



### **Bottled Water Consumption**

Do you know how much bottled water Americans consume annually? Do you know how much money is wasted on bottled water? Do you know how many plastic water bottles get thrown in the trash everyday?

#### **The sheer numbers are staggering:**

- Roughly 38 billion plastic water bottles end up in U.S. landfills each year -- *100 million every day!* That's enough, laid end to end, to reach China and back each day.
- In 2006, Americans drank an average 167 bottles of water each for a total of 50 billion bottles (total spent \$15 billion). Of that total, only 23% was recycled.
- We are shipping 1 billion water bottles *a week* around the U.S. in ships, trains, and trucks.
- We are paying 2 to 4 times the cost of gasoline for a product that is virtually free.

#### **The problem with plastics:**

- It takes over 700 years for plastic to decompose.
- Plastic pollution is a world-wide problem. There is a growing "garbage patch" of plastic estimated to be more than twice the size of Texas floating in the North Pacific Ocean.
- Ecosystems and wildlife are negatively impacted by plastic debris.
- Disposable plastic water bottles are made out of oil which is a finite natural resource. Plastic bottles require energy to make and transport. Currently, the amount of oil we use to produce water bottles each year (17 million barrels) could fuel over 1,000,000 cars for an entire year.

#### **The environmental impact of **one** disposable bottle:**

- Picture a disposable water bottle  $\frac{1}{4}$  full of petroleum. That is how much petroleum it takes to make and distribute a single plastic bottle of water.
- It takes THREE bottles of water to make and distribute ONE disposable plastic bottle of water.
- 120 grams of greenhouse gases are generated by a single disposable plastic bottle of water.



## **Your Tap Water**

Contrary to the abundant marketing messages, tap water is potentially more healthful than bottled water because it is more highly regulated and monitored for quality than bottled water. Tap water is closely regulated by the Environmental Protection Agency under the Clean Water Act of 1977. Bottled water is regulated by the Food and Drug Administration and is not subject to all the same testing requirements.

### **Did you know?**

- People prefer tap water over bottled water 4 out of 5 times in blind taste tests.
- Tap water can be 1000 times cheaper than bottled water (.02¢ versus \$1 - \$20 per gallon).
- Over 25% of bottled water is actually filtered tap water.
- Tap water is easy to filter at the office or at home - go to [www.nsf.org/consumer/drinking\\_water](http://www.nsf.org/consumer/drinking_water).

### **Where does your tap water come from?**

Most people have no idea whether their tap water comes from a well or from a surface water feature such as a spring, lake, or river. Either way, it starts as precipitation that has fallen to the earth and has either percolated down into underground sediments or rock or has flowed as runoff to surface water features.

### **Watershed stewardship – protecting your tap water source**

Most likely, the tap water you drink comes from your watershed - the area of land around you that collects and stores the rainwater or snow that has fallen. It is important to take good care of your watershed -- be careful what you leave on the ground or put in bodies of water around you. Eventually, you may be drinking it!

Many communities where bottling companies withdraw millions of gallons of water each day suffer environmental harm from this activity. These communities are fighting to stop multi-national corporations in local regulatory and other legal arenas. These large water withdrawals from aquifers (underground water supplies) or surface water features can negatively impact the local watershed by: reducing stream flow, lowering lake levels, decreasing local water well productivity, upsetting eco-systems and causing aquatic plant growth increases and fish stock decreases. In coastal areas, salt water intrusion into aquifers and wells can be accelerated by these large fresh water withdrawals.

### **Find out More**

You can learn more about your tap water source and quality at

<http://www.epa.gov/safewater/dwinfo/index.html>. You can also call your local water provider. No such information is provided for bottled water.



## **Reusable Bottle Options**

Understanding all the options can be daunting. How do you decide which type of reusable bottle to buy? Here's a primer on reusable bottles that outlines the pros and cons of each type of material and explains why Back2Tap chose to offer only stainless steel bottles.

### **Are plastic bottles safe?**

Start by looking on the bottom of plastic containers for the triangular recycling symbol with a number 1-7 inside it. These are resin codes that indicate the composition of the plastic.



### **Plastic bottle**

### **overview:**

- Plastic #1 (most water and soda bottles) is not meant to be reused due to the possibility of bacterial buildup. It is recyclable.
- Plastics #2, 4, and 5 are safe, but not very durable over the long run. Only #2 is recycled by most municipalities. None are truly dishwasher safe.
- Plastics #3, 6, and 7 (polycarbonate only) leach hormone disruptors at very low levels that some experts say pose a health concern.

### **Metal bottle alternatives:**

- Aluminum is reactive and requires a liner that could pose problems with wear (Sigg bottles are aluminum). Lined bottles are not recyclable.
- Stainless steel bottles perform best because:
  - Food grade stainless steel is non-reactive so no lining is necessary.
  - No harmful chemicals leach into your drink.
  - Drinks taste fresh in metal bottles – no residual odors and no metallic taste.
  - Drinks stay cooler longer.
  - Bottles are lightweight and hip.
  - Bottles are durable and won't wear out
  - Bottles are 100% recyclable after many years of use.

### **Environmental and Economic Considerations**

Choosing a reusable bottle based on its environmental impact is also complicated. Plastic bottles take the least amount of resources to manufacture and may seem like the best option, but stainless steel bottles are more durable than plastic, making them more resource efficient in the long run.

Stainless steel bottles cost between \$10 and \$30, but they will easily pay for themselves because they will not need to be replaced for years. Furthermore, if you fill them with tap water, rather than spending 17-75 cents per disposable bottle of water in the grocery store, it will only take between 2 weeks to 6 months to break even.

A further benefit of stainless steel is that it can be cost-effectively recycled. Plastic is typically only down-cycled (turned into something of a lesser purpose) in a process that is barely economical.

ANY reusable bottle, no matter where it comes from or what it is made of, is better for the environment than the manufacturing and shipping of bottled water. Stainless steel bottles appear to have the lowest long term impact on the planet as well as being the safest health-wise and having the best performance features. Best of all, you can fill your stainless steel water bottle with tap water, filtered if you want, knowing that you are consuming the healthiest, most cost-effective, and carbon-conscious drink under the sun.



## Reusable Bottle Comparison Table

### Reusable Bottle Comparison Table

<b>Bottle Type</b>	<b>Suitable for reuse</b>	<b>Non-leaching</b>	<b>Recyclable</b>	<b>Fresh Taste</b>	<b>Dishwasher Safe</b>	<b>Long Term Durability</b>	<b>Comments</b>
Plastic #1 PETE Polyethylene Terephthalate			√				Potential to harbor bacteria
Plastic #2 HDPE High Density Polyethylene	√	√	√				Good short term choice
Plastic #3 PVC Vinyl							Leaches phthalates
Plastic #4 LDPE Low Density Polyethylene	√	√					Good short term choice
Plastic #5 PP Polypropylene	√	√					Good short term choice
Plastic #6 PS Polystyrene							Leaches styrene
Plastic #7 (Polycarbonate only) Other	√			√		√	Leaches Bisphenol A, a hormone disruptor
Aluminum (with liner)	√	√		√			Liner can crack with wear, ice cubes don't fit, \$10-30
Stainless Steel	√	√	√	√	√ (not caps)	√	\$10-30, fits ice cubes, and into car and bike cup holders



## **Your Health**

Your reusable bottle choice comes down to personal philosophy: how much risk and what types of risk are acceptable to you? If experts don't agree, do you need proof that something is safe before you use it (this is the precautionary approach), or do you need proof that something is unhealthy before you decide to avoid it?

### **Plastic #1**

Most disposable water bottles are made of plastic #1 or PET. Some people try to reduce their plastic use by washing them out and reusing them, but plastic #1 is not meant to be reused due to the possibility of bacterial buildup. A Canadian study found that 13% of the water bottles tested in an elementary school had bacterial levels (9% were found to have fecal coliforms) exceeding drinking water quality guidelines by the end of the school day. Unfortunately, children sometimes don't wash their hands thoroughly before opening them. These bottles are not durable enough to withstand use, cleaning, and reuse without losing their integrity. The compelling issue with these bottles is not whether plasticizers leach into the drinks, but that bacteria accumulate in them and cannot be easily washed out. Long storage time on the shelf or in a warm garage or trunk increases the likelihood of bacterial growth and concentration of antimony in the water. Contrary to urban legend, freezing bottled water has not been shown to cause any degradation of water quality.

### **Plastic #3, #6, and #7**

Many sources say not to drink from plastics 3 and 6 due to the potential for leaching. Plastic #3 (PVC) can leach phthalates which have been shown to cause developmental and reproductive damage. Plastic #6 (polystyrene) may leach styrene which can cause nervous system effects and liver damage. Polycarbonate, one type of plastic #7 (other assorted types) from which the clear, brightly colored bottles are sometimes made, has been shown to leach Bisphenol A, a hormone disruptor that mimics estrogen. Plastic #7 (polycarbonate only) is a bit controversial. There were two groups who studied it and came to differing conclusions - both groups were made up of technical experts. Both groups agreed that Bisphenol A can leach into the drinks at low levels. One group said the levels were too low to cause any concern, and one group said that the levels were significant. It has been banned by the Canadian government.

### **Plastics #2, #4, and #5**

Plastics #2, 4, and 5 are the healthiest plastic bottle options since they are not known to leach. These plastic bottles do absorb odors and stains and many of them leak if not held upright. This lack of durability makes them a poor choice for long term use. Plastic #2 is commonly recyclable, whereas plastics #4 and 5 are not recyclable in most municipalities

### **Aluminum**

Aluminum is reactive with acidic liquids so these bottles have to be lined with an enamel or epoxy layer that could become a problem with wear and tear. The most popular aluminum bottles (Sigg) have very narrow necks making them difficult to clean, dry, and load with ice.

### **Stainless Steel**

Food-grade stainless steel does not have any known safety issues and is non-reactive so the bottles do not leach and do not have to be lined. These single layer lightweight stainless steel water bottles appear to be the best choice health-wise.



## **Global Water Crisis**

In many parts of the world, the lack of clean water is a devastating problem. About 4,000 children die every day, one every 8 seconds, because of the effects of unclean water. That means that at least 2 million people, mostly children, die every year from water-borne diseases such as diarrhea, cholera, dysentery, typhoid, hepatitis and malaria. In most cases, these diseases would be preventable by having access to clean drinking water and proper sanitation.

### **Did you know?**

- About 1.2 billion people globally lack safe water to consume.
- About 2.6 billion people do not have access to adequate sanitation.
- Just one toilet flush in the West uses more water than most Africans have to perform an entire day's drinking, cooking, washing and cleaning.
- Women and children in water stressed countries walk 3-6 miles every day to fetch water for their families, which prevents them from pursuing an education, maintaining their households or earning additional income.
- More than 1/2 of the hospital beds in the developing world are occupied by people suffering from preventable diseases caused by unsafe water and inadequate sanitation.
- Dirty water poses a greater threat to human life than war or terrorism.
- Meeting the UN goal of reducing by half the percentage of people without access to safe drinking water and basic sanitation by 2015 would cost about \$4 billion a year for 10 years. That amount represents just one month's spending on bottled mineral water in Europe and the US.



## **Back2Tap Links**

Find more information about tap water campaigns, water quality, water filters, health issues, sustainability, Pacific garbage patch, recycling, privatization of water, and watershed awareness.

### **Tap water campaigns**

<http://www.foodandwaterwatch.org/water/bottled/take-back-the-tap/#documentContent>

<http://www.thinkoutsidethebottle.org/>

Bottle Twaddle, Is Tap Water all Tapped Out? <http://www.sciam.com/article.cfm?id=bottled-twaddle>

### **Water Quality**

*United States Environmental Protection Agency (EPA):*

<http://www.epa.gov/safewater/dwinfo/index.html>

*Environmental Working Group (EWG):*

<http://www.ewg.org/tapwater/findings.php>

*National Resources Defense Council (NRDC):*

<http://www.nrdc.org/water/drinking/qtap.asp>

### **Water Filters**

*National Sanitation Foundation (NSF) on drinking water and water filters:*

[http://www.nsf.org/consumer/drinking\\_water](http://www.nsf.org/consumer/drinking_water)

*Food and Water Watch:*

<http://www.foodandwaterwatch.org/take-action/consumer-tools/choosing-a-water-filter>

*Consumer Reports (May 2007) on water filters:*

[http://www.consumerreports.org/cro/home-garden/kitchen/water-filters/water-filters-5-07/overview/0507\\_filter\\_ov.htm](http://www.consumerreports.org/cro/home-garden/kitchen/water-filters/water-filters-5-07/overview/0507_filter_ov.htm)

*Grist magazine:*

<http://www.grist.org/advice/possessions/2004/05/04/mcrandle-bottled/index.html>

*Green Guide magazine:*

<http://www.thegreenguide.com/reports/product.mhtml?id=23&sec=2>

### **Health issues**

*Johns Hopkins Bloomberg School of Public Health Public Health News Center on water bottles and bottled water:*

[http://www.jhsph.edu/publichealthnews/articles/2008/goldman\\_schwab\\_bpa.html](http://www.jhsph.edu/publichealthnews/articles/2008/goldman_schwab_bpa.html)

*Physicians for Social Responsibility on safe drinking water:*

[http://www.psr.org/site/PageServer?pagename=Safe\\_Drinking\\_Water\\_main](http://www.psr.org/site/PageServer?pagename=Safe_Drinking_Water_main)

*Centers for Disease Control and Prevention:*

<http://www.cdc.gov/ncidod/dpd/healthywater/index.htm>

### **Sustainability**

*Pacific Institute:*

[http://www.pacinst.org/topics/water\\_and\\_sustainability/bottled\\_water/bottled\\_water\\_and\\_energy.html](http://www.pacinst.org/topics/water_and_sustainability/bottled_water/bottled_water_and_energy.html)

*Ask Pablo:*

<http://askpablo.org/>

### **Pacific Garbage Patch**

*Algalita Marine Research Foundation:*

<http://www.algalita.org>

### **Recycling**

*Container Recycling Institute (CRI):*

<http://www.container-recycling.org/>

### **Privatization of water**

*Corporate Accountability International (CAI):*

<http://www.stopcorporateabuse.org/stopcorporateabuse/home.html>

### **Watershed Awareness**

*Clean Water Action:*

<http://www.cleanwateraction.org/>

*H2O for ME (Maine):*

<http://www.h2oforme.com/blog/>

*Great Swamp Watershed Association*

<http://www.greatswamp.org/>

