



STORM WATER ...

WHO CARES?!??



Why do

I

need to care about storm water?



First, a little **background**
information ...

Connectivity

YOUR STREET CONNECTS TO LAKES & RIVERS

Storm sewers connect
our streets and yards with
lakes and rivers.

What goes down the drain
can pollute our water!

- CLEAN UP!**
- Sweep up grass clippings and spilled fertilizer
 - Take leaves out of street
 - Pick up after pets
 - Use only phosphate-free fertilizer

- DON'T DUMP!**
- Don't dump these things down storm sewers:
- Paint and oil
 - Motor oil and antifreeze
 - Dry wash water
 - Car wash

LAKE



Water leaving Worthington drains to **four different lakes**





Lake Okabena, Lake Ocheda,
and Lake Bella are in the

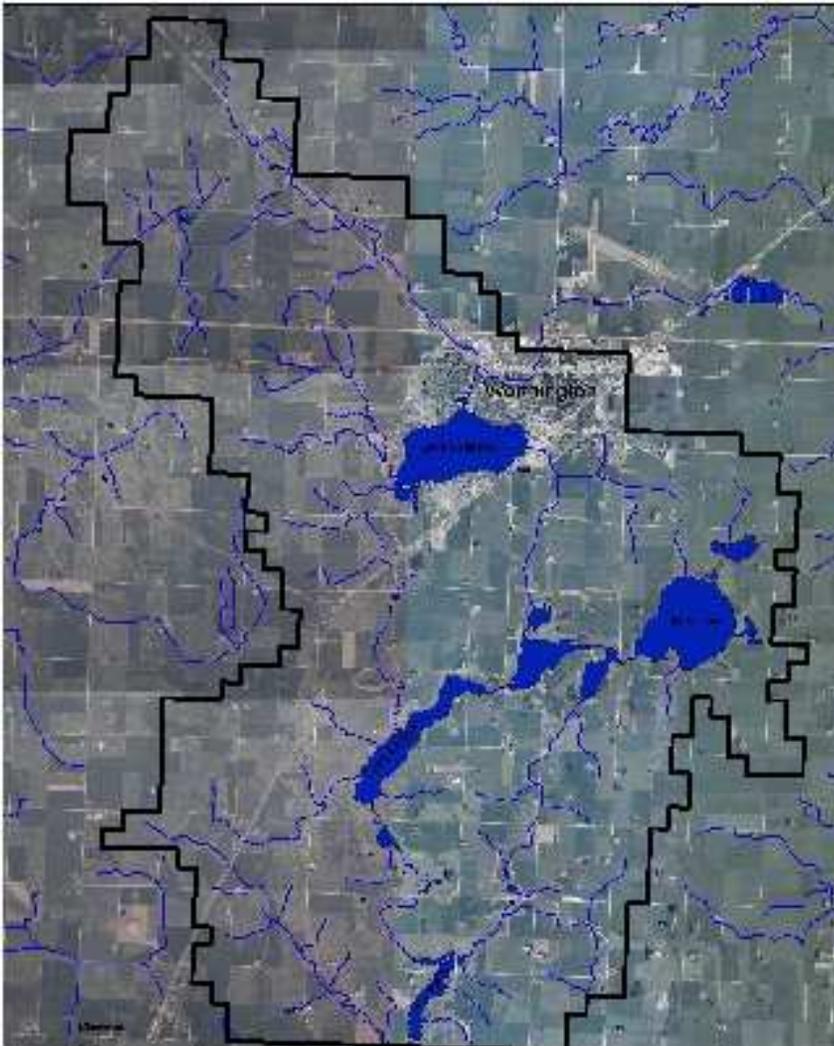
**Okabena-Ocheda
Watershed District.**

Heron Lake is in the

Heron Lake Watershed District.

A decorative horizontal banner at the top of the slide features a collage of nature-related images: a white star-shaped flower, a green frog, a brown bird, and a blue sky with white clouds. Below the banner is a vertical orange bar on the left and a light gray gradient background for the text.

Watersheds are areas of land where all of the water runs to the lowest spot, which is usually the lake.



Okabena – Ocheda Watershed

Okabena-Ocheda watershed = 71 square miles

71 square miles = 45,440 acres

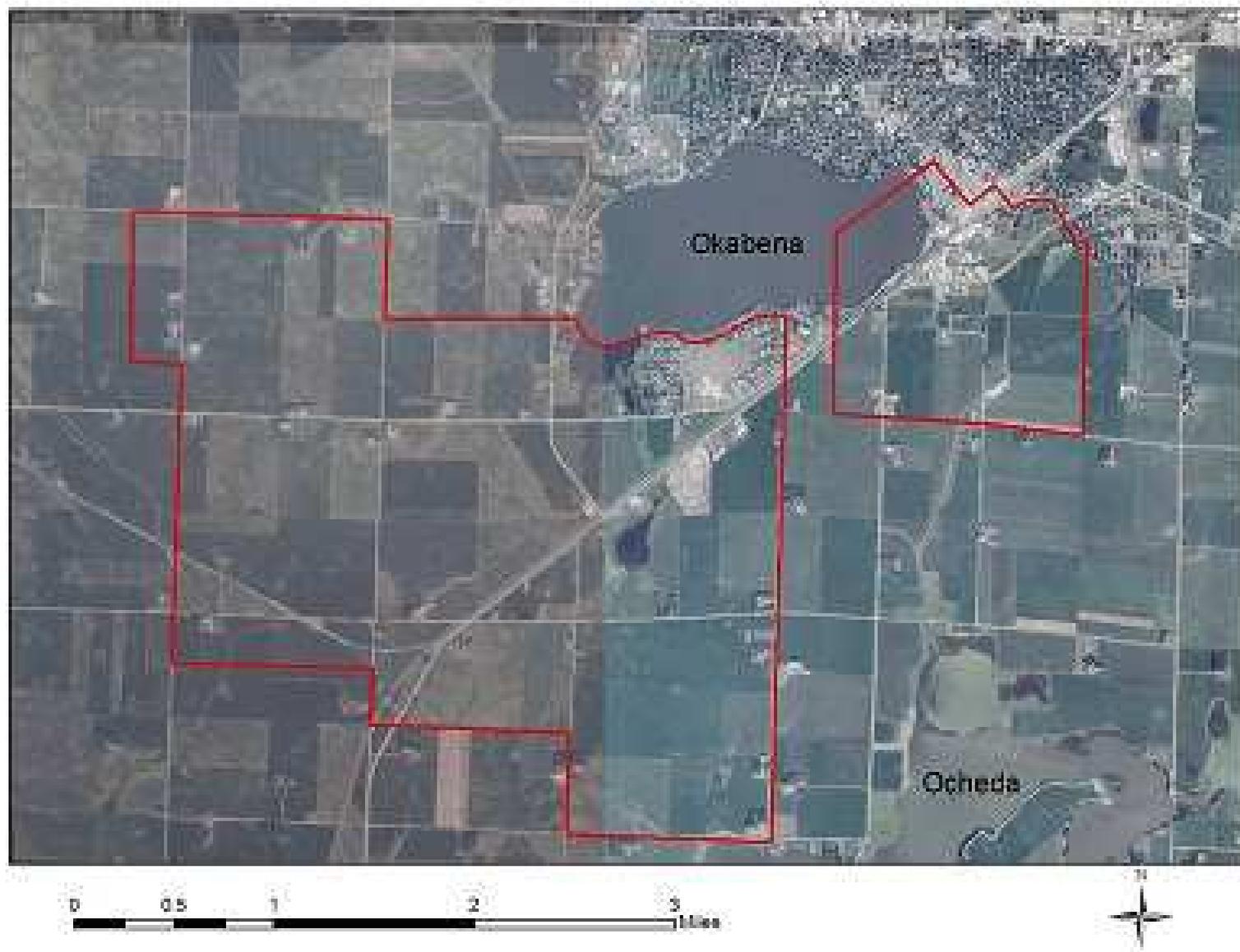
All of the water eventually drains to Lake Bella, 180 acres in size.

Lake Bella is the basin for an area over **252** times its size

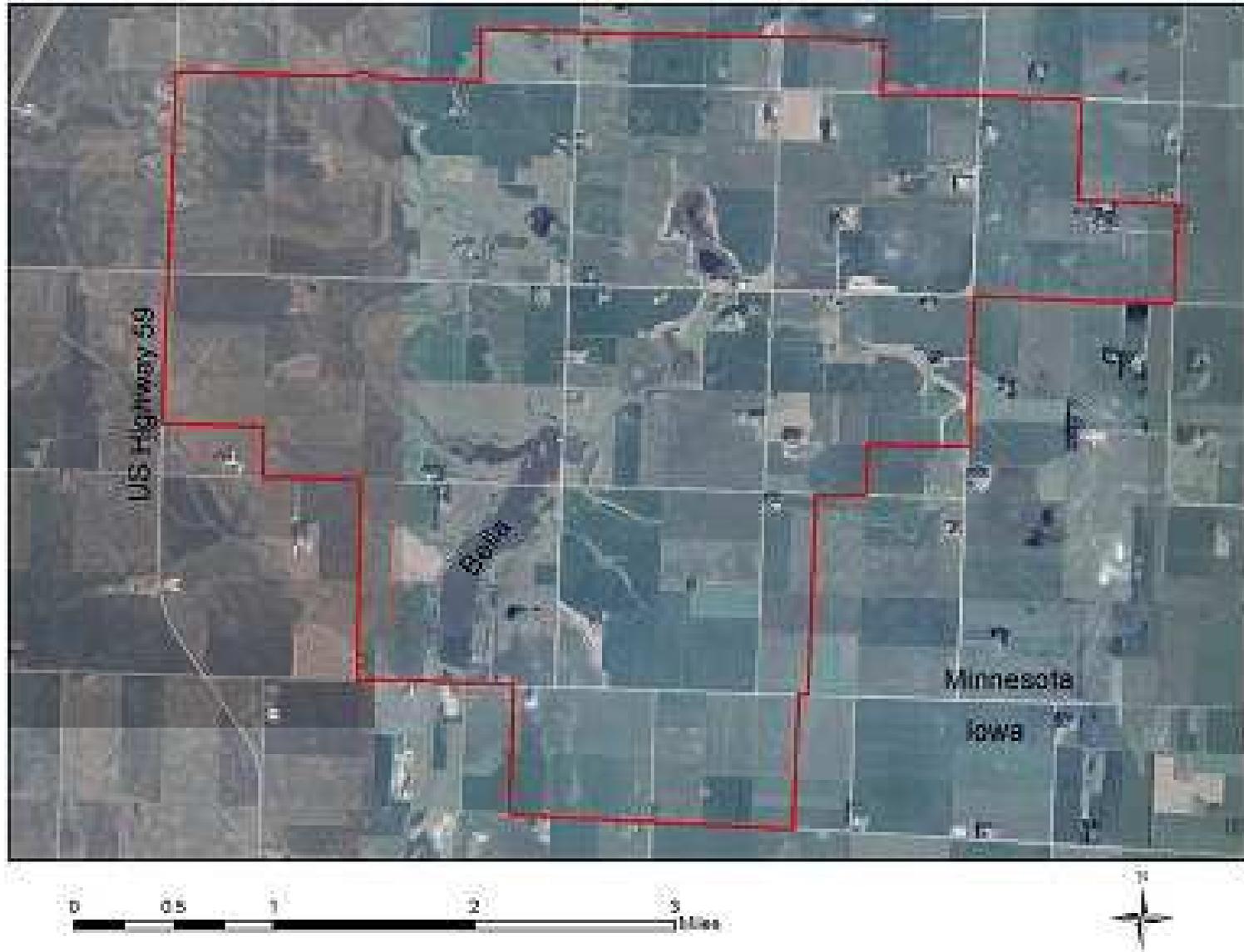


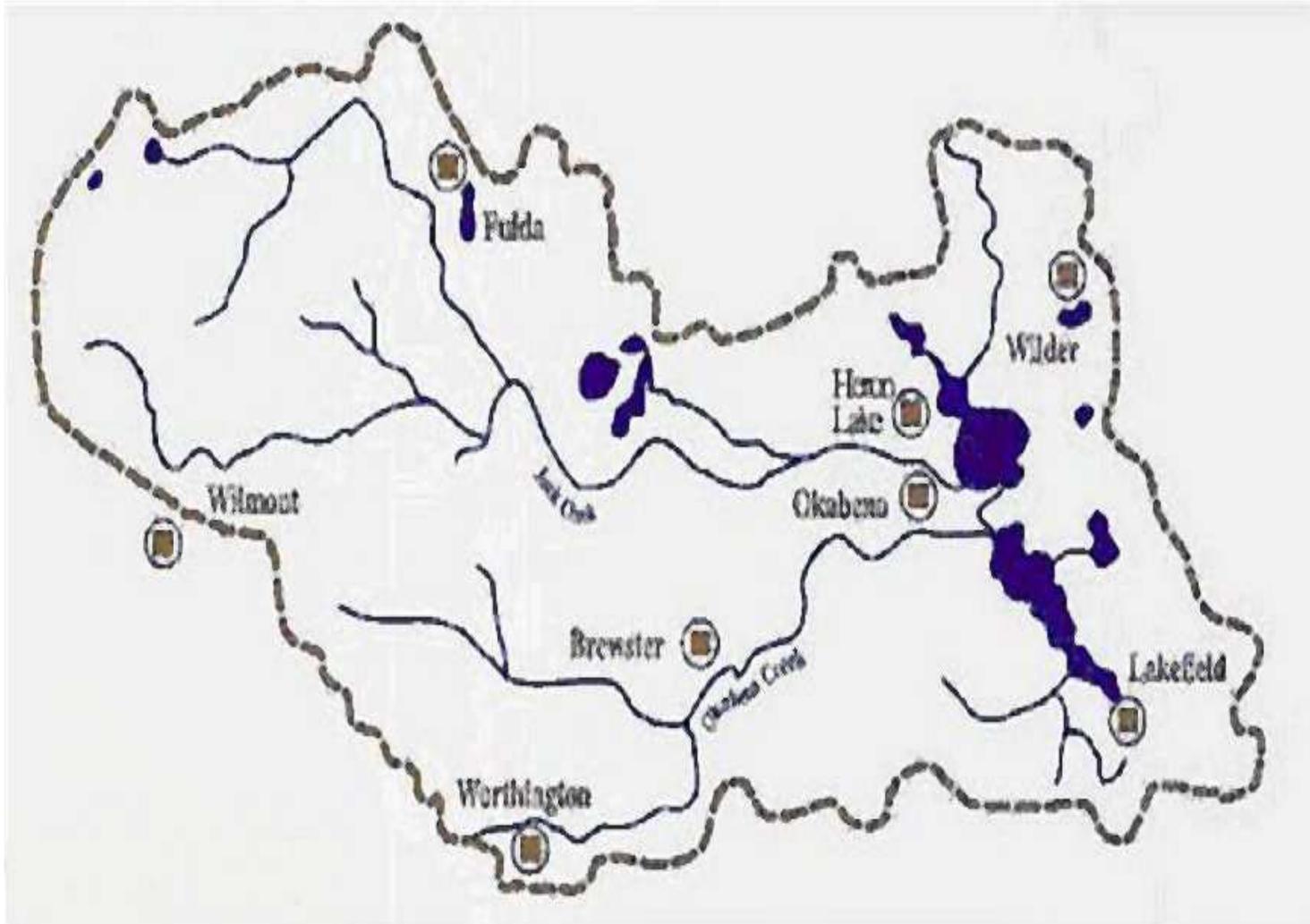
Urban runoff in the Okabena-Ocheda Watershed District can influence the water quality of the well recharge areas for **Worthington's drinking water.**

Malcolm and Worthington South Wellhead Protection Areas



Lake Bella Wellhead Protection Area





Heron Lake Watershed

Heron Lake watershed = 472 square miles

472 square miles = 302,080 acres

Heron Lake = 2,845 acres

Heron Lake is the basin for an area over **100** times its size



Heron Lake is on the **EPA Impaired Waters list** for having excess nutrients, which means there's **too much phosphorus** in the lake. This is a direct result of runoff throughout the watershed.

A decorative header strip at the top of the slide features three distinct nature scenes: a white flower on the left, a bird in flight in the center, and a blue sky with clouds on the right. The background of the slide is a light beige gradient with a vertical textured strip on the left side.

According to the Clean Water Act, efforts must be undertaken to **remove the lake** from the list and this is done, in part, through **proper storm water management.**



SO WHAT?

What does all of this
have to do with me?

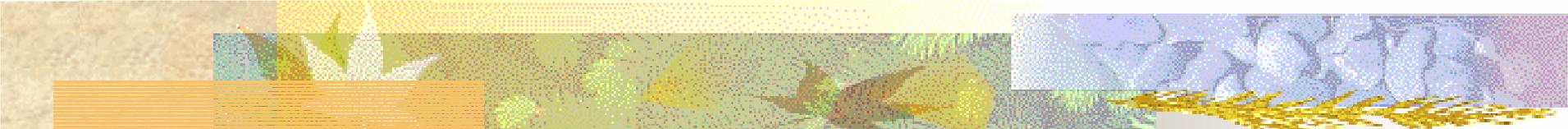
A decorative header banner featuring a collage of images: a white starburst, a green landscape, a brown animal, and blue clouds. Below the banner is a vertical orange bar on the left and a light gray gradient background for the text.

Urban storm water contributes to flooding outside of Worthington.

When the water leaves Worthington, it can have a negative effect on the streams and lakes you care about.

A decorative header strip at the top of the slide. It features a collage of nature-related images: a white flower on the left, a bird in flight in the center, and a blue sky with clouds on the right. The background of the header is a textured, light brown color.

Every home has storm
water runoff, which means
everyone has an impact
on our lakes and streams.



Town or country,
Urban or rural -
Doesn't matter!

We're all involved!

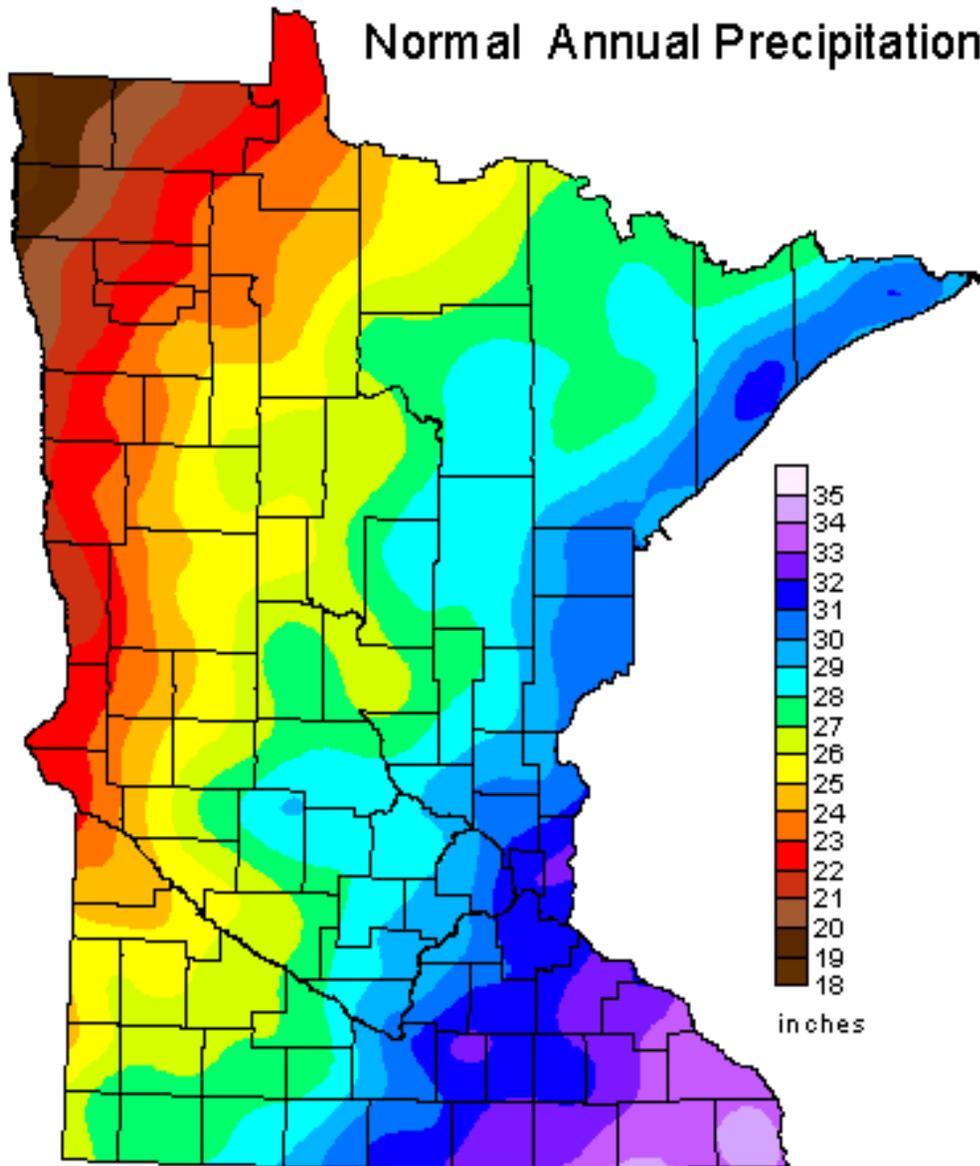
A decorative header strip featuring a collage of nature scenes: a white flower, a green landscape, a brown animal, and blue rocks.

All of us should try to **hold water back when we can**, or at least slow down what runs off our yards.



FOOD FOR THOUGHT ...

Normal Annual Precipitation



Worthington
averages
28 inches
of rain
each year.

**Imagine
that this
is your
house.**

+ "Green Concrete" Compacted Lawn

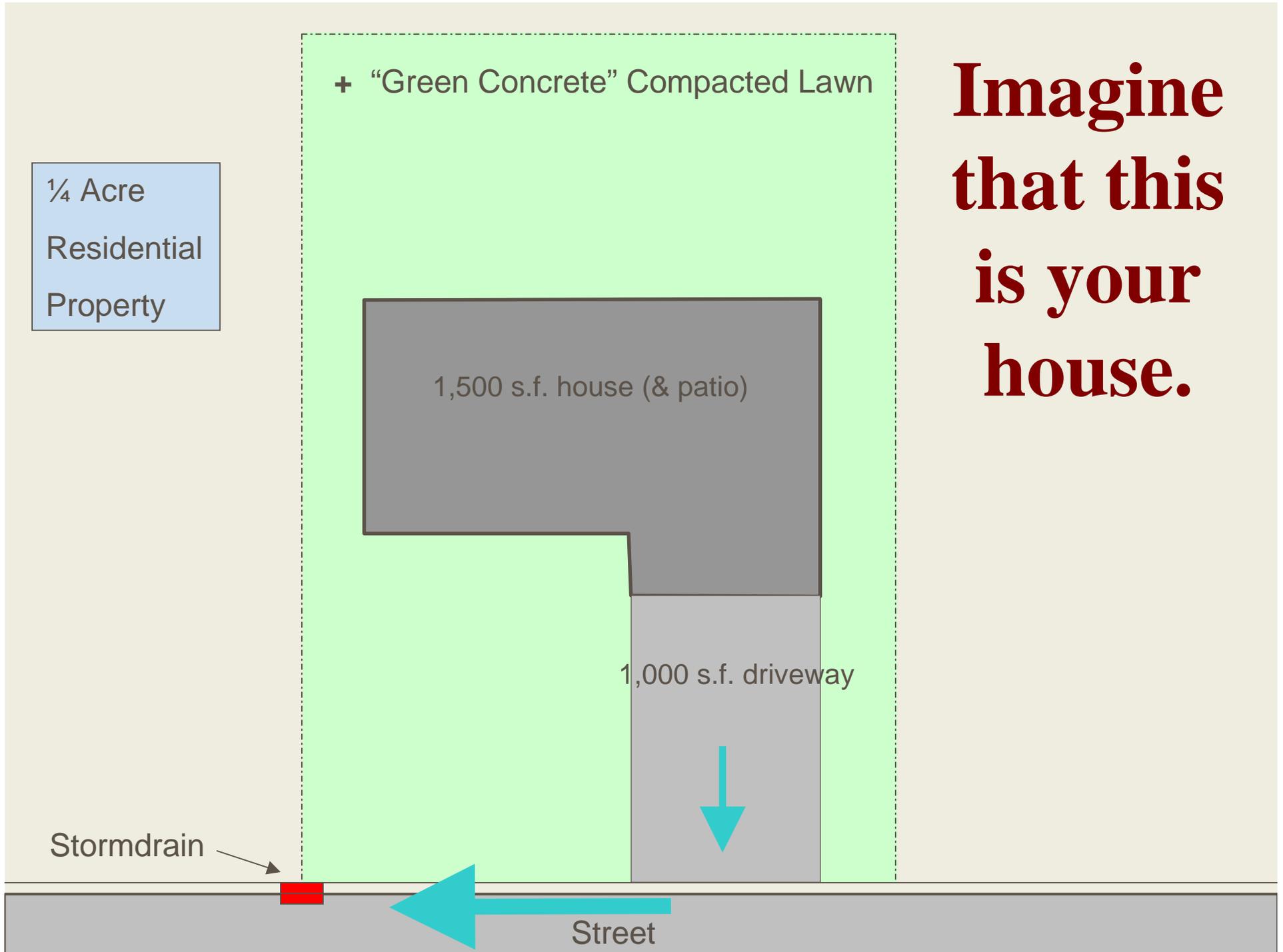
1/4 Acre
Residential
Property

1,500 s.f. house (& patio)

1,000 s.f. driveway

Stormdrain

Street



¼ Acre
Residential
Property

+ “Green Concrete” Compacted Lawn
8,390 s.f. “impervious” x 1” rain
(if infiltrates first ¼” of rain)
= 3,880 gallons of runoff

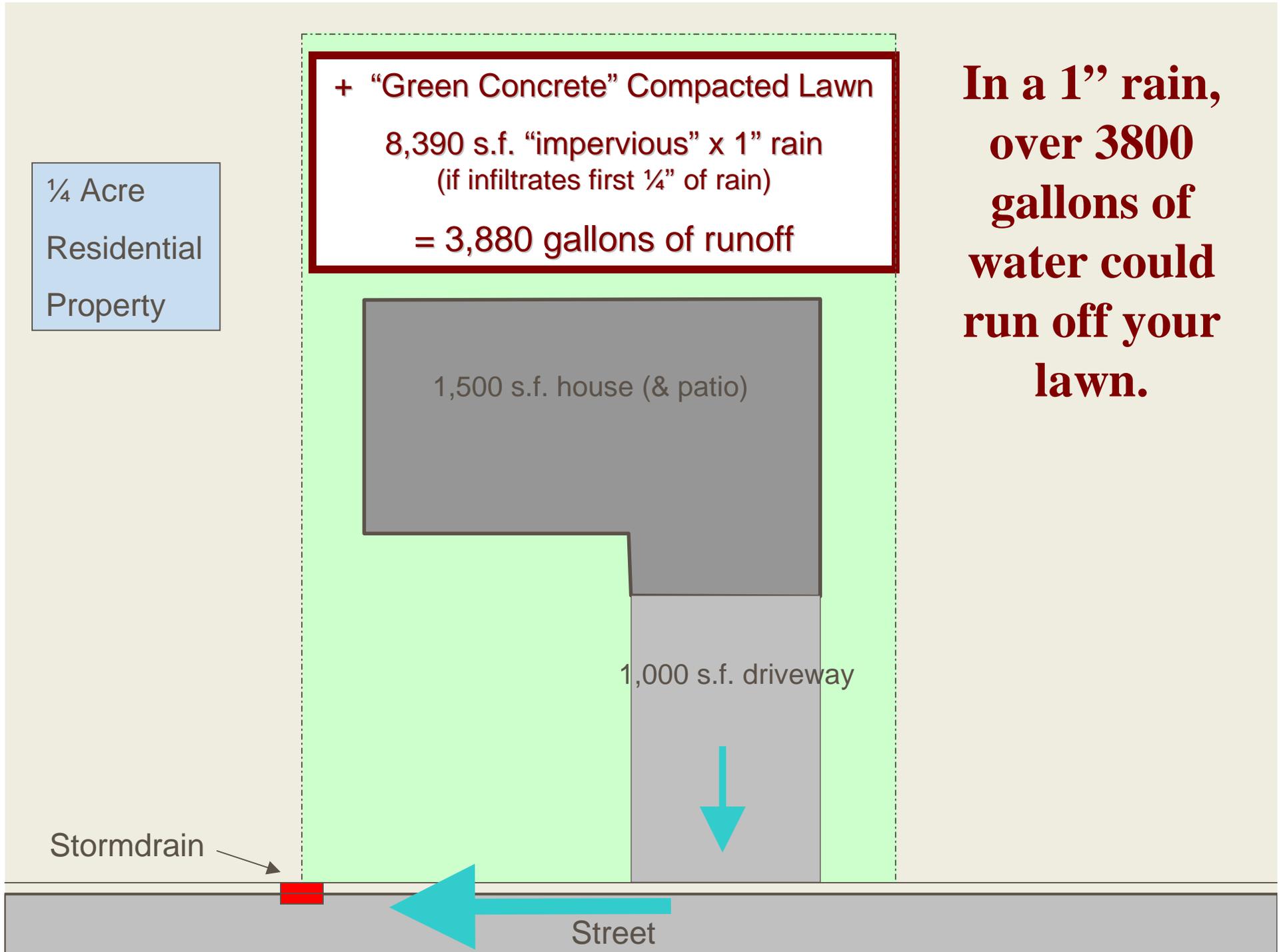
1,500 s.f. house (& patio)

1,000 s.f. driveway

Stormdrain

Street

**In a 1” rain,
over 3800
gallons of
water could
run off your
lawn.**



¼ Acre
Residential
Property

+ “Green Concrete” Compacted Lawn
8,390 s.f. “impervious” x 1” rain
(if infiltrates first ¼” of rain)
= 3,880 gallons of runoff

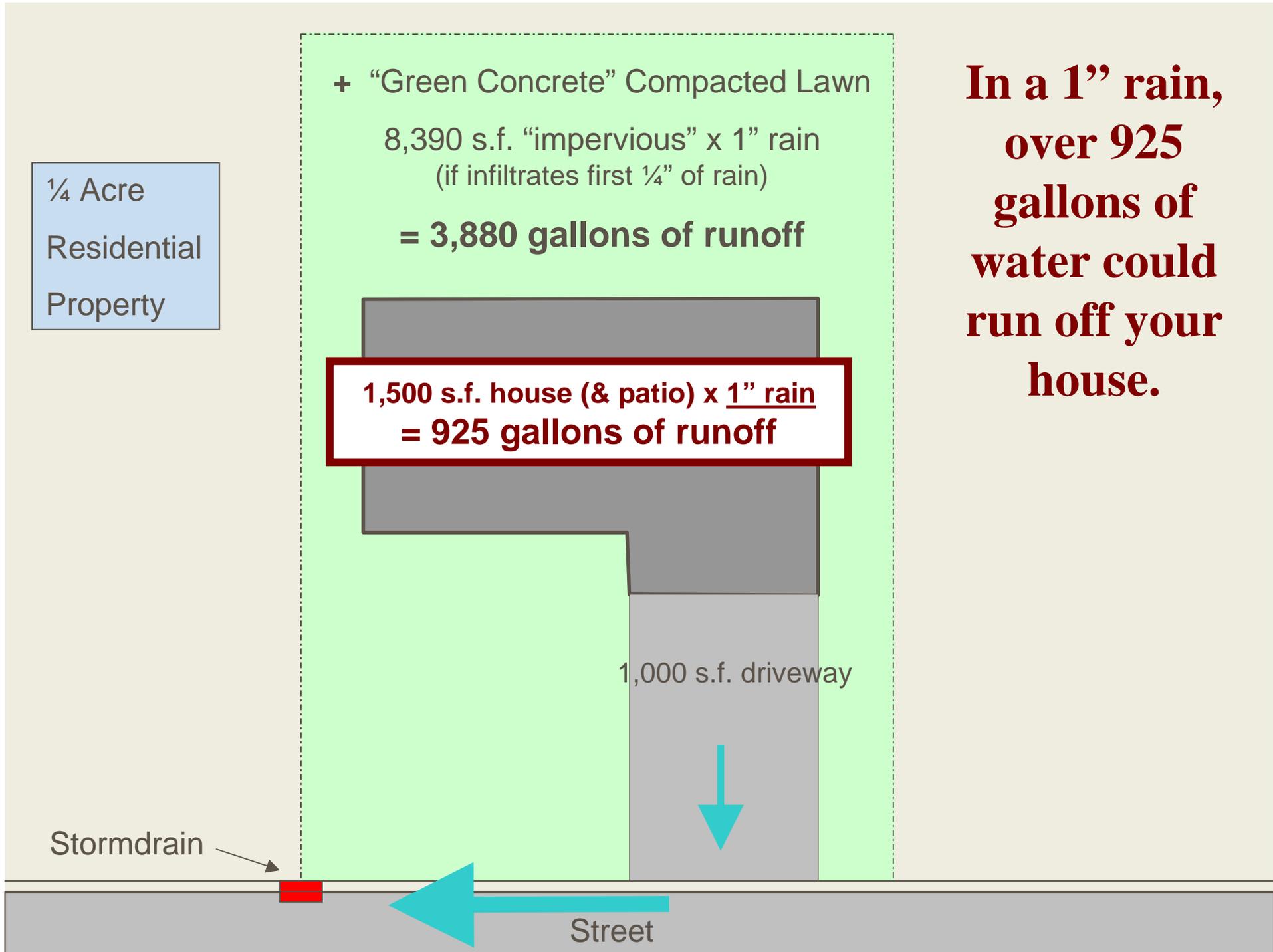
**1,500 s.f. house (& patio) x 1” rain
= 925 gallons of runoff**

1,000 s.f. driveway

Stormdrain

Street

**In a 1” rain,
over 925
gallons of
water could
run off your
house.**



¼ Acre
Residential
Property

+ “Green Concrete” Compacted Lawn
8,390 s.f. “impervious” x 1” rain
(if infiltrates first ¼” of rain)
= 3,880 gallons of runoff

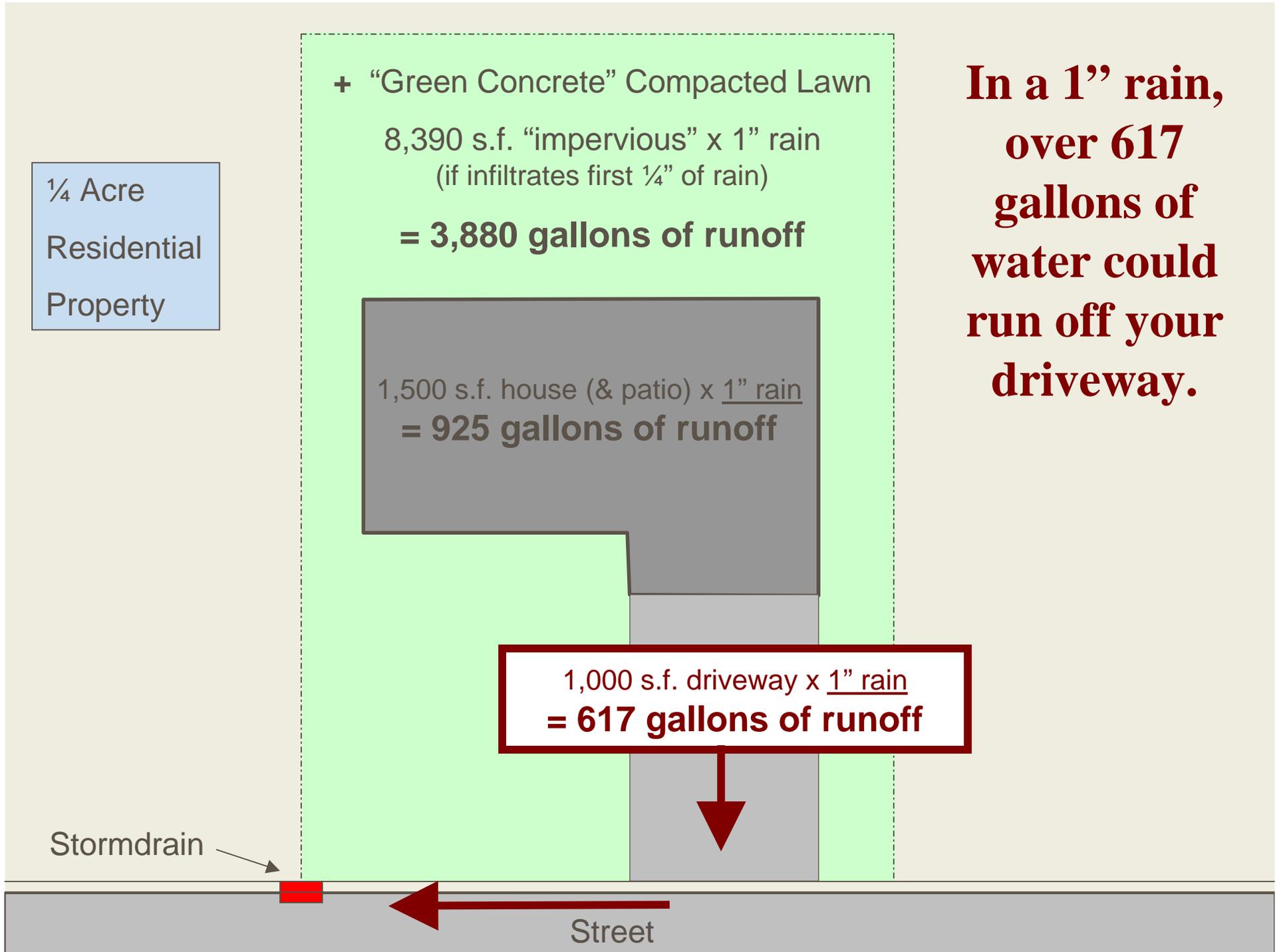
1,500 s.f. house (& patio) x 1” rain
= 925 gallons of runoff

1,000 s.f. driveway x 1” rain
= 617 gallons of runoff

**In a 1” rain,
over 617
gallons of
water could
run off your
driveway.**

Stormdrain

Street



¼ Acre
Residential
Property

+ "Green Concrete" Compacted Lawn
8,390 s.f. "impervious" x 1" rain
(if infiltrates first ¼" of rain)
= 3,880 gallons of runoff

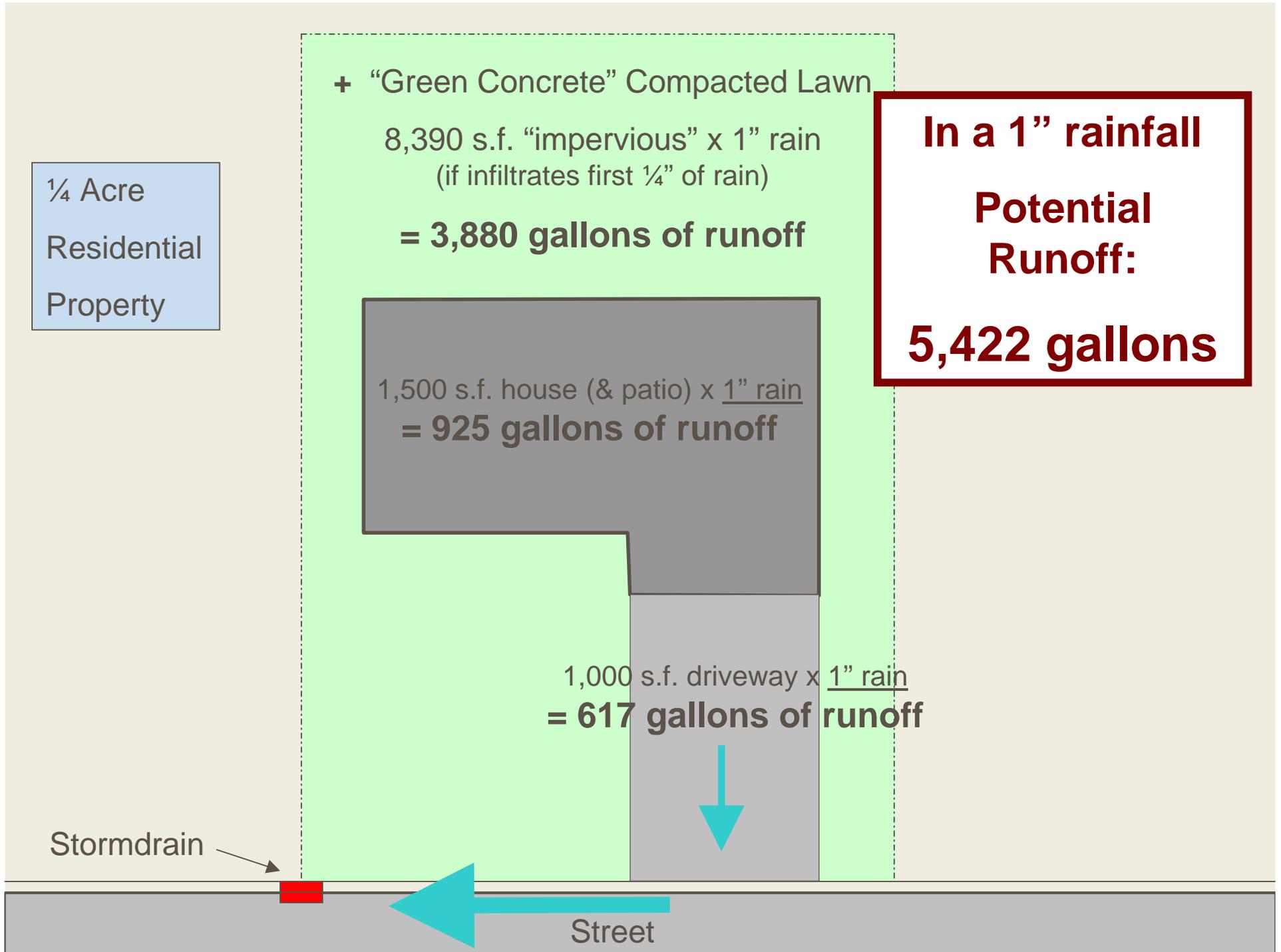
1,500 s.f. house (& patio) x 1" rain
= 925 gallons of runoff

1,000 s.f. driveway x 1" rain
= 617 gallons of runoff

**In a 1" rainfall
Potential
Runoff:
5,422 gallons**

Stormdrain

Street



¼ Acre
Residential
Property

+ "Green Concrete" Compacted Lawn

8,390 s.f. "impervious" x 1" rain
(if infiltrates first ¼" of rain)

= 3,880 gallons of runoff

1,500 s.f. house (& patio) x 1" rain
= 925 gallons of runoff

1,000 s.f. driveway x 1" rain
= 617 gallons of runoff

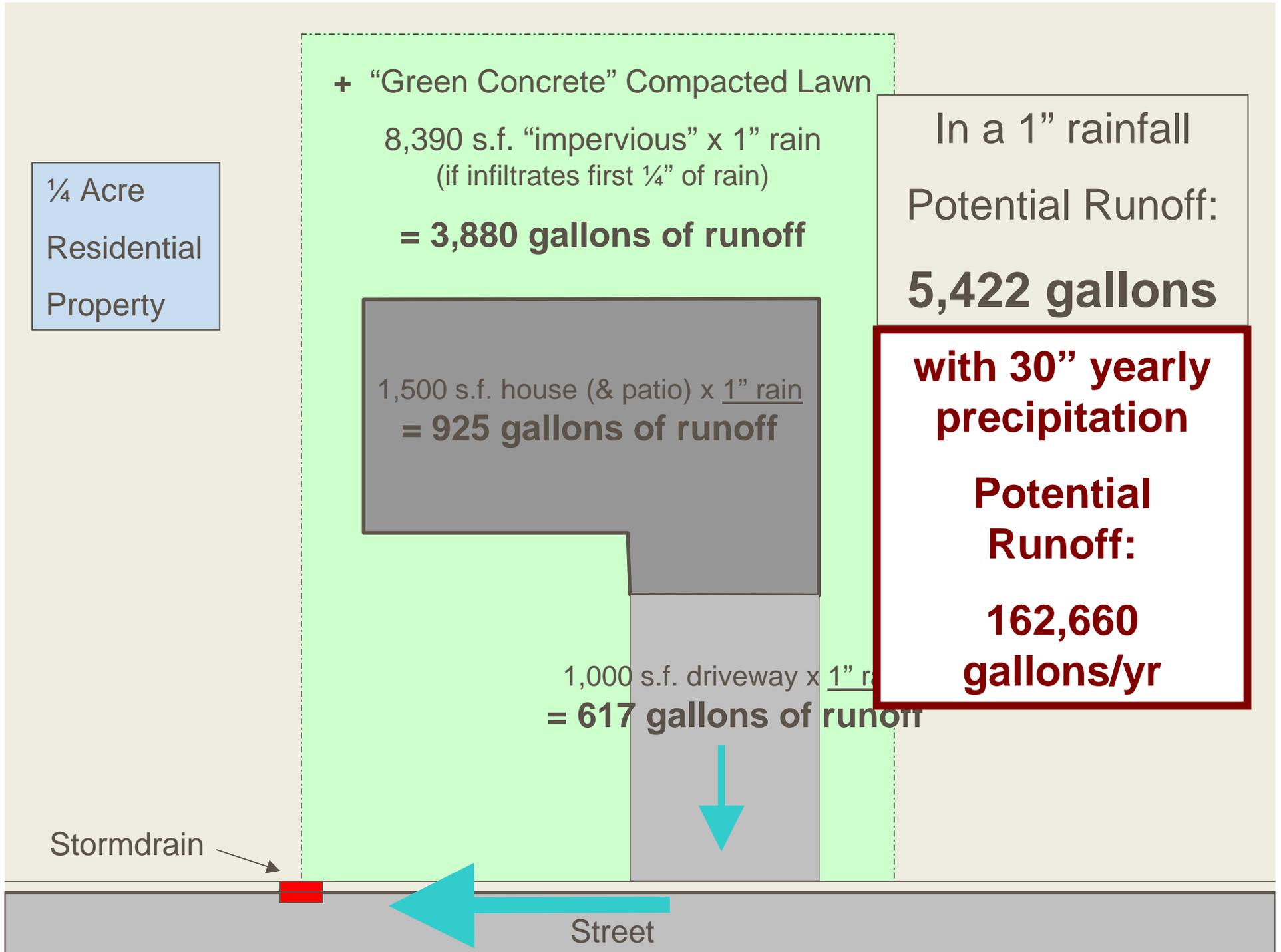
In a 1" rainfall
Potential Runoff:
5,422 gallons

**with 30" yearly
precipitation**

**Potential
Runoff:
162,660
gallons/yr**

Stormdrain

Street



+ "Green Concrete" Compacted Lawn

8,390 s.f. "impervious" x 1" rain
(if infiltrates first ¼" of rain)

In a 1" rainfall
Potential Runoff:

¼ Acre

Residential
Property

1 gal water = 8.3 lbs
162,660 gals = 1,350,078 lbs or 675 tons
1 semi holds 26 tons

gallons

**This translates to
26 semi-loads of water
running off of your house each year**

0" yearly
precipitation

al Runoff:

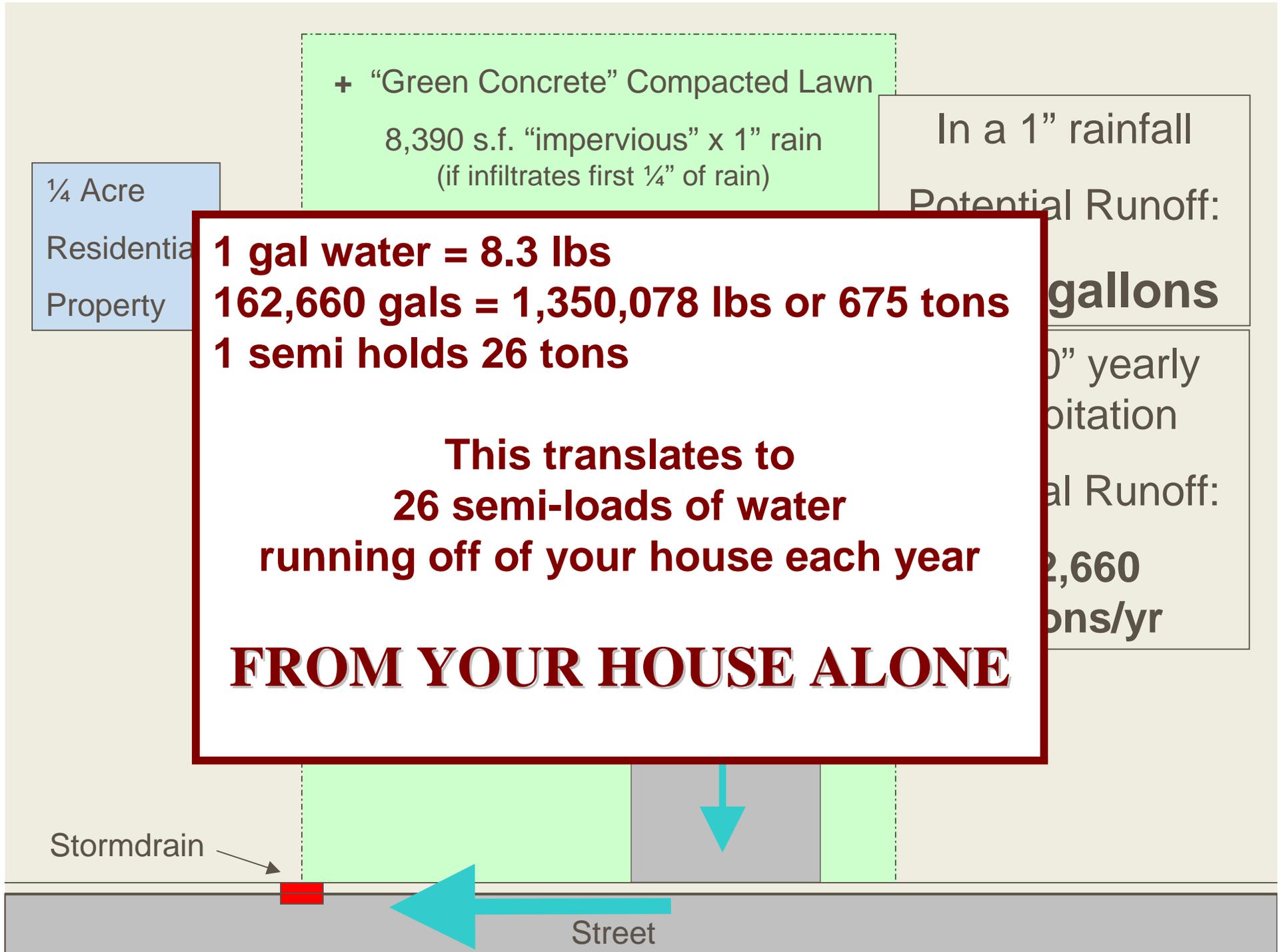
2,660

ons/yr

FROM YOUR HOUSE ALONE

Stormdrain

Street

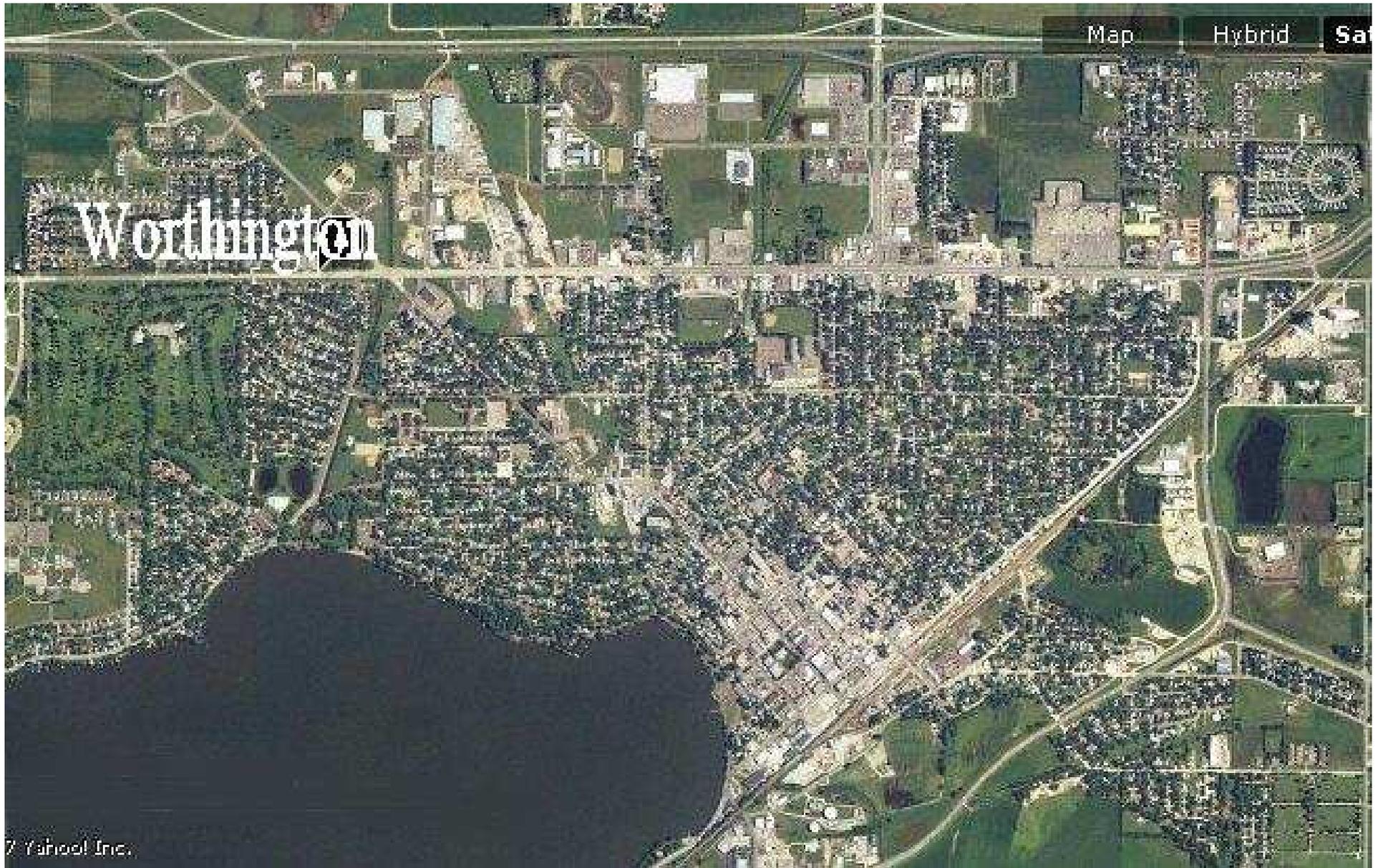




Our streets and driveways act as **runways** for the rain

Anything that's not green = impervious surface (runways)

Where can the rain soak in or be slowed down?



- 
- The heavy, fast rain events are the worst.
 - We need to **plan ahead** for those events.
 - What happens if we don't?



We have problems with **flooding**
in town as well as in the country ...







2007/05/29





Okabena Creek - normal flow



Okabena Creek - flooded



Across the road



The road in
between
gets washed
away ...



... and all
the new
gravel ends
up in the
ditch.



Everything that's picked up by the flood waters **gets carried downstream** and is going to end up in our lakes.



Flooding causes
urban and rural
erosion problems ...



Worthington, MN



Worthington Boat Landing



Elk Creek



What gets washed away here ...



ends up
here ...



and here. Who pays to clean it all out again?



The dirt (sediment) carries
phosphorus,
which is also found in fertilizers
and on grass clippings.



What does a little over-fertilizing matter?



What do a few clippings in the curb matter?

They get washed into the storm drains and into our lakes ...





One pound of phosphorus =
500 pounds of algae

MPCA



**How about oil spills?
What does a little oil matter?**



One quart of motor oil can contaminate 250,000 gallons of water

We're dumping a lot of stuff in our lakes.

Increased amounts of runoff with sediment, nutrients and pollutants can disrupt natural processes

We're over-fertilizing our lakes and we're wasting our money.





Remember what
it's all about ...

Connectivity

YOUR STREET CONNECTS TO LAKES & RIVERS

Storm sewers connect
our streets and yards with
lakes and rivers.

What goes down the drain
can pollute our water!

- CLEAN UP!**
- Sweep up grass clippings and spilled fertilizer
 - Take leaves out of street
 - Pick up after pets
 - Use only phosphate-free fertilizer

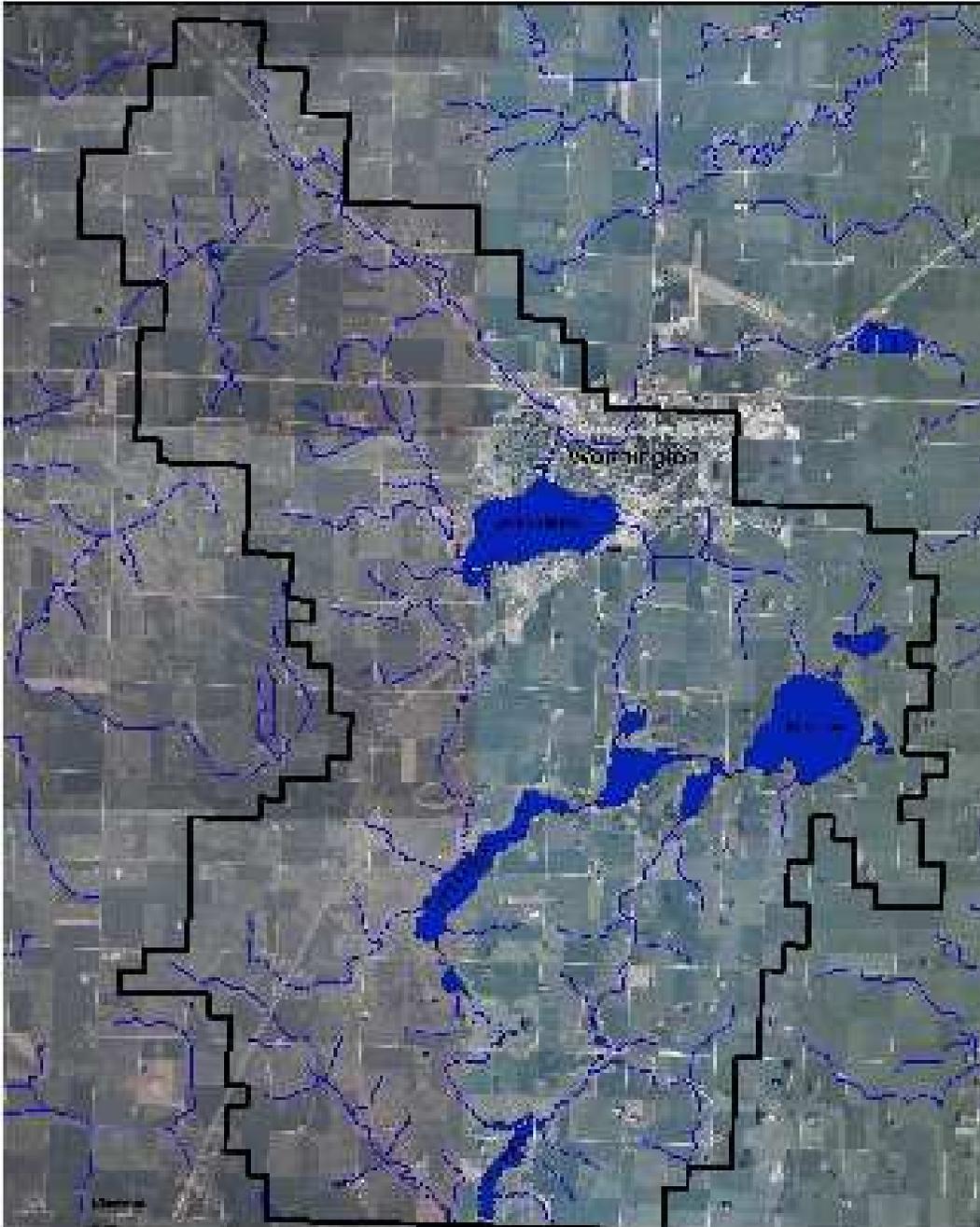
- DON'T DUMP!**
- Don't dump from your down storm sewers
 - Paint and oil
 - Motor oil and antifreeze
 - Dry wash water
 - Tire wash

LAKE



Water leaving Worthington drains to **four different lakes**

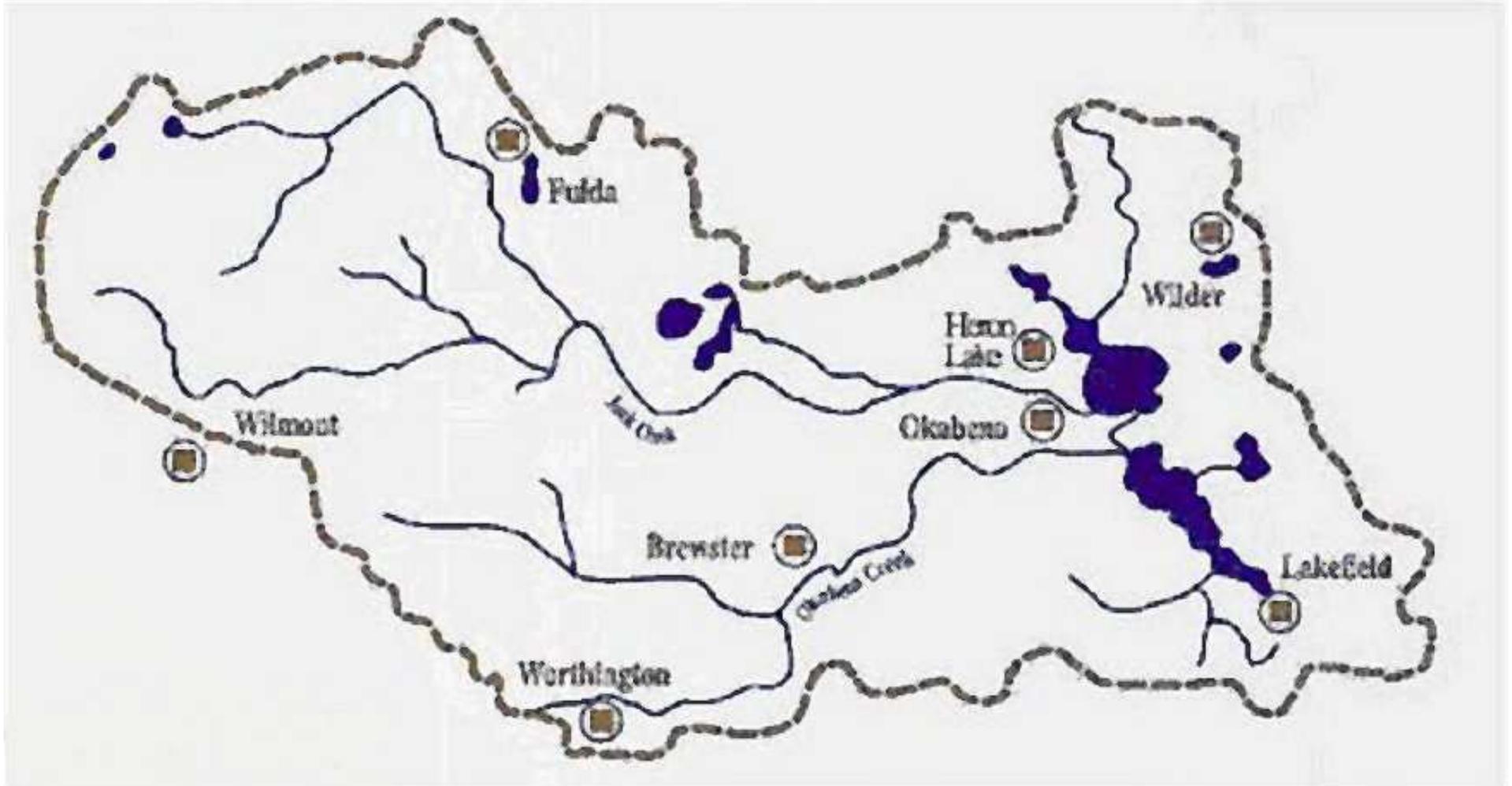




Connectivity

Lake Bella is the basin for an area over **252** times its size

Connectivity



Heron Lake is the catch basin for an area over **100** times its size



What can we do????



Stop the problem

before

it becomes a problem



Consider the effect of
every household doing
SOMETHING to slow
down the water running
off of their property.

A decorative horizontal banner at the top of the slide. It is divided into three sections: a green field with a white flower on the left, a brown field with a bird in the middle, and a blue sky with white clouds on the right. Below the banner is a vertical strip of textured brown paper on the left side of the slide.

You know the **3 Rs of Recycling -**

Reduce

Reuse

Recycle



It's the same for water

Reduce when you can,
Reuse when you can, and
Recycle when you can.



Here's some ideas ...

**Raise the height on your lawn mower to 3 inches –
the grass acts as a filter for debris and sediment**



U of M Mowing Height Study
photo by: Mary Meyer



Use rain barrels (or 5 gallon buckets!)
for water conservation and recycling to water your plants

Rain Gardens

(Capturing rain water and storm water)



Just like a regular landscape planting,
but designed primarily to absorb rain water

Concept - Gregg Thompson, Illustration - Taina Litwak, Animation - Ron Struss



Rain garden at the Heron Lake Gun Club



Good use of slope to run water into the garden, which is then elevated on the other side to hold the water.

Heron Lake residence





These gardens will stop
some of the debris from
going into the lake.



Speed Bump
(Flow Diverter)

To rain garden

Terraced gardens in Lakefield





Plantings and a lake log
to control erosion on a
steep hillside in Fulda,

combined with porous
pavers and natural
vegetation left along
the lake will filter runoff
from large rain events.





A grate on a boat ramp will prevent debris
from entering Fulda Lake



Keep the leaves out of the street, and run your sump pump away from your house but through your lawn, rather than directly into the street.

A decorative horizontal banner at the top of the slide. It is divided into three sections: the left section shows a white flower, the middle section shows a green landscape with a tree, and the right section shows blue clouds. Below the banner is a thin orange horizontal line.

Reduce, reuse, and recycle

storm water whenever possible.

We can't stop it all, but we can do what we can. All of us together can make a difference and keep our lakes clean and enjoyable.

Let's start NOW!



**IF YOU HAVE GENERAL QUESTIONS
OR TO REPORT A STORM WATER PROBLEM,
PLEASE CONTACT ONE OF THE FOLLOWING PEOPLE:**

**Dwayne Haffield, City Engineer
City of Worthington
507-372-8640**

d.haffield@ci.worthington.mn.us

**Dan Livdahl, District Administrator
Okabena-Ocheda Watershed District
507-372-8228**

dan.livdahl@okabenaokedawd.org

**Jan Voit, District Administrator
Heron Lake Watershed District
507-793-2462**

hlwd@roundlk.net