***Significant Facts About Water and the Denver Basin***

***Compiled by the Black Forest Water & Wells Committee***

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The Denver Basin is a giant bowl reaching from Greeley in the north to Colorado Springs in the south

The basin extends from the front range out to Limon

The basin is actually four bowls inside each other representing four separate aquifers

The aquifers are the Dawson (top,) Denver, Arapahoe and Laramie-Fox Hills (bottom.)

State water officials believe the four aquifers are sealed from each other

However, tests in one area from an Arapahoe well affected the adjacent Denver and Dawson aquifer

No one knows for sure how much the aquifers are sealed from each other

Drilling logs do not show a clear, impermeable boundary between aquifers

If these bowls are being recharged at all, it is a slow process over generations of time

Only a little over half of the Denver Basin water can be economically removed

Through continuous, long-term use, a well becomes less and less efficient

After several years, it is not economical to pump because of decreasing output

A local well-driller with 30 years of experience presented a program about wells in the Denver Basin

He said the geology of the Denver Basin is not unified or homogeneous

Basin has multiple interlocking and overlapping layers of sand, gravel, sandstone and claystone

Wells 1/4 mile apart can produce widely varying amounts of water

Wells only 200 feet apart can have widely different static levels

Having a water allocation or water right is no guarantee of predicted amount of water in that area

“Paper water does not equate to wet water”

Statewide, agriculture accounts for 86% of the water used in Colorado

Water use from Denver Basin is 62% agriculture, 20% municipal and 12% domestic (private wells)

Water rights all across the state have been sold to developers and municipalities

These water rights include both underground water and water from rain and snow runoff

The water in Colorado rivers all belongs to someone with water rights

Some of the water in the Colorado River belongs to states like Arizona and Utah

When water rights are sold, farm land is idle and unused because of arid conditions and no irrigation

Over 45,000 acres along the Arkansas River are now idle under the “buy and dry” principle

The water for these rights can be used upstream in Pueblo and beyond

For water use, the “use it or lose it” rule sometimes causes water waste

If water is not used, water not owned by a water right can be given to another user

Another user may claim he can put the water to better use

Water that is owned is sometimes “used” by pouring it out on the ground so no one else can claim it

For the water that falls out of the sky, 70% evaporates back into the atmosphere and 30% soaks into the ground and runs off into streams, rivers and the ocean.

For residential households in the Black Forest, the State of Colorado considers water use as follows

An acre foot of water is 326,500 gallons which is 1 acre (about a football field) 1 foot deep in water

The average household uses 0.35 acre-feet of water per year. This is 313 gallons per day.

90% of the water used in a household is returned into the ground via the septic system

Just 10% is actually consumed or evaporated into the air

15% of the water used for watering gardens and lawns is returned into the ground

85% of irrigation water is evaporated into the air and not soaked into the ground

100% of the water used for animal watering is consumed and none is returned into the ground

Colorado Springs gets water from the Arkansas River and from snow runoff on the Western Slope

Colorado Springs gets water that would otherwise run off into streams and then the Arkansas River

Water is piped from the Western Slope through Twin Lakes near Buena Vista and then into Arkansas River

A secondary pipeline comes over the front range just south of the Air Force Academy

The Southern Delivery System (SDS) is a 24-inch waterline from Pueblo Reservoir to Colorado Springs

At present, Colorado Springs Utilities has water rights and supplies above the current demand

CSU also has extensive Denver Basin water rights

CSU policy is not to use Denver Basin aquifer water except in an emergency

Annexed developments surrender their water rights to CSU except for golf courses and ponds

Flying Horse and Flying Horse North water their golf courses with aquifer water

Wolf Ranch created Wolf Lake (6 acres) with aquifer water

So far, Colorado Springs Utilities has not provided water to anyone outside the city limits

The city is considering providing water to entities outside the city limits

Providing water this way would be a revenue boost to Colorado Springs Utilities

Colorado Springs uses 40 million gallons per day in the winter and 100 million gpd in the summer

Thousands of homeowners rely on Denver Basin water for their homes

The Denver Basin has well over 100,000 wells, but the exact number is difficult to find in state documents

El Paso County alone has over 22,000 private wells

The suburb of Highlands Ranch in Denver (100,000 residents) uses Denver Basin water for 10% of its needs

70% of water used in the South Denver metro area is groundwater

Castle Rock, Parker and other municipalities use Denver Basin water

Water levels in the Denver basin are declining in several areas

Around the city of Castle Rock some wells have been declining up to 30 feet/year

The Denver basin is thinner in the Castle Rock area

The Castle Rock area has a huge number of Denver basin wells

Fortunately, according to a local well driller, Black Forest wells have been holding quite steady for many years

The Dawson aquifer is much thicker in the Black Forest area than further north

The State of Colorado Division of Water Resources allocates how much water anyone can pump

The state has models that tell the thickness of the aquifer at any given location

The decree takes the thickness of the aquifer (feet) times the acreage of the parcel = acre-feet

This is called the saturated thickness

The state considers 0.2 or 1/5 of each cubic foot to be water

Calculated volume of water allowed per year is divided by 100 for 100-year duration of aquifer

Figure is again divided by 3 for 300-year rule

Amount of water allocated for pumping is based on 1985 geological model

The amount is based on pumping the aquifers dry in 100 years

The 100-year rule was initiated in 1973

We are 46 years, almost halfway, into the 100 years toward “dry” wells in many parts of the state

El Paso County initiated a 300-year rule in 1986 to extend available water for private wells in the county

El Paso County approves only 1/3 of the state allocation per year

Theoretically the 300-year rule should provide water for two more centuries

The 300-year rule was challenged in the Colorado Supreme Court but was upheld for El Paso County

In spite of the 300-year rule, all of the northern El Paso County water providers need more water

Water providers were told they had enough water for their developments

Continuous pumping is resulting in diminishing returns from well production

Manager of Woodmoor Water says well that formerly pumped 100 gpm only pumps 40 gpm now

Monument, Palmer Lake, Woodmoor, Tri-View, Meridian Ranch, Paint Brush Hills need more water

Several have purchased additional water rights on ranches south of Colorado Springs and Leadville

Access to that water not available at this time

Loop proposal suggested in late 2021 to pipe SDS water north through Cherokee Metro pipeline

Cherokee Metro would get SDS water in exchange for CSU using Cherokee pipeline

Cherokee wishes to be absorbed into CSU but high debt is stumbling block

Pipeline would be extended from Sundance Ranch to Monument and Palmer Lake

Renewable water would be provided to northern water providers to save Denver Basin water

Wastewater would be piped south to connect to CSU wastewater system along I-25

Estimated cost around $134 million

Urban development south of Black Forest will potentially use huge amounts of Denver Basin water

Sterling Ranch, The Retreat at TimberRidge and The Ranch will total 7400 homes

The entire Black Forest has about 6600 homes with private wells by comparison

These developments are currently planning to use Denver Basin water from the Black Forest

Not enough groundwater exists under these developments to serve the high number of homes

Water rights on Sundance Ranch, Flying Horse North, Bar-X Ranch and McCune Ranch purchased to provide more water

A potential annexation plan may mean some of these developments will use city water

Unintended consequence of annexation may be that developments will redesign to all urban lots

More stringent development requirements in Colorado Springs city limits than for rural developments

Developers are leapfrogging over Banning-Lewis Ranch because of stringent city requirements

Resulting developments often use Denver Basin water instead of renewable city water

Cherokee Metropolitan District has obtained significant water rights in the Black Forest

Sundance Ranch, Flying Horse North, Shiloh Ranch and County Line Road water rights were purchased

State granted permission to pump 1246 acre-feet of Dawson water per year from 23 well sites

Cherokee has permission to pump a total of 3708 acre-feet of water per year from all 4 aquifers

Coupled with planned residential development, this is 10 times as much water use as for 5-acre lots

All the well sites are on the property boundaries so half of the water pumped belongs to neighbors

The water is being piped to supply 18,000 customers in southeast Colorado Springs

Cherokee Metro has committed 2025 af/yr of water to Sterling Ranch

This is 1.8 million gallons of water per day.

Cherokee Metro District wells already drilled are not producing significant water

Only 4 wells have been drilled to date

One Denver well drilled to 1970 feet (12-inch bore) and produced only 50 gpm

One Arapahoe well drilled to 2520 feet (12-inch bore) and produced 450 gpm

One Dawson well drilled to 1044 feet (12-inch bore) and produced 68 gpm

A second Dawson well drilled to 1030 feet (12-inch bore) and produced 65 gpm

The two Dawson wells do not even have a pump installed and are not producing

These wells cost around $750,000 to drill

Three of these four wells are producing very poorly

These wells suggest that commercial extraction may not be productive or economical

Transmissivity or flow of water back and forth underground may not be very rapid

Clay and sandstone don’t allow water to flow laterally very easily

Water seems to be located in “pockets” within clay and sandstone layers

“Pockets” of water sufficient for private wells but not for commercial extraction

Water seems to not flow back into large wells fast enough to produce profitable results

This is an excellent example of “paper water may not equal real water.”

Falcon Area Water Authority (FAWA) is planning a huge water project in Black Forest

Project will pipe water from 27 sites to Falcon and Sterling Ranch area

Water coming from High Forest Ranch (7), Bar-X Ranch (16) and Winsome (4) sites

Water rights granted for 1270 acre-feet/year to be pumped

FAWA officials say more water rights are for sale in the Black Forest

Remains to be seen if “paper water equals wet water”

**Future Potential Uses of Denver Basin Water**

A developer has obtained rights to 39,000 acre-feet of water per year from Greenland Ranch

Greenland Ranch is a conservation easement on thousands of acres between Monument and Castle Rock

This conservation easement will not be developed but remain as open space

Front Range Water Company (Sun Resources) is proposing a 24-inch pipeline to Denver

To put this in perspective, this is 35 million gallons of water per day they are allotted.

This water would be pumped to an eastern Denver suburb

A water developer in Denver is proposing to pipe San Luis Valley water (Alamosa) to Denver

The San Luis Valley is very arid, gets only a few inches of rain per year and is heavily irrigated

All the water is appropriated so developer would have to buy water and dry up farm land

Sean Tonner is leading a group that proposes to spend $118 million dollars for water

They propose to buy 22,000 acre-feet of water that would dry up 10,000 acres of farm fields

They propose to pay farmers to not plant crops and save another 30,000 acre-feet of water from irrigation

That would dry up another 15,000 acres of farmland and leave it idle

They want to sweeten the pie with a $50 million gift to the San Luis Valley farmers

Plan involves a 200-mile pipeline to transport the water to Eleven Mile Reservoir and South Platte River

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**Common Sense Principles That SHOULD Logically**

**Govern Water Use in the Denver Basin**

**The Dawson aquifer should only be used for private wells**

**Denver Basin water should not be pumped from one area of the**

**basin to another**

**All wells, including commercial wells, should be sited well away**

**from property boundaries**

**All urban density developments should be required to use**

**renewable water only**

**Paper water does not equal real water**