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EPA WaterSense

WaterSense Labeled New Homes

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WaterSense Program, U.S. EPA
WaterSmart Innovations 2010
October 6, 2010

Objectives

- What is WaterSense?
- The WaterSense Specification for Single Family New Homes
- Sneak Preview! The New and Improved Water Budget Tool
- Inspecting New Homes for the WaterSense Label

EPA WaterSense

A Thirsty Nation

- Between 1950 and 2000, U.S. population doubled while the demand on public supply systems more than tripled.
- At least 36 states are anticipating water shortages between 2003 and 2013.

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Strained Resources

- Updating infrastructure could cost nearly $500 billion over next 20 years
- Can delay projects by using water efficiently
- Save energy and costs associated with pumping and treating water

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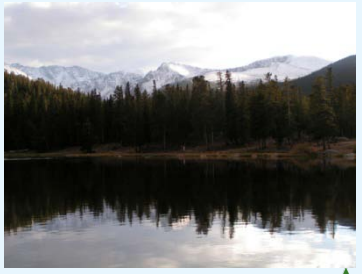
Benefits to Water Efficiency

- Reduce water use today to protect the resource for future generations
- Help mitigate the devastating effects of drought

- Save energy used to pump, heat, and treat water
- Minimize water pollution and help maintain the health of aquatic ecosystems



EPA WaterSense

Why WaterSense?

WaterSense is voluntary partnership and labeling program launched by EPA in 2006

- Our vision
  - All Americans will understand the importance of water efficiency and take positive actions to reduce their water use – in their homes, outdoors, and at work.
- How will we achieve it?
  - By transforming the marketplace for products and services that use water
  - By promoting a nationwide ethic of water efficiency to conserve water resources for future generations and reduce water and wastewater infrastructure costs

EPA WaterSense

What's Special About WaterSense?

- High efficient and performing
  - Products must offer equivalent or superior performance while using about 20 percent less water than conventional models
- A label with integrity
  - Third-party bodies test and certify that products & homes meet WaterSense criteria
  - Backed by the credibility of EPA
- Smart use of taxpayer dollars
  - Manufacturers/builders absorb research, testing/inspection, and branding costs
  - Licensed certifying parties certify the products and police the label's use
  - EPA leverages national network of partners to promote WaterSense

WaterSense New Homes Program

Water conservation named one of the top green building trends of 2010!

WaterSense labeled new home under EPA pilot program
Chapel Hill, NC

- WaterSense labeled new homes will:
  - Reduce water use in single-family new homes by 20%
  - Educate homeowners about continuing water-efficient behaviors
  - Encourage community infrastructure savings

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WaterSense Complements Other Green Programs

- One-stop inspection for multiple programs
  - The WaterSense certification process for new homes is similar to ENERGY STAR®
  - Home energy raters can conduct water-efficiency home inspections
    - Must be trained on the specification
    - Maintain a relationship with a WaterSense licensed certification provider
    - For more information contact RESNET
  - A one-stop inspection saves builders time and money when seeking multiple certifications

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New Homes Certification System

WaterSense Certification System

Program Administrators
- Train providers (really their QADs)
- Verify/approve provider applications
- Oversee the quality assurance process

Licensed Certification Providers
- Employ or contract at least 1 QAD
- Maintain up to date records as required by the program administrator
- Issue the WaterSense Label
- Audit labeled homes
- Train and approve inspectors

Water Efficiency Inspectors
- Inspect homes for WaterSense label
- Often the point of contact for builders
- Can not issue label directly

HERS (ENERGY STAR) Rating System

RESNET
- Build & Maintain Home Energy Rating System (HERS)
- Verify/approve provider applications
- Oversee the quality assurance process

Accredited Rating Providers
- Employ at least 1 QAD
- Maintain up to date records as required by the program administrator
- Re-audit homes HERS system requirements

Accredited Training Providers
- Train QADs
- Train Raters
- Train providers on quality assurance processes

Raters
- Provide home rating services
- Often the point of contact for builders
- Can sometimes issue the label directly

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Elements of a WaterSense labeled new home

- Required Elements:
  - Leak prevention
  - Service pressure
  - Hot water delivery system
  - Toilets/urinals
  - Bathroom faucets
  - Kitchen faucets
  - Showerheads
  - Landscape design
  - Homeowner's manual
- Optional Elements:
  - Dishwashers
  - Clothes washers
  - Evaporative cooling systems
  - Water softeners
  - Drinking water treatment systems
  - Irrigation system

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New Homes Specification: Indoors

- **Required items:**
  - Water service pressure maximum 60 psi
  - Leak prevention measures
  - WaterSense labeled plumbing fixtures
  - Other water-efficient plumbing fixtures
  - Efficient hot water distribution system

- **Optional items must meet efficiency criteria, if installed:**
  - ENERGY STAR qualified dishwasher or clothes washer (if appliances installed)
  - Evaporative air conditioners
  - Water softeners
  - Drinking water treatment systems

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Indoor Requirements & Inspection: Hot Water Delivery System

- The average home wastes more than 3,650 gallons of year waiting for hot water to be delivered to the fixture.
- 10-15% of the energy used in hot water systems is wasted through distribution losses.
- Distance from the water heater and volume of water that needs to be discharged are the primary factors.

Indoor Requirements & Inspection: Hot Water Delivery System

Hot water delivery system

- Requirement:
  - The hot water distribution system shall store no more than 0.5 gallons of water in any piping/manifold between the hot water source and any hot water fixture.
  - No more than 0.6 gallons of water shall be collected from the hot water fixture before hot water is delivered (accounts for additional water that must be removed from the system before hot water can be delivered).
  - Timer- and temperature-based recirculating systems **do not** meet this requirement.

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Indoor Requirements & Inspection: Showers

- New Home Specification will be revised in 2011 to include WaterSense labeled showerheads

- Showerhead Requirements:
  - Showerheads must have a maximum flow rate of 2.5 gpm.
  - In cases with more than one showerhead, the entire device must meet the maximum flow requirement in all possible operating modes.
- Shower Size Requirements:
  - The total allowable flow rate of water flowing at any given time from all showerheads must be limited to 2.5 gpm per shower compartment with a floor area less than 2,160 square inches (in^2).

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Outdoor Requirements & Inspection: Landscape Design

EPA provides builders with two options for complying with landscape requirements:

- **Option 1:** Regionally-based allocations determined using EPA's water budget tool.
- **Option 2:** Maximum turf allocation determined using a set percentage (40%) of the landscaped area.

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Outdoor Inspection: Landscaped Area

- Front yard must be landscaped
- Also includes any area improved upon by the builder such as:
  - Landscaping
  - Turf or sod
  - Water features or pools
- Landscaped area is defined as the designed area of landscape excluding the footprint of the home and permanent hardscape areas such as driveways, sidewalks, and patios.
- Excluded from landscapable area:
  - Septic drainage fields
  - public right-of-ways

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Outdoor Requirements & Inspection: Irrigation System

- *IF irrigation systems are installed*, they must:
  - Be designed or installed by a WaterSense irrigation partner.
  - Be audited by a WaterSense irrigation partner.
  - Shall be designed to sustain the landscape without creating runoff or direct overspray of the property
  - Achieve a minimum 65% distribution uniformity
  - Be equipped with technology that inhibits or interrupts operation during periods rainfall or sufficient moisture

EPA WaterSense

Your Name:	Landscaper
Builder Name:	WaterSense Builder
Lot Number/Street Address:	123 WaterSense Street
City, State, Zip Code:	Chicago, IL 60653

Peak Watering Month: June

Obtain from Water Budget Data Finder at www.epa.gov/watersense/nhspecs/wb_data_finder.html

Is an irrigation system being installed on this site? yes

This worksheet determines the baseline and the landscape water allowance (LWA) for a site based on its peak watering month.

The baseline is the amount of water required by the site during the peak watering month if watered at 100 percent of reference evapotranspiration (ET_o). The following formula is used to calculate the baseline:

$$Baseline = ET_o \times A \times C_u$$

Where:
ET_o = Local reference evapotranspiration (inches/month)
A = Landscaped area (square feet)
C_u = Conversion factor (0.6233 for results in gallons/month)

The LWA is the water allotment for the site. The following formula is used to calculate the LWA:

$$LWA = 0.70 \times Baseline$$

Where:
LWA = Landscape water allowance (gallons/month)
Baseline = ET_o x landscaped area x 0.6233

To calculate the Baseline and LWA for a site, enter the designed landscaped area and average monthly reference evapotranspiration for the site's peak watering month. (Enter data in white cells only.)

STEP 1A - ENTER THE LANDSCAPED AREA (A)

12,280 Area of the designed landscape (square feet)

STEP 1B - ENTER THE AVERAGE MONTHLY REFERENCE EVAPOTRANSPIRATION (ET_o)

6.43 Average monthly reference ET (inches/month) for the site's peak watering month

Obtain from Water Budget Data Finder at www.epa.gov/watersense/nhspecs/wb_data_finder.html

OUTPUT - BASELINE FOR THE SITE

49,219 Monthly baseline (gallons/month) based on the site's peak watering month

OUTPUT - WATER ALLOWANCE FOR THE SITE

34,453 Monthly landscape water allowance (gallons/month) based on the site's peak watering month

To calculate the LWR for the site, enter the information requested below for the site's peak watering month. (Enter data

STEP 2A - ENTER THE AVERAGE MONTHLY RAINFALL (R) AT THE SITE FOR THE PEAK WATERING MONTH IDENTIFIED IN

3.56 **Average monthly rainfall (inches/month) for the site's peak watering month**

Obtain from Water Budget Data Finder a www.epa.gov/watersense/nhspecs/wb_data_finder.html

STEP 2B - COMPLETE TABLE 1 BELOW (enter data in white cells only)

Enter the area of the hydrozone (square feet). The total area must equal the landscaped area entered in Step 1A.

Choose the plant type from the dropdown list (source data is displayed in Table 2).

Choose the irrigation type from the dropdown list (source data is displayed in Table 3; guidance is displayed in Table 4 and Table 5)

Table 1. Landscape Water Requirement

Zone	e Feature Area (sq. ft.)	Plant Type or Landscape Feature	Landscape Coefficient (K_L)	Irrigation Type	Uniformity (DU_{LQ})	LWR_H (gal/month)
1	7,150	Turfgrass - High water requirement	0.8	Fixed Spray	65%	29,168
2	2,200	Shrubs - Medium water requirement	0.5	Drip - Standard	70%	4,555
3	2,030	Groundcover - Low water requirement	0.2	Drip - Standard	70%	716
4	900	Nonvegetated Softscape		No Irrigation	NA	-
5						-
6						-
7						-
8						-
9						-
10						-
11						-
12						-
13						-
14						-
15						-
Total Area	12,280	Landscape Water Requirement for the Site (gal/month)				34,439

Table 2. Plant Type or Landscape Feature and Associated Landscape Coefficient

Plant Type or Landscape Feature	K_L Water Requirements		
	Low	Medium	High
Trees	0.2	0.5	0.9
Shrubs	0.2	0.5	0.7
Groundcover	0.2	0.5	0.7
Turfgrass	0.6	0.7	0.8
Pool, Spa, or Water Feature	0.8		
Permeable Hardscape	0		
Nonvegetated Softscape	0		

Source: Based on LEED for Homes Rating System 2008.

Table 3. Distribution Uniformity

Irrigation Type	$DU_{(LQ)}$ or EU*
Drip - Standard	70%
Drip - Press Comp	90%
Fixed Spray	65%
Micro Spray	70%
Rotor	70%
No Irrigation	NA

*Lower quarter distribution uniformity (DU_{LQ}) applies to sprinkler zones and emission uniformity (EU) applies to drip/microirrigation zones.
Source: (The Irrigation Association, October 2001) in Landscape Irrigation Scheduling and Water Management, IA 2005.

Table 4. Appropriate Irrigation Types - Landscaped Areas with Irrigation Systems

IF THE PLANT TYPE IS:	THEN THE IRRIGATION TYPE CAN BE:			
	Drip - Standard	Drip - Press Comp	Fixed Spray	Micro Spray*
Trees	x	x		x
Shrubs	x	x		x
Groundcover	x	x		x
Turfgrass	x	x	x	x

* Micro spray may only be used on vegetation other than turfgrass if it meets the definition of microirrigation system, which according to the *2009 WaterSense Single-Family New Home Specification* is: " application of small quantities of water on or below the soil surface as drops, tiny streams or miniature spray through emitters or applicators placed along a water delivery line. Microirrigation encompasse methods or concepts, such as bubbler, drip, trickle, mist or spray, and subsurface irrigation. For the purposes of this specification, microirrigation includes emission devices that have flow rates less than

Table 5. Appropriate Irrigation Types - Landscaped Areas without Irrigation Systems

IF THE PLANT TYPE OR LANDSCAPE FEATURE IS:	THEN THE IRRIGATION TYPE SHALL BE:		
	Drip - Standard	Fixed Spray	No Irrigation
Trees, Shrubs, or Groundcover with Low Water Requirements (K_L = 0.2)	x		
Trees, Shrubs, or Groundcover with Medium or High Water Requirements (K_L > 0.2)		x	
Turfgrass with Low, Medium, or High Water Requirements (K_L > 0.2)		x	
Pool, Spa, or Water Feature		x	
Permeable Hardscape			x
Nonvegetated Softscape			x

*Please see additional information in the WaterSense Water Budget Approach for landscapes installed without irrigation systems.

WaterSense Single-Family New Home Specification: Water Budget Tool

This water budget tool shall be used to determine if the designed landscape meets Criteria 4.1.1.1 of the specification.
Please refer to the WaterSense Water Budget Approach for additional information.

Your Name:	Landscaper
Builder Name:	WaterSense Builder
Lot Number/Street Address:	123 WaterSense Street
City, State, Zip Code:	Chicago, IL 60653
Peak Watering Month:	June
Is an irrigation system being installed on this site?	yes

This worksheet determines if the designed landscape meets the water budget.

If the landscape water requirement is LESS than the landscape water allowance, then the water budget criterion is met.
If the landscape water requirement is GREATER than the landscape water allowance, then the landscape and/or irrigation system needs to be redesigned to use less water.

STEP 3A - REVIEW THE LWA AND LWR FROM PART 1 AND PART 2

LWA 34,453 (gallons/month) LWR 34,439 (gallons/month)

STEP 3B - REVIEW THE TOTAL AREA OF TURFGRASS* IN THE DESIGNED LANDSCAPE FROM STEP 2B

The designed landscape contains 7,150 square feet of turfgrass.* This is 58% of the landscaped area.

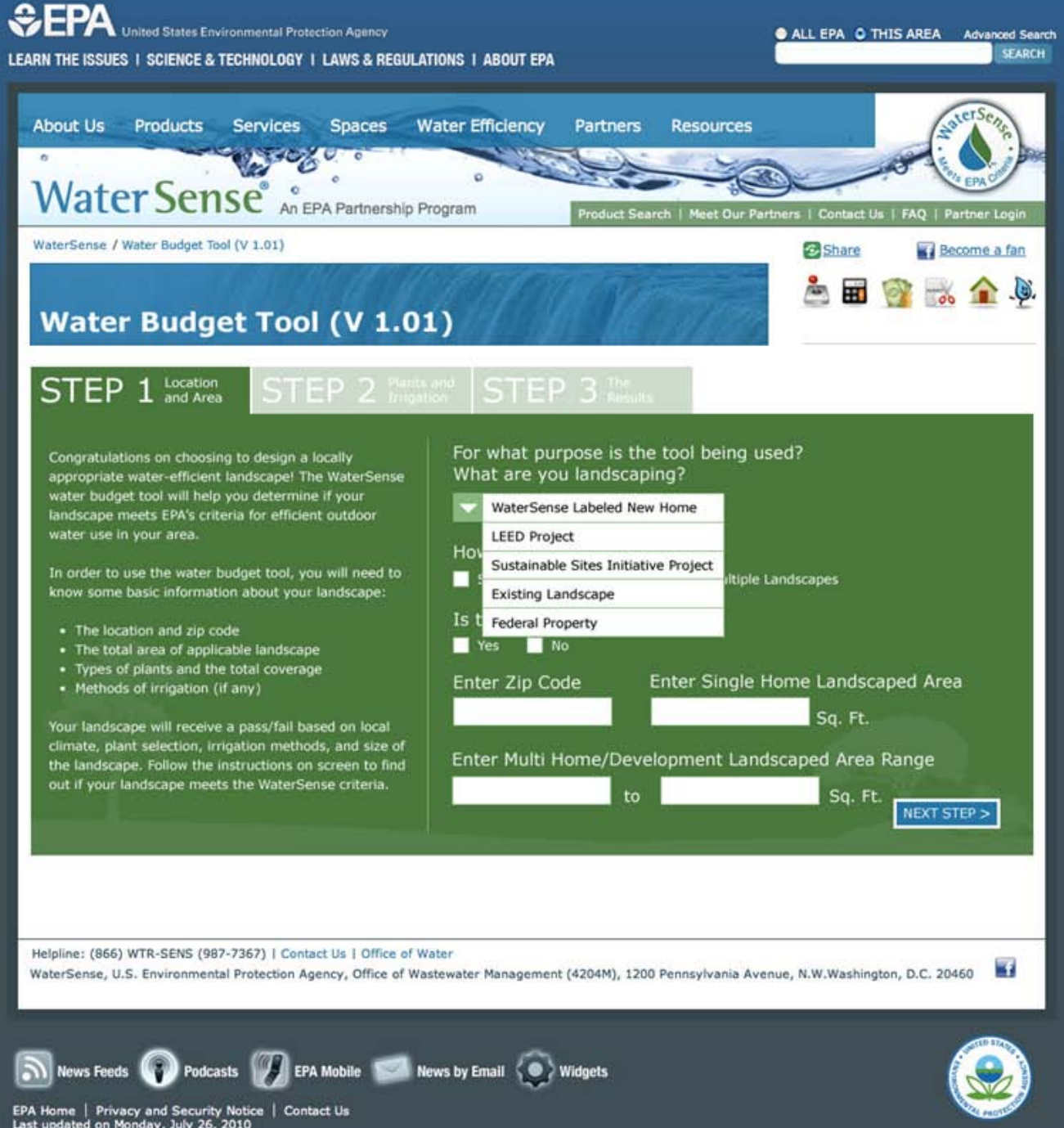
*This includes the area of any pools, spas, and/or water features, designated by WaterSense to be counted as turfgrass.

OUTPUT - DOES THE DESIGNED LANDSCAPE MEET THE WATER BUDGET?

YES

If YES, then the water budget criterion is met.
If NO, then the landscape and/or irrigation system needs to be redesigned to use less water.

The designed landscape water requirement is a 30% reduction in water use from the baseline calculated in Part 1.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STEP 1 Location and Area
STEP 2 Plants and Irrigation
STEP 3 The Results
Congratulations on choosing to design a locally appropriate water-efficient landscape! The WaterSense water budget tool will help you determine if your landscape meets EPA's criteria for efficient outdoor water use in your area.
In order to use the water budget tool, you will need to know some basic information about your landscape:
The location and zip code
The total area of applicable landscape
Types of plants and the total coverage
Methods of irrigation (if any)
Your landscape will receive a pass/fail based on local climate, plant selection, irrigation methods, and size of the landscape. Follow the instructions on screen to find out if your landscape meets the WaterSense criteria.
For what purpose is the tool being used?
What are you landscaping?
WaterSense Labeled New Home
LEED Project
Sustainable Sites Initiative Project
Existing Landscape
Federal Property
Yes No
Enter Zip Code
Enter Single Home Landscaped Area
Sq. Ft.
Enter Multi Home/Development Landscaped Area Range
to
Sq. Ft.
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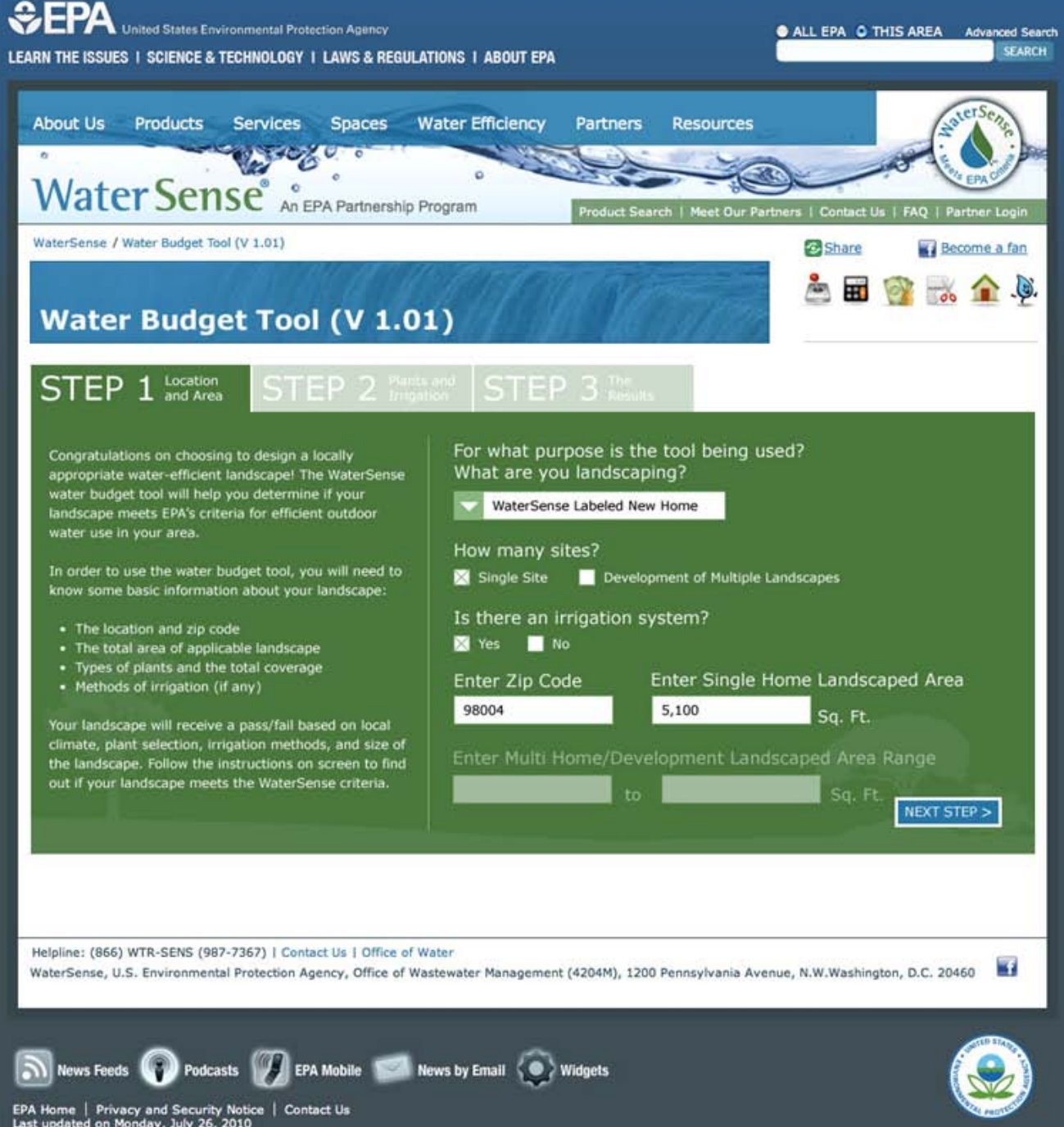
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Types of plants and the total coverage
Methods of irrigation (if any)
Your landscape will receive a pass/fail based on local climate, plant selection, irrigation methods, and size of the landscape. Follow the instructions on screen to find out if your landscape meets the WaterSense criteria.
For what purpose is the tool being used?
What are you landscaping?
WaterSense Labeled New Home
How many sites?
Single Site Development of Multiple Landscapes
Is there an irrigation system?
Yes No
Enter Zip Code
98004
Enter Single Home Landscaped Area
5,100
Sq. Ft.
Enter Multi Home/Development Landscaped Area Range
to
Sq. Ft.
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STEP 1 Location and Area
STEP 2 Plants and Irrigation
STEP 3 The Results
Fill out the chart below with all the appropriate information to calculate your landscape's water needs.
Zone
Area (sq. ft.)
Plant Type / Landscape Feature
Water Demand
Irrigation type
Impact on Water Use
Required Water (gal/month)
1 2,290 Trees
2 Shrubs
3 Groundcover
4 Turfgrass
5 Pool, Spa or Water Feature
6 Permeable Hardscape
7 Nonvegetated Softscape
Total: 2,290
add zone
0 Water Allowance (gal/month)
0 Total Site Water Requirement for the Site (gal/month)
0 Remaining Difference (gal/month)
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Water Budget Tool (V 1.01)

STEP 1 Location and Area | STEP 2 Plants and Irrigation | STEP 3 The Results

Fill out the chart below with all the appropriate information to calculate your landscape's water needs.

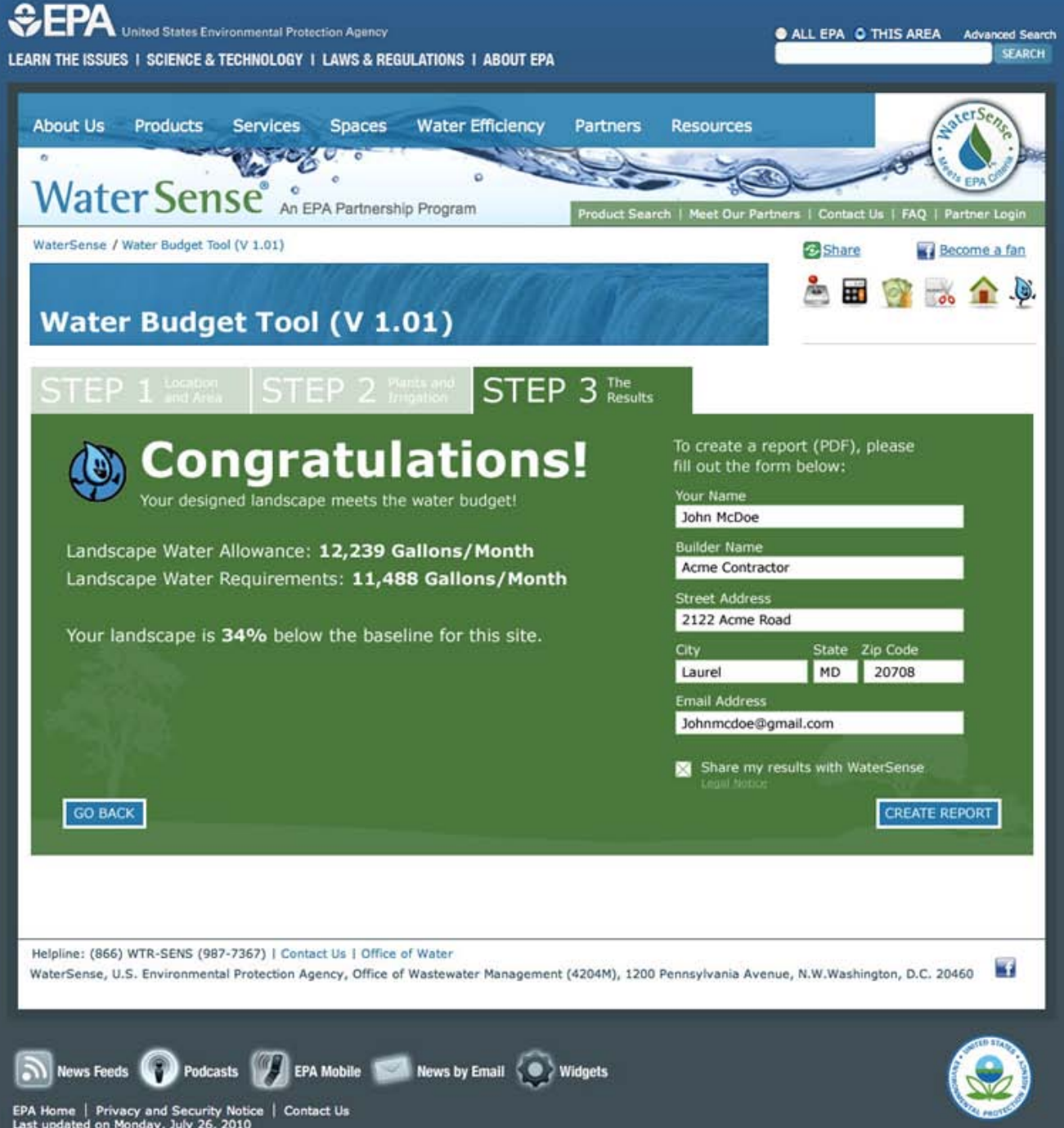
Zone	Area (sq. ft.)	Plant Type / Landscape Feature	Water Demand	Irrigation type	Impact on Water Use	Required Water (gal/month)
1	2,290	Turfgrass	Medium	Fixed Spray	8 drops	8,038
2	130	Groundcover	Low	Drip - Standard	2 drops	105
3	588	Shrubs	Low	Drip - Standard	4 drops	476
4	392	Shrubs	Low	Drip - Standard	3 drops	318
5	710	Groundcover	Low	Drip - Standard	4 drops	575
6	450	Groundcover	Low	Drip - Standard	3 drops	365
7	540	Turfgrass	Low	Fixed Spray	4 drops	1,611

Total: **5,100**

+ add zone

12,239	11,488	+751
Water Allowance (gal/month)	Total Site Water Requirement for the Site (gal/month)	Remaining Difference (gal/month)

NEXT STEP >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Water Budget Tool (V 1.01)
STEP 1 Location and Area
STEP 2 Plants and Irrigation
STEP 3 The Results
Congratulations!
Your designed landscape meets the water budget!
Landscape Water Allowance: 12,239 Gallons/Month
Landscape Water Requirements: 11,488 Gallons/Month
Your landscape is 34% below the baseline for this site.
To create a report (PDF), please fill out the form below:
Your Name
John McDoe
Builder Name
Acme Contractor
Street Address
2122 Acme Road
City
Laurel
State
MD
Zip Code
20708
Email Address
Johnmcdoe@gmail.com
Share my results with WaterSense
Legal Notice
GO BACK
CREATE REPORT
Helpline: (866) WTR-SENS (987-7367) | Contact Us | Office of Water
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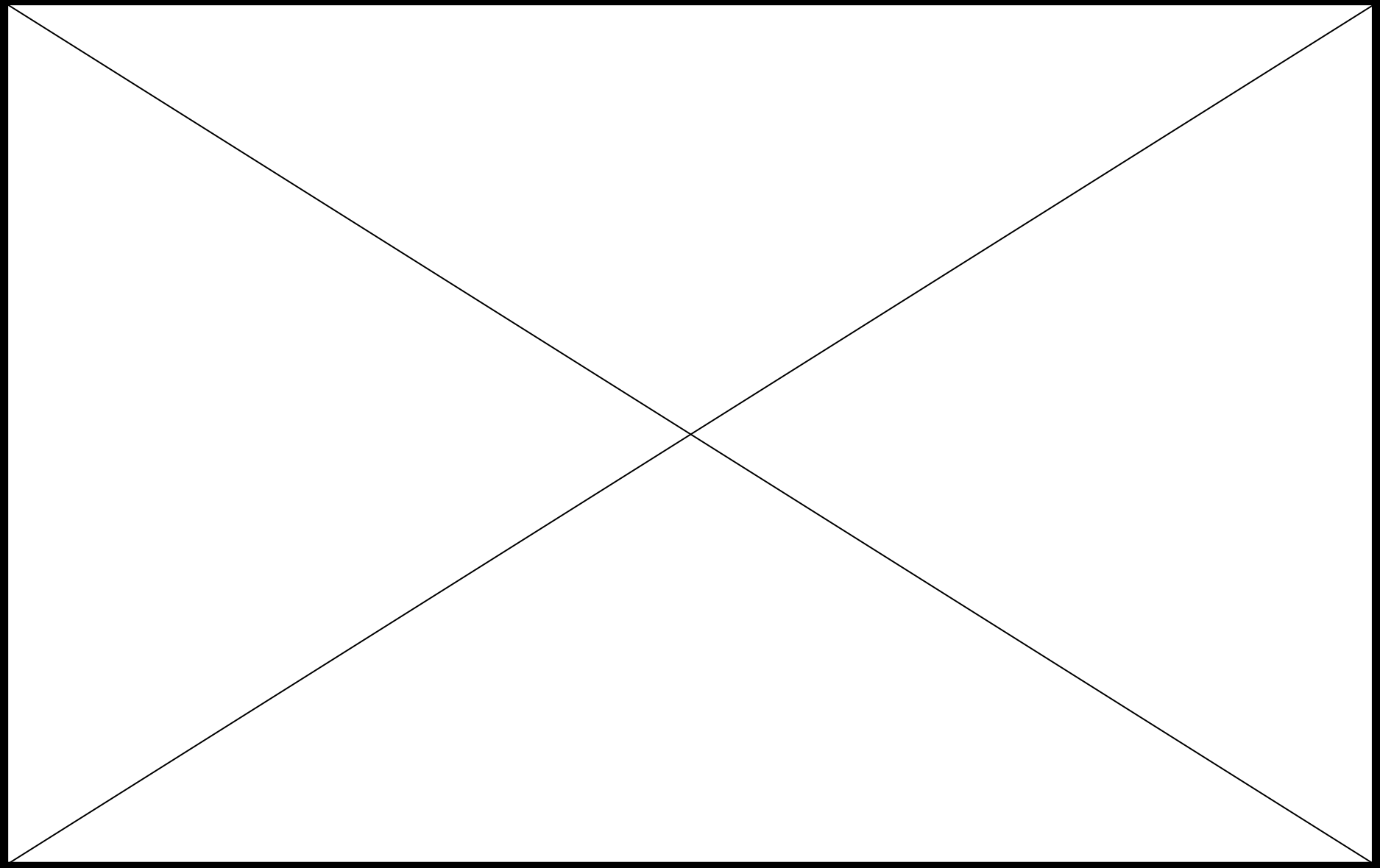

Why Purchase a WaterSense Labeled New Home?

- WaterSense labeled homes will be 20% more efficient than a traditional new home
  - 10,000 gallons of water - equal to 400 loads of laundry
  - 500 kilowatt hours of electricity—enough to power a television for four years

EPA WaterSense

Learn More

- WaterSense Information
  - Web site: www.epa.gov/watersense
    - Partnership information
    - new homes specification,
    - certification system, or
- For questions:
  - E-mail: watersense@epa.gov
  - Toll-free Helpline: (866) WTR-SENS
    - 1(866) 987-7367

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Doing more. With less.