

IAWC Exhibit 8.01

The following regulations are listed in the “*Energy Independence & Security Act of 2007*,” Public Law 110–140 – Dec. 19, 2007:

1. A top-loading or front-loading standard-size residential clothes washers manufactured on or after January 1, 2011 shall have a water factor of not more than 9.5. (water factor is equal to gallons/cycle/cubic feet)
2. Dishwashers manufactured on or after January 1, 2010, shall—
 - a. for standard size dishwashers (≥ 8 place settings + six serving pieces) not exceed **6.5 gallon per cycle**; and
 - b. for compact size dishwashers (< 8 place settings + six serving pieces) not exceed **4.5 gallons per cycle**.

TABLE 1
Flow rates from typical fixtures and appliances before and after Federal Standards

Type of Use	Pre-Regulatory Flow*	New Standard (maximum)	Federal Standard	Year Effective	WaterSense / ENERGY STAR Current Specification+ (maximum)
Toilets	3.5 gpf	1.6 gpf	U.S. Energy Policy Act	1994	1.28 gpf
Clothes washers**	41 gpl (14.6 WF)	Estimated 26.6 gpl (9.5 WF)	Energy Independence & Security Act of 2007	2011	Estimated 22.4 gpl (8.0 WF)
Showers	2.75 gpm	2.5 gpm	U.S. Energy Policy Act	1994	2.0 gpm
Faucets***	2.75 gpm	2.5 gpm (1.5 gpm)	U.S. Energy Policy Act	1994	1.5 gpm at 60 psi
Dishwashers	14.0 gpc	6.5 gpc for standard; 4.5 gpc for compact	Energy Independence & Security Act of 2007	2010	5.8 gpc for standard; 4.0 gpc for compact
Commercial Pre Rinse Spray Valves	1.8 to 6 gpm	1.6 gpm	U.S. Energy Policy Act of 2005	2006	Under development

* Source: *Handbook of Water Use and Conservation*, Amy Vickers, May 2001

** Average estimated gallons per load and water factor (see calculations)

*** Regulation maximum of 2.5 gpm at 80 psi, but lavatory faucets available at 1.5 gpm maximum (see calculations)

+Source: <http://www.epa.gov/watersense/> and <http://www.energystar.gov> websites

ABBREVIATIONS USED	
gpcd	gallons per capita per day
gpf	gallons per flush
gpl	gallons per load
gpm	gallons per minute
gpc	gallons per cycle
WF	water factor, or gallons per cycle per cubic feet capacity of the washer (the smaller the water factor, the more water efficient the clothes washer)

TABLE 2
Daily indoor per capita water use from various fixtures and appliances in a typical single family home before and after Federal Regulations

Type of Use	Pre-Regulatory Standards		Post-Regulatory Standards		Savings
	Amount** (gpcd)	Percent of Total	Amount** (gpcd)	Percent of Total	
Toilets	17.9	30.4%	8.2	21.4%	54%
Clothes washers*	15	25.5%	9.8	25.6%	30%
Showers	9.7	16.5%	8.8	23.0%	9%
Faucets	14.9	25.3%	10.8	28.2%	28%
Dishwashers*	1.4	2.4%	0.65	1.7%	54%
Total Indoor Water Use	58.9	100%	38.3	100%	35%

Note: List only includes common household fixtures and appliances and excludes leaks and "other domestic uses" in order to be conservative.

*Regulatory Standards effective in 2010 and 2011. For calculations of amount in gpcd, refer to the calculation below.

**Source: *Handbook of Water Use and Conservation*, Amy Vickers, May 2001

CALCULATIONS

Clothes washer (pre-regulatory):

Number of times clothes washer used everyday * = 0.37 loads per day
 Clothes washer water use rate range * = 39 gpl to 43 gpl
 Average water use rate = **41 gpl**
 Water usage per capita = 41 gpl * 0.37 loads/day
 = **15 gpcd**
 Water factor (WF) as gallons/cycle/cu. ft = 41 gpl / 2.8 cu. ft (assuming capacity of an average washer to be 2.8 cu. ft, most washers range between 2.7 – 2.9 cu. ft)
 = **14.6**

Clothes washer (new standard):

Number of times clothes washer used everyday * = 0.37 loads per day
 New regulatory standard = **9.5 WF**
 = 9.5 gallons/per cycle/cubic feet
 = **26.6 gpl** (Assuming capacity of an average washer to be 2.8 cu. ft, most washers range between 2.7 – 2.9 cu. ft)
 Therefore, new usage per capita = 26.6 gpl * 0.37 loads/day
 = **9.8 gpcd**

Dishwasher:

Number of times dishwasher used everyday* = 0.10 times
New regulatory standard = **6.5 gallons/per cycle** (for standard dishwashers only)
Therefore, new usage per capita = 6.5 gallons/per cycle * 0.1
= **0.65 gpcd**

Faucet:

Actual faucet flow during use* = 67% rated flow
Rated flow* = **1.5 gpm to 2.5 gpm**
Frequency of faucet use* = 8.1 min/day
Range of usage per capita = 8.1 gpcd to 13.5 gpcd
Assume average of range for estimated gpcd = **10.8 gpcd**

*Source: *Handbook of Water Use and Conservation*, Amy Vickers, May, 2001