



LCCN Testimony

Monthly Meeting of the Lone Star Conservation District Board of Directors

Regarding the Basis for Its Relentless Pursuit of Misguided Regulation

June 9, 2015

My name is Michael Massey. I represent the Lake Conroe Communities Network (LCCN), Montgomery County's community engagement group. We seek to understand, influence & champion coordinated decision making of water management authorities for the specific health, quality and economic benefit of the citizens of the County.

We have been closely observing Lone Star's process of regulatory development for years now. Out of complete frustration with what we saw occurring year after year and the huge negative impact its continuation will have on our community, we became very active in 2015. We have presented formal public comment to the Board at every one of its workshops, including those held jointly with GMA 14. We have introduced major detailed justifications for our position without response from Lone Star. Nothing we have seen or heard has changed our position as stated to the Board on January 28, 2015.

Experience this year only sharpens the precision of our objections:

- Lone Star's regulatory developments are based on false premises that find crises and problems with Montgomery County groundwater resources that do not exist.
 - There is no technical basis for regulation.
- Lone Star's framing of its regulatory process takes into account none of the critical fundamentals required for groundwater regulation under Texas Law, e.g., most blatantly property rights considerations among many others), rendering its pending regulations defenseless to regulatory audit if they are finalized. Such inevitable audits both from within and from outside of Montgomery County will put the County in chaos at a time when it cannot afford time consuming disruptions to its business and distractions and bottlenecks to its economic development.
 - Lone Star's regulatory framework must be abandoned and rebuilt with the full participation of the County.
- Lone Star's assessments of the economic impacts of proposed regulations on Montgomery County are so vague and generic as to completely avoid the concrete role and real and major impacts of water resources on every aspect of Montgomery County life and economic development potential.
 - Until sound Montgomery County-specific determinations are made of the economic impacts of regulation and then until appropriate and viable mitigation strategies are proposed and accepted as such by the County, proposals to regulate do not meet the state mandated requirements for their promulgation.

The overall result of the above is a destructive regulatory process that threatens the heart of Montgomery County's life and economic development potential. Notwithstanding the many years of its development, **the only practical way to avoid impending disaster is to SUSPEND ALL PENDING RULES ON GROUNDWATER RESTRICTION.**

Lone Star's Track Record for Dealing with New Information

In the nearly 15 years since its initial regulatory development in 2003, Lone Star has a consistent track record of avoiding any information that in its view could disrupt its plans:

- Lone Star Pursuit of New Data:
 - With the narrow exception of monitoring stations to measure land surface subsidence, there has been no primary data production to clarify and anchor 2003 bases for regulation
 - Notably, the most critical factor to Lone Star positioning -- aquifer recharge -- has never advanced from futile attempts to directly determine it via computer simulation modeling and limited direct field measurement efforts.
 - Experts in the field know the complications of direct determination and choose instead to measure and monitor the direct effects of recharge, viz. STORAGE.
 - Measurements of available storage are readily available. They show that the entire Gulf Coast Aquifer and its individual components have been full, are full and can be expected to remain basically full.
 - Accordingly, REAL recharge rates evidenced from field operations at least match water production rates and, based on history at least, can be expected to continue to increase with increases in water production.
- Lone Star Reaction to New Data from Others
 - USGS has consistently warned against the misuse of its complex simulation modeling data in quantitative policy and regulatory processes. Lone Star has and continues to ignore these warnings.
 - Over the course of 15 years of modeled projections of the future, comparisons with actual field measurements have consistently shown large discrepancies. This is typical of complex simulation models and USGS has made major adjustments to the calibration of its models in the face of extensive real measurements in the field increasingly available since 2003. Lone Star has ignored these recalibrations and held to its definition of best available science written in 2003 -- then and now still based entirely on simulation modeling.
 - Perhaps its most egregious clash with what it perceives as threatening new data from others occurred in its response to the Texas Water Development Board (TWDB) release of its TERS Report in June 2014. TERS formalized what many had been telling and documenting to Lone Star since 2009, viz., that Montgomery County aquifers had huge capacity and availability. Rather than welcoming the TWDB information, Lone Star attacked it.

Lone Star's attack of the TWDB TERS report – memorialized in a Press Release dated June 27, 2014 -- epitomizes the Lone Star approach to new information. But it also provides an excellent compressed picture of the fundamentally false premises under which Lone Star continues to press for its regulations and propagate false understandings and fear throughout the community. LCCN's analysis of the central thesis of the Lone Star Press Release is provided here as an appendix. In summary, LCCN sees:

- Fundamental misuse of the term Artesian Pressure
- Total lack of understanding of hydraulic pressure gradients, the real force behind well water production
- Misrepresentation of real aquifer capacity as seen and tapped by individual wells and the small portion so far tapped by county well operations.

Appendix A:
LCCN Analysis of Lone Star Press Release
Regarding TWDB TERS Report



Analysis of Lone Star Explanation: Basis for Pending 2016 Groundwater Regulations

June 9, 2015

One could not find a denser more concrete statement of the misguided rationale for everything that is happening at Lone Star. Nor could it be any clearer how much it is **ALL based on false premises tangled up in technical language that is used and misused and bastardized into the weapons for their fight.**

The following is an excerpt from the Lone Star Groundwater Conservation District Press Release of June 27, 2014 addressing the recently released TWDB's TERS Report. A full copy of the Press Release is provided as an appendix to this document.

Other Factors Considered: One of the primary reasons the Lone Star GCD enacted

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RE: PRESS RELEASE - TWDB Releases TERS Numbers

its rules and regulatory plan was to address the serious problems many landowners in the county were already having with groundwater level declines in the aquifers, ranging from 200 to 300 feet of water level declines in some areas of the Evangeline and Jasper Aquifers. Those declines have caused well owners many problems in making their wells perform properly and being able to pay for the drilling and operational costs to pump groundwater. Pumping even one-half of 1 percent of the average TERS numbers released for Montgomery County would cause further water level declines to the point of complete elimination of all artesian pressure in the aquifers in Montgomery County. It is that artesian pressure that pushes water into a well bore and towards a well pump so that it can easily and affordably be produced by the well owner. To protect well owners from further water level declines and the loss of artesian pressure, and to operate the aquifers on a long-term sustainable basis, the Lone Star GCD uses total effective recharge to the aquifer as the basis for how much groundwater it allows to be pumped annually.

Allowing pumping at the levels included in the TERS calculation would also result in significant land subsidence, and could have a significant impact on water levels in streams and creeks in Montgomery County.



FALSE PREMISE OF ARTESIAN PRESSURE:

The most basic of principles known to any well engineer, geologist or hydrologist:

HYDRAULIC PRESSURE GRADIENTS are what moves water from the formation to the well (not artesian pressure)

- Hydraulic pressure is the weight of the column of water between the free surface of the aquifer (outcrop) and the static water level in a well
- Therefore, increasing water well depths inherently INCREASE hydraulic head and PRODUCE more power (hydraulic head) to make more water, NOT DESTROY IT (loss of Artesian Pressure).
- Increasing water well production REQUIRES some increase in the hydraulic pressure so that more water moves from the formation to the well.
- So INCREASING WELL WATER DEPTH is a blessing from the Good Lord, not the evil incarnate
- In confined aquifers like the Jasper, there is NO CONNECTION between static water level and aquifer storage. Increased static water level depths in wells DO NOT mean loss of storage or depletion of the aquifer. The weight of evidence on this is simply overwhelming, readily available and ALL supported by physical measurements in the field (not simulation modeling). The mechanisms at work to add/subtract from storage are different.

A growing county with greater and greater water demands should and will induce increased static water well depths to support the increasing water production needed to meet demand.

Montgomery County is BLESSED with an aquifer that has plenty of capacity to deliver to the increasing needs of the growing county.

In the northern half of the county (area of greatest future growth in water demand), the average depth to the top of the Jasper aquifer is 1,000 to 1,200 ft. Current static well levels in the largest county well fields (Conroe; The Woodlands) are about 300 to 400 ft. At these values, there is plenty of available and untapped hydraulic capacity for increased water supply.

ARTESIAN PRESSURE: What it really is

- The natural pressure in a confined aquifer formation to **push water UP a well pipe to the surface, NOT** to push water from the formation to the pipe.
- Pre-development, artesian aquifers have surface elevations that can support geysers when localized natural artesian pressures are positive at and near the surface (capped only by the thin layer of compacted soil above them).
- As artesian aquifers are developed, the static well water levels fall (necessary for production of sufficient hydraulic head to deliver desired water production rates) and so does the



artesian pressure. Movement from rural, one-family-use wells to urban-scale water production for whole communities inherently shifts the scale well water production well beyond reliance on delivery through artesian pressure.

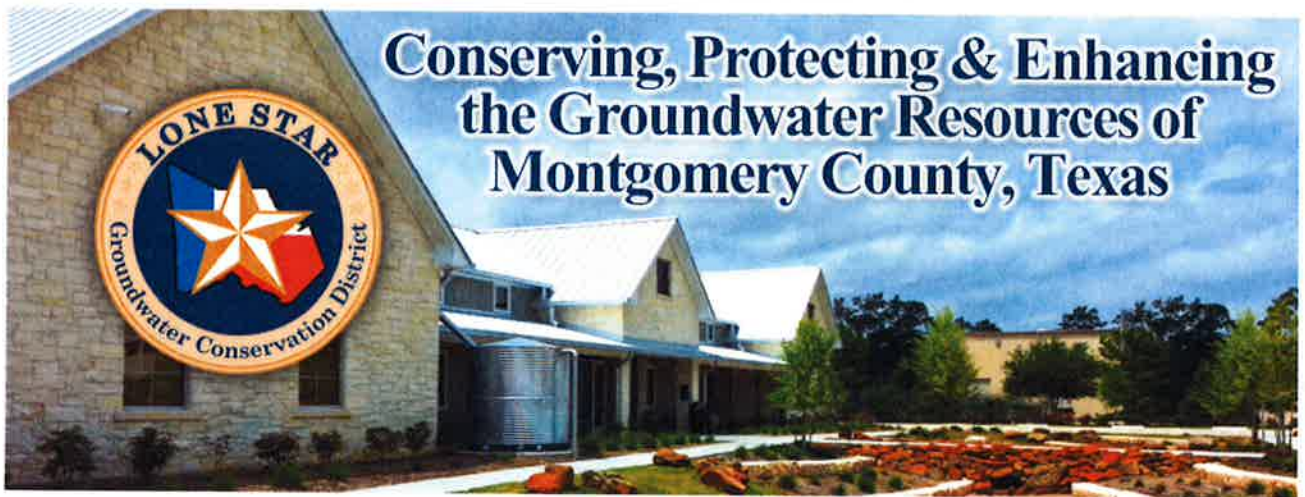
- "Loss of artesian pressure" relates ONLY to the amount of lift work that must be performed to bring well water to the surface and the related well engineering required to achieve and maintain it. Lift work is performed by a water pump located down in virtually all water wells of any significant production, artesian or otherwise.
- The cost in cents/1,000 gal attributable to lift costs (to supplement insufficient amounts of artesian pressure given the production desired) is SMALL. At electricity prices of 10 cents/KWH, Lift costs for 300 ft are only about 15 cents. As such, lift is a minor and secondary component of total costs and a routine part of well engineering, maintenance, and upgrading with time.

SUBSIDENCE -- MORE SPECIFICALLY "LAND SURFACE SUBSIDENCE"

It seemed this bogus issue had finally slipped from the front pages of Lone Star's lexicon on this whole matter. But here it is again in mid 2014 when the leverage is needed, no matter what the support is or is not for it.

- In its Town Hall Meeting presentation (readily available; use link here [WATCH TOWN HALL VIDEO](#)) LCCN clearly showed that, on this issue, MONTOMGERY COUNTY IS NOT LIKE HARRIS AND THE OTHER SUBSIDENCE DISTRICT COUNTIES BELOW US.
- The county's future lies not with the Evangeline (a shallow aquifer with limited use by a small localized few) but with the deep Jasper now and eventually with the still deeper Catahoula.
 - These aquifers have so far shown no evidence of land surface subsidence above them
 - These are deep, thick, clay boundary-layered aquifers that experts do not expect will produce any impacts at the land surface
 - USGS who initially (2003) showed modeling results that suggested otherwise (10-15 ft drops in Conroe by about now), recalibrated their models in 2010 in the face of actual field data in Montgomery County (NO subsidence). They have not supported serious land surface subsidence model work since then and won't. People have studiously avoided asking them to do so for good reason.

FOR THE RECORD, who is saying that an increase in well water depths of 200-300 ft is a problem....other than those trying to shut down groundwater use? The average depth to the top of the Jasper aquifer is about 1,000 ft or more. Such capacity to support depth speaks to the BLESSINGS of our Jasper, not to problems in its use so far or forecasted for the next level of economic development in our county.



PRESS RELEASE

For Immediate Release

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TWDB Releases TERS Numbers

CONROE, TX - June 27, 2014 - The Texas Water Development Board (TWDB) earlier this month released its total estimated recoverable storage (TERS) numbers for aquifers across the state, including those for Montgomery County and the Lone Star Groundwater Conservation District (Lone Star GCD). As expected, the figures, which are often misunderstood, are vastly larger for virtually every county across the state than the annual groundwater availability numbers that groundwater conservation districts use for pumping limits to achieve their 50-year planning goals in order to protect wells and well owners' abilities to access groundwater from their properties.

It is important to recognize that the very large water volumes provided in the TERS have limited to no applicability for the Lone Star GCD's setting of management goals for the aquifers underlying Montgomery County. This is due to the TERS calculation being somewhat irrelevant when compared to more pressing factors the district must balance in the management process.

The TERS numbers for Montgomery County are reported by the TWDB as a ballpark estimate in a range somewhere between 45 million and 135 million acre feet. As explained below, pumping of even less than 1 percent of that amount could result in catastrophic economic consequences for many well owners in Montgomery County.

Other Factors Considered: One of the primary reasons the Lone Star GCD enacted

its rules and regulatory plan was to address the serious problems many landowners in the county were already having with groundwater level declines in the aquifers, ranging from 200 to 300 feet of water level declines in some areas of the Evangeline and Jasper Aquifers. Those declines have caused well owners many problems in making their wells perform properly and being able to pay for the drilling and operational costs to pump groundwater. Pumping even one-half of 1 percent of the average TERS numbers released for Montgomery County would cause further water level declines to the point of complete elimination of all artesian pressure in the aquifers in Montgomery County. It is that artesian pressure that pushes water into a well bore and towards a well pump so that it can easily and affordably be produced by the well owner. To protect well owners from further water level declines and the loss of artesian pressure, and to operate the aquifers on a long-term sustainable basis, the Lone Star GCD uses total effective recharge to the aquifer as the basis for how much groundwater it allows to be pumped annually.

Allowing pumping at the levels included in the TERS calculation would also result in significant land subsidence, and could have a significant impact on water levels in streams and creeks in Montgomery County.

Limitations of TERS: The TERS calculation does not consider many factors that limit the practical recovery of groundwater from storage such as:

1. **Economic recoverability:** As noted above, very large declines in water levels and well yields will occur with only a small fraction of one percent of the TERS removed. Using TWDB's information for Montgomery County, removing just 0.26% of the total storage in the aquifer, or 460,000 acre-feet, would result in additional average water level declines of 387 feet. The Evangeline and Jasper Aquifers, which supply over 95% of the groundwater pumped in the county, would experience average drawdowns of 78 and 710 feet, respectively. Those severe declines would be in addition to the 200 to 300 feet of declines the aquifers have already experienced. It would take a very high density of deep, closely spaced and low-yield wells to recover any significant portions of the TERS water. In addition to the cost of well installation, the power costs to pump water from wells increases significantly with large water level declines. In sum, allowing such further declines in the aquifer would prevent many Montgomery County landowners from being able to pump meaningful amounts of water from beneath their land because it would not be affordable to drill and operate wells capable of doing so.
2. **Physical recoverability:** Not all sediments within an aquifer are the same. Slow drainage from less permeable sediments like clays could significantly limit the recoverability of water that is included in the TERS.
3. **Water quality:** The TERS calculation is not limited to fresh water portions of aquifers, but includes all areas of the Gulf Coast Aquifer system included in the state's computer model. This is important in the Lone Star GCD, where the Jasper Aquifer portion of the Gulf Coast Aquifer system contains both fresh and brackish water zones.

In conclusion, the TERS numbers are widely misunderstood and of limited value in their applicability to the groundwater management efforts of Lone Star GCD and

other groundwater conservation districts in Texas, as they attempt to manage groundwater resources for the benefit of the residents today and in the future.

The Lone Star GCD encourages interested stakeholders to access additional material for more information on this subject. Links are provided below.

References

Oliver, W., 2014. "Estimated Recoverable Storage: What it does, doesn't and might mean for planning." Presented at Texas Alliance of Groundwater Districts quarterly meeting, February 26, 2014. <http://www.slideshare.net/TXTAGD/tagd-TERS-presentationfeb2014>

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