COMIC by Ernie

WATERWAYS WORD SCRAMBLE

by Carmen

Unscramble the words to find out the type of pollution that we can prevent to protect our river.

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EL PASO WATER CHRONICLES

The Latest News in Water and Science from El Paso

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El Paso Waterways: A System Formed Through Gravity

by TecH20

In El Paso, water flows towards the Rio Grande. It is the 4th longest river in the US and travels 1,885 miles, from the San Juan Mountains in Colorado, at an elevation of 12,000 feet. Water from the snow melt of the Rocky Mountains flows from Colorado to Texas. By the time the water is in El Paso, the elevation has dropped to 3,740 feet above sea level. Gravity continues to pull the water to the Gulf of Mexico, where the elevation is 0 feet, or sea level.

The Rio Grande River channel has cut through the bedrock over millions of years, winding and following the lowest elevation because of gravity. The water in the river is seasonal and not only comes from snow in Colorado, but also from the precipitation flowing from mountains and higher ground running along the river's path. This is known as **runoff**, and it helps **recharge** the river as it flows to the Gulf of Mexico.

During El Paso's rainy season, the river is recharged through naturally created paths that flow into its banks. These paths are created not only because of gravity pulling the water from high to low ground but also because water seeks an easy path to flow.

The Path of Least Resistance: El Paso's Arroyos

Geologists say that “Water seeks the path of least resistance.” That means that in addition to the effect of gravity, water will flow in places where it is easy to do so. Places with less boulders, less vegetation, and less obstacles, means less resistance. In El Paso and the surrounding areas, there are small stream channels called **ARROYOS**, carved out by water and gravity over time and following the paths of least resistance. (Arroyo is Spanish for brook and refers to a dry creek, a gulch, or a stream bed that momentarily fills up and flows when there is a heavy rainfall.) Arroyos are not as long as a river but can wind for miles. They are formed through the erosion of loose sandy soil, easily moved because our Chihuahuan desert has sparse vegetation to hold the soil in place.

NOTE: NEVER HIKE IN AN ARROYO IF THERE ARE RAINSTORMS NEARBY
To hikers, arroyos seem like easy flat paths in the desert, however, rainwater can travel long distances in a short period of time in an arroyo. Even if a rainstorm is several miles away, water can fill an arroyo and dangerously gain momentum towards unsuspecting hikers.

Arroyos are the Rio Grande and Hueco Bolson’s Friend

Arroyos are important for recharging our **surface water**, the Rio Grande River and our **groundwater** in the Hueco Bolson Aquifer. During El Paso rainstorms, arroyos channel our water through a **drainage divide**. A drainage divide happens when the runoff from rain or snow heads in different directions because of a land feature such as mountains. On the west side of the Franklin Mountains, arroyos make their way off the mountain to help replenish the Rio Grande. In fact, arroyos are responsible for replenishing this river along almost all of its 1,885 miles, but they are especially prominent in desert areas. On the other side of the divide, on the east side of the Franklin Mountains, arroyos tend to drain into the flat plain areas between the Franklin and Hueco Mountains. This valley depression is called a **bolson** and allows for runoff to recharge the groundwater through a process called **percolation.** Gravity pulls the water through the soil to the Hueco Bolson Aquifer located underneath El Paso. The **aquifer** is made of permeable rock that can store the water. El Paso uses this aquifer to draw some of its water for the community.

El Paso Uses Natural and Manmade Arroyos

In El Paso, arroyos are so important that we celebrate them! There are several nature trail parks that are located inside the city such as the Wakeem-Teschner Nature Preserve and the Billy Rogers Arroyo Park, both located west of the Franklin Mountains. These parks are arroyos that are used as hiking and nature trails during dry weather.

There is a very good chance that where you live in El Paso there once was a natural arroyo nearby. As the city grows, more and more natural arroyos are replaced with artificial arroyos. These arroyos can take many forms, but most artificial arroyos are streets. El Paso receives only 8 to 10 inches of rainfall annually, making the decision to use streets as temporary arroyos practical and money saving. El Paso streets are our method for channeling rainwater away from places where it can do damage. During heavy rainstorms it is best not to travel while the streets direct water to the drainage areas.

Another manmade form of redirecting water is with **retention ponds**. These are cement lined channels or tanks where water can collect and can be directed toward the Rio Grande. Because natural arroyos are prone to erosion, a man-made arroyo or pond can serve as a more permanent structure to collect and direct El Paso’s water during the monsoon season.

El Paso Streets Are Man Made Arroyos: *Keeping El Paso waterways free of debris is the job of everyone.*

Care and Upkeep of El Paso's Water Drainage System

No matter how good a plan is to direct water back to our river and bolson, if the arroyos and reservoirs are not kept clean of debris, water's path of least resistance can be blocked and flooding can occur. Huge blocks of concrete from construction sites, old tires, worn out furniture, mattresses and other large items normally taken to the city dump have been found disposed of in our waterways causing neighborhoods to flood and millions of dollars of damage. Despite this, the most dangerous pollutants to our water are often the smallest. Small particle pollutants from fertilizers, pesticides, industrial waste, bacteria, and municipal waste products all can contribute to declines in river biodiversity as well as cause health hazards.

Water pollution is often categorized as "point source" or "non-point" source pollution. **Point source pollution** can be tied to a particular location; whereas **non-point source pollution** comes from sources that cannot be traced back to a single point of origin. Most pollution to the Rio Grande in El Paso is non-point source, such as debris in our arroyos, motor oil, lawn fertilizer and antifreeze runoff. However, we do share our river with other communities in Texas, New Mexico, and Mexico, and the river is threatened by point source pollution discharged at a single point from some farms and industries along the river. Projects such as the American Heritage River Project seek to fund cleanup and reduce environmental factors contributing to river degradation. El Paso Water's river treatment plants use several effective processes to remove contaminants and make the water safe to drink. The City of El Paso Environmental Services Department and the El Paso County Water Improvement District #1 join forces to raise awareness of the dumping problem, and to remind citizens to be watchful, take a stand and report illegal dumping by calling 311.

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