

**Exhibit No. 3**

**TGI's Aquifer Evaluation Report on HTR Well Nos. 1 through 4, inclusive,  
dated February 10, 2023**



February 10, 2023

High Timber Resources, LP  
P.O. Box 5468  
Bryan, Texas 77805

Re: Aquifer Evaluation Report –  
Permit Amendment to Add Beneficial Uses to Wells BVOP-0017, BVOP-0018, BVR-0565, BVR-1006, BVR-1012, and BVR-1005 and Drilling and Production Permit Application for Proposed Six (6) New Wells To Be Completed in the Simsboro Aquifer, Robertson County, Texas

Dear Sir or Madam:

Per your request and in compliance with the rules of the Brazos Valley Groundwater Conservation District (BVGCD), Thornhill Group, Inc. (TGI) provides herein an evaluation of the projected effect of producing 11,870 acre-feet of water per year from six (6) proposed new production wells to be completed in the Simsboro aquifer on the properties identified as 00001-000015, 000011-000290, 000014-000450, 000038-000321, 000063-000860, and 000066-000120 in the Robertson County Central Appraisal District (CAD) database located in Robertson County. TGI conducted its evaluations and prepared this report in compliance with the rules and guidelines provided by the BVGCD, specifically in Rule 8.4(b)(7)(B) for wells (and multiple wells) capable of producing 800 or more acre-feet per year. Additionally, the aquifer evaluation report provides sufficient information to validate your Permit Amendment to add additional beneficial uses to your existing permitted Simsboro wells.

TGI's evaluations focused on assessing local aquifer conditions and parameters, and the extent to which production from the subject wells may influence other groundwater users in the BVGCD. TGI's evaluations are based on previous investigations conducted, including permit applications and field-testing. Additionally, TGI relied upon reported data, published reports, the applicable groundwater availability model (GAM), and TGI's extensive experience with and knowledge of the Simsboro aquifer in Central Texas, within the BVGCD, and particularly in Robertson County. Specifically, TGI's work was conducted to accomplish the following goals:

- ❖ Assess the local hydrogeologic setting, focusing on the physical characteristics and hydraulic parameters of the local Simsboro aquifer;
- ❖ Estimate and calculate the potential short-term and long-term drawdown at each of the wells, including interference drawdown between wells;

- ❖ Establish a target maximum proposed pumping rate for each well and for the aggregated well field;
- ❖ Model the feasibility of the targeted pumping rate and the potential impacts (e.g., artesian pressure reduction) to the aquifer and other nearby well owners (e.g., drawdown); and,
- ❖ Provide this Hydrogeological Evaluation Report in compliance with District rules.

For convenience, applicable illustrations and supporting documentation are included in the following attachments:

- Attachment 1 – Figures
- Attachment 2 – Tables
- Attachment 3 – Reference Materials
- Attachment 4 – Selected References

## Proposed Pumping Location and Permit Pumping Rates

Figure 1 provides a map showing the locations of the proposed wells and the outlines of the two (2) distinct contiguous properties on which the proposed well permits are sought. Proposed well identifications, coordinates, and estimated land-surface elevations in feet above mean sea level (MSL) as obtained from the National Elevation Dataset (NED) are as follows:

<b><u>Well Identification</u></b>	<b><u>Latitude*</u></b>	<b><u>Longitude*</u></b>	<b><u>NED Land Surface Elevation (ft AMSL)</u></b>
Hightimber_1	31.064429° N	-96.644738° W	323
Hightimber_2	31.055200° N	-96.642940° W	340
Hightimber_3	31.038877° N	-96.651306° W	348
Hightimber_4	31.029549° N	-96.640775° W	390
Hightimber_5	31.053744° N	-96.597003° W	410
Hightimber_6	31.062202° N	-96.596186° W	349

\*Coordinate system is WGS84 converted from NAD83 State Plane Texas Central (feet).

The proposed wells are located north of W FM 979 approximately 5 to 7 miles northeast of the City of Calvert. The proposed production capacity in gallons per minute (gpm) and requested permit allocation in acre-feet per year are as follows:

<u>Well Identification</u>	<u>Maximum Pumping Rate (GPM)</u>	<u>Annual Permit Allocation (AF)</u>
Hightimber_1	1,400	1,806
Hightimber_2	1,400	1,806
Hightimber_3	1,700	2,323
Hightimber_4	1,800	2,323
Hightimber_5	1,400	1,806
Hightimber_6	1,400	1,806

The proposed well locations comply with the BVGCD rules regarding spacing between wells and allocation of acreage per well. All wells are within or exceed the ½ foot per GPM rule for spacing distance from property lines, and do not violate the 1 foot per GPM rule for spacing distance from other wells completed in the same aquifer. Figure 2 shows all BVGCD registered wells within 1 (one) mile at a 1-inch to 1,000-foot scale. Figure 3 shows locations for BVGCD registered wells within five (5) miles of the subject proposed wells.

## Hydrogeologic Conditions and Aquifer Characteristics

### Surface Geologic Setting

Figure 4 is a surface geology map that shows the general trend in strike along outcrops is southwest to northeast. Beds dip normal to the trend in strike direction at an increasing rate towards the coast. The wedge of sediments that make up the area of interest thicken gulfward and represent a repeating pattern of transgressional and regressional depositional environments that were deposited between 35 to 65 millions years ago. A representative hydrostratigraphic column is presented below:

Period	Series	Strata	Hydrogeologic Unit
Tertiary	Eocene	Jackson Group	Yegua-Jackson Aquifer
		Yegua Fmn.	
		Cook Mountain Fmn.	Confining Unit
		Sparta Sand	Sparta Aquifer
		Weches Fmn.	Confining Unit
		Queen City Sand	Queen City Aquifer
		Reklaw Fmn.	Confining Unit
		Carrizo Sand	Carrizo-Wilcox Aquifer
	Calvert Bluff Fmn.		
	Simsboro Fmn.		
	Paleocene	Hooper Fmn.	Confining Unit
Miday Fmn.			

Both subject properties overlie the Calvert Bluff Formation of the Carrizo-Wilcox Aquifer. From youngest to oldest, the Carrizo-Wilcox Aquifer is composed of the Carrizo Sand, the Calvert Bluff Formation, the Simsboro Formation, and the Hooper Formation. While the Carrizo-Wilcox is mapped as a single Major Aquifer by the Texas Water Development Board (TWDB), it does not behave as a single aquifer within the BVGCD boundaries. This is due to the depositional history of the formations the comprise the aquifer. In general terms, coarser grained near shore deposits are bound and hydraulically separated to varying degrees by finer grained marine deposits. Also present at the surface across both subject properties is surficial alluvium deposited by the South Walnut and Walnut Creeks.

Faults associated with the Milano Fault Zone are mapped on the western contiguous property. They are normal faults with the downthrown block to the East. There are no mapped faults at the eastern contiguous property.

### [Simsboro Aquifer Conditions and Hydraulic Parameters](#)

The target water bearing formation for all proposed wells is the Simsboro Formation. A table of the representative depths to top and bottom of the Simsboro as well as total saturated thickness is presented below:

<b>Well Identification</b>	<b>Simsboro Top Depth (feet bgl)</b>	<b>Simsboro Base Depth (feet bgl)</b>	<b>Simsboro Thickness (feet)</b>
Hightimber_1	146	592	445
Hightimber_2	160	606	445
Hightimber_3	229	698	469
Hightimber_4	270	739	469
Hightimber_5	387	919	532
Hightimber_6	239	760	521

This data is extrapolated from the most recent version of the TWDB Central Portion of the Sparta, Queen City, and Carrizo-Wilcox Aquifer Groundwater Availability Model (GAM). A nearby geophysical log approximately 2,000 feet south Hightimber\_6 indicates the top of the Simsboro to be around 325 feet bgl. TGI also extracted hydraulic data for the subject properties from the most recent version of the GAM (Young, et al., 2018) which are presented in the following table.



<b>Well Identification</b>	<b>Hydraulic Conductivity (ft/d)</b>	<b>Transmissivity (gpd/ft)</b>	<b>Storage Coefficient (-)</b>
Hightimber_1	12.5	41,569	0.0001
Hightimber_2	13.1	43,758	0.0001
Hightimber_3	14.5	50,935	0.0001
Hightimber_4	14.5	50,935	0.0001
Hightimber_5	12.4	49,502	0.0001
Hightimber_6	12.1	47,238	0.0001

Water level elevations from the GAM were utilized in conjunction with the estimated elevation of the top of the Simsboro formation in feet AMSL to assess confinement of the target aquifer at each proposed well site. The results are presented in the following table:

<b>Well Identification</b>	<b>Extracted GAM Heads (ft AMSL)</b>	<b>Simsboro Top (ft AMSL)</b>	<b>Artesian Head (ft)</b>
Hightimber_1	212	182	30
Hightimber_2	222	180	42
Hightimber_3	229	120	110
Hightimber_4	229	120	110
Hightimber_5	249	23	226
Hightimber_6	248	110	138

At the two northernmost wells of the western property, the GAM indicates a slight artesian head, but the aquifer may or may not be under confined conditions. Nearby BVGCD Simsboro monitoring well BVOP-0018 shows that water levels as of 2023 are approximately 130 feet below ground level (bgl), which is approximately 20 feet deeper than indicated by the GAM. Monitoring wells BVR-1012 and BVR-1006 towards the southern end of the western property likewise indicate slightly lower water elevations than the GAM at approximately 225 feet bgl.

### Projected Effects of Proposed Pumping

The immediate impacts from production will be drawdown at the pumping wells. As the wells pump, artesian pressure or potentiometric head around the wells will decline forming a cone of depression. As production continues the cone of depression will extend radially from the well field until an aquifer boundary is reached or the production rate reaches equilibrium with the captured groundwater flows. There may be some inter-aquifer leakage induced from the overlying Calvert Bluff; however, the amount of leakage will serve to lessen the artesian

drawdown in the Simsboro and will likely not result in any identifiable water-level changes in the Calvert Bluff or alluvium due to the stratification in the geologic layers.

### Drawdown Simulations Using the GAM

TGI utilized the recently released revision and update of the Central Portion of the Sparta, Queen City, and Carrizo-Wilcox Aquifers GAM to calculate drawdown due to the proposed pumping for continuous pumping periods of one (1) year and 10 years. Figure 5 and Figure 6 provide maps showing modeled drawdown contours after one (1) year and 10 years of pumping at the permitted rate, respectively, according to the GAM. Table 1 provides modeled drawdown at specific registered and permitted Simsboro well sites within 5 miles of the proposed well locations.

Due to the grid scale (i.e., one mile) and configuration in the model, the GAM does not provide an accurate spatial representation of drawdown at the well site and in the immediate surrounding area, and the simulation likely predicts less drawdown than will actually occur near the pumping well. The GAM drawdown results at some distance from the proposed well field are probably more representative of the actual aquifer conditions and the potential results from pumping.

Note that several of the wells designated by the BVGCD as “Simsboro” wells may not actually be deep enough to penetrate the Simsboro aquifer. TGI did not attempt to verify the completion intervals of those wells, but simply reported the dataset as provided by BVGCD.

### Drawdown Simulations Using Analytical Modeling

As stated previously, due to the scale and configuration of the GAM grid, the GAM probably does not provide accurate drawdown calculations for the specific well sites and areas in the immediate vicinity of the proposed well field. Therefore, for comparison purposes and per the BVGCD rules TGI used an analytical modeling program based on the Theis non-equilibrium equation to calculate theoretical potentiometric head declines at and surrounding the proposed production wells. TGI has used the Theis model for several submittals to the BVGCD as well as for evaluations and submittals to numerous districts across the State of Texas. The Theis model incorporates many assumptions, most of which are sufficiently satisfied in the local Simsboro aquifer. However, the Theis model assumes an aquifer that is uniform over an infinite area. To account for recharge boundaries and possible inter-aquifer leakage into the Simsboro, TGI modeled long-term pumping (i.e., from one to 10 years) by incorporating a leaky artesian storage coefficient progressing towards a near unconfined storage coefficient. A table of the transmissivity and storage coefficient values utilized in the analytical modelling by time step and for each well is presented below:

<b>Well Identification</b>	<b>Transmissivity (gpd/ft)</b>	<b>1-Year Storage Coefficient (-)</b>	<b>10-Year Storage Coefficient (-)</b>
Hightimber_1	45,000	0.03	0.15
Hightimber_2	50,000	0.03	0.15
Hightimber_3	55,000	0.03	0.15
Hightimber_4	55,000	0.03	0.15
Hightimber_5	57,500	0.03	0.15
Hightimber_6	50,000	0.03	0.15

While the Theis model likely provides more reliable results within and near the well field, it probably overstates drawdown at distance from the pumping center. Also, the Theis model is more accurate for shorter pumping durations; therefore, the 10-year calculation likely overestimates drawdown from the well field.

Figure 7 and Figure 8 provide the Theis-modeled drawdown contours for pumping periods of one (1) year and 10 years, respectively. Table 1 provides the tabulated drawdown at specific Simsboro well sites, based on the locations and designations of aquifers provided by BVGCD in their database files. Estimated drawdowns due to pumping of the proposed wells for both the GAM and analytical modelling is presented in the following table:

<b>Well Identification</b>	<b>1-Year GAM Drawdown (ft)</b>	<b>10-Year GAM Drawdown (ft)</b>	<b>1-Year Analytical Drawdown (ft)</b>	<b>10-Year Analytical Drawdown (ft)</b>
Hightimber_1	21	66	36	45
Hightimber_2	26	69	32	41
Hightimber_3	34	67	31	40
Hightimber_4	39	64	27	36
Hightimber_5	35	54	28	35
Hightimber_6	30	49	25	33

Depending on the actual depths to the top of the Simsboro encountered at each individual well site and the static water levels, some wells may progress to unconfined conditions under these modelling scenarios. The heightened drawdown from the GAM modelling in comparison to the analytical is likely due to the constant storage coefficient utilized in the GAM which was varied over time in the analytical scenarios.

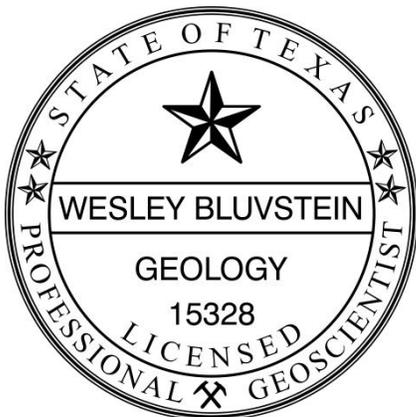
It is worth noting that the nature of the modelling assumes constant pumping for the entire duration being evaluated, i.e. 1 and 10 years. In reality, it is not feasible or practical for a well to pump continuously for 10 years or even 1 year. Breaks in pumping due to well maintenance, operation schedules, and demand needs will allow for recovery periods, and ultimately that will likely decrease the observed drawdown.

## Conclusions

Based on our review of the BVGCD rules and the work conducted as described herein, TGI concludes the following:

- ❖ The proposed wells and pumping amounts can be completed and produced in accordance with the well spacing and production-based acreage (i.e., allocation) rules set forth by the BVGCD;
  - Current available drawdown and predicted drawdown demonstrate that the wells will be capable of sustaining their target rates;
- ❖ The predicted drawdown derived from the Theis analytical model are more accurate than the GAM predictions for the proposed well sites and areas near the well field;
- ❖ GAM-predicted drawdown probably provides a more reasonable estimate of future impacts at greater distances from the proposed well field and for longer time periods; and,
- ❖ Production from the proposed wells will initially cause only reduction in aquifer interstitial pressure but the possibility of abstraction of water from storage is introduced at longer time frames and depending on environmental conditions.

We very much appreciate the opportunity to again assist you in our specialty. If you have any questions, please call.



The seal appearing on this document was authorized by Wesley Bluvstein, P.G. on February 10, 2023.

Attachments

Sincerely,  
**THORNHILL GROUP, INC.**



Wesley Bluvstein, P.G.