

Installing a Water-wise Landscape



But first,
do you know...



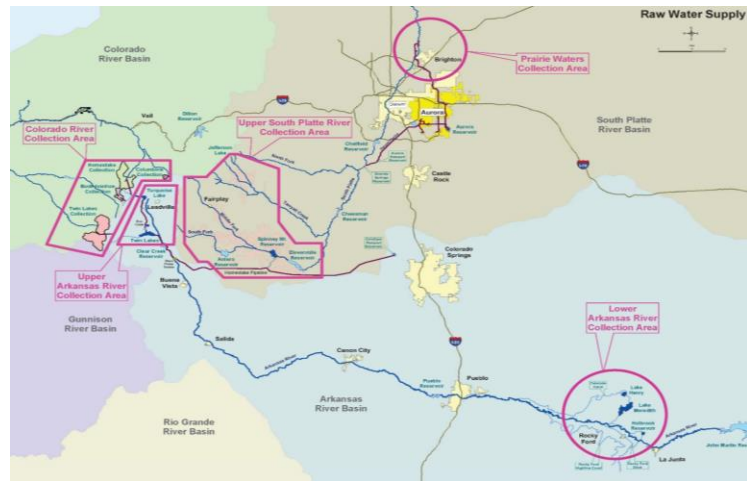
...where we get our water?



Colorado is a headwaters state, with the majority of the state's rivers beginning high in the Rocky Mountains as snowmelt. One of the benefits of living in a state that relies primarily on surface water is that unlike groundwater, surface water is a renewable water source.

One of the drawbacks is that precipitation levels vary greatly from year-to-year making the majority of the state's water supply relatively unpredictable – and highly prone to drought.

...where we store our water?



Aurora's water system starts nearly 180 miles away and includes the use of reservoirs, the natural river system, pipes, tunnels and pumps, all of which help us pull the water we own from our three river basins and deliver it to Aurora.

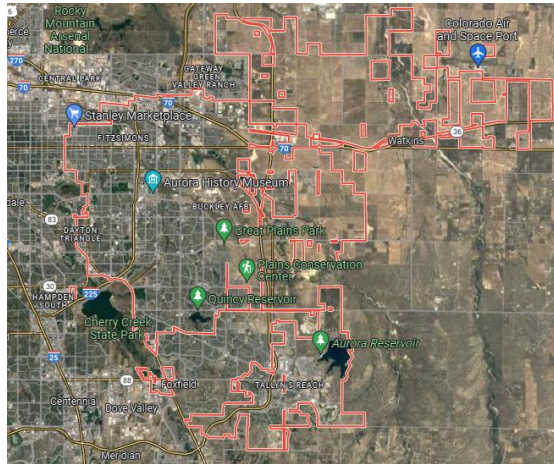
Aurora receives 25% of its water supply from the Colorado, 25% from the Arkansas and 50% from the South Platte river basins.

We have water in 12 reservoirs:

Homestake	Turquoise
Twin Lakes	Spinney Mountain
Jefferson	Strontia Springs
Rampart	Quincy
Pueblo	Aurora
Meredith	Henry

...how much water we use as a city?

16.6 billion gallons



The average annual distribution for the past three years is 16.6 billion gallons annually. About half of that water is used outdoors. Aurora has a semi-arid climate, and our snow and rain levels are about half of the average annual precipitation for the United States, so it's important that we all do our part to help conserve water.

We offer programs to help you save water and money.

Indoor

- Free indoor water assessments
- Toilet rebates
- Low-income water efficiency program

Outdoor

- Free water-wise designs
- Rebates on irrigation parts and water-wise landscapes
- Outdoor water assessments
- Water conservation classes
- Aurora Water-wise Garden volunteering



The Aurora Water Conservation office has saved...



**795 million
gallons of
water
(2016-2021)**



Class Goals



- Present a step-by-step conversion process
- Show cost effective methods
- Cover design, site prep, turf/weed removal, planting, irrigation options and scheduling and maintenance

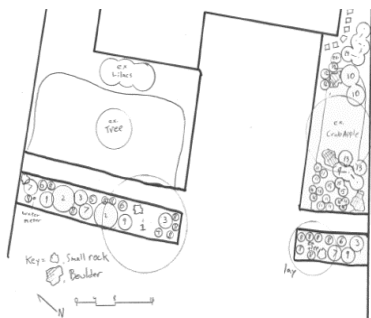


Before & After Photos





Landscape Design



Lays out the foundation of your new landscape
Helps you avoid design errors

Required by

- City (if commercial property)
- HOA (often but not always)



A to-scale design is a landscape design created on a site map of your property. It is recommended for the success of your water-wise landscape – and it is required to participate in the Water-wise Rebate Program.

Why is a design important?

- When you create a design, you become more familiar with your plant material
- You can complete your project in stages, without second-guessing, with fewer mistakes
- Your landscape will look better, more balanced and professional
- It will help you stay in your budget

If a project is put together piece-meal, it may end up costing you in the long-run through increased maintenance problems and changes to an unsatisfactory element.

To receive a free design from Aurora Water Conservation, call 303.739.7195 or email conservation@auroragov.org.

Landscape Design

Choose your xeric plants wisely.

Things to consider:

- Water and sun requirements
- Spacing
- Color, texture, height, seasonal interest
- Reproduction: seeds, runners, division
- Number of varieties in your design



Spacing. Know what your plant sizes are at planting compared to maturity and plan accordingly.

Water and sun requirements. Research your plants. You don't want to put a shade-loving plant in a full-sun area.

Color. Know your color compatibility chart! Design with color in mind. Consider bloom and foliage color for all seasons.

Texture. Use a variety of plant material textures. Look for perennials, shrubs, and trees with wide and narrow leaves. Look for shrubs in the juniper family with scale-like leaves. Some perennials have interesting seedheads that are soft or fuzzy to the touch.

Height. Consider both aesthetics and functionality. Use tall trees to your advantage by shading the southern or western side of your home during the hot summer months to reduce your power bill.

Seasonal interest. Choose ornamental grasses and material with interesting seedheads that may be left over winter for winter interest.

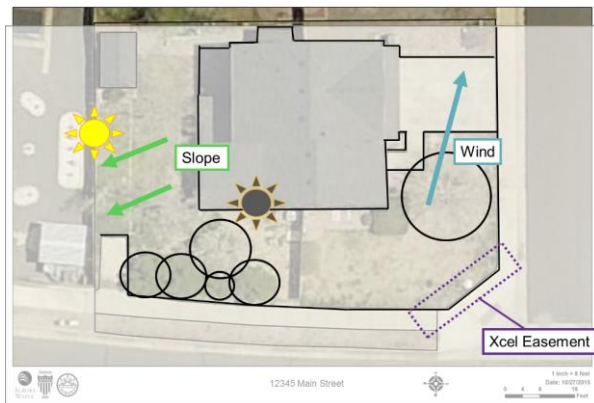
Reproduction: Reproduction method affects maintenance, and some plants seed/spread more vigorously than others. Remember that seedheads are relatively easy to prune, runners are relatively easy to pull, rhizomes are somewhat more difficult to dig, and division of bulbs are somewhat in between.

Limit varieties if you are a beginning gardener. It'll be easier!

Landscape Design

Know the existing conditions of your site.

- Exposure
- Soil type
- Slope
- Wind
- Easements



Determine existing site features:

- ✓ Soil Type (Clay, Sand or Loam)
- ✓ Exposure (North, South, East or West)
- ✓ Slope (None, Slight or Steep)
- ✓ Current Irrigation (Pop-Ups, Drip, Hand or None)
- ✓ Current Uses (Play Area, Dog Run, Outdoor Room, etc.)
- ✓ Gardening Knowledge (Expert, Moderate or Limited)
- ✓ Existing Problems (Weeds, Dead Lawn, Water Bill, etc.)

What kind of soil do you have?

Aurora has mostly very high clay soil, but there are areas of high sand, too.

You can determine the chemical composition and pH of your soil with a **soil test**. At-home pH kits receive poor reviews, so for accurate and comprehensive results, look into CSU tests (for ph, salts, and nutrient levels, recommendations) for about \$35

www.soiltestinglab.colostate.edu/

Phasing Plan

- Lays out a schedule to complete the plan, step-by-step
- Helps determine priorities and proper order
- Usually on a two-month schedule



The phasing plan will help you determine when and how long it may take to complete the different phases of your project.

Check the water-wise rebate program for specific phasing requirements and deadlines.

The next few slides will show example phasing plans for three different method of turf removal.

Preparing the Site

There are several methods to choose from when removing sod and weeds:

1. Mechanical – Sod Cutter
 - Pros: fastest method, no chemicals
 - Cons: labor intensive, disposing of sod, can damage tree roots, cost of rental
2. Chemical - Spray turf with Glyphosate (Roundup)
 - Pros: quick results
 - Cons: chemical herbicide, cost of chemicals and PPE
3. Smother with Newspaper and Mulch
 - Pros: no chemicals, mulch is “built in”
 - Cons: long process



Remember, it is important to fully kill your turf , because in a water-wise landscape, bluegrass is considered a weed.

Site Prep Method #1 Sod Cutter



1. Mow the existing grass very short and lightly water 4-24 hours in advance
2. Rent a sod cutter
3. Wear proper safety equipment
4. Compost, repurpose, or give away your old sod
5. Stay clear of a tree's drip line to damage fewer roots



Phasing Plan for Sod Cutter

	Week						
	1	2	3	4	5	6	7
Rebate Approval				If rebate: Call to schedule inspection			If rebate: Call when complete
Turf Removal	Remove sod						
Planting	Check on plant prices & availability.		Purchase plants, dig holes, amend soil and start planting.				
Hardscape & Landscape Features	Demolition Create final grade Construct all features						
Irrigation	Choose an irrigation system	Modify or construct your irrigation system. If you are using drip, place emitters within 6" from the base of each plant					
Mulch						Mulch the Area with 3 inches of bark or rock	



Site Prep Method #2 Herbicide



1. Buy a non-selective herbicide like on that uses glyphosate (Roundup)
2. Read and follow the instructions on the bottle
3. Wear proper PPE
4. Once the grass is dead, cover with mulch according to your design



Chemicals can be dangerous! Read all of the instructions and warnings on the bottle. For more bang for your buck, buy the concentrate and mix as directed.

Application:

- Spray large drops when there is no wind
- Sprays are easily carried on the wind and can damage other plants!
- Spray the area twice (the 2nd time a week later). Once the grass is dead cover with mulch, do not remove.

Food coloring may be added to the mixture and will allow you to see where you have already sprayed. If you're spraying a large area, this is highly recommended.

Roundup works best:

- On healthy, green, growing turf and weeds
- On sunny days between 65 and 90 degrees

Phasing Plan for Herbicide

	Week						
	1	2	3	4	5	6	7
Rebate Approval					If rebate: Call to schedule inspection.		If rebate: Call when complete
Turf Removal	Purchase glyphosate and sprayer, spray sod. Check turf after 1 week, spray again if necessary.						
Planting	Check on plant prices & availability.		Purchase plants, dig holes, amend soil and start planting.				
Hardscape & Landscape Features	Demolition Create final grade Construct all hardscapes						
Irrigation	Choose an irrigation system.	Modify or construct your irrigation system. If you are using drip, place emitters within 6" from the base of each plant					
Mulch					Mulch the area with 3 inches of inorganic or organic mulch.		



Site Prep Method #3 Smother



- Newspaper or cardboard
- Use soy-based ink newspapers
- Place cardboard or newspaper and lightly water
- Top with mulch
- Do not disturb for at least one month



Use soy-based ink newspapers

- Most newspapers use soy-based ink; avoid any pages that are shiny (typically advertisements)
- Soy ink will naturally decompose in the soil

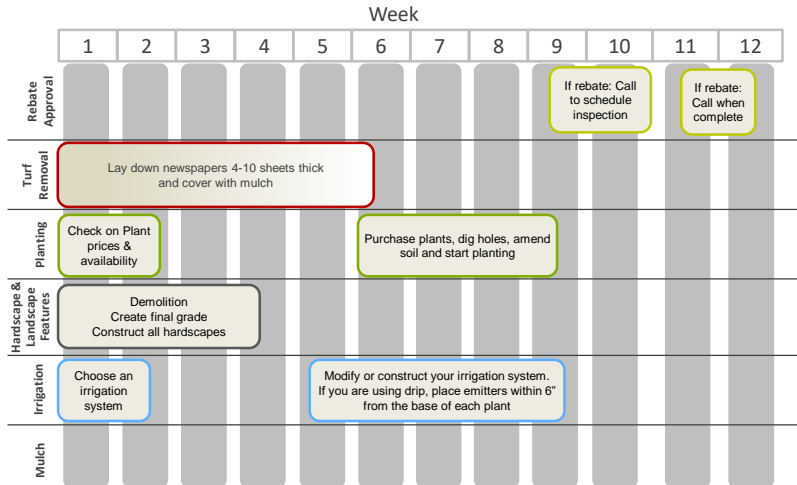
Application:

- Apply overlapping sheets of newspaper
- Lay at least 4 sheets thick of newspaper or one sheet of cardboard and overlap
- Lightly water
- Cover with 3" of mulch

To sufficiently kill the turf you will need to leave the newspaper and mulch in place for at least one month.

When you plant, rake back the mulch and plant directly through the paper/cardboard into the soil.

Phasing Plan for Smother



Hardscapes & Landscape Features

Hardscape is required per city code:

- Boulders
- Berms
- Rock Walls

Landscape features are not required but- enhance your yard:

- Bench
- Patio



Unlike laying sod, it takes some time for a water-wise landscape to establish itself. Hardscapes and landscape features give the area structure and the feeling of a more complete landscape. They also provide additional textures and year-round interest.

Consider the following landscape features for your xeriscape:

- | | |
|---------------|---------------|
| Patio | Dry River Bed |
| Walkway | Bench |
| Arbor | Pergola |
| Water Feature | |

In the city of Aurora, **one** hardscape feature is **required** in a front yard xeriscape.

"Hardscapes" according to city code are:

1. Boulders (3)
2. Berms (1)
3. Rock/Retaining Walls (minimum 18" tall)

Site Layout

Accurate placement of plants according to your design is critical

Laying it out:

1. Mark location of hardscapes and landscape features
2. Mark the location of plants you have not purchased
3. Physically place all plants before planting



Accurate placement according to design is critical – and mandatory if you are participating in the rebate program.

If your design was done by the Water Conservation office, the plants are drawn to their mature size.

On the design it may look like plants are touching - they will some day! When you purchase the plants, they will be much smaller. Take the time to measure the distance (with your scale) between plants' centers.

Laying out your site:

1. Mark layout of landscape features with marking spray paint, chalk, powder or a hose.
2. Put flags or stakes in the ground to mark the location of plants you have not purchased.
3. Physically place plants in their proper locations while still inside their container.
 - Use a measure tape to determine proper location on the ground (see next slide)

Proper Placement



Proper spacing is critical! Use a measuring tape for accurate spacing. Refer to your design and measure with your scale the distance between plants. The plants shown above are 2' apart according to the plan. Notice the measurement is to the center of each plant.

Planting



1. Pull back your mulch.
2. Dig the hole twice as wide as the container and just as deep as the soil in the container.
3. Notice the space around the plant. This extra room allows the roots to grow easily into the looser soil.



Check the Hole Depth



This hole is too
SHALLOW

This hole is too DEEP

This hole is just right



Add Amendment



Buy the cheap stuff – this compost is made of steer manure and costs about \$1 per bag. Fill the plant container full of amendment.



Mix the amendment with the soil removed from the hole



Amending is vital. Organic amendments “build” the soil that feeds your plants. Clay and sandy soils will both benefit from organic amendment, as it improves texture, creates appropriate pore space, increases water-holding capacity, and adds nutrients. Incorporate amendment thoroughly and deeply; it is helpful to apply during soil tilling.

Compost is decomposed organic material. Add 2-3 inches across your entire garden. Choose fully decomposed material free of insecticides, herbicides and weed seeds.

Manure is fresh animal waste. It has the potential to “burn” roots and may be contaminated by bacteria (including e. coli), so only add it in the fall so it has time to decompose fully. Look for aged/composted manure which does not smell and is dark in color. Manure may be high in salts, so add only 1 inch per season.

Cover crops aka green manure are plants planted in the fall and allowed to die naturally in the winter. They decompose with tilling in the early spring, adding nutrients and aerating the soil. It virtually eliminates your need to haul in and add amendment! Mow and then till in the material a month before planting.

Peat moss is low in nutrients and is not recommended. Plus, peat moss bogs are fragile ecosystems and harvesting is disruptive.

Amendment methods

Clay soils benefit from adding some pea gravel along with the organics. Incorporate amendment thoroughly and deeply; it is helpful to apply during soil tilling.

Replace Soil

Backfill around the plant with the newly mixed soil. Use your hands to apply moderate pressure to firm the soil to remove air pockets.



Do **not** step on the soil to compact it.

Water



Thoroughly water with a hose a few inches from the surface of soil.

If the soil settles and the root ball is exposed, add a bit more soil and water one more time.



Always water in new plant material.

Allowing water to settle the soil around the plant is ideal.

Mulch

Mulches retain soil moisture, inhibit weeds and slow erosion

Choose from

organic or **inorganic**



We do **not** recommend fabric under mulch--it creates an unnatural barrier between soil, air, water, and plants. We **do** recommend fabric under pathways and patios.

Mulch is a surface covering applied to the garden bed. Its benefits include:

- | | |
|--------------------------|---------------------|
| retains moisture | creates a tidy look |
| prevents erosion | prevents crusting |
| keeps plants clean | prevents weeds |
| provides a place to walk | prevents compaction |

Apply mulch in a thick layer, at least 3" for best performance.

Organic vs. Inorganic

Plastic is not recommended. It warms soil, is expensive, adds nothing positive to the soil, and prevents water and oxygen from flowing between soil layers.

Wood chips, straw, grass clippings, newspaper all decompose and add nutrients to your soil. Apply 3 inches of material when plants are about 6 inches tall.

Irrigation Pros & Cons

Hand Watering

- Pro: Moderately water-efficient. Gives you time with your plants to see how they are doing
- Con: Takes time, difficult to know how much water you're using

Sprinkler Irrigation (Pop-Ups / Rotors)

- Pro: You can see it working
- Con: Most evaporation, wind drift, overspray and obstruction as plants grow

Drip Irrigation (recommended)

- Pro: Most water-efficient. Little evaporation, watering at the roots of the plant, flexible system
- Con: Difficult to locate breaks



Basics

1. Do not water xeriscape like it is turf! Plants do not need much water and can be harmed by overwatering.
2. Use irrigation zones that are programmed to supply different amounts of water (that align with that zone's plant material) and use the same system components in each zone
3. Perform regular maintenance to verify that your system is working properly

Getting Started

Before you do anything else, search for and fix leaks. You may not need to purchase / install new equipment, you may be able to modify your existing system.

Resources

1. Free outdoor water assessments. Call 303.739.7195 to schedule yours.
2. Irrigation rebate. Go to www.aurorawater.org or call 303.739.7195 for more information.
3. Attend FREE city of Aurora classes on irrigation

Maintenance



Weekly / Monthly Maintenance includes weeding if needed and deadheading (removing spent blooms) before the plant goes to seed. This process encourages re-blooming AND stops the spread of unwanted seeds.

Occasionally Prune shrubs and divide ornamental grasses. Ornamental grasses require division every 5+ years, depending on the species, to remove dead material.

Spring: Cut back perennials and most ornamental grasses, apply pre-emergent if desired, check for irrigation problems

Summer: Weed and water

Fall/Winter: Wrap newer trees (especially with thin or dark bark), blow out your irrigation system, water in the winter if we have periods of no precipitation and temperatures of 40 or higher

Resources

1. Free Aurora Water Conservation classes
2. Volunteer in Aurora's Water-wise Garden! Volunteers are essential to the maintenance and development of Aurora's 6-acre garden. Call us at 303.739.7195 or email conservation@auroragov.org for more information.

Thank You

Water Conservation Office

Hotline 303-739-7195

conservation@auroragov.org

