Public Comments Regarding GMA-12 DFC/MAG Preliminary Scenarios

*"Advances are **made by answering questions.***
***Discoveries are made by questioning a**nswers."*
Bernard Haisch

In 2010, when the TWDB set our Modeled Available Groundwater (MAG) from the District's Desired Future Condition (DFC) numbers, I naively thought the best science had established a pretty good concept of our aquifers. We knew how much groundwater could be stored, how much could actually be removed from its geological formations, how much would percolate through the soils to the river beds and streams, how much could be replaced by rainfall. More importantly, we used the best science to predict how much could safely be pumped out of the aquifers without causing harm.

Imagine my surprise when some of these 2010 numbers increased by as much as 50%. It appears the primary variable that accounts for this increase is the human factor… more people moving in to BCS and more people outside the District needing a source of water. So if the 2010 DFCs were to calculate the safest amount of groundwater withdrawal that would keep our aquifers healthy and preserve them for future generations, what has changed in the aquifers, climate or streams in the last five years that would allow more discharge or pumping now?

The proposed 2016 Simsboro DFC would allow a 385 ft drawdown by 2070. This is an additional 115 ft decline! When asked why, I have been told that the computer modeling programs are better and we have more data to analyze. Also, I have been told the Simsboro has only dropped 39 feet since 2000 and that says the aquifer is performing way better than expected. This is followed by the statement that a 39 foot drop is way below its [Simsboro's] DFC.

Having completed a cursory review of some of the Simsboro well data in Robertson County, I have some misgivings as to the accuracy and value of the data collected. Computer modeling is only as good as the data used to create the end product. Please consider the following observations:

1. Driller's reports and well permits do not always indicate the correct GPS coordinates to properly locate the monitored well,
2. Well aquifer assignments have been confused,
3. Well water levels for some wells are erratic beyond normal use expectations possibly due to faulty measuring devices or techniques,
4. Most metered wells are not validated regarding their production and water levels at least once a year,
5. Determination of which wells to monitor does not follow a statistical sampling, and
6. District staff is prohibited from monitoring select wells due to owners refusing egress/regress despite legislative authority that would allow access. The staff is reluctant to force the issue using legal means.

I also reviewed the 2014 Annual Report. A Report given by the District's hydrologist in May2014 is quoted below. My comments are interjected in blue/underlined text.

Simsboro Aquifer

In Robertson County the amount of artesian head decline is influenced by the increase in pumping for agriculture in the area west of Hearne. Even with that pumping, the head decline in Well 59-03-437 is a good indicator of aquifer artesian head change as that well is pumped on a limited basis. **Well 59-03-437 is actually west of Calvert and is shown in Figure 1 as having an average drawdown of 30.15 feet. Well 59-04-001 is west of Hearne.** *At this time do not have a good explanation for the amount of artesian head decline in Well 39-61-501.* **Well 39-61-501 data shows a recorded static level of -231 ft. every month from 3/2013 to 8/2014. This is obviously abnormal but was still included in the** "average."

The DFC is an average of 270 feet of artesian head decline occurring by 2060. If we take the average for the 12 wells measured, the artesian head decline is about 39 feet for the period 2000 through about the beginning of 2013. **First, why not take all 59 Simsboro monitored wells? Second, why select 1/2013 for the end date when several more months of collected data was available? Third, why take an average of these wells, when plotting trend lines would have been a much better indicator of our actual decline?**

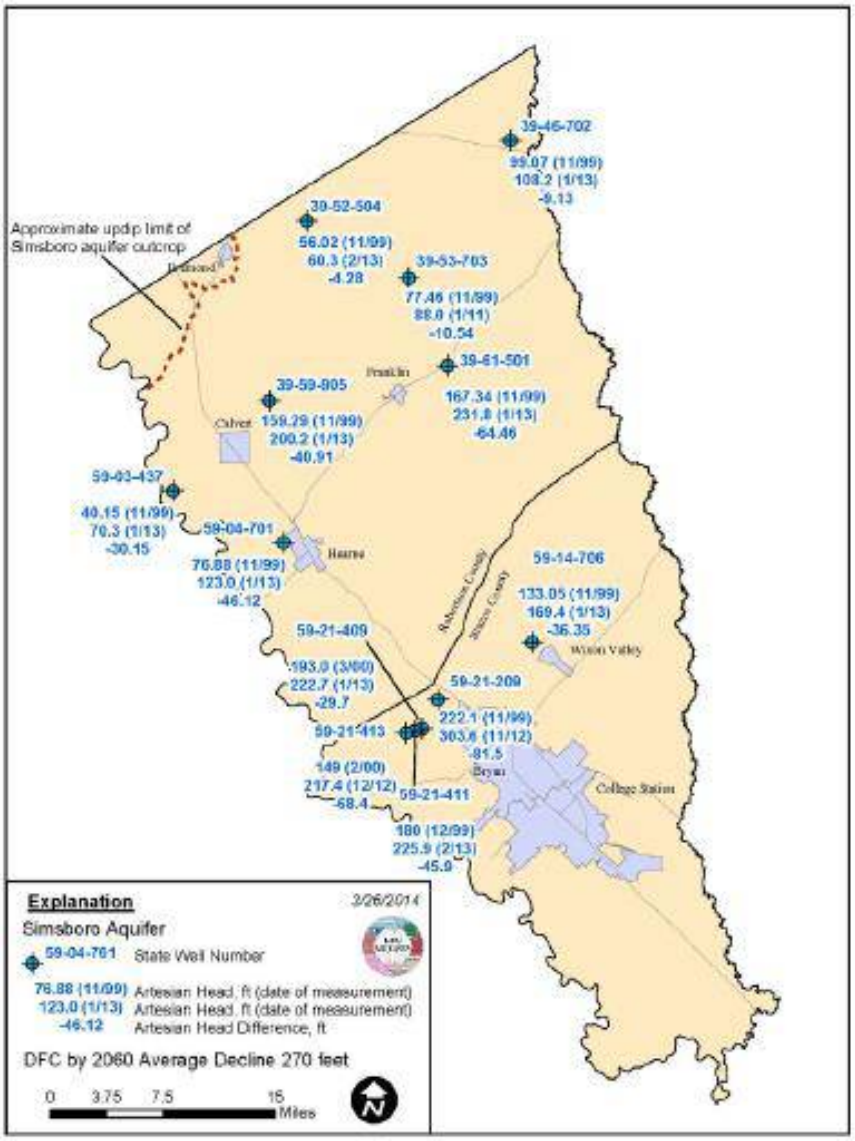


Figure 1

Of the twelve selected wells, please consider the following seven in Robertson County as identified above (also Attachment A).

1. **Well 39-52-504 is located in northern Robertson County a good distance from the primary producer of Simsboro groundwater and is over the Simsboro outcrop.**
2. **Well 39-46-702 is located in the NE corner of Robertson County a good distance from the primary producer of Simsboro groundwater, near the Navasota River and Lake Limestone and over the Carrizo-Wilcox outcrop zone.**
3. **Well 39-53-703 is a domestic/livestock well with no reading dated 1/11 on water level report and the last reading was taken in 7/2011. There have been no recorded readings since 7/2011. This well is over the Carrizo-Wilcox outcrop zone.**
4. **Well 39-61-501 is the well mentioned above with the identical water levels for 14 consecutive months.**
5. **Well 59-03-437 is very close to the Brazos River and** "pumped on a limited basis."
6. **Well 39-59-905 is a domestic/livestock well NE of Calvert with no reading dated 1/11 on the water level report and is over the Carrizo-Wilcox outcrop zone.**

7. **Well 59-04-701 is a municipal well located within 5 miles of several large producing agricultural wells. This well is not a primary well used by the City of Hearne residents. Please note the dramatic decline of water levels beginning in 2010 in Figure 2. This coincides with the arbitrated settlement of contested permits and the beginning of an annual 20,000 ac.ft. withdrawal of the Simsboro groundwater for agricultural irrigation west of Hearne.**

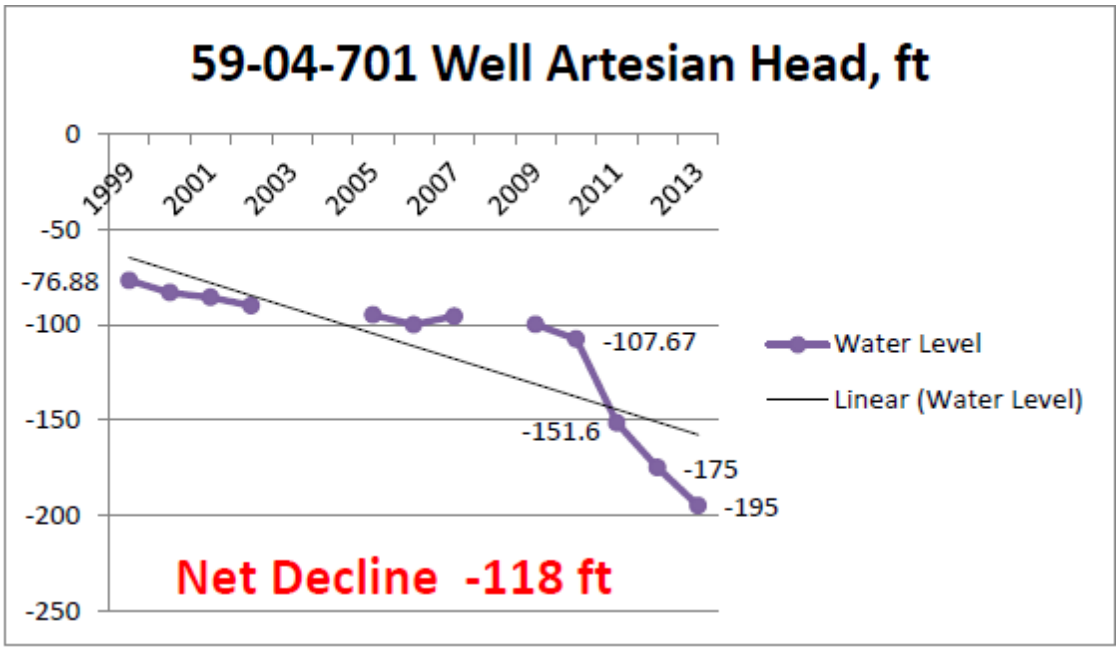


Figure 2

My last comment regarding this letter is somewhat explained by reviewing Attachment B. It is obvious that selective data may express true facts to derive a completely erroneous or misleading "prediction." **The datasets are available to evaluate our wells by plotting water levels by year and extending the slope of the line for predictive results (Attachment C) rather than accepting a poorly grouped average.**

Would it not be more accurate, from a study design perspective, to have a random sampling of monitored wells for each aquifer that would represent its geometric position within the District's boundaries? These wells should be defined by as many attributes as possible including its location, well head elevation, aquifer, outcrop zone, beneficial use, well depth, pump size, rate capacity, etc. Whatever information is necessary to understand the movement of groundwater. The monitoring should include artesian water levels or water levels and, if metered, the meter readings to validate reported production. I would be comfortable monitoring a larger sample less often to insure a representative selection of wells per aquifer. In addition, this methodology should help to identify outliers and anomalies which could otherwise skew study conclusions.

Obviously, I feel the data and modeling efforts need improvement. What concerns me is the materials and information compiled by the District staff and experts are accepted as presented without critical review and challenge by the Board of Directors. This Preliminary Groundwater Modeling Results presentation is simply a series of slides without explanation. There is no narrative to provide an opportunity for the reviewer to assess the following (Texas Water Code §36.108 (d)):

1. *aquifer uses or conditions within the management area, including conditions that differ substantially from one geographic area to another;*
    a. *for each aquifer, subdivision of an aquifer, or geologic strata and*
    b. *for each geographic area overlying an aquifer*
2. *the water supply needs and water management strategies included in the state water plan;*

3. *hydrological conditions, including for each aquifer in the management area the total estimated recoverable storage as provided by the executive administrator, and the average annual recharge, inflows, and discharge;*
4. *other environmental impacts, including impacts on spring flow and other interactions between groundwater and surface water;*
5. *the impact on subsidence;*
6. *socioeconomic impacts reasonably expected to occur;*
7. *the impact on the interests and rights in private property, including ownership and the rights of management area landowners and their lessees and assigns in groundwater as recognized under Section 36.002;*
8. *the feasibility of achieving the desired future condition; and,*
9. *any other information relevant to the specific desired future conditions.*

I realize there has been a long standing relationship with many of the Board of Directors and the professionals providing critical information to the Board. This should not lessen anyone's responsibility to be thorough in presenting information and/or recommendations nor negate the Board's responsibility to critically review and totally understand the information provided.

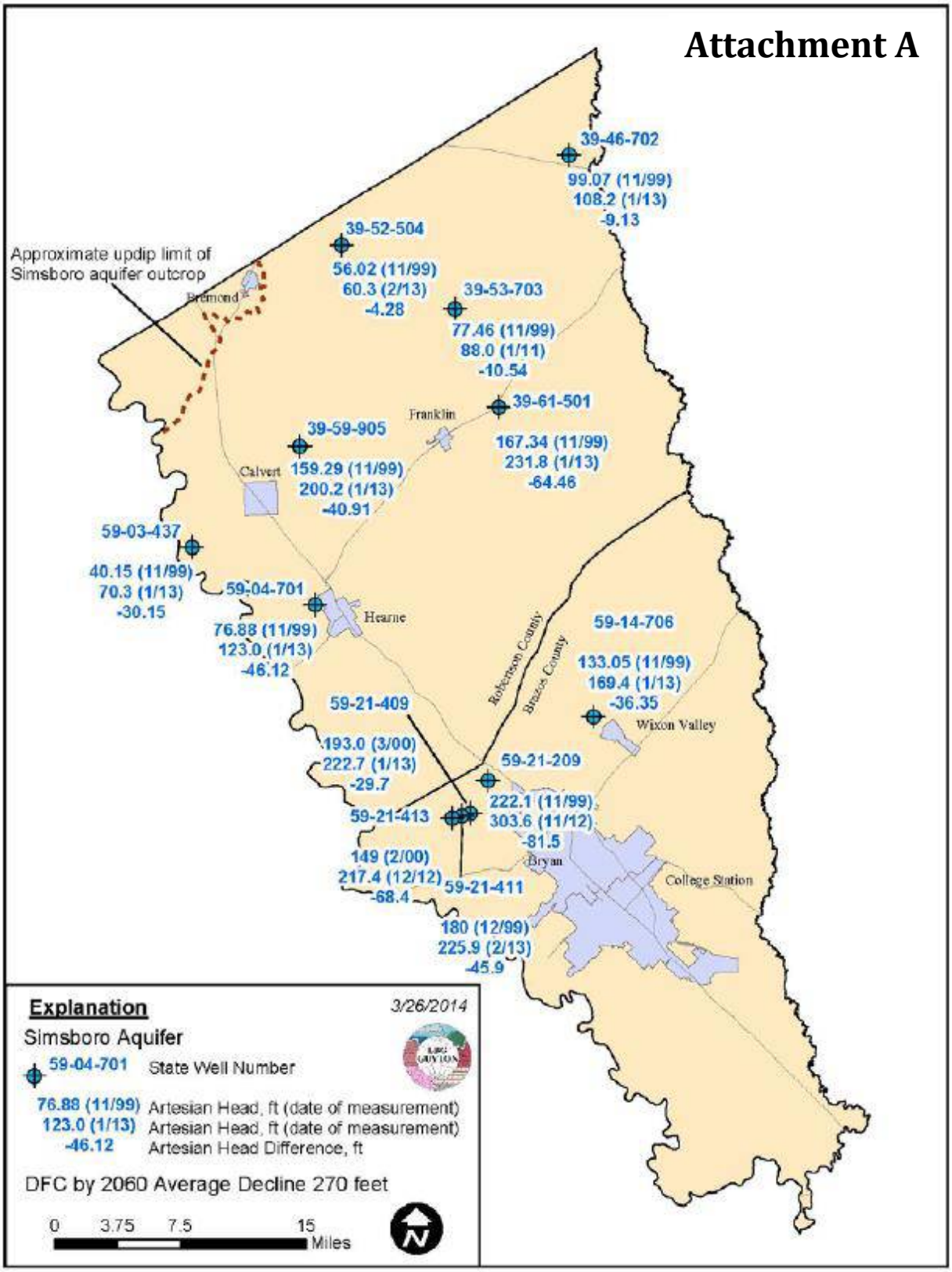
Therefore, until better data and computer models are available, I would ask the District to continue the current DFCs until the next review period. Increasing the DFCs will only encourage letting more permits on the potentially false promises of available groundwater. If this means the 2070 population projections require City and RWS providers to look elsewhere to meet the needs of their users, they have time to plan and prepare. It will give us time to critically review the datasets available and truly compare the subsequent models to historic use to validate its methodology.

Keeping our DFCs the same will also allow time to assess the consequences of declining water levels in real time. I am aware of well pumps being lowered to remedy previously performing wells. The analysis of all reworked or new

replacement wells might reveal a pattern or discovery that could be essential to our predictive criteria. Also, these events have a significant price tag for most users and a cost benefit analysis should be considered.

Lastly, I am concerned about the relationship between our rivers and streams and our aquifers. This interconnectivity between surface water and groundwater is critical for many fragile biological habitats. Without the explanatory report, I cannot determine if this environmental impact was considered. Regardless, it may be time for a new gain-loss study of the Brazos River to compare the impact of the withdrawal from the Simsboro of 20,000 ac.ft. along the river.

Attachment A



Attachment B

Texas Water Development Board
REPORTED WATER LEVEL DATA ON STATE WELL NUMBER = 5904701

No.	STATE WELL NUMBER	PUBLISHABLE/ NON-PUBLISHABLE	DEPTH FROM LAND SURFACE	MONTH	DAY	YEAR
1	5904701	P	-8.05	11	9	1979
2	5904701	P	-8.05	11	19	1979
3	5904701	P	-6	3	21	1980
4	5904701	P	-10.98	3	27	1981
5	5904701	P	-10.98	4	27	1981
6	5904701	N		3	24	1982
7	5904701	P	-21.04	11	12	1982
8	5904701	P	-22.45	11	9	1983
9	5904701	P	-30	11	16	1984
10	5904701	P	-32.65	11	6	1985
11	5904701	P	-31.84	12	16	1986
12	5904701	P	-35.92	11	18	1987
13	5904701	P	-41.95	1	12	1989
14	5904701	P	-44.07	11	8	1989
15	5904701	P	-48.79	11	12	1990
16	5904701	P	-49.66	11	4	1991
17	5904701	P	-51.25	11	13	1992
18	5904701	P	-65.5	3	21	1994
19	5904701	P	-75.8	12	8	1994
20	5904701	P	-57.4	11	15	1995
21	5904701	P	-63.12	11	12	1996
22	5904701	N		11	5	1997
23	5904701	N		11	17	1998
24	5904701	P	-76.88	11	10	1999
25	5904701	P	-83.3	9	13	2000
26	5904701	P	-85.79	11	16	2001
27	5904701	P	-90.06	11	12	2002
28	5904701	N		10	10	2003
29	5904701	P	-83.15	2	23	2005
30	5904701	P	-95	12	15	2005
31	5904701	P	-100.04	12	15	2006
32	5904701	P	-95.7	11	5	2007
33	5904701	P	-99.96	2	25	2009
34	5904701	P	-107.67	1	27	2010
35	5904701	P	-113.72	1	13	2011
36	5904701	P	-118	3	24	2011
37	5904701	P	-109.8	4	13	2011
38	5904701	P	-135.4	6	8	2011
39	5904701	P	-151.3	7	18	2011
40	5904701	P	-151.6	10	6	2011
41	5904701	P	-130.8	1	11	2012
42	5904701	P	-124.6	2	20	2012
43	5904701	P	-120	4	4	2012
44	5904701	P	-125	5	22	2012
45	5904701	P	-145.8	7	5	2012
46	5904701	P	-136.8	9	7	2012
47	5904701	P	-146.3	10	2	2012
48	5904701	P	-175	11	6	2012
49	5904701	P	-182	12	4	2012
50	5904701	P	-123	1	3	2013
51	5904701	P	-122.4	2	20	2013
52	5904701	P	-123.4	3	13	2013
53	5904701	P	-123.8	4	29	2013
54	5904701	P	-124.3	5	20	2013
55	5904701	P	-125.6	6	7	2013
56	5904701	P	-165	7	2	2013
57	5904701	P	-198	9	25	2013
58	5904701	P	-197	10	9	2013
59	5904701	P	-195	11	19	2013
60	5904701	P	-195	12	27	2013
61	5904701	P	-194	1	13	2014
62	5904701	P	-179	2	27	2014
63	5904701	P	-154	3	18	2014
64	5904701	P	-143	4	9	2014
65	5904701	P	-138	5	15	2014
66	5904701	P	-174	6	26	2014
67	5904701	P	-163	7	16	2014
68	5904701	P	-161	8	19	2014

NET DECLINE
Nov 1979 to Aug 2014
155 feet
over 35 years

LBG-Guyton Time Period selected for Simsboro drawdown average

Nov-99 to Jan-13 (13 years)
Net Decline 46.13 ft. or Average 3.5 ft/year

Lazarus Graph Time Period selected for Simsboro drawdown average

Nov-99 to Dec-13 (14 years)
Net Decline 118.12 ft. or Average 8.34 ft/year

Attachment C