

**REPORT  
TO THE  
NEW JERSEY LEGISLATURE  
ASSEMBLY ENVIRONMENT & SOLID WASTE  
AND  
SENATE ENVIRONMENT & ENERGY  
COMMITTEES**

***SUMMARIZING LABORATORY TEST RESULTS ON  
THE QUALITY OF BOTTLED DRINKING WATER  
FOR THE PERIOD  
JANUARY 1, 2009 THROUGH DECEMBER 31, 2009***

**NOVEMBER 2010**

***New Jersey Department of Health and Senior Services***  
Division of Epidemiology, Environmental & Occupational Health  
Consumer, Environmental and Occupational Health Service  
Food and Drug Safety Program



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## INTRODUCTION

The Department of Health and Senior Services is required by Public Law 1994, Chapter 79 (N.J.S.A. 24:12-11), enacted on July 24, 1994, to prepare and submit a report annually on the quality of bottled water to the Senate Environment and Assembly Environment Committees or their successors. The Legislation calls for the Department to summarize test data submitted by water bottlers, both imported and domestic, and any analytical spot checks conducted by the Department. In addition to summarizing the bottled water test data, the report provides information on the ongoing bottled water inspectional activities and consumer services provided by the Department. The report delineates the major activities associated with the certification of bottlers selling water in New Jersey and enforcement actions taken by the Department.

The bottled water industry has had a relatively stable growth rate since 2000; however, the rate has had a drop since 2007 from 6 percent to -4.3 % in 2009. Growth of New Jersey bottled water sales was comparable to the national bottled water sales trend according to the Beverage Marketing Corporation.

New Jersey continues to rank eleventh nationwide in the consumption of bottled water with an estimated 201,900,000 gallons of water consumed in 2009. The per capita consumption of bottled water in New Jersey decreased from 24.4 gallons to 22.5 gallons.

Nationally, the majority of bottled water sold continues to be non-sparkling product in one, two, five, and six-gallon containers. Imported water sales were on the rise from 2002 through 2007; however, there has been a decrease in sales of approximately two to four percent in the North American region during the last few reporting years.

## **PUBLIC HEALTH ASPECTS**

With the considerable consumption of bottled water in the United States, there has been a greater awareness and interest in the safety and quality of these products. Bottled water source supplies are subject to the same types of contaminants that can impact public drinking supplies. Bottled water producers primarily rely on springs and wells for their water supplies and these sources can be influenced by contaminants entering the water bearing strata. While chemical contaminants are seldom found in bottled or public drinking water supplies at high enough levels to cause acute health affects, small amounts over a long period of time could lead to chronic or long-term adverse health effects.

Specific standards have been developed for impurities that have been detected in ground and surface water supplies. Bottled water sources must meet the same water safety standards that have been developed under the State's Safe Drinking Water Act and the regulations establishing New Jersey Maximum Contaminant Levels (MCLs) for public drinking water supplies. These standards are developed by examining the toxicological data for the contaminants of concern through animal studies or epidemiological human health studies. This information is used to develop an estimate of the concentration of the contaminant that may be toxic and the concentration determined, if any, that would not cause an adverse health affect. A MCL is the highest amount of a specific contaminant allowed in drinking water, including bottled water products. MCLs are set for carcinogens to expect no more than one cancer case, or other major adverse health effect, to occur in one million persons ingesting the chemical contaminant in a lifetime. The MCLs are based on a daily consumption of two liters of water.

The New Jersey Drinking Water Quality Institute reviews ongoing scientific studies on the effects of chemicals detected in drinking water and recommends MCLs for each chemical contaminant of concern. The Institute is made up of representatives from the New Jersey Department of Environmental Protection (DEP), the Department of Health and Senior Services (DHSS), the academic scientific community, water suppliers, and the general public.

The DHSS bottled water oversight activities are in place to ensure that bottled water products sold in the State:

- Meet the established MCLs for chemical, radiological, and microbiological contaminants;
- Are derived from an approved source;

- Are bottled in a safe and sanitary manner; and
- Are properly labeled.

In addition to the potential for chemical contamination, source water supplies can also be subject to microbiological contamination. Spring water supplies can be vulnerable to the infiltration of surface water and pathogenic microorganisms including protozoa, such as *Giardia lamblia* and *Cryptosporidium parvum*. These pathogens may enter the ground water strata from which a bottler draws their supply. While pathogenic bacteria are readily eliminated through disinfection, standard disinfection techniques employed by water bottlers such as ozonation and ultra-violet light (UV) treatment do not eliminate protozoan cysts. In order to address this potential problem, the DHSS established rules that require water bottlers to evaluate their source of supply for direct surface water influences. Microscopic particulate analysis or other hydrologic evaluations are conducted and the bottlers must certify that their water is not under the direct influence of surface water or employ additional treatment, which includes submicron filtration to eliminate the potential for the presence of protozoa.

## **STATUTORY AND REGULATORY PROVISIONS**

DHSS is responsible for enforcing the laws and regulations governing bottled water. The DHSS's Consumer, Environmental and Occupational Health Service, Food and Drug Safety Program (FDSP) in the Division of Epidemiology, Environmental and Occupational Health Services administers the Bottled Water Project.

### **Title 24 - Food and Drugs**

Bottled water is considered, under federal and state laws, to be a food product. As such, bottled water manufactured or sold in the State must comply with the laws governing bottled water under N.J.S.A. 24:12-8 et seq.

The following delineates the major provisions of the law enforced by the DHSS:

- Bottled water sold in the State must meet the water quality standards adopted by the DEP for drinking water, pursuant to the New Jersey Safe Drinking Water Act (N.J.S.A. 58:12A-1).
- Plant operators must test bottled water for microbiological and hazardous chemical contaminants at prescribed frequencies. Product testing must be conducted in a laboratory certified by the Department of Environmental

Protection (N.J.S.A. 24:12-10).

- Test results must be forwarded to the DHSS at prescribed frequencies (N.J.S.A. 24:12-11).
- The DHSS shall prepare and submit an annual report to the Senate Environment and Assembly Environment Committees, or their successors, summarizing the test results submitted to the DHSS and any spot checks conducted by the DHSS (N.J.S.A. 24:12-11).
- The law provides specific penalty provisions and actions the Commissioner, DHSS, can take when bottled water may present an imminent and substantial health endangerment (N.J.S.A. 24:12-14).
- The law requires the Commissioner, DHSS, to adopt and implement rules for (1) monitoring, sampling, and inspection procedures for source and finished product bottling; (2) maintenance and retention of required records; (3) submission of monitoring and sampling reports to the DHSS; and (4) other information that the Commissioner deems necessary to determine compliance with the law (N.J.S.A. 24:12-12).

### **Rules Governing Manufacture, Storage, Distribution, and Handling of Bottled Water:**

The rules governing bottled water adopted by the DHSS are found in the administrative code at N.J.A.C. 8:21-5.1. The major provisions of the rules enforced by the DHSS relate to the standards and testing criteria for bottled water and are as follows:

- Delineates the good manufacturing practices and sanitary controls for water bottling plants operating in the State.
- Requires bottlers to address the potential for groundwater contaminants impacting their source of supply, and requires adequate treatment systems in place when groundwater influences are identified.
- Sets the specific water quality standards and testing frequencies. (The microbiological, physical, chemical, and radiological standards, including testing frequencies, are listed in the Water Quality Standards section of the report.)
- Adopts by reference the DEP Safe Drinking Water Act Water Quality

Standards. This will ensure that the water quality standards are kept current without formal rule changes each time the DEP amends or adds new water quality standards.

- Establishes the procedures for submission of required test results by laboratories certified by the DEP. A list of certified laboratories is available from DEP.
- Adopts federal labeling standards and nomenclature requirements promulgated by the U.S. Food and Drug Administration (FDA) for bottled water products.
- Requires certification of in-state, out-of-state, and foreign bottling plants selling water in New Jersey.
- Requires certification fees to support inspections of water bottlers, conduct expanded spot checks of bottled water products, and administer bottled water project activities.

## NEW JERSEY BOTTLED DRINKING WATER STANDARDS

All in-state and out-of-state certified bottled water firms must submit water analysis test results to the DHSS on both source water and each finished bottled water type (i.e., spring, distilled, mineral or well water). Sampling frequencies and bottled drinking water standards are listed as follows:

### SAMPLING FREQUENCIES

| Frequency of Sampling |               |                        |
|-----------------------|---------------|------------------------|
| Type of Analysis      | Source Water* | Finished Bottled Water |
| Volatile Organics     | Annually      | Annually               |
| Inorganics            | Annually      | Annually               |
| Synthetic Organics    | Annually      | Annually               |
| Secondary Standards   | Annually      | Annually               |
| Radiological          | Every 4 years | Every 4 years          |
| Microbiological       | Weekly        | Weekly                 |

\* Source water is water from an approved source that has not been treated or disinfected.

Note: If an approved Community Water System (municipal water supply) is used as a water supply for bottled water, the results from the water utility may be used to prevent duplication in testing.

## New Jersey Bottled Drinking Water Standards

| VOLATILE ORGANIC COMPOUNDS                   |                   | INORGANIC COMPOUNDS                           |                                   |
|--|-------------------|---|-----------------------------------|
| CONTAMINANTS                                 | MCL (ug/l or ppb) | CONTAMINANTS                                  | MCL (ug/l or ppb)                 |
| Benzene                                      | 1.0               | Antimony                                      | 6.0                               |
| Carbon Tetrachloride                         | 2.0               | Arsenic                                       | 10.0                              |
| Meta-Dichlorobenzene                         | 600.0             | Asbestos                                      | 7x10 <sup>6</sup> fibers/l >10 um |
| Ortho-Dichlorobenzene                        | 600.0             | Barium  | 2000.0                            |
| Para-Dichlorobenzene                         | 75.0              | Beryllium                                     | 4.0                               |
| 1,1-Dichloroethane                           | 50.0              | Cadmium                                       | 5.0                               |
| 1,2-Dichloroethane                           | 2.0               | Chromium                                      | 100.0                             |
| 1,1-Dichloroethylene                         | 2.0               | Copper  | 1000.0                            |
| Cis-1,2-Dichloroethylene                     | 70.0              | Cyanide                                       | 200.0                             |
| Trans-1,2-Dichloroethylene                   | 100.0             | Fluoride                                      | 2400.0                            |
| 1,2-Dichloropropane                          | 5.0               | Lead  | 5.0                               |
| Ethylbenzene                                 | 700.0             | Mercury                                       | 2.0                               |
| Methyl tertiary Butyl Ether                  | 70.0              | Nitrate (as nitrogen)                         | 10000.0                           |
| Methylene Chloride                           | 3.0               | Nitrite (as nitrogen)                         | 1000.0                            |
| Monochlorobenzene                            | 50.0              | Nitrate/Nitrite combined                      | 10000.0                           |
| Napthalene                                   | 300.0             | Selenium                                      | 50.0                              |
| Styrene                                      | 100.0             | Thallium                                      | 2.0                               |
| 1,1,2,2-Tetrachloroethane                    | 1.0               | Turbidity                                     | 0.5 NTU                           |
| Tetrachloroethylene                          | 1.0               |   |                                   |
| Toluene                                      | 1,000.0           | <b>TOTAL TRIHALOMETHANES (THMs) INCLUDES:</b> |                                   |
| 1,2,4-Trichlorobenzene                       | 9.0               | Bromoform                                     |                                   |
| 1,1,1-Trichloroethane                        | 30.0              | Dibromochloromethane                          |                                   |
| 1,1,2-Trichloroethane                        | 3.0               | Chloroform                                    |                                   |
| Trichloroethylene                            | 1.0               | Dichlorobromomethane                          |                                   |
| Vinyl Chloride                               | 2.0               | Sum of the four compounds:                    | 80.0                              |
| Xylenes (total)                              | 1,000.0           |   |                                   |
|  |                   | Phenols                                       | 1.0                               |
| <b>Disinfectant/Disinfectant By-Products</b> |                   |   |                                   |
| Chlorine                                     | 4,000.0           |   |                                   |
| Chloramine                                   | 4,000.0           |   |                                   |
| Chlorine Dioxide                             | 800.0             |   |                                   |
| Haloacetic Acids                             | 60.0              |   |                                   |
| Chlorite                                     | 1,000.0           |   |                                   |
| Bromate                                      | 10.0              |   |                                   |

**KEY:** One microgram per liter (ug/l) is equal to one part per billion (ppb).



## New Jersey Bottled Drinking Water Standards (continued)

| SYNTHETIC ORGANIC COMPOUNDS              |                    | SECONDARY STANDARDS                 |  |
|--|--------------------|-------------------------------------|--|
| CONTAMINANTS                             | MCL (ug/l or ppb)  | PHYSICAL & CHEMICAL CHARACTERISTICS | RECOMMENDED UPPER LIMIT                    |
| Alachlor                                 | 2.0                | Color                               | 10 color units                             |
| Atrazine                                 | 3.0                | Odor                                | 3 threshold odor units                     |
| Benzo [a] pyrene                         | 0.2                | PH                                  | 6.5 to 8.5 (optimum range)                 |
| Carbofuran                               | 40.0               | Taste                               | No objectionable taste                     |
| Chlordane                                | 0.5                | MBAS (foaming agents)               | 0.5 ppm                                    |
| Dalapon                                  | 200.0              | Aluminum                            | 0.2 ppm                                    |
| Dibromochloropropane                     | 0.2                | Chloride                            | 250.0 ppm                                  |
| Di[2-ethylhexyl] adipate                 | 400.0              | Fluoride                            | 2.0 ppm                                    |
| Di[2-ethylhexyl] phthalate               | 6.0                | Hardness as CaCO <sup>3</sup>       | 250.0 ppm                                  |
| Dinosep                                  | 7.0                | Iron                                | 0.3 ppm                                    |
| Diquat                                   | 20.0               | Manganese                           | 0.05 ppm                                   |
| Endothall                                | 100.0              | Silver                              | 0.1 ppm                                    |
| Endrin                                   | 2.0                | Sodium                              | 50.0 ppm                                   |
| Ethylene dibromide (ED)                  | 0.05               | Sulfate                             | 250.0 ppm                                  |
| Glyphosate                               | 700.0              | Total dissolved solids              | 500.0 ppm                                  |
| Heptachlor                               | 0.4                | Zinc                                | 5.0 ppm                                    |
| Heptachlor Epoxide                       | 0.2                | <b>MICROBIOLOGICAL STANDARDS</b>    |  |
| Hexachlorobenzene                        | 1.0                | Total Coliform                      | Membrane Filter Method <1 cfu/100 ml       |
| Hexachlorocyclopentadiene                | 50.0               | Total Coliform                      | Absent by Presence/Absence Method          |
| Lindane                                  | 0.2                | <b>RADIONUCLIDES STANDARDS</b>      |  |
| Methoxychlor                             | 40.0               |                                     | <b>MCL in pCi/l (picocuries per liter)</b> |
| Oxamyl                                   | 200.0              | Gross Alpha                         | 15   |
| PCBs (Polychlorinated Biphenyls)         | 0.5                | Combined Radium 226 and 228         | 5  |
| Pentachlorophenol                        | 1.0                |                                     |  |
| Picloram                                 | 500.0              |                                     |  |
| Simazine                                 | 4.0                |                                     |  |
| Toxaphene                                | 3.0                |                                     |  |
| 2,3,7,8-TCCD (Dioxin)                    | 3x10 <sup>-5</sup> |                                     |  |
| 2,4-D (2,4 - Dichlorophenoxyacetic Acid) | 70.0               |                                     |  |
| 2,4,5-TP (Silvex)                        | 50.0               |                                     |  |

**KEY: One microgram per liter (ug/l) is equal to one part per billion (ppb)**

**Microbiological methodology is established in the most recent edition of *Standard Methods for the Examination of Water and Waste Water*.**

## **BOTTLED WATER PROJECT ACTIVITIES**

The FDSP certifies out-of-state firms marketing products in the State as well as New Jersey bottled water plants. The project reviews all test results that are required to be submitted to the DHSS and takes regulatory action to gain compliance, when necessary. As part of the DHSS's regulatory responsibilities and consumer health service activities, the project responds to consumer inquiries and complaints, collects samples for analysis by the DHSS's Public Health and Environmental Laboratories (PHEL), and conducts compliance inspections of water bottling plants. Product labels are also reviewed before approval is given to market a product in the State. The following is a summary of the DHSS's major activities during the 2009 reporting period to regulate the bottled water industry and respond to consumers' requests for information concerning these products:

In continuation of our food defense initiatives, the Bottled Water Project maintains a strong partnership with the FDA Imports Branch which notifies the Project of unlicensed imported bottled water entries whenever an importer files a Prior Notice of Importation with FDA.

- In recent years, DHSS prioritized the investigation of imports based upon notification from FDA. Investigations of these bottled water imports revealed that much of these products were intended for distribution into New Jersey. It is important for DHSS to certify the source and license the foreign bottling facility, as some countries do not have the same strict water quality standards as New Jersey.
- Project staff licensed 238 companies to sell bottled water in New Jersey with 28 new out-of-state water bottlers licensed in 2009, with fifteen of the twenty eight new licenses as foreign water bottlers.
- Project staff responded to 30 consumer requests for information concerning bottled water. This number is a decrease compared to the 61 inquiries handled during the 2008 reporting period. The Consumer Information section of this report discusses a DHSS initiative to respond to consumer inquiries and requests for information.
- Project staff handled over 200 requests for information from individuals or firms concerning New Jersey's regulatory requirements, such as test result submission requirements, labeling requirements, and information on obtaining New Jersey bottled water certification.

- Project staff investigated two consumer complaints during 2009 compared to four complaints received during the previous reporting period. The most common complaints continue to be off odor or taste and particulate matter reported by consumers.
- Of the seventeen bottlers, six were inspected in 2009. Five were issued Satisfactory inspection ratings and found to be in substantial compliance with the good manufacturing practice rules enforced by the DHSS. One firm was issued a Conditional Satisfactory rating and then received a Satisfactory rating upon re-inspection.
- There were nine firms that did not reapply for certification due to discontinuance of operations or discontinuance of wholesale distribution or sale into New Jersey. Of the nine firms that did not reapply, four were domestic, and five were foreign bottlers.
- Project staff conducted 32 spot checks of bottled water products to confirm test results submitted to the DHSS.

## **SUMMARY OF TEST SUBMISSION RESULTS**

Bottled water test submission results for 2009 continue to follow the same pattern as the findings reported during the 1995 through 2008 reporting periods. The findings indicate that the vast majority of bottled water sold in the State continues to meet the water quality standards. Some of the mineral waters continue to be high in sodium and other inorganic compounds. Most exceedances occurred in secondary water quality standards and were aesthetic rather than public health concerns. The pH exceedance is an example of this. Any exceedance noted in the standards, other than the Secondary Standards, were reviewed with the firm in non-compliance. The product was subject to corrective action, additional sampling, and review for adherence to the New Jersey Bottled Drinking Water Standards.

### **Microbiological Results:**

The DHSS reviewed over 2,600 microbiological tests for total coliform and standard plate count. There were no exceedances of the total coliform standard for finished products. Total coliform must be less than one colony forming unit per 100 ml or the absence of any total coliform bacteria. In all cases, the finished products produced from these sources were reported to be free of coliform bacteria. Coliform bacteria are indicator organisms of potential microbiological contamination of water supplies, and if present, the treatment processes in place by the bottler must be capable of eliminating microbiological contaminants in the finished product.

## **Sodium Results:**

Sodium levels in bottled waters, excluding mineral water, is insignificant as a source of dietary sodium when compared with the daily sodium intake from other dietary sources. Individuals on a sodium-restricted diet should be aware that some bottled waters may contain elevated levels of sodium and should pay attention to the sodium declaration on bottled water product labels.

Under FDA labeling requirements enforced by the DHSS, bottled water products containing levels of sodium greater than 50 mg/l require a nutritional labeling statement and a sodium declaration on the label. Many of the bottled water manufacturers make low sodium or sodium-free claims, and the sodium content appears on the product label. The mineral water products that exceeded the sodium standard reflect this excess with a sodium labeling declaration.

## **SPOT CHECK SUMMARY TESTING**

The DHSS conducts approximately 50 spot checks of bottled water product annually to determine if these results are in conformity with those submitted to the DHSS by bottled water manufacturers as required. The samples are representative of popular and imported brands being sold in the State. Twenty-three were imported brands, and 25 were domestically-produced brands. The emphasis on imported brands is congruent with DHSS' efforts to monitor the safety of imported food products sold or distributed in New Jersey.

In 2009, there were 48 spot check samples collected that were analyzed for microbiology, volatile organics, synthetic organics, (pesticides & herbicides), inorganics, secondary standards, radiological, physical characteristics, and trihalomethanes.

The results of the spot check sampling showed no exceedances in the total coliform standard. The standard plate count ranged from <1/ml up to 690/ml. There is currently no upper limit set for standard plate count in the regulations.

### **\*INORGANICS**

The arsenic standard was exceeded in one instance, with a high value of 17.3 parts per billion (ppb). The MCL permitted is 10 ppb. The product in question was voluntarily destroyed by the importer, with the provision that the firm will cease importing and distributing this product.

## **\*SECONDARY STANDARDS**

There were 26 exceedances in the secondary aesthetic standard parameters which included pH (15), sodium (6), phenol (3), chloride (1), and fluoride (1). The secondary standards are not based on adverse health consequences and are not considered to be of public health significance.

The pH test submissions exceeded the recommended range of 6.5 - 8.5 pH units in 15 of the bottled waters tested. Five of the bottled waters recorded low pH ranges with the lowest pH detected at 4.9. One sample recorded a high pH level of 8.6. Bottled water outside the recommended pH range is not a health or safety issue, but one of concern only to the bottling plant operator, since water with low or high pH may be corrosive or scale forming.

\*The MCL for sodium was exceeded in six instances of imported water with a range from 54.0 to 1,220 parts per million (ppm). Excess sodium is of concern to people who have hypertension.

\*The MCL for phenol was exceeded in three instances in both domestic and imported products with a level of 4.95 parts per billion (ppb) as the highest exceedance. Slightly excessive phenol is associated with gastrointestinal discomfort.

\*The MCL for chloride was exceeded in one instance with a level of 506 ppm as the high exceedance. Excess chloride is of concern to people who have hypertension.

\*The MCL for fluoride was exceeded in one instance with a level of 3.95 ppm as the high exceedance. Excess fluoride is associated with teeth discoloration.

## **SYNTHETIC ORGANIC COMPOUNDS**

The standards for synthetic organic compounds were found to be in compliance.

## **RADIONUCLIDES STANDARDS**

The standards for radionuclides were found to be in compliance.

## CONCLUSION

For 2009, bottled water in New Jersey generally met regulatory standards promulgated to ensure a safe, wholesome, and truthfully labeled product. Over the past ten years, bottled water quality has continually improved in meeting or exceeding regulatory standards. The DHSS will continue to closely monitor bottled water quality and safety through spot check sampling, with a significant emphasis on imported products, and thorough review of the required laboratory test submissions.

Although bottled water is not considered a “high risk food,” continued regulatory oversight is necessary in part due to the explosive growth in the bottled water industry. This growth, for more than a decade, has placed bottled water in nearly every supermarket and vending machine, where dozens of brands compete for consumer dollars. In the coming years, industry experts anticipate that bottled water will be second only to soda as the beverage of choice in the United States.

The DHSS is also partnering with the International Bottled Water Association and the 17 licensed bulk/bottled water firms in New Jersey to bolster food defense initiatives. Based upon vulnerability assessments, food defense experts are in consensus that bottled water is one of the most likely targeted food products by potential terrorists. The primary goal of this partnership is to focus attention on the 17 facilities in order to foil or deter potential tampering or terrorism. Food defense/food security assessments were conducted during one of the bottled water facility inspections in 2009. Furthermore, aggressive enforcement action on imported bottled water products furthered DHSS’ food security initiatives. The elevated arsenic found in one imported brand of mineral water validates these initiatives.

New firms are continually entering the market and require additional focused surveillance. Source waters that could potentially be contaminated require on-going monitoring, and the subsequent removal of any pollutants must be ensured. As new water standards are introduced, systems are needed to ensure compliance. With continued surveillance, the quality and safety of the bottled water market in New Jersey can continue to meet all regulatory and industry standards.

## APPENDIX 1

### TYPES OF BOTTLED WATER

The Department has adopted the Federal Standards of Identity, and all bottled water products must conform to the nomenclature established in 21 CFR 165.110(a) (identity). Bottled waters can have differing characteristics that affect the taste, odor, and chemical composition. These characteristics are due to the exposure of the water to underground strata from which they are drawn and also to the treatments applied by the manufacturer prior to bottling. The treatments may result in either the addition or removal of minerals to achieve a desired taste. The standards of identity for all regulated bottled water products that are sold are described as follows:

**Artesian Water or Artesian Well Water:** Artesian water is obtained from a well that is under natural pressure due to the water source being confined by layers of clay or rock. The water rises naturally to a height above the top of the aquifer. Artesian or artesian well water may be collected with the assistance of external force (pumps) to enhance the natural underground pressure.

**Mineral Water:** Mineral water contains very large amounts of mineral salts in excess of 250 mg/l (milligrams per liter). Mineral waters usually contain such salts as calcium, sodium, chloride, sulfate, carbonates, and bicarbonates. All other waters described here also contain these mineral salts but at much lower concentrations.

**Distilled Water:** Distilled water is processed by heating it to produce water vapor, then condensing and collecting the water. This process leaves most of the minerals behind and produces a very flat and tasteless water. This type of water is used for batteries, clothing irons, and other domestic uses. This water treatment is also effective in removing microorganisms including bacteria and other larger parasites.

**Purified Water or Demineralized Water:** Purified water is processed by either (1) distillation described above; (2) reverse osmosis, a process that filters the water through a filter membrane; or (3) deionization, a process in which the minerals are attracted to particles of the opposite electrical charge and removed. All three processes must result in water that meets the established definition of "Purified Water" in "The United States Pharmacopoeia – National Formulary (USP-NF)", edition 34-29.

**Sparkling Bottled Water:** Sparkling bottled water is water that has naturally occurring carbon dioxide or effervescence.

**Spring Water:** Spring water is derived from an underground or subsurface formation where the water flows naturally to the surface and continues as a current of flowing water into a brook, stream, or river. Spring water is collected at the point of discharge or through a borehole tapping the underground formation feeding the spring.

**Ground Water:** Ground water is derived from a subsurface-saturated zone under pressure equal to or greater than atmospheric pressure. The types of ground water include well, artesian well, spring, and mineral water.

**Well Water:** Well water is derived from a hole that is bored or drilled into an aquifer or underground water source to extract water. This is accomplished by the installation of a well casing, pumps, and a sanitary seal to extract a safe supply.



## APPENDIX 2

### BOTTLED WATER RESOURCE INFORMATION

**NJ Department of Health & Senior Services  
Consumer, Environmental and Occupational  
Health Service**

P.O. Box 369  
Trenton, NJ 08625-0369  
609-826-4935

General information on bottled water,  
bottled water inspections, and  
registration requirements  
<http://www.state.nj.us/health/eoh/foodweb>

**U.S. Environmental Protection Agency  
Office of Ground Water and Drinking Water**

Ariel Rios Building  
1200 Pennsylvania Avenue NW  
Washington, DC 20460-0003  
202-564-3750

Safe Drinking Water Hotline  
1-800-426-4791  
Drinking and bottled water standards  
<http://www.epa.gov>

**U.S. Food & Drug Administration**

200 C Street, S.W.  
Building # FB-8  
Washington, DC 20204  
888-INFO-FDA

Federal bottled water standards,  
good manufacturing practices,  
procedures, and product labeling  
<http://www.fda.gov>

**National Sanitation Foundation  
International**

P.O. Box 130140  
Ann Arbor, MI 48113-0140  
800-673-6275  
734-769-8010

Information on bottled water treatment  
systems, bottled water dispensing  
equipment standards, and bottled  
water plant voluntary inspection  
<http://www.nsf.org>

**International Bottled Water Association**

1700 Diagonal Road, Suite 650  
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General information on bottled water  
statistics, processing equipment, and  
bottled water products and free  
consumer brochures  
<http://www.bottledwater.org>