



## **INTRODUCING “*FLEX FLUSH*™”**

**A faster and easier way to conserve water**

**Location: Residential bathrooms**

**Saving Status: One million gallons of water**

### **Introduction:**

In this paper, an innovative water conservation project is described. This paper focuses on an innovative and cost effective device “FlexFlush™” and results of its implementation in a test market. The ultimate water saving potential of this innovative water conservation device is substantial.

Water is essential to life and our water resources are becoming even more limited. In communities large and small, everybody has been called upon to find new ways to conserve water at home and at work. This water conservation project paper reviews an innovative approach using a tension device to close the flapper inside a typical toilet tank more quickly for a liquid disposal. Three hundred water conservation devices have been distributed with verified installations in one hundred fifty locations. Water bills for twenty locations are compared with before and after installation data to show how many gallons of fresh water are being saved. It is estimated that more than one million gallons of drinking water have been saved as a direct result of this innovative water conservation project.

### **Water conservation innovation**

There is a potential to save billions of gallons of fresh water annually in the US alone. One of the most neglected water saving practices is to use less water for liquid disposals. The design of popular toilet tanks has not changed for decades, using same amount of water for both a solid disposal and a liquid disposal. The toilet tank uses a flapper that stays open until the tank is entirely empty each time the tank handle is pressed. This generates a significant waste of water since there are usually multiple liquid disposals versus one solid disposal for each person daily. The dual flush concept has been utilized for decades to provide a solution in European countries. The European toilet water tank model has two buttons, one for liquid disposal and one for solid disposal. The dual flush concept is currently available and is becoming more popular in the US. However, currently there are millions of these existing toilets that do not utilize the dual flushing concept, and as a result, billions of gallons of fresh water are being wasted every year.

This innovative water conservation solution is a retrofit tension device that closes the flapper a couple of seconds sooner. Toilet tanks with flappers are already installed in hundreds of millions of homes. The inventor has created this water conservation device when there was an extreme drought situation in the state in which he lives. He wanted to respond to a request of the governor

to conserve at least 15% more water. The inventor satisfied the requested challenge; saving more than 15% of the water consumption (Water bills are available for comparison).

Once the retrofit water conservation device is installed, no other changes are required... the same toilet tank and toilet tank handle will be used. For liquid disposal, the handle would be pressed and then released as usual, saving about a gallon of water per liquid disposal since the tension device closes the flapper a couple of seconds quicker. For solid disposal, the same handle should be pressed and released after a short pause, sending the full tank water to the bowl as originally designed.

About 3,500 gallons of water per person can be saved annually by utilizing this water conservation device. The inventor wanted to create a simple and affordable device. It took many tries and making numerous changes to have a water conservation device that is easy to manufacture, distribute and install. The video of the water conservation device is available online at <http://www.youtube.com/watch?v=-64Ly93M12w>

### **Advantages:**

The advantages of using this water conservation device are as follows:

- It can be installed in less than 5 minutes without using any tools.
- Anybody who can replace the flapper can install the water conservation device.
- It is such an inexpensive device that every homeowner can afford the initial installation cost.
- It is easy to manufacture and to distribute the water conservation devices, making it possible to stop the water waste on a massive scale in less than a year.

### **Feedbacks from Current Users:**

"I was happy with the easy installation of the water conservation device. We are saving water using the device every day. It's great", One of the Reynoldstown Residents (The water conservation device was installed on a low flow toilet tank - 1.6 gallon/flush)

"The *FlexFlush*<sup>TM</sup> is a simple, inexpensive and easy to install device that significantly reduces the amount of water we use every time we flush our toilet. The *FlexFlush*<sup>TM</sup> saves our home around 7,000 gallons of water a year and can do the same in the other American homes. Congratulations on developing this great device." George Hornbein, Founder of Greening Neighborhoods, a non-profit organization.

"I met Shervin at an Inventors Association of GA meeting back in September 2010. I was introduced to his new easy water flush device and was immediately intrigued by how simple it is and how easy it is to install. I gave it a try and am now saving twice what I paid for my initial purchase, about \$18-20 dollars per month. Although I have just a two adult person household, it was well worth it!" Joe D'Andrea, High-Tech Interconnect Electronics Sales & Marketing Professional

## **Existing Programs:**

There are many ways to reduce the water usage of toilet tanks. Water tanks contribute about 30% of the water usage in a household. In 1994, a new law passed to reduce water tank capacities from four/five gallons to 1.6 or 1.2 gallons. Currently there are \$100 rebates to encourage homeowners to replace their toilet tanks after demolishing the existing tanks when they install new low flow toilet tanks. However stronger incentives are recommended such as providing \$240 with the condition that the toilet tank to be replaced by a licensed plumber. The budget for these incentives ranges from hundreds of millions of dollars to a couple of billions dollars that are paid by federal, states and local governments, taking monies away from other needed services.

The FlexFlush™ devices can be manufactured and distributed for less than \$5.00 per device. The innovative water conservation project can be implemented at a much faster pace than tank replacements. Even If the tank is planned to be replaced in couple of months or a year later, installation of the FlexFlush™ device can save water much sooner, conserving water that would be wasted considering the current toilet only replacement programs. The water conservation device can also be installed after replacing an old toilet with a low flow toilet, since contemporary low flow toilet models still are not manufactured to use less water for liquid disposals versus solid disposals.

This device has been introduced to more than one thousand residents through water conservation awareness programs. They prefer using the water conservation device instead of replacing the toilet tank because the toilet tank replacement is much more expensive and takes much more time for the installation. Demolition of existing tanks would also create additional problems that are not addressed in the current governmental initiatives. Additionally under those initiatives, hundreds of millions of old tanks and bowls would be sent to landfills.

Another major problem is associated with the fact that people flush twice or more when they replace a toilet with a low flow toilet which defeats the purpose of installing these low flow toilet tank models. Using this water conservation device, less water can be used for liquid disposals and still get the designed force for a solid disposal, since it will use full tank water as usual. Every year every person flushes about 2,555 times for liquid disposals, considering an average of seven liquid disposals per person per day, and 365 times for solid disposals, considering an average of one solid disposal per person per day. The water conservation device can save water by using less water for liquid disposals without sacrificing the pushing force for a solid disposal. This water saving is substantial, literally billions of gallons of fresh water annually.

## **Implementation recommendations:**

It is best to start immediately to distribute the water conservation devices, mailing them with water bills or providing them in major avenues such as hardware stores for mass scale distribution. The FlexFlush™ devices can be installed in advance of any other programs such as toilet tank replacement programs. Furthermore, these water conservation devices can be installed even after any toilet replacement program for achieving additional water saving. There will be new laws in the coming years to make a low flow toilet replacement compulsory before selling a

house. The water conservation device installation should be added for the best water saving result.

### **Conclusion:**

FlexFlush™ is a faster and easier way to conserve water in our homes and reduce water bill payments. We can conserve water in the US and contribute to other communities currently without access to clean drinking water. No other current solution can provide the level of water savings resulting from using less water for liquid disposals in a such a short time. In fact, the water conservation device can be used in tandem with other water conservation efforts to provide extra water saving. We can save millions of gallons of water in less than a year. This water conservation project needs support from organizations such as watershed managements and any other organizations that consider fresh water as an essential resource and seeking to be part of water conservation solutions.

News press:

March 2010: The Launch Hour interview with inventor discussed the invention as a simple and elegant water conservation product,

<http://thelaunchhour.businessradiox.com/podcasts/Launch%2002112010.MP3>

April 2010: Urban League published an article entitled “A man with a mission to conserve water”.

Jun 2010: The water conservation device is shown and recommended by Greening Neighborhoods’ founder as published in the Buckhead Reporter.

Dec 2010: Inventor was featured encouraging a school green group to innovate in an article published in the North Fulton Business News, <http://www.northfulton.com/Articles-c-2010-12-17-185188.114126-sub-Daves-Creek-Green-Team-meets-watersaving-inventor.html>

References:

- EPA Water Sense, “toilets”, April 2011, <http://www.epa.gov/WaterSense/products/toilets.html>
- U.S. Water News Online, “Bill introduced to repeal low-flow toilet requirement” November 1999 <http://www.uswaternews.com/archives/arcpolicy/9bilint11.html>
- Willoughby Mariano, “Statement on toilet replacement program has support”, The Atlanta Journal-Constitution, B8 section, April 4, 2011



Shervin Ahmady is a Georgia-based inventor and professional engineer. He received his MS from GA Tech with a major in Building Construction & Integrated Facility Management (Project delivery track). He is also a LEED (Leadership in Energy and Environment Design) accredited professional registered with USGBC (US Green Building Council). He served as an adviser for Urban League sustainable communities programs and provides water conservation awareness workshops in the metro Atlanta area. He is also the current president of Inventors Association of Georgia and proud to be a green inventor.