

By Jim Buzbee
PPCWD President

The Palo Pinto County Municipal Water District is considering the building of a new lake as an additional water supply for Mineral Wells and the rural water districts in this area who buy water from the city. It would be called Turkey Peak Lake, for the landmark hill which would be incorporated into the dam.

This major project (\$21 million) will impact our future for many years to come. It will affect the future economic growth of the entire county, our health and physical well being, and of course our pocket books. I hope in this article to enlighten you about the background of this project, why we are considering it, and the cost and payment plan. It will be up to you to let us know if you think it is worth building. **How we got where we are**

Some of you may remember when the city of Mineral Wells was so desperate for water that it laid a pipeline to the Brazos River and pumped water that was so salty it crusted over the outside of the evaporative air conditioners. Then there were the years of annual water rationing. In the late 50's and early 60's a number of farsighted people decided we had to have a more reliable source of water if the town would ever progress. They got some landmark legislation from Austin setting up the Palo Pinto County Municipal Water District Number 1.

This water district is set up as an independent governmental entity with the power to own and operate public works, enter into public contracts, tax property in the district, pass and enforce ordinances, and do most of the things any governmental entity can do. This district is governed by a 5-member board of directors who are appointed by the Mineral Wells City Council. The boundaries of the District coincide with the city limits of Mineral Wells. To pay for the lakes, treatment plants etc., their upkeep, and other expenses the district sells water and taxes property in the district.

It is this water district which built the present primary water supply, Lake Palo Pinto, completing it in 1964. Another site on Keechi Creek had been considered but the Palo Pinto Creek water shed was much larger, the water was likely to be better quality, and an anticipated excellent dam site was available. The original capacity of this lake, based on the best available topographic information at that time (the U.S. Coast and Geodetic Survey maps), and calculated by the consulting engineers was 34,250 acre feet, at a spillway level of 863 feet above mean sea level. An acre foot is the amount of water contained in a volume having a depth of one foot and a surface area of an acre (a little less than a city block in Mineral Wells).

Later the board of directors acted on a proposal from the Brazos Electric Power Co-operative to pay for an addition of four feet to the height of the dam in exchange for the right to build a power plant near the lake and use water in the lake as coolant for the plant. This addition was completed in 1965 and the new calculated capacity was 44,100 acre feet. Under terms of the agreement this power plant may contribute enough heat to the lake to evaporate up to 3,876 acre feet of water per year.

Water from this lake is purchased by the City of Mineral Wells, treated and resold to its citizens and to various rural water districts. These districts distribute water north almost to the Jack County line, east into Parker County including Millsap and Horseshoe Bend, South into Hood County and west to Santo and Palo Pinto. The population in these surrounding rural areas is growing much faster than the city. The rural districts presently use 21 percent of the water but are destined to use 40 percent in 2040. Under normal conditions average daily use of water by all these users in 1990 is potentially 8 million gallons per day (including 4.75 mgd for the City and the rural water districts and an allocated 3.46 mgd for the power plant). If we are in a drouth water use could increase to over 9.0 million gallons per day. By 2020 these numbers are expected to be 11.0 and 13.0 million gallons per day. The numbers for the city are accurate but the calculated amount of water use by the power plant is now quite a bit less than their amount of water use by the power plant is now quite a bit less than their allocation. Their use increases as they generate more power. Because of the air conditioning load their needs are greatest during a hot drouthy summer; just when our needs are greatest and the supply the least.

Calculation of the dependable daily yield in million gallons per day from lake capacity in acre feet is complicated and includes consideration of evaporation, weather patterns, silting in of the lake and many other factors, but assuming a 1 year reserve the engineers calculated Palo Pinto Lake should be able to yield almost 12 million gallons per day.

Then why build a new lake? It takes years and years to provide a new water supply. It took over five years from inception to get Lake Palo Pinto completely finished and what with all the permits, environmental studies, etc. it would now take twice as long. Water consumption, on the other hand, has grown in ways that surprised even those of us who are involved with it continuously. Accordingly, the Water District's board of directors has from time to time engaged consulting engineering firms to update projections, verify our long range plans, and evaluate the condition and adequacy of the lakes, treatment facilities, pipelines etc. of the district. Even though this has cost considerable money, we have considered it only prudent in view of the high cost of a long range mistake.

The most recent of these studies was completed in 1986 and yielded some astonishing results.

1. The government maps used to calculate the original lake capacity were not very accurate. New lake bottom contours were determined in 1987 using sonar type depth measurements. Calculations of the lake capacity from this more accurate data resulted in a capacity of 27,650 acre feet; over 37 percent less than originally estimated. This new lake capacity determination was verified by independent measurement and calculation in 1988 by the Texas Water Development Board, at state agency.

2. The re-evaluation of evaporation and other losses in the lake and in the creek

channel which conveys the water from the lake to the pump station near the town of Brazos further reduced the estimated reliable yield. The net effect of these discoveries was to reduce the estimated, usable, reliable yield to about 8.5 million gallons per day, or just slightly more than we potentially use now. This calculation was done assuming only a six month reserve.

We thought we had a bountiful supply of water. Instead we have discovered that drouth periods have reduced the reserve in Lake Palo Pinto to about a six-month supply four times since the lake was built and that twice it was down to a two month supply. Of course knowing what we know now we could manage our supply a little better in the next drouth but it is still cause for considerable concern.

The best predictions by our engineers and the State Water Development board are that demand will equal the actual supply in 2010. This means we will need to not only have a new lake constructed but also have it full of water. Filling it could take a week or five years in this area.

3. The damn dam is moving! Mother Nature is pretty capricious and generally has little regard for man's projects. Shortly after the dam was completed a big rain storm did extensive damage to the spillway and caused the hill on the south end of the dam to partially cave off into the spillway. This damage was repaired at a cost of about a half million dollars and some monitor bore holes were drilled into the hill. By periodically exploring these bore holes with electronic instruments it can be determined if the hill is moving again. This exploration has been performed by consulting engineers at least once a year since then. Starting about 1984 some motion started to show up. Additional bore holes were drilled and the exploration was done more frequently. This coupled with additional studies has confirmed that the thing is on the move again and will in all likelihood cave off again sometime in the future, blocking the spillway. No one can predict when; it could be 20 years from now and it could be this afternoon. This would be very expensive to repair and even more expensive to prevent.

It seems that this particular hill contains a number of ancient slides. The clay of which it is made behaves much like silly putty, if you watch it over a long period of time. It kind of flows down into a puddle. In addition this hill has previously broken into separate layers during prehistoric movements. These layers are somewhat like pieces of dough which are mashed together and baked into a dinner roll. Its all one roll but when you pull on it it comes apart at the contact points between the original pieces of dough. The hill tends to be weak at the points between the layers and when ground water lubricates the joint the layers start to slide and flow. This action will likely continue for centuries.

As a result of all this bad news the Water Board has, through its consulting engineers, started the planning and investigation for a new dam below the present site which would enlarge the lake and get away from the problem site. We now have enough information to make a responsible

decision and ask for your input.

The planned dam would be located north of the town of Santo on Palo Pinto Creek at a point just west of the F.M. 4 bridge. It would back up water to the same level as that in Lake Palo Pinto and we now plan to operate both impoundments as one lake. The present spillway at Lake Palo Pinto would likely be removed so water can flow freely between basins and a bridge added across the spillway area to allow road access to the south side of the lake. The larger impoundment should moderate the large level changes which have been characteristic of Lake Palo Pinto and enhance its recreational potential.

The new lake would approximately double the capacity of the present lake but would be much deeper, have much less surface area and proportionately less evaporation loss. The shoreline, will be very steep, cliffs in many cases, and it should be a beautiful lake, but the steepness will probably limit development around it and prevent access except at a very few points.

The Future: There seems to be no question that if the area grows we will have to have an additional source of water. It is also certain that it will not grow without water. Engineering investigation on alternate sites and sources indicates water from Turkey Peak would be much more economical than any other source.

Most of our neighbors are considering much more costly sources. Weatherford plans to purchase water from the Fort Worth area. Stephenville and Jacksboro are planning lakes at a much higher cost per gallon of water. Granbury is producing water from the Brazos River with a very expensive process (electrodialysis) to get rid of the excessive salt and Graham is planning to buy water from a new lake on the Brazos River and blend this with water from their own small lake to get the salt content within reasonable limits. This lake project has now been cancelled, however. Clearly Mineral Wells is in an enviable position.

But! We won't stay that way unless we act. Water has become such a valuable commodity and since demand exceeds supply almost everywhere, the state legislature has acted to apportion the available water on a permit basis. We now have a permit to impound 44,100 acre feet from the Texas Water Rights Commission. We would need additional water rights allocated to us to build Turkey Peak.

Oviously there is a finite amount of water in the Brazos River drainage area and the water we want is part of that. Texas is part of the Sun Belt and is still growing, even now, and is destined to grow even more in the future. There is considerable expansion taking place down river and new applications for water rights are being filled frequently. Obviously delay diminishes our chances of getting a larger water allocation; particularly without an expensive and time consuming law suit.

In addition to the water rights permit there are a number of other permits required and restrictions which limit what we can do, how fast we can do it, and what it will cost. The additional red tape that has come about since Palo Pinto Lake was built is astounding. Just since 1979

the Army Corps of Engineers has gotten in the act and a "Section 404" permit is required from them. To get this permit may require both time and expense. As an example the permit for Stacy Reservoir, on the Colorado River (Texas) requires that \$3.7 million be spent to enhance the habitat of the endangered Concho Watersnake. In addition, there are requirements for impact studies for water quality, bays and estuaries, fishery resources, mitigation studies for these impacts, water conservation plans, unappropriated water analysis, etc. In the last legislative session a bill to require full fledged environmental impact studies was introduced. It did not pass but will doubtless be re-introduced.

Our engineers recommend a schedule starting with the permit phase right now; this will take about two years to complete. Starting in 1991 we would start procuring the land necessary and the relocation of Farm Road 4. In 1993 or 1994 financing and construction should start and be complete by 1998. Conservatively the lake should be full by 2005, allowing time to seek an alternate if things don't go as planned. Of course, gaining a single large new industry could substantially shorten the time before the water is needed.

Money-Honey?
It won't be cheap, but the money will be spent in Palo Pinto County rather than some place far away. The best estimate is that the project would cost \$21 million. It seems that those who use the water should be the ones to pay for it and all projections of costs have been based on financing with revenue bonds. This means that water rates would have to rise substantially, but taxes wouldn't. The rates would rise gradually culminating in a rate of \$2.13 to 2.24 per thousand gallons (in 1989 dollars), depending on slightly different financing plans.

As a comparison, rates in small towns around the metroplex range from a low of 75 cents to a high of \$2.98 per thousand gallons, at the present time. Those near the bottom are probably still using local wells. The average is \$2.30. Representative, present, rates from surrounding towns are: Stephenville \$1.65, Breckenridge \$1.43, Cleburne \$1.54 and Graham \$1.25. Our present rate is approximately \$1.05. Our financial advisors tell us all of these surrounding towns are facing substantial increases in the near future; for example, Jacksboro:

Use Category	Dollars
0-2,000 gal.	\$12 (min.)
2-7,000 gal.	\$2.50/1,000
7-14,000 gal.	\$3.00/1,000
14,000-? gal.	\$3.50/1,000

That's our situation; let us know what you think. Present board members are Fred Eubanks, Bill Graham, Jess Turner, Blake Speer and myself, Jim Buzbee. I'm sure any of us would be happy to talk to you about the project or come to your club meeting and expand on this information and answer questions. Every human pursuit that I know of always changes and moves ... forward or backward.

Editor's note: This information has been provided by Jim Buzbee and the Palo Pinto County Water District No. 1. The Opinion/Editorial Page is open to response from responsible citizens concerning this important issue.