## Water Measurements

No discussion concerning water can take place without first understanding the Water Conversions Tables and Facts. Water is measured in acre feet:

1 Acre foot = 43,560 Cubic feet

1 Acre foot = 325,851 Gallons

1 Cubic foot = 7.48 Gallons

1 Gallon = 8.34 Pounds

1 Gallon of water = 231 Cubic inches

1 Million Gallons a day = 694.4 Gallons per Minute = 1.55 Cubic Feet per Second

## Water Uses

Individual water use is really a drop in the bucket. While per capita water use is estimated at about 1400 gallons per day in the U.S., the amount used directly by an individual is only a small part of that.

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| Agriculture | 41% |
| Electric Generation Cooling | 38% |
| Industry | 11% |
| Public Tap Water | 10% |

There are many regional differences in the amount of water used. In the West, most of the water is used for irrigation, while in the East more water is used by industry.

## Some Things to Think About

97% of the world's water is salt water leaving only 3% for fresh water. Of that 3%, 0.77% is Polar ice cap, 0.22% is ground and soil water and 0.003% is rivers and streams. Generally speaking, 1 acre foot of water can support two families of four for one year or 40,731 gallons per individual which equates approximately to 111.59 gallons per day. Fresh good quality water is being used up at a much faster rate than people realize. It is a precious resource that needs to be carefully managed.

In the rush to find oil in Montague, whenever an oil company fractures a well, they will use up to anywhere from 1 to as high as 7 million gallons of fresh water. That equates to 3.0688 to as high as 21.48 acre feet of water. Another way to measure this usage of 7 million gallons is equal to 166,667 barrels at 42 gallons per barrel. Any way you want to look at it, that is a lot of water. EOG Resources, Inc. has publicly stated they plan on drilling 3,000 oil and gas wells in Montague county over the next ten years. When they

have completed this drilling program, will there be any water left and if there is, how deep will it be and will it be of usable quality?

When legendary oil investor, T. Boone Pickens says “water may be the next shortage like oil is today,” you have to pay attention. The city of El Paso is already buying the water rights as far away as the Big Bend area of Texas. The Rio Grande isn’t as grand as it used to be, and the Colorado River now turns to dust before reaching the Gulf of California. Water cannot be taken for granted anymore. The Bass family of Fort Worth has been buying up water rights in Southern California for years.

There are numerous locations in West Texas where the water table is declining on an annual basis. A classic example is the farmland area south of Interstate 20 below Pecos. It is now an abandoned agricultural area because of the irrigation water having been used up. Several artesian springs North of Fort Stockton have been dry since the 1950’s. There are many stories like this in Texas and not just in the western part of the state. In short, what was is no more. It is gone to never return again. The people in these waterless areas appreciate better than anyone at how things can change from wet to dry and no more.

**Montague County and the Trinity Aquifer**

The Trinity Aquifer extends in a ban through the central part of the State from the Red River, eastern Montague County and slightly into north western Cooke county, to the eastern edge of Bandera and Medina counties. If you were to view this on a map, you would see the western half of Montage County does not have a lot of underground water. We are told that the area around Ringgold is not only dry, but what little water there is has a high degree of sulfur.

Unlike the Edwards, the Trinity Aquifer recharges very slowly. Only 4-5% of water that falls as rain over the area ends up recharging the Aquifer, and water also moves through the Trinity much more slowly than through the Edwards. The Trinity contributes a significant amount of water as recharge for the Edwards.

The annual rainfall for Montague County averages thirty to thirty-five inches a year. Depending on the rainfall and temperature per any given year, the replenishment to the Aquifer is approximately 1.2” to 1.75” inches per annum. Those are very small numbers considering the current and future demands placed on the water supply.

Exploding growth over the Trinity and dwindling supplies have stirred concern about regulation of this resource. In 1990, the Texas Natural Resource Conservation Commission designated the Trinity region to be a Priority Groundwater Management Area (PGMA), defined as an area where a CRITICAL water shortage is occurring or can be expected to occur in the next 25 years. Inclusion in a PGMA gives county officials some authority to regulate development over the Aquifer and can aid in the formation of a groundwater conservation district, which would have taxing and regulatory power and could regulate well spacing and production.

## Ownership of Water

Ownership of water is directly related to its source and type. Under Texas law, underground water belongs to the owner of the surface estate, while surface water belongs to the State of Texas and may be only used by the landowner with the State's permission. The State of Texas holds title to all surface water of the state in trust for the public welfare. The Texas Water Code defines the surface water owned by he state to include the water of the ordinary flow, underflow and tides of every flowing river, natural stream and lake and of every bay or arm of the Gulf of Mexico, as well as the storm water, flood water and rainwater of every river, natural stream, canyon, ravine, depression and watershed in the state. Any channelized flow of water is deemed to be owned by the state.

Diffused surface water is not state water. These are waters which do not flow in any defined water course, channel, ravine, creek or depression, but rather across the surface of the earth in variant and unregulated ways. Diffused surface water is subject to capture and use by the landowner without obtaining permission of the state through a permit. The water must be captured before it enters any type of creek, ravine, stream or river.