Nat'l Stores		trace
FINAST (low suds)	First Nat'l Stores		trace
GAIN (careful: there are two kinds)	Procter & Gamble	1-1/4 C.	trace
IGA (phosphate free)	Independent Grocers Ass'n Distrib. Co.	1 C.	trace
INSTANT FELS	Purex Corp.		no phosphate
IVORY FLAKES	Procter & Gamble		no phosphate
IVORY SNOW	Procter & Gamble		no phosphate
MIRACLE WHITE	Drackett Products Co.		trace
PUREX (all temperature)	Purex Corp.		no phosphate
STOP & SHOP (cold water)	Stop & Shop Co., Inc.		trace
STOP & SHOP (hi-power blue)	Stop & Shop Co., Inc.		trace
TREND	Purex Corp.		no phosphate
WOOLITE (for machines)	Boyle Midway, Inc.		no phosphate
COLD WATER XE (careful: there are two kinds)	Colgate-Palmolive		no phosphate

HIGH PHOSPHATE POWDERED LAUNDRY DETERGENTS AND SOAPS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
AJAX (total color new)	Colgate-Palmolive	1 C.	6.4
ALL (bleach, borax, and brighteners)	Lever Bros.	3/4 C.	7.0
ALL (concentrated)	Lever Bros.	3/4 C.	7.0
BOLD (all fabric)	Procter & Gamble	1-1/4 C.	5.8
BONUS (heavy duty)	Procter & Gamble	1-1/4 C.	5.8
CHEER (all temperature)	Procter & Gamble	1 C.	6.7
COLD POWER	Colgate-Palmolive	1 C.	6.4

C. = Cup

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
DASH (low suds, conc'd)	Procter & Gamble	1/2 C.	6.2
DREFT (for baby laundry)	Procter & Gamble	1-1/8 C.	6.7
DUZ (heavy duty)	Procter & Gamble	1-1/4 C.	6.5
FAB (with brighteners)	Colgate-Palmolive	1 C.	6.4
GAIN	Procter & Gamble	1-1/4 C.	5.8
IGA (all purpose)	Independent Grocers Ass'n Distrib. Co.	1 C.	5.6
IGA (white with ultra brighteners)	Independent Grocers Ass'n Distrib. Co.	1 C.	5.6
OXYDOL	Procter & Gamble	1-1/4 C.	5.8
PUNCH	Colgate-Palmolive	1 C.	6.4
PURITY SUPREME (total power)	Purity Supreme Inc.	1 C.	4.3
RINSO	Lever Bros., Inc.	1-1/4 C.	5.8
STAR (blue)	Star Mkt. Div. of Jewel Co., Inc.	1 C.	4.3
STOP & SHOP (blue power)	Stop & Shop Co., Inc.	1 C.	4.3
STOP & SHOP (low suds, bleach, borax, brighteners)	Stop & Shop Co., Inc.	3/4 C.	3.9
TIDE	Procter & Gamble	1-1/4 C.	5.8
COLD WATER XE	Colgate-Palmolive	1 C.	6.4

LIQUID LAUNDRY DETERGENTS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
*ALL } two kinds	Lever Bros.	1/2 C.	7.0
ALL } two kinds	Lever Bros.	no phosphate	
DYNAMO	Colgate-Palmolive	no phosphate	
FINAST (heavy duty)	First Nat'l Stores	no phosphate	
IGA	Independent Grocers Ass'n Distrib. Co.	no phosphate	
PURITY SUPREME (heavy duty)	Purity Supreme Inc.	no phosphate	
STAR'S	Star Mkt. Div. of Jewel Co., Inc.	no phosphate	
STOP & SHOP (heavy duty)	Stop & Shop, Inc.	no phosphate	
STOP & SHOP (cold water)	Stop & Shop, Inc.	no phosphate	
WISK	Lever Bros., Inc.	1/2 C.	5.3

LAUNDRY SOAP BARS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
FELS NAPHTHA (heavy duty)	Purex Corp.	no phosphate	

*Same type of box for both products

LIQUID COLD WATER WASH FOR DELICATE FABRICS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
CVS WOOL WASH	Consumer Value Stores	no phosphate	
WOOLITE	Boyle Midway Inc.	no phosphate	

LAUNDRY BOOSTERS AND WATER CONDITIONERS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
ARM & HAMMER WASHING SODA	Church & Dwight	no phosphate	
ARM & HAMMER BORAX	Church & Dwight	no phosphate	
MIRACLE WHITE (super cleaner)	Drackett Products, Inc.	no phosphate	
20 MULE TEAM BORAX	U.S. Borax	no phosphate	

WHITENERS AND BRIGHTENERS FOR LAUNDRY

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
BORATEEM	U.S. Borax & Chemical Company	no phosphate	
LA FRANCE	Purex Corp.	no phosphate	

LAUNDRY PRESOAKS AND LAUNDRY BOOSTERS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
*AXION } two kinds	Colgate-Palmolive	1/2 C.	4.8
AXION } two kinds	Colgate-Palmolive	no phosphate	
*BIZ } two kinds	Procter & Gamble	1/2 C.	5.3
BIZ } two kinds	Procter & Gamble	no phosphate	

WATER SOFTENERS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
CALGON	Calgon Consumer Products, subsid. Merck & Co.	contains two water softeners	

SOIL AND STAIN REMOVERS FOR LAUNDRY

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
GREASE RELIEF	Texize Chemicals Co.	no phosphate	
MAGIC (prewash)	Armour-Dial	no phosphate	
MIRACLE WHITE	Drackett Products	no phosphate	
SHOUT	Johnson Wax	no phosphate	
SPRAY & WASH	Texize Chemicals Co.	no phosphate	

POWDERED AUTOMATIC DISHWASHING

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
ALL	Lever Bros.	1-1/2 C.	2.3
CALGONITE	Calgon Subsid. of Merck	2 tbsp.	2.6
CASCADE	Procter & Gamble	2 tbsp.	3.1
ELECTROSOL	Economics Lab., Inc.	1 tbsp.	2.1
FINAST	First Nat'l Stores	2 tbsp.	2.1
FINISH	Economics Lab., Inc.	2 tbsp.	2.6
IGA	Independent Grocers Ass'n Distrib. Co.	2 tbsp.	2.4
STAR'S	Star Market Div. of Jewel Co.	2 tbsp.	2.4
STOP & SHOP (lemon scented or regular)	Stop & Shop Co., Inc.	1 tbsp.	2.1

LIQUID DISHWASHING AND HAND WASHABLES

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
AJAX	Colgate-Palmolive	no phosphate	
DAWN	Procter & Gamble	no phosphate	
DEW (pink lotion)	Kemp Chemicals Inc.	no phosphate	
DOVE	Lever Bros.	no phosphate	
IGA (pink lotion)	Independent Grocers Ass'n. Distrib. Co.	no phosphate	
IVORY LIQUID	Procter & Gamble		trace
JOY	Procter & Gamble		trace
LEMON CHIFFON	Armour-Dial	no phosphate	
LUX	Lever Bros.	no phosphate	
OCTAGON (lemon, regular)	Colgate-Palmolive	no phosphate	
PALMOLIVE	Colgate-Palmolive	no phosphate	
PUREX (herbal, lime)	Purex Corp.	no phosphate	
PURITY SUPREME (green, gentle pink, or white)	Purity Supreme, Inc.	no phosphate	
PURITY SUPREME (lemon, lime scented)	Purity Supreme, Inc.	no phosphate	
RICHMOND (pink lotion)	First Nat'l Stores	no phosphate	
STAR'S (green, lemon, pink, white)	Star Mkt. Div. of Jewel Co.	no phosphate	
STOP & SHOP (lemon scented or pink)	Stop & Shop, Inc.	no phosphate	
SUN GLORY	Stop & Shop, Inc.	no phosphate	
SWEETHEART	Purex Corp.	no phosphate	

LIQUID ALL-PURPOSE CLEANERS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
AJAX	Colgate-Palmolive	1/4 C.	1.3
BARCOLENE	Barcolene Co.	1/4 C.	4.5

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
FANTASTIK	Colgate-Palmolive	no phosphate	
409	Clorox Co.	contains phosphate, amount not specified	
LESTOIL	Noxell Corp.	no phosphate	
LYSOL	Lehn & Fink Div. of Sterling Drug	1/4 C.	6.0
MR. CLEAN	Procter & Gamble	1/4 C.	1.8
PINESOL	American Cyanamid Co.	no phosphate	
SEAMIST PINE OIL	Trager Mfg. Co.	no phosphate	
TOP JOB	Procter & Gamble	1/4 C.	1.8

POWDERED ALL-PURPOSE CLEANERS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
LYSOL	Lehn & Fink Div. of Sterling Drug	no phosphate	
SPIC & SPAN	Procter & Gamble	1/2 C.	6.6

POWDERED BATHROOM CLEANSERS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
AJAX	Colgate-Palmolive	10 gms	0.09
BON AMI	Bon Ami Co.	no phosphate	
COMET	Procter & Gamble	no phosphate	
FINAST	First Nat'l Stores	no phosphate	
IGA	Independent Grocers Ass'n Distrib. Co.	no phosphate	
OLD DUTCH	Purex Corp.	no phosphate	
STOP & SHOP	Stop & Shop Co., Inc.	no phosphate	

LIQUID BATHROOM CLEANSERS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
SOFT SCRUB	Clorox Co.	no phosphate	

BUBBLE BATH AND BATH OIL BEADS

PRODUCT	MANUFACTURER	RECOMMENDED VOLUME/USE	PHOSPHATE GMS/USE
CALGON (bubble bath, herbal bath, bouquet bath, peach, and bath oil beads)	Calgon Div. of Merck	all contain phosphate (amounts not listed)	
VASELINE INTENSIVE CARE (bath beads)		contains phosphate (amount not listed)	
MR. BUBBLE		ingredients not listed	
BONNIE BUBBLE BATH		no phosphate	

The following kinds of laundry and cleaning products are not listed in the preceding tables because they contain *no phosphate:*

Liquid and powdered bleach; ammonia; spray and pump bathroom cleaners; fabric softeners; steel wool soap pads; starch; soap bars; shampoo; metal cleaners.

COCHITUATE, 314 PROJECT

Lake Cochituate is widely recognized as one of the most important recreational lakes in Massachusetts. Less well known is the fact that the quality of its water has steadily decreased due to a complex series of causes. In order to reverse this deterioration, the Massachusetts Department of Environmental Quality Engineering applied for and received from the U.S. Environmental Protection Agency a grant (under Section 314 of Public Law 92-500) to examine the feasibility of, and construct where justified, a variety of innovative facilities to decrease the amount of nutrients entering the lake. Hopefully, nutrient reduction will lead to a decrease or elimination of the unpleasant algal growth that occurs in late summer and early fall.

If shown to be environmentally sound and cost effective in decreasing nutrients, engineering solutions will be implemented at three of the lake's tributaries: Pegan Brook, Snake Brook, and Beaver Dam Brook.

Aware that the above three activities can deal with only a portion of the problem, the MDEQE decided to contract with the Lake Cochituate Watershed Association to carry out a citizen awareness campaign. The campaign is aimed at informing individuals living within the Watershed, particularly in the Course Brook and Snake Brook basins, of activities that produce excessive nutrients, and to help citizens learn how they can decrease the input of nutrients through individual actions. This brochure is a major part of that effort. Others deal with lawn fertilization and septic systems.

Thanks to the support of local industry and commerce, state and local water pollution control and health agencies, and to the tireless energy of its many volunteer members, its efforts have led to the successful reduction of levels of hazardous pollutants, oils, acids, and algae fertilizing nitrates and phosphates entering the lake.