

## Learning Objectives:

- I can identify and form an opinion on current fracking issues.

## Bellringer Pre-Assessment:

- What is an aquifer?
- How can our waste or pollution affect our drinking water?

## Check for Understanding Questions:

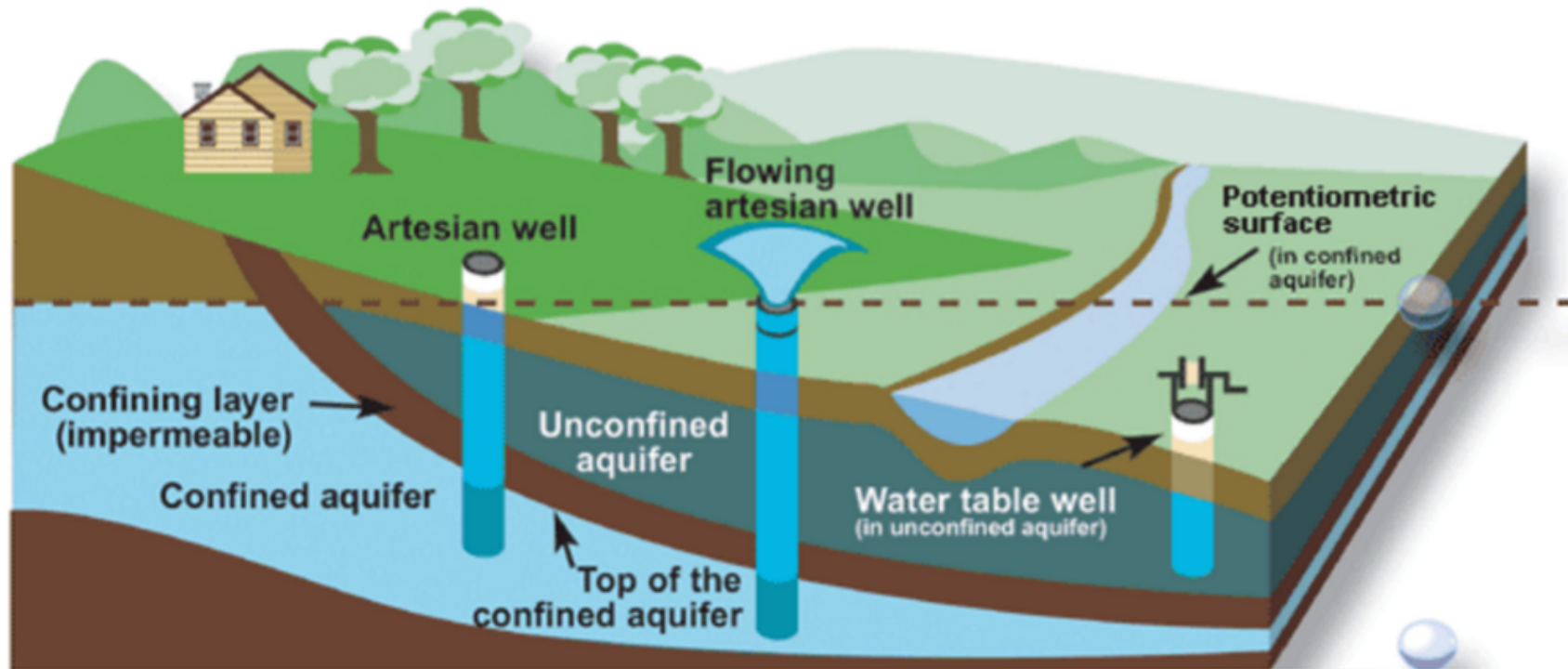
- Why is groundwater so important?
- What are some of the pros and cons to fracking?  
Name at least one for each.

**Aquifer:** is from the Latin aqua (meaning "water") and ferre (meaning "to bear")

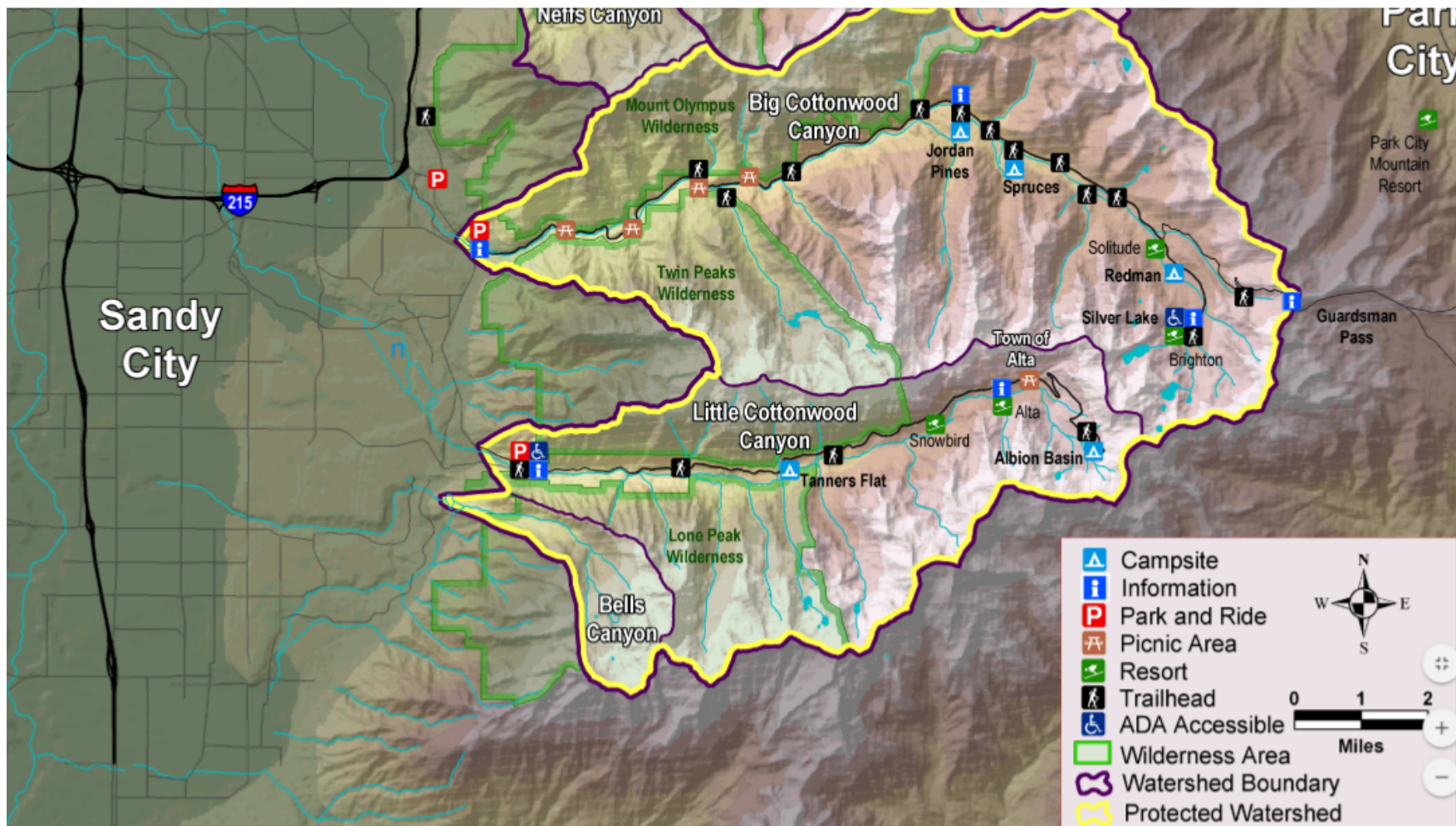
Sediment or rock that contains or transmits water easily.

An aquifer literally bears water. Some aquifers are massive, such as the Ogallala Aquifer in the United States that stretches across parts of eight states from South Dakota to Texas. But not massive enough — we're draining them faster than the water can be replenished.

# Aquifers and wells

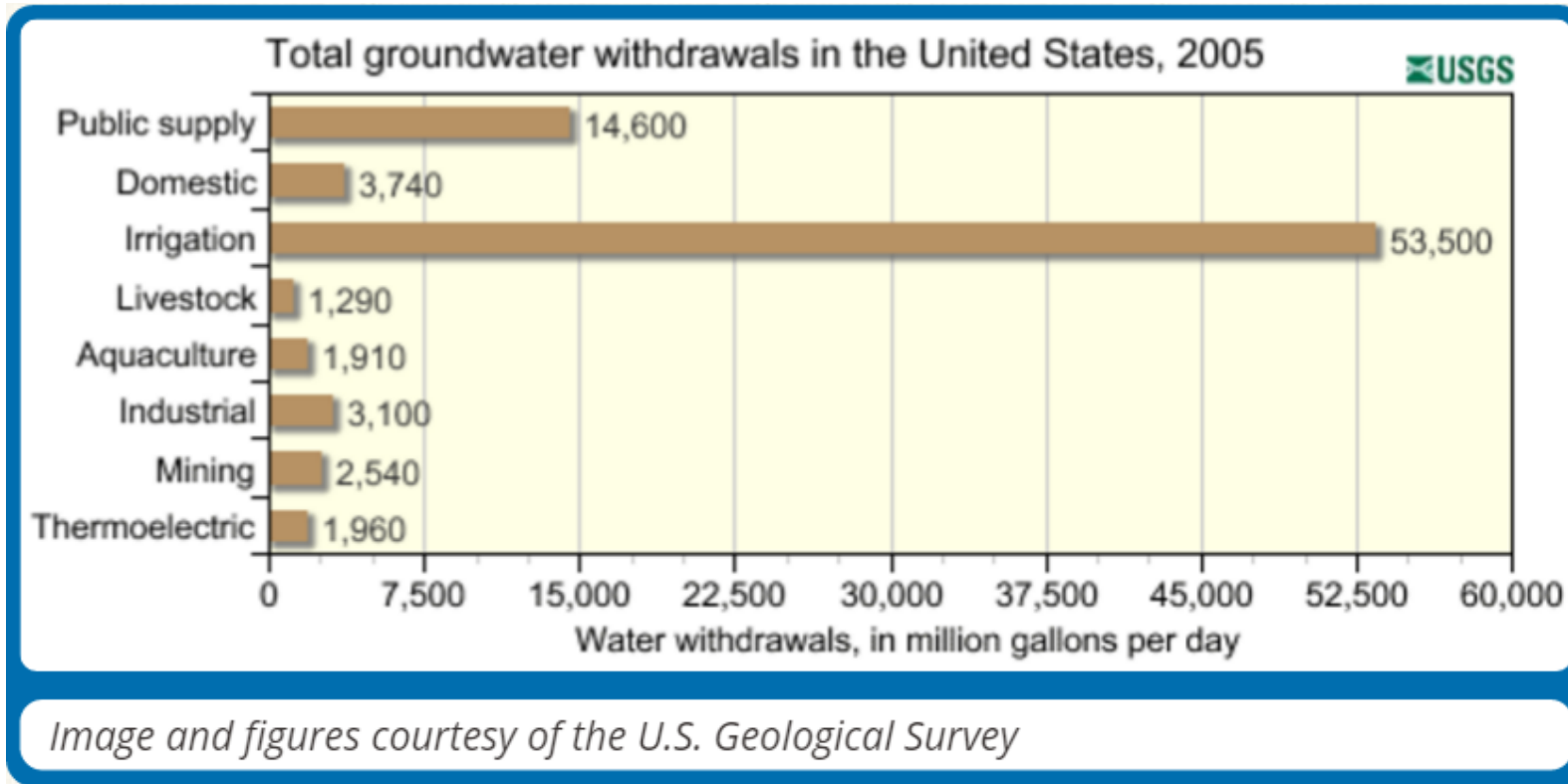


Source: Environment Canada, USGS



## **How much do we depend on groundwater?**

- Groundwater supplies drinking water for 51% of the total U.S. population and 99% of the rural population.
- Groundwater helps grow our food. 64% of groundwater is used for irrigation to grow crops.
- Groundwater is an important component in many industrial processes.
- Groundwater is a source of recharge for lakes, rivers, and wetlands.



## Groundwater Facts:

- > About 27 trillion gallons of groundwater are withdrawn for use in the U.S. each year.
- > A gallon of water weighs about 8 pounds.
- > The High Plains Aquifer covers eight states and 175,000 miles.
- > 26% of household water use is for flushing the toilet.
- > About 25% of all rainfall in the U.S. becomes groundwater.
- > Water is the only substance on Earth found naturally in three forms - solid, liquid, and gas.



# What the frack is Fracking?

In 2000, shale beds provided just 1 percent of America's natural gas supply. Today, that figure stands at nearly 56 percent for natural gas and 48 percent output for oil.

Most of that production increase is due to the growing popularity of hydraulic fracturing--known colloquially as "fracking"--a process used to release oil or gas from underground formations that are otherwise too difficult to mine.



## Debate

We're going to have a debate.

- Read your article
- Form your opinion
- Debate

## Debate

We're going to have a debate again.

- Read the opposing article
- Form your new opinion
- Debate

## Check for Understanding Questions:

- Why is groundwater so important?
- What are some of the pros and cons to fracking?

*Name at least one for each.*

## Learning Objectives: Did you accomplish them?

- I can identify the permeability of different materials.

## Self-Evaluation

- How well did you understand the material today?  
(1-Lost, 2- understand, 3-can teach it)
- How well did you and your team members participate in class?  
(1-didn't do anything, 2-Bare minimum, 3-fully participated)