

Tulsa Area Rain Garden Project: Engaging Cities, Involving Volunteers, and Outreach to the General Public



Kevin Gustavson

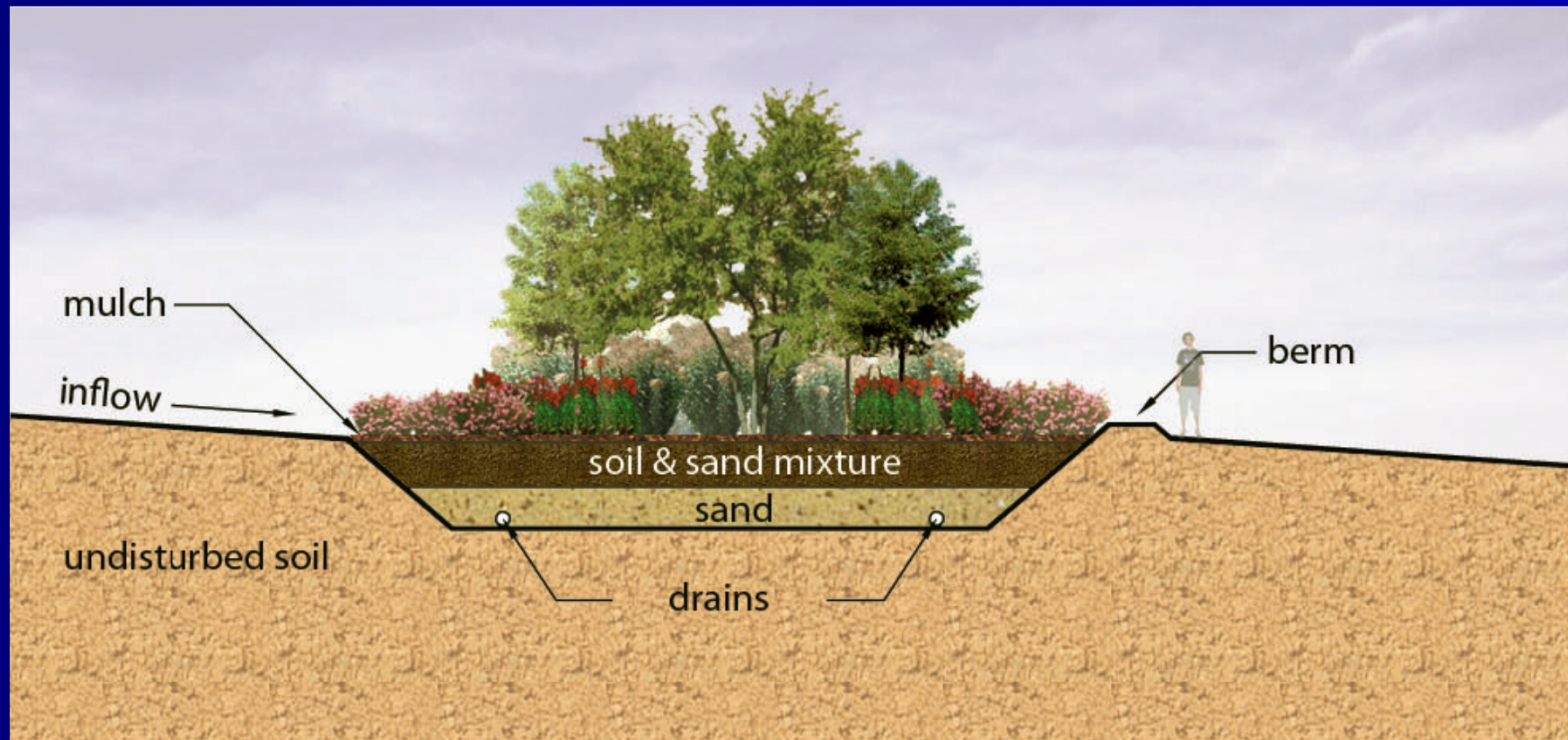
Oklahoma Conservation Commission



Rain Gardens

When it rains, divert stormwater toward a rain garden.

Soils and plants in rain gardens trap or use pollutants.



→ cleaner water makes its way to local streams and lakes.

Indian Nations Council of Governments (INCOG):

Regional Planning Organization in the Greater Tulsa Area.

Green Country Stormwater Alliance (GCSA)

→ 18 cities pool resources to handle
national stormwater regulations.



Tulsa Area Rain Garden Project

INCOG applied for an ARRA Grant (2009)
(Federal Stimulus Package)

→ needed green infrastructure component
(longtime interest in promoting LID).



Conservation Commission (OCC)
unused 319 money (US EPA) → ~\$8,000
less than a year to spend the money on
demonstration project or lost.



OCC offered staff time of Project Coordinator,
Kevin Gustavson.



Tulsa Area Rain Garden Project

Initial idea: 1) build a handful
of small demonstration rain gardens
in the Tulsa Area.



Tulsa Area Rain Garden Project

Initial idea: 2) Use GCSA to help find locations throughout the Tulsa Area



Initial Challenge

Small budget: How to maximize our output?

Free mulch?

(City of Tulsa Greenwaste site)

Free rocks and soil?

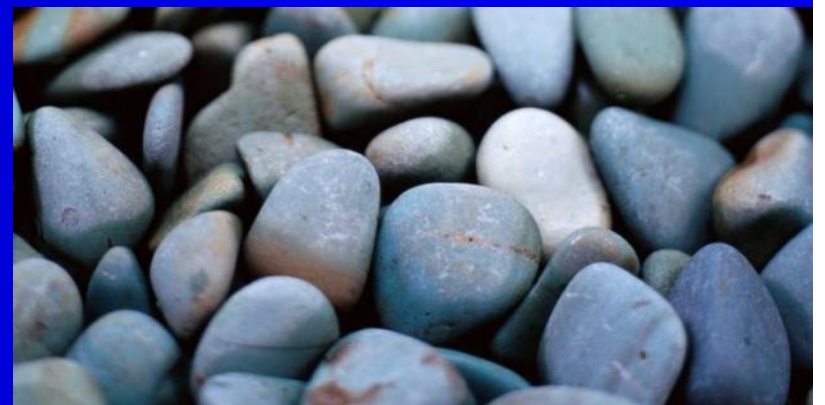
Cities often have piles

Free use of heavy equipment?

Cities?

Free labor?

Volunteers / city labor?



Key to Success: Engaging Cities

Met with GCSA

→ Offered **plants, educational signage, and expertise** to build a rain garden in their city (as many as money allowed)

IF they could provide:

- Construction equipment
- Soil, if needed
- Rocks
- Labor
- Access to volunteer groups
- Mulch



Engaging Cities

Stormwater managers suggested locations

Prioritized based on:

- Site conditions (soil type, slope, impact)
- Visibility
- Ability to provided requested contributions



Another Challenge

Short timeline:

- EPA money needed to be spent by mid-2010.
- Best time to plant is fall.

Solution:

- Buy materials in early 2010, build in the fall
 - Found nurseries willing to receive money in summer and deliver our plants in fall.
 - Contributions from cities became crucial for fall planting.

End Result

Four large rain gardens.

Each with educational signage.

Five groups of volunteers involved.

Four cities and one school district contributing labor, equipment, and materials.

Educational outreach throughout and beyond Tulsa area at no cost through presentations, the media, and the internet.

All for about \$9,000 plus staff time.

We bought plants, landscaping fabric and edging, signs.

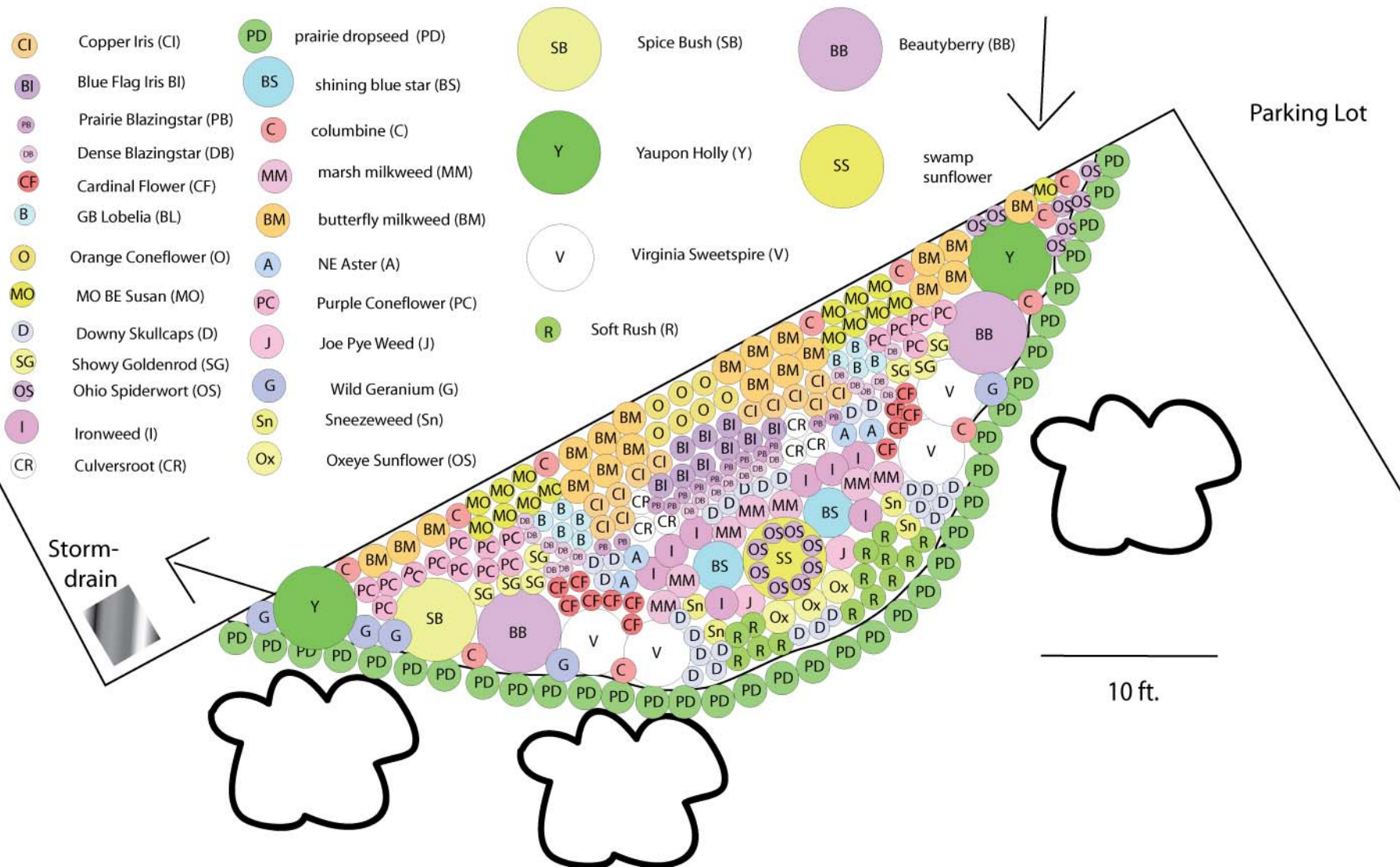
Ray Harral Nature Center, Broken Arrow



Before: All parking lot runoff went to stream via stormdrain.



Ray Harral Nature Center, Broken Arrow



Ray Harral Nature Center, Broken Arrow



City of Broken Arrow provided bobcat and 3 city workers to build.
Scott Grant from Tulsa County Conservation District helped out.

Ray Harral Nature Center, Broken Arrow



Planting with Blue Thumb and
Broken Arrow Beautification Committee
Volunteers, and city staff.





All OK native plants



Ray Harral Nature Center, Broken Arrow



Curb will be cut to let water in after vegetation is better established
...late Spring 2012.

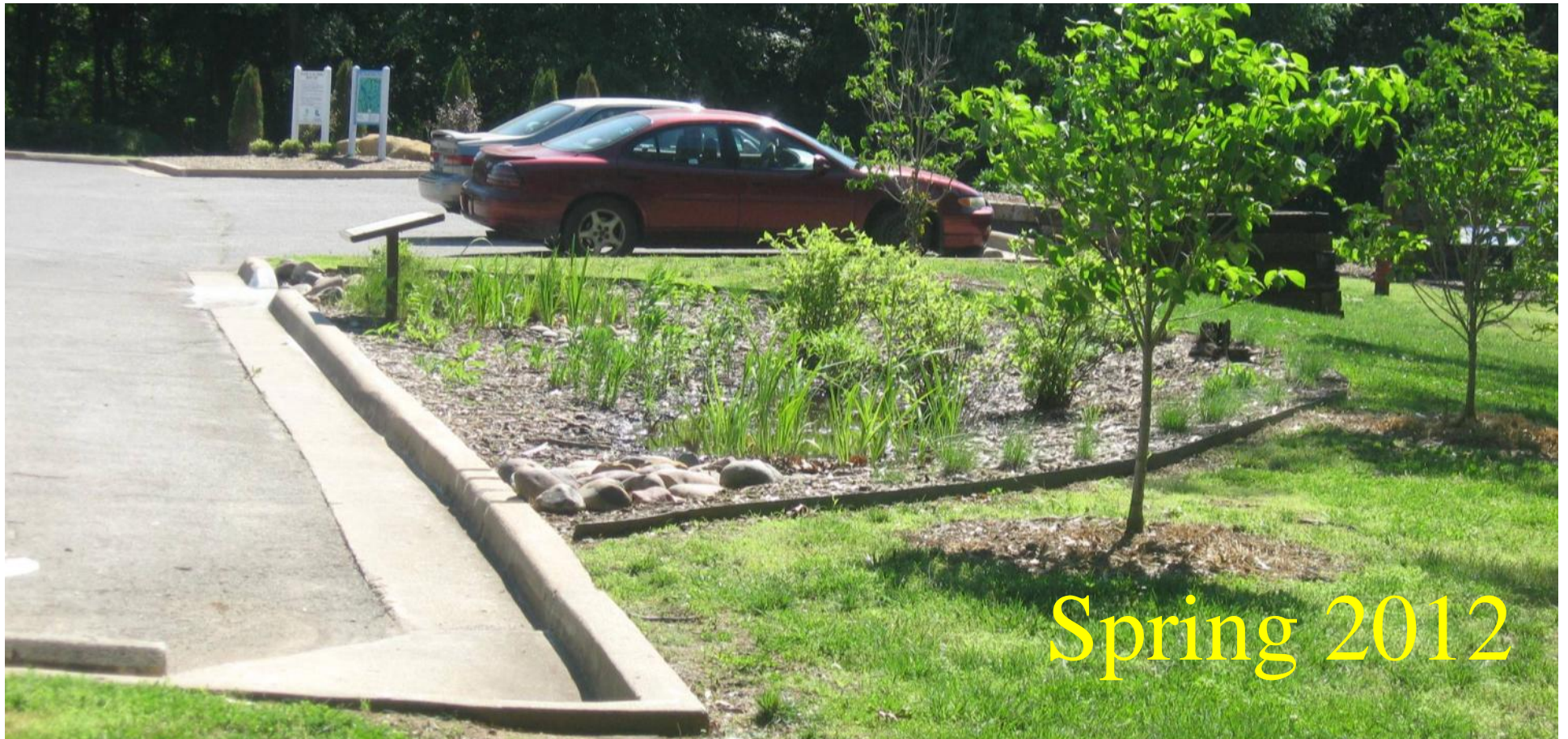
Ray Harral Nature Center, Broken Arrow



First significant rain after one of the hottest, driest, summers in recorded history.

Curbcut and Signage – October 2011





Spring 2012



Fall 2012

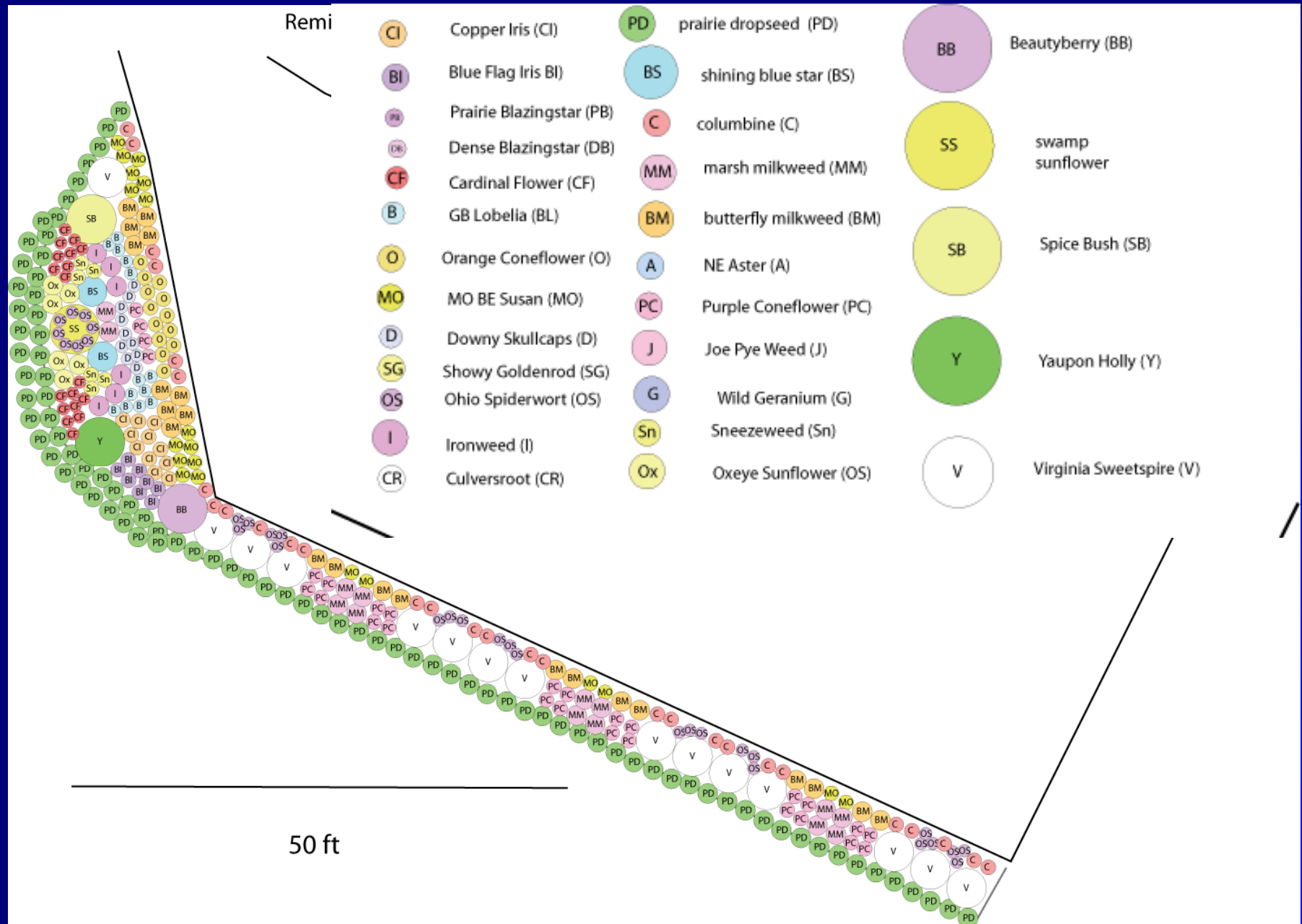
Remington Elementary School, Tulsa

School with an environmental theme, underprivileged kids



Rain garden along new overflow parking lot.

Remington Elementary School, Tulsa



Remington Elementary School, Tulsa

Tulsa County School District

- Backhoe and 3 workers
- Cleared grass (right)
- Hauled rocks and mulch (onsite)
- Soil amendment and berm construction (lower right)



City of Tulsa

Provided (and hauled in):

- Soil - Mulch - Rocks



Remington Elementary School, Tulsa

IBM Volunteers, United Way Day of Caring (a really hot day)

- Dug up remaining grass (missed by excavator).
- Built outlet structures
- Spread mulch



Remington Elementary School, Tulsa

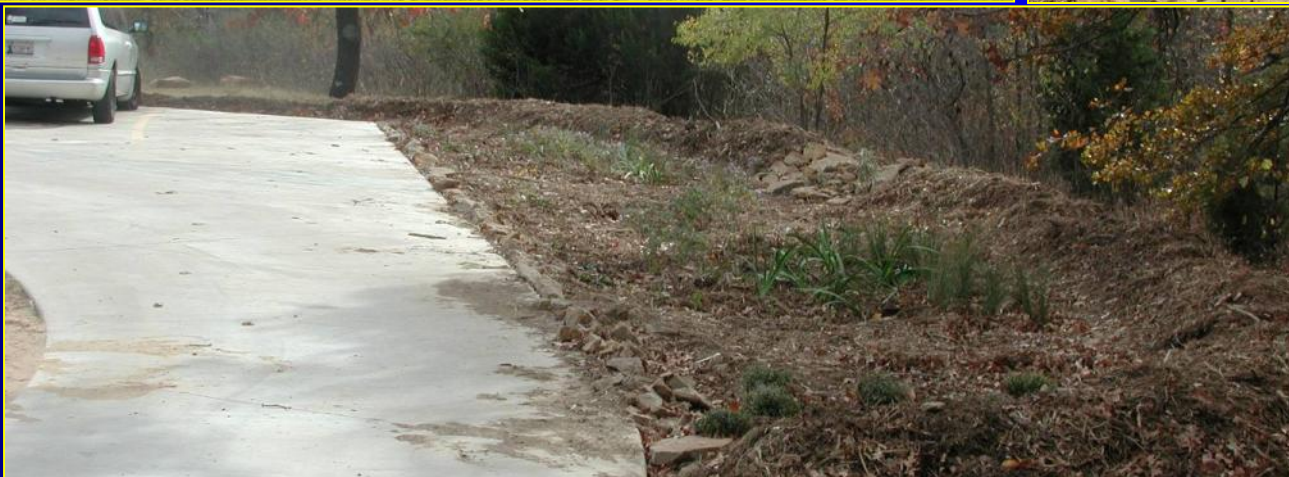
300 + Elementary School kids, a few teachers and Blue Thumb Volunteers

→ Each pupil planted one plant in the garden,
with the help of Blue Thumb volunteers.

→ Then Blue Thumb volunteers planted the rest the next day.



Remington Elementary School, Tulsa



Remington Rain Garden – July 2011



No supplemental watering.

Remington Rain Garden – August 2011



First big rain after a rough summer.

Sapulpa Aquatics Center



Plan: Rain Garden in the swale.

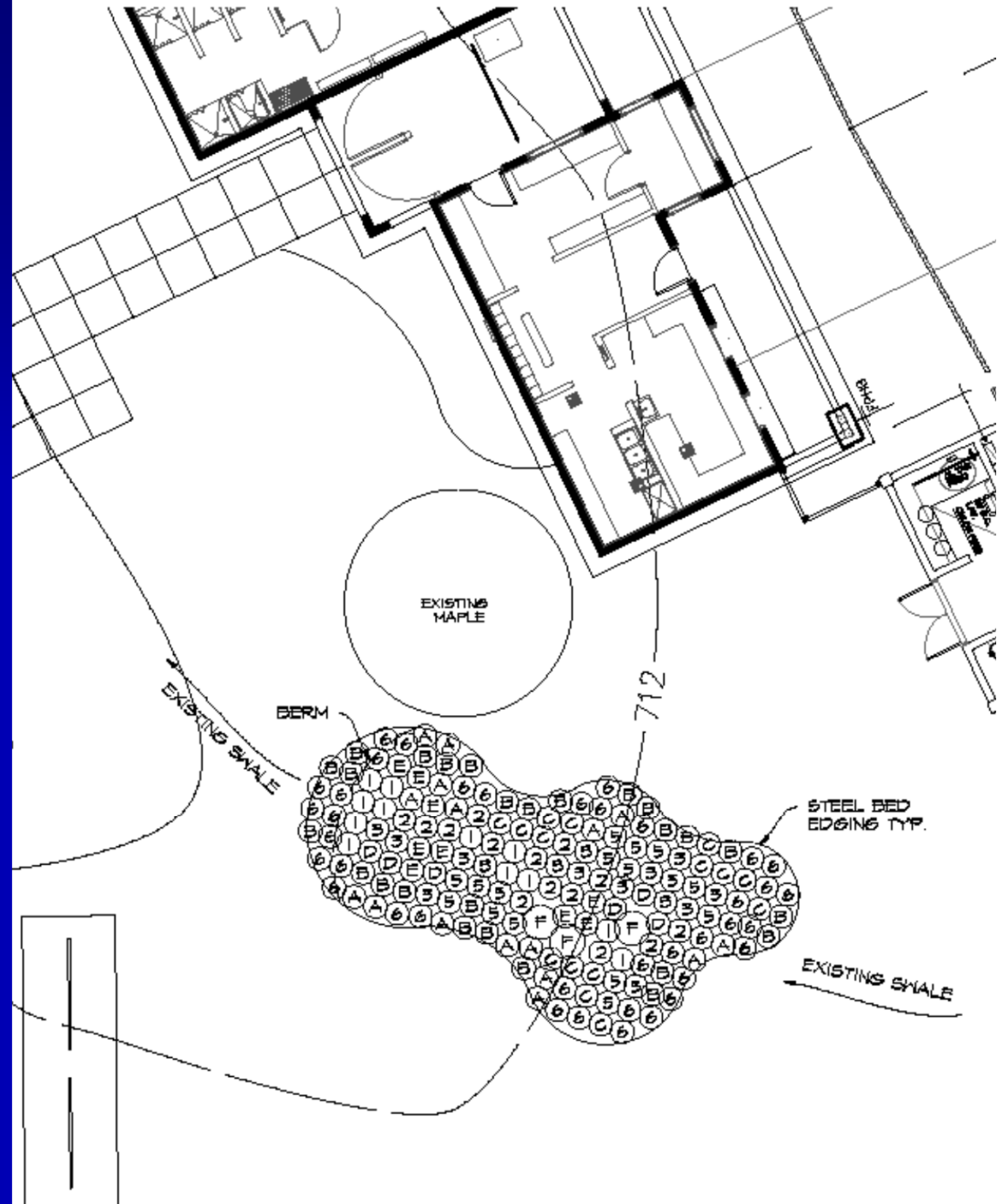
Sapulpa Aquatics Center

Planting Design:

Jim Crosby
Planning Design Group

Slightly different plant
list (more grasses),
to tie in with Aquatic
Center plantings.

Still all native plants.



Sapulpa Aquatics Center

City of Sapulpa

- Cleared grass
- Hauled in rocks, soil, and mulch
- Soil amendment
- Berm and outlet construction
- Installed edging



Sapulpa Aquatics Center

Creek County Master Gardeners and City of Sapulpa staff

→ Planted Garden

→ Added mulch



Sapulpa Aquatics Center



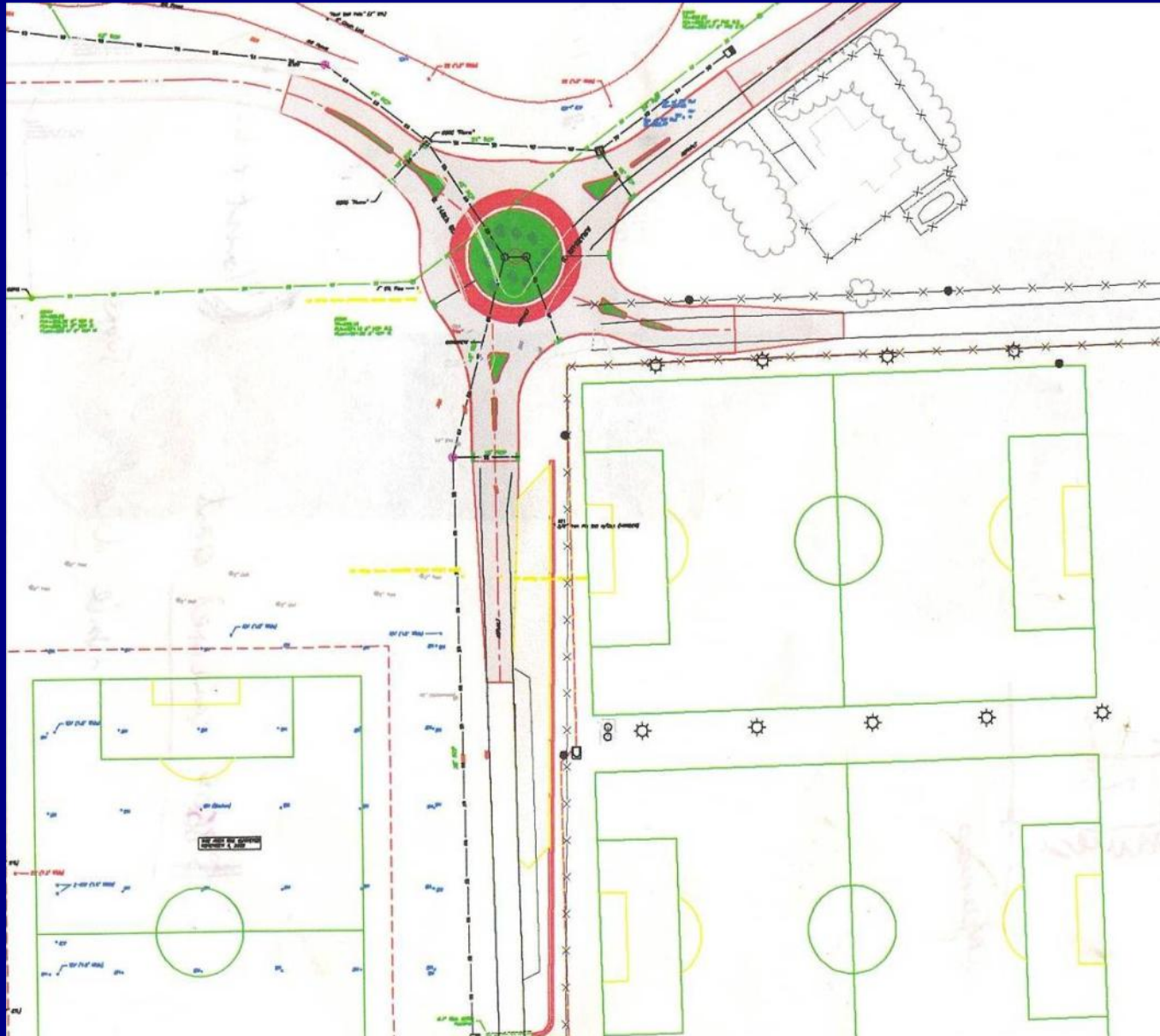
Plants were more mature than the other sites to begin with.

Sapulpa Aquatics Center – August 2010



First big rain after a rough summer.

Bixby Athletic Center Roundabout



Bixby Athletic Center Roundabout

Construction and Planting: Fall 2011 – Spring 2012. Project was delayed...contingent on other funding sources.

All work completed by City...planted by a contractor.

Used remaining grant funds to purchase a majority of the plants,
city purchased the remainder.

Grateful to Wild Things Nursery for taking care of the plants
for an extra...and very hot...summer...and winter.

Bixby – Bentley Park Roundabout – 4/2012





Bixby – Bentley Park Roundabout – 11/2012

Education – Signage

One sign at each rain garden.

Low cost signage from Oklahoma State University Sign Shop
(paid on a different INCOG grant ~\$1000)



Tulsa Area Rain Garden Demonstration Project



What is the problem?

When it rains, water flowing over the landscape picks up pollutants and carries them to local streams. Fertilizers (nutrients), insecticides, and herbicides may wash off of lawns. Oil, grease, and heavy metals may wash off of parking lots, driveways, roads, and roofs (from atmospheric deposition).



Excessive algae growth in a stream impacted by nutrients

What is a Rain Garden?



A rain garden is a planted depression in the landscape that catches and cleans water flowing over yards, business grounds, parking lots, and other urban areas before it reaches local streams.

How do rain gardens clean rain water?

- Water, and any pollutants it carries, enters the rain garden when it rains
- Water is ponded behind the berm (see photo) and allowed to infiltrate into the ground.
- Plant roots and soil microbes take up nutrients and help break down other pollutants.



- Cleaner water flows through the ground to streams or ground water aquifers.
- Rain gardens are designed to drain within a day, shown to actually reduce mosquito populations.

What are the best plants for rain gardens?

Many Oklahoma native plants are ideal for rain gardens because they:

- Tolerate wet periods when it rains and dry periods between storms (supplemental watering not needed).
- Resistant to local pests (no pesticides needed).
- Low nutrient needs (no fertilizer needed).

Some of the Oklahoma native plants used in this project include:



Special Benefits: Native plants attract local wildlife. Butterflies need native plants to reproduce.



Where are rain gardens used?

Rain gardens can pond and clean rainwater running off parking lots, roofs, and lawns in any urban/suburban setting



Reduced flooding – an added benefit

By trapping rainwater, multiple rain gardens throughout a community can reduce peak flows in local streams and rivers. This hydrologic benefit also leads to reduced erosion of streambanks.

Where are Tulsa Area Project Rain Gardens?

- Sapulpa Aquatics Center
- Bentley Athletic Park, Bixby
- Ray Harral Nature Center, Broken Arrow
- Remington Elementary School, Tulsa



*Help out by building a rain garden at your home or business!!
To learn more, contact: 918-801-2150*

Partners

Primary funding for this project was through a grant from the U.S. Environmental Protection Agency.

Essential additional support was provided by the following groups:

- City of Bixby
- City of Sapulpa
- Tulsa Public Schools
- City of Broken Arrow
- City of Tulsa
- Planning Design Group

A special thanks to all the volunteers who helped complete the rain gardens!



Education – Signage

Staff from BT, INCOG, TCCD and BT volunteers
helped put in the signs (October 2011)





Education – Presentations

Presentations on rain gardens and native plants:

Oklahoma GardenFest 2010 Keynote Speaker

Master Gardeners

- Creek County
- Tulsa County
- Washington County

Tulsa Perennial Society

Lendonwood Gardens Earth Day

Fall Garden Festival - Tulsa



Informal presentations on rain gardens:

All volunteers involved in construction/planting,
including school kids

Education – Media: Newspaper

Sapulpa Daily Herald,
10/2010

Very enthusiastic reporter



The Sapulpa Daily Herald Feature Business On Page B2 Oklahoma Conservation Committee Taps Sapulpa For Rain Garden Project

By ERIC BRUCE
HERALD SPORTS EDITOR

SAPULPA - Liberty Park was the site chosen for Sapulpa to build one of the first completed rain gardens, built with grant money from the Environmental Protection Agency (EPA), in the Tulsa area.

The Indian Nations Council of Government, along with the Oklahoma Conservation Commission, tailored a grant received by the EPA to build Rain Gardens in the Tulsa and surrounding areas, as part of an effort to trap run-off rain water and use it in a constructive manner.

A rain garden is a depressed area of the ground planted with vegetation, allowing runoff from impervious surfaces such as parking lots and roofs the opportunity to be collected and infiltrated into the groundwater supply or returned to the atmosphere through evaporation and evapotranspiration, according to the EPA's Web site. Liberty Park in Sapulpa is one of those areas that has a landscape which is not only full of small hills but also depressions where water can stand for long periods of time because it has no where to go.

Brooke Lawrence, the City of Sapulpa's Environmental Administrator, along with Kevin Gustavson of the Oklahoma Conservation Commission, teamed together to bring about the rain garden to Sapulpa.

The grant provided by the EPA was used to buy the plants, edging and the grass used to build the rains

garden.

The City of Sapulpa provided the labor and man-power to make the project happen and Sapulpa's Master Gardeners were on hand to plant and put the garden together.

The city was out no money. The dirt came from a shale pit that was already being mined and Sapulpa received free mulch from the City of Tulsa who is also participating in the rain garden initiative.

Jim Crosby of the Planning Design group, who were the original designers of Liberty Park,



donated his time to help develop the rain garden.

John Waytula of the Parks Department was also instrumental in helping with the project.

The garden itself was planted with all Oklahoma native plants, grasses and flowers.

It is highly visible, located right next to the new Liberty Park water

park, just at the entrance of the park itself, near the parking lot.

The EPA funded the grant but Sapulpa was under no mandate to use the funds or build the rain garden.

Instead, Sapulpa saw it as an opportunity to do the environmentally conscience thing and build the rain garden in an area that certainly needed it.

According to Gustavson, "the area is being treated using a low impact development approach."

According to the EPA, low-impact development is sustainable landscaping approach that can be used to replicate or restore natural watershed functions and/or address targeted watershed goals and objectives.

"The goal is to design a site to be the way that it was before something was built on it. For example, with the rain garden, we are dealing with excessive run-off that doesn't infiltrate the ground or guttering," said Lawrence.

According to the low-impact development Web site, below the surface of the garden, a number of processes are occurring which mimic the hydrologic action of a healthy forest. Soils are engineered and appropriate plants selected for the rain garden. The garden is a small bioretention cell in which stormwater is cleaned and reduced in volume once it enters the rain garden. Nitrogen and phosphorus levels and overall sediment loads in the stormwater are reduced by the action of the plants and growing media on the water. Multiple rain gardens over an area will have a positive cumulative effect on both the volume and quality of stormwater run off.

Plants with deep fibrous roots tend to have a competitive advantage in a rain garden and provide the most cleaning and filtration benefits to the environment. Typical rain gardens are populated with natives or native cultivar because those are most well adapted to a locality, but other ornamental horticultural plants that are non-invasive but able to grow in the garden conditions can also be excellent choices.

They can be used in home which takes away the need for water to run away from the home in guttering and it can also save on a water bill by taking the need for watering away.

One would just use the natural rain water to irrigate instead of sprinkler systems.

In Kansas City, there is a "10,000 rain garden" initiative, as the city raises awareness and tries to promote the building and use of rain gardens.

There are four other rain gardens in the Tulsa area scheduled to be completed with the grant money



MASTER GARDENERS AT WORK: Kevin Gustavson, above, of the Oklahoma Conservation Commission, puts mulch in the new rain garden at Liberty Park. The garden was planted by the Sapulpa Master Gardeners and the City of Sapulpa Employees, below, all of who volunteered their time.

ERIC BRUCE/PHOTOS



PLANTING THE GRASS: Brook Lawrence and Sredrick Samules of the City of Sapulpa plant grass and plants in the rain garden located at Liberty Park.

Education – Media: TV

Oklahoma Gardening (PBS)

- 13 minute segment on rain gardens

NBC Channel 2 News

- News segment on Remington construction

CBS Channel 6 News

- News segment on Nature Center construction

PBS Oklahoma News Report

- News segment on Sapulpa construction



Education – Media: TV

NBC Channel 6 News

– News segment on Nature Center construction



Education – Media: Web

ABC Channel 8 Web video on Remington Rain Garden Construction

Facebook: “Tulsa Blue Thumb”

- Photos from construction to present at each rain garden
- Powerpoint presentation on “Rain Gardens and Why We Need Them”
- Video clips from TV and web broadcasts about rain gardens



Maintenance

Replant

Weed

Repair



Remington Elementary Maintenance





Tulsa MET School Fall 2012





Questions?

