



September 5, 2024

Penny Hanson, General Manager
Neches and Trinity Valleys GCD
501 Devereaux Street
Jacksonville, TX 75766

RE: Hydrogeological Report for the Neches and Trinity Valleys GCD
Queen City Sand Wellfield – Bluebonnet Property, Henderson County, TX

Dear Ms. Hanson,

LRE Water ("LRE") is pleased to submit this Hydrogeological Report to the Neches and Trinity Valleys Groundwater Conservation District ("NTVGCD" or District) on behalf of Pine Bliss, LLC. The purpose of this Hydrogeological Report is to assess the potential impacts associated with a proposed Queen City wellfield on an approximately 4,112-acre property (herein referred to as the "Bluebonnet Property") in Henderson County, Texas. According to District Rule 5.4(k), applicants requesting to drill and operate a proposed new well or well system with a daily maximum capacity of more than 2 million gallons or requests to modify to increase production or production capacity of a non-exempt well with an outside casing diameter greater than 10 inches is required to submit a Hydrogeological Report with the permit application. This Hydrogeologic Report addresses the area of influence, estimated drawdown, recovery time, relation of proposed pumping to the modeled available groundwater (MAG) and the desired future conditions, and water usage for the proposed production as it relates to the current Regional Plan. The information provided herein is intended to supplement the Groundwater Availability Study prepared by LRE for Pine Bliss, LLC, dated June 5, 2024, and to address deficiencies in the permit application, as noted in the District's letter to Pine Bliss, LLC, dated August 8, 2024.

The proposed wellfield will consist of 11 wells producing a total combined production capacity of 3,475 gallons per minute (gpm), or 5,620 acre-feet per year (ac-ft/yr) from the Queen City Sand. The intended use for which production is requested includes all beneficial purposes as those terms are defined in Section 36.001(9) of the Texas Water Code (2011) and NTVGCD Rule 1(c). The produced water is planned to be used within Regional Water Planning Areas C, G, H, K, and L.

Background

For this work, LRE compiled and reviewed publicly available information pertaining to the geologic structure, lithology, and hydraulic properties of the Queen City Sand beneath the Bluebonnet Property. This included a review of geologic and hydrogeologic data from published groundwater studies, geologic maps, state well reports, well drilling reports, and other applicable information from published literature. Data sources included the Texas Commission on Environmental Quality (TCEQ), the Texas Water Development Board (TWDB) Groundwater Database, the Submitted Drillers Report (SDR) Database, and LRE files. LRE's literature review included the TWDB Report No. 150 ("R-150") "Ground-Water Conditions in Anderson, Cherokee, Freestone, and Henderson Counties, Texas by Guyton & Associates (1972) and TWDB Report No. 327 ("R-327") "Evaluation of Ground Water Resources in the Vicinity of the Cities of Henderson, Jacksonville, Kilgore, Lufkin, Nacogdoches, Rusk, and Tyler in East Texas" by Preston and Moore (1991). Hydraulic properties for the Queen City Sand were extracted from the Northern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifer Groundwater Availability Model ("North QCSCW GAM"; Layer 4) Conceptual Report by Schorr and others (2020).

Appendix A provides the latitude and longitude coordinates and pumping rates for the proposed wells on the Bluebonnet Property. Each proposed well will be completed with an outer casing diameter greater than 10 inches and will be equipped with a pump capable of producing the proposed pumping rates outlined in Appendix A. On August 15, 2024, the District provided LRE (via email) a list of all exempt and non-exempt wells registered with the District in Henderson County. LRE compiled all publicly available well data from the NTVGCD, the TWDB, and the SDR Databases to identify wells within 1-mile of the Bluebonnet Property (See Appendix B). Figure 1 presents a map of the proposed well locations on the Bluebonnet Property and all surrounding wells in the NTVGCD, TWDB, and SDR Databases within 1-mile of the Bluebonnet Property. All proposed well locations are at least a ¼-mile radial distance from the nearest property boundary and surrounding wells, as shown in Figure 1. These proposed well locations meet the minimum well spacing requirements outlined in District Rule 7(a) and adhere to the TCEQ's well setback requirements from potential sources of contamination or flood-prone areas, as specified in Title 30 of the Administrative Code (30 TAC) §290.41(c)(1).

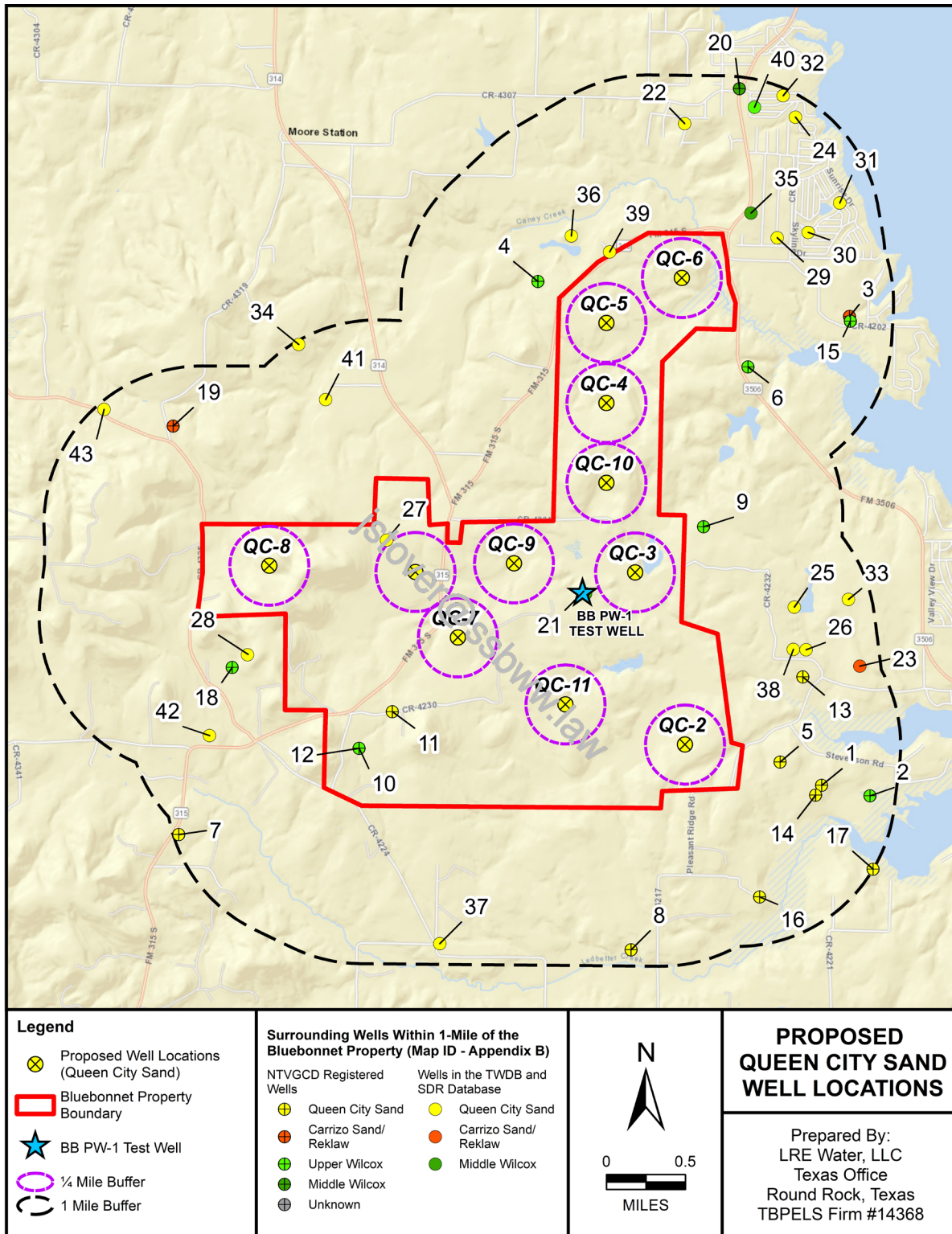


Figure 1. Proposed Well Locations on the Bluebonnet Property

Analytical Groundwater Modeling

LRE conducted analytical groundwater modeling to assess local drawdown impacts, recovery time, and well interference between proposed wells on the Bluebonnet Property. Proposed well locations and pumping rates were selected based on considerations of the hydrogeologic conditions, including aquifer depths, saturated sand thickness, aquifer productivity, hydraulic characteristics, and well spacing requirements. Table 1 summarizes the input parameters used in the analytical modeling, which are based on estimated hydraulic properties from surrounding well data, interpretation of geophysical logs, and data obtained from the Conceptual North QCSCW GAM Report by Schorr and others (2020).

Table 1. Input Parameters for Analytical Modeling

Proposed Well	Top of Screen (ft bls)	Bottom of Screen (ft bls)	Aquifer Thickness (ft)	Sat. Net Sand (ft)	Pump Depth (ft bls)	SWL (ft bls)	Sy*	K (gpd/ft ²)	T (gpd/ft)
QC-1	110	360	350	250	200	10	0.15	34.00	8,500
QC-2	110	340	325	230	200	15	0.15	34.69	7,980
QC-3	95	340	340	245	170	0	0.15	50.26	12,315
QC-4	100	345	345	245	200	0	0.15	65.36	16,015
QC-5	80	325	325	245	200	0	0.15	74.35	18,215
QC-6	65	295	295	230	190	0	0.15	105.22	24,200
QC-7	125	365	340	240	220	25	0.15	32.19	7,725
QC-8	225	485	375	260	340	110	0.15	18.96	4,930
QC-9	70	320	320	250	170	0	0.15	45.16	11,290
QC-10	95	340	340	245	190	0	0.15	57.46	14,080
QC-11	110	350	345	240	185	5	0.15	32.92	7,900

"ft bls" indicates feet below land surface; land surface elevation from NED (USGS, 2004), "ft" indicates feet, "SWL" indicates static water level, "gpd/ft²" indicates gallons per day per foot squared, "gpd/ft" indicates gallons per day per foot, *indicates value is obtained from Layer 4 of the North QCSCW GAM Conceptual Report (Schorr and others, 2020), Sy = Specific Yield (unconfined aquifer), K = hydraulic conductivity, T = Transmissivity.

LRE evaluated the local drawdown impacts and well interference between wells completed in the Queen City Sand on the Bluebonnet Property using the Cooper-Jacob (1946) equation, with a correction to account for the reduction in saturated thickness in an unconfined aquifer during pumping (Kruseman and de Ridder, 1994). The correction is given by $s' = s - s^2 / 2b$ or $s = b - b\sqrt{(1 - 2s'/b)}$, where s' represents the equivalent drawdown for a confined aquifer (in feet) calculated using the Cooper-Jacob (1946) equation, s is the corrected drawdown for an unconfined aquifer (in feet), and b is aquifer thickness (in feet) (Kruseman and de Ridder, 1994). The results from modeling the proposed production in the Queen City Sand after five years of pumping are summarized in Table 2.

Table 2. Results from the Analytical Modeling After Five Years

Proposed Well	Proposed Pumping Rate (gpm)	Proposed Production (ac-ft/yr)	Drawdown from Pumping Well (ft)	Drawdown Imposed from Surrounding Well (ft)	Cumulative Drawdown in Well (ft)	Recovery Time (Days)
QC-1	225	364	93	10	103	208
QC-2	225	364	102	3	105	225
QC-3	300	485	87	12	99	191
QC-4	425	687	98	25	123	148
QC-5	500	809	104	23	127	149
QC-6	625	1,011	100	14	115	157
QC-7	200	323	91	14	104	197
QC-8	200	323	150	1	152	222
QC-9	225	364	69	18	88	162
QC-10	325	526	82	23	106	150
QC-11	225	364	102	8	110	213

"gpm" indicates gallons per minute, "ft" indicates feet, "ac-ft/yr" indicates acre-feet per year.

Table 2 presents the cumulative drawdown calculated using the Cooper-Jacob (1946) equation and correction (Kruseman and de Ridder, 1994), which includes drawdown in the wellbore from both the pumping well and additional drawdown imposed from other proposed wells pumping from the Queen City Sand on the Bluebonnet Property. Based on the proposed pumping rates and estimated hydraulic properties in Table 1, cumulative drawdown in the proposed wells range from 88 to 152 feet after five years (Table 2). Recovery time was calculated as the length of time for water levels to recover 90% of the drawdown after pumping for five years using the Cooper-Jacob (1946) equation. As indicated in Table 2, the time for water levels to recover in the Queen City Sand ranges from 148 to 225 days. Hydrographs of the simulated pumping and recovery water levels in each proposed well due to the combined production of 5,620 ac-ft/yr at the Bluebonnet Property for five years are presented in Appendix C.

The area of influence can typically be defined as the distance where the impacts from pumping results in 1-foot of drawdown in the aquifer. Figure 2 illustrates the cumulative drawdown and area of influence in the Queen City Sand after five years of pumping based on the analytical modeling using the Cooper-Jacob (1946) equation and correction (Kruseman and de Ridder, 1994) and input parameters in Table 1.

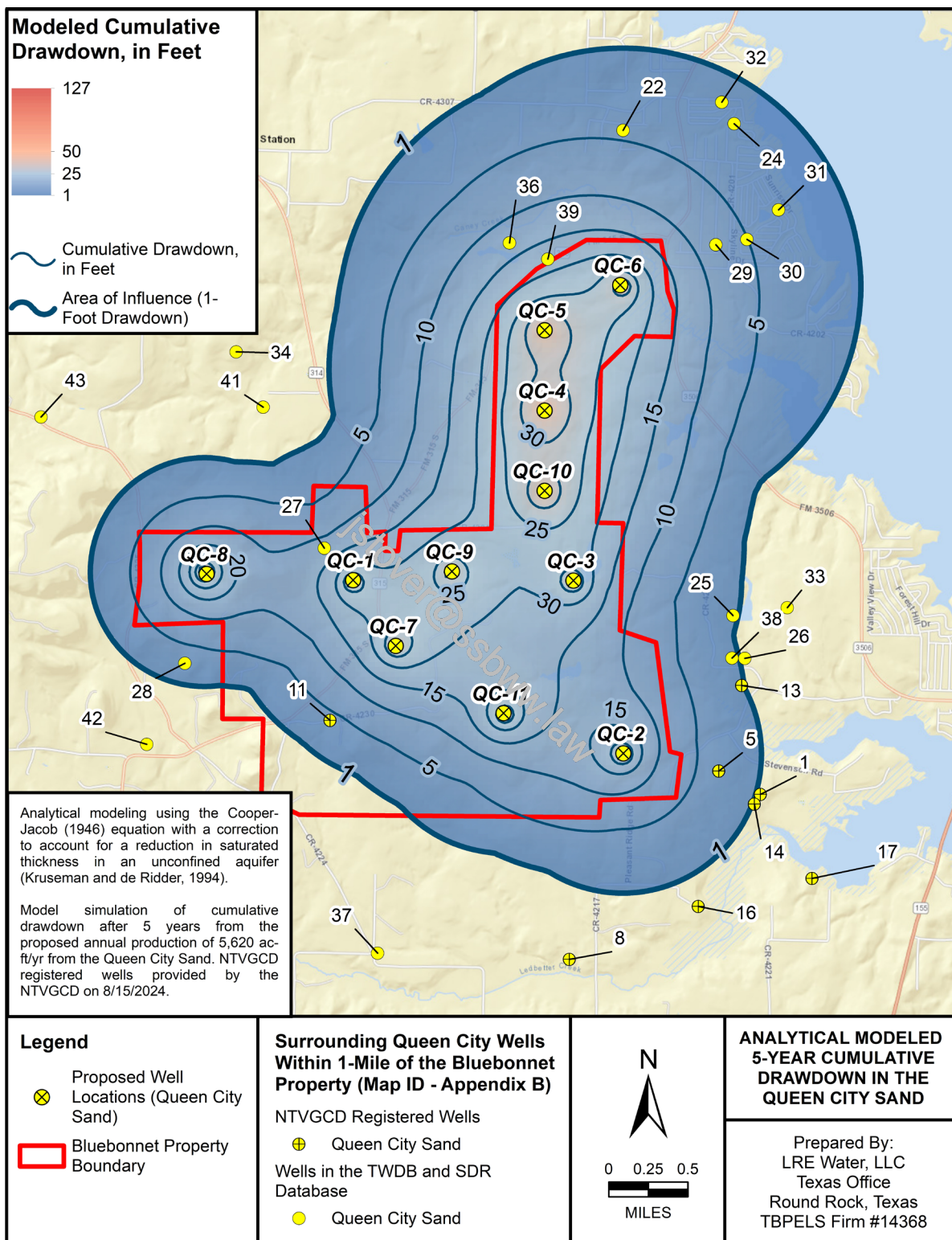


Figure 2. Analytical Modeled Cumulative 5-Year Drawdown in the Queen City Sand

It is important to note that the analytical modeling does not consider boundary conditions such as faults or additional water supply from recharge, which may occur from precipitation infiltration in the aquifer outcrop, seepage from lakes or other bodies of surface water, or by vertical and lateral movement of water between formations. The proposed wells are located within the outcrop of the Queen City Sand and in close proximity to Lake Palestine, which may provide recharge to the Queen City Sand. However, wells completed in the Queen City Sand may also be more susceptible to changes in water levels and impacts of drought conditions. Therefore, actual aquifer conditions and impacts to the Queen City Sand may differ from the results presented herein.

Numerical Groundwater Modeling

LRE conducted numerical modeling to evaluate the regional impacts of the combined production of 5,620 ac-ft/yr for five years from the Queen City Sand (North QCSCW GAM; Layer 4) on the adopted DFCs. The results of the numerical modeling suggest that the proposed combined production of 5,620 ac-ft/yr from the Queen City Sand could not be sustained for five years under current model constraints. Based on LRE's evaluation, computed transmissivity values for the Queen City Sand from surrounding well data were higher than those for the Queen City Sand (Layer 4) in the North QCSCW GAM Numerical Report by Panday and others (2020). Therefore, the combined production of 5,620 ac-ft/yr that could be sustained in the analytical modeling was not attainable in the numerical modeling. In addition, the size of the model grid cells and proximity of the proposed wells on the Bluebonnet Property resulted in multiple wells being located in the same model grid cell, leading to accelerated water level depletion in certain model cells. To mitigate this numerical modeling constraint, MODFLOW algorithms automatically reduced the simulated pumping rates to prevent the model cells from being depleted (a process called "auto-flow" reduction in MODFLOW). The combined annual production of 5,620 ac-ft was automatically reduced in MODFLOW to 4,131 ac-ft (Year 1), 3,624 ac-ft (Year 2), 3,420 ac-ft (Year 3), 3,307 ac-ft (Year 4), and 3,236 ac-ft (Year 5), a production reduction of approximately 15-23% (Table 3). Due to model assumptions and limitations, projected impacts from the proposed combined annual production of 5,620 ac-ft from the Queen City Sand could not be accurately depicted. Figure 3 illustrates the cumulative drawdown in the Queen City Sand as result of the auto-flow reduced pumping rates in MODFLOW outlined in Table 3.

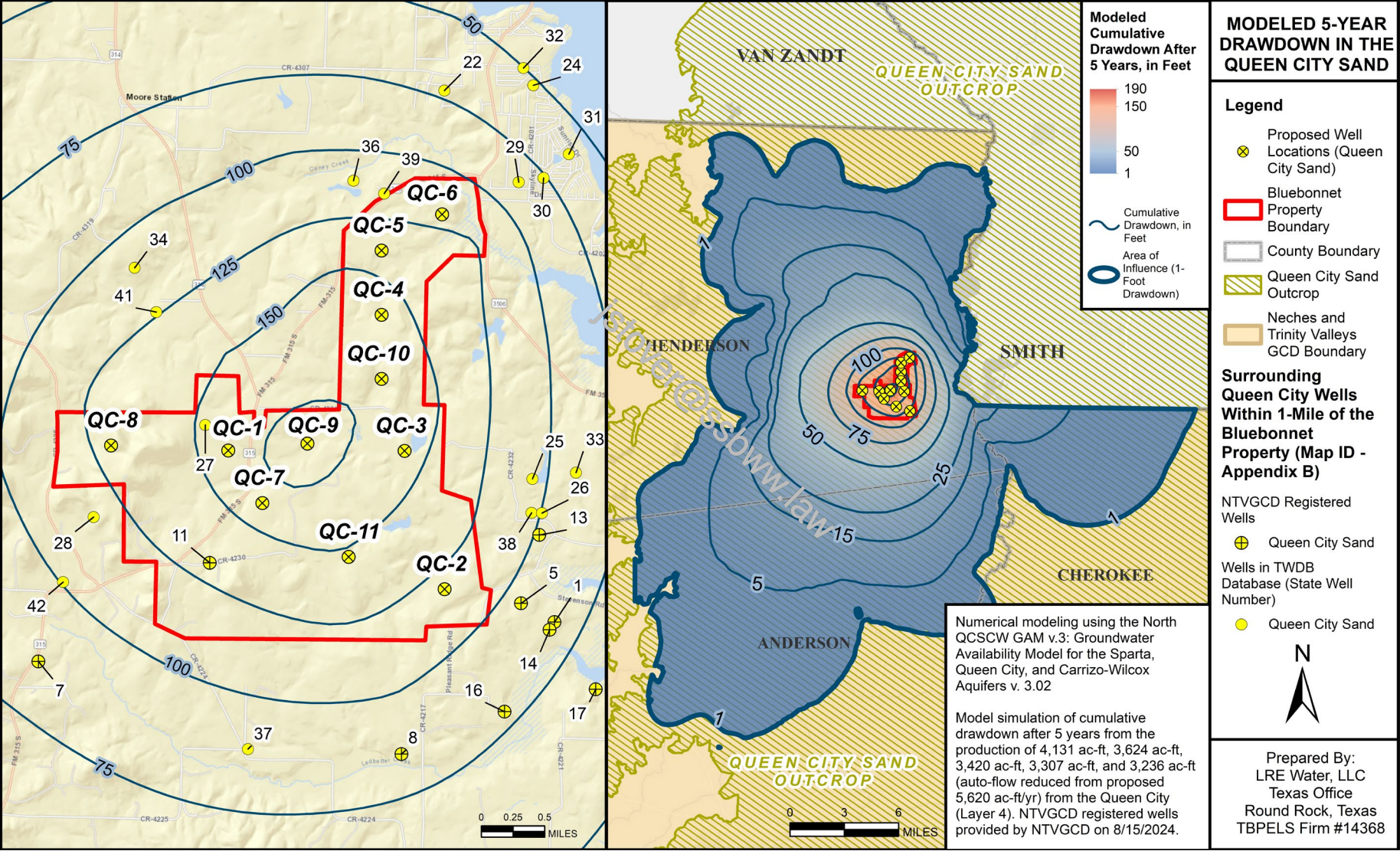


Figure 3. Numerical Modeled Cumulative 5-Year Drawdown in the Queen City Sand (North QCSCW GAM; Layer 4)

Table 3. Auto-Flow Reductions in the Queen City Sand (Layer 4) in MODFLOW

Model Time (Years)	Combined Pumping Rate (gpm)	Combined Annual Production (ac-ft)	Percent Reduction (%)
0	3,475	5,620	0%
1	2,553	4,131	15%
2	2,240	3,624	19%
3	2,114	3,420	21%
4	2,044	3,307	23%
5	2,000	3,236	23%

"gpm" indicates gallons per minute, "ac-ft" indicates acre-feet.

While the North QCSCW GAM is a useful tool for predicting regional changes within aquifer systems, its size and complexity can limit its ability to accurately represent local hydrogeologic conditions. More specifically, the GAM may lack detailed localized data, such as results from pumping tests, current water level measurements, and specific aquifer depths. To more accurately reflect current and future aquifer conditions and regional impacts from the proposed pumpage, updates to the hydraulic properties of the Queen City Sand (Layer 4) in the North QCSCW GAM and/or modifications to the model grid cell size are necessary.

Modeled Available Groundwater

Modeled available groundwater (MAG), as defined in Chapter 36 of the Texas Water Code (2011), represents the estimated average amount of water that may be produced annually to achieve a DFC. The MAG, as set forth in Section H of the District's Groundwater Management Plan (Amended August 15, 2019), is based on the model run GAM Run 17-024 MAG from June 19, 2017 (Wade, 2017). The MAG for the Queen City Sand in Henderson County is 15,412 acre-feet from 2010 to 2070, based on the GAM Run 17-024 MAG (Wade, 2017).

The TWDB issued the most recent GAM Run-21-016 MAG Report for the Carrizo-Wilcox, Queen City, and Sparta Aquifers in GMA-11 on February 17, 2022 (Wade, 2022), which used the North QCSCW GAM and documented development of the estimated modeled available groundwater associated with the DFCs adopted by GMA-11 on August 11, 2021. According to the 2021 Joint Planning Cycle GAM Run 21-016 MAG, the MAG for the Queen City Sand in Henderson County ranges from 10,671 ac-ft/yr from 2020 to 2040, and 10,670 ac-ft/yr from 2050 to 2080 (Wade, 2022).

The most recent DFCs were approved by GMA-11 on August 11, 2021 and were based on modeling Scenario 33, as documented in Technical Memorandum 21-01 (Hutchinson, 2021a). As described in the GMA-11 Desired Future Conditions Explanatory Report

(Hutchinson, 2021c), average drawdown across the county represents the regional average drawdown occurring due to pumping during the period of interest. The recently adopted DFCs for Henderson County are an average drawdown of 33 feet in the Queen City Sand (Layer 4) from 2013 to 2080 (Hutchinson, 2021a).

Cumulative drawdown from the numerical modeling was computed and compared to the drawdown from the “Base Run” used to calculate the 2021 DFC’s for the Queen City Sand (Hutchison, 2021b). Table 4 presents the MODFLOW modeling results comparing the simulated “Base Run” average drawdown in Henderson County after five years, based on Scenario 33 documented in Technical Memorandum 21-01 (Hutchinson, 2021b), and the simulated model-predicted average drawdown in Henderson County after five years of pumping from the Queen City Sand (Layer 4) on the Bluebonnet Property at the rates presented in Table 3.

Table 4. Five-Year Model Predicted Average Drawdown in Henderson County

Aquifer	Model Layer	Average Drawdown, in Feet		
		Simulated “Base Run” Scenario 33 (TM 21-01)	Simulated “Base Run” & “Proposed QC”	Simulated “Proposed QC” Only
Queen City	4	16.5	29.2	12.7
Carrizo	6	101.0	102.5	1.5
Upper Wilcox	7	72.8	73.9	1.1
Middle Wilcox	8	56.5	57.1	0.6
Lower Wilcox	9	47.2	47.6	0.4
Avg CZ-WLX	6-9	69.4	70.3	0.9

“Base Run” indicates the Groundwater Availability Model (GAM) Scenario 33, TM 21-01 (Hutchinson, 2021b), “Proposed QC” indicates proposed production in the Queen City Sand (Layer 4) based on MODFLOW auto-reduced flowrates in Table 3.

After five years, the average drawdown in Henderson County from the “Base Run” Scenario is approximately 16.5 feet for the Queen City Sand (Hutchison, 2021b) (Table 4). The additional drawdown in Henderson County due to the proposed production in the Queen City Sand at the Bluebonnet Property (Simulated “Proposed QC” Only) is approximately 12.7 feet after five years (Table 4).

Regional Water Plan

The place of use for the proposed water will be in areas that are currently experiencing significant water challenges, specifically in counties that are part of Regional Water Planning Areas C, G, H, K, and/or L. Detailed and board-approved water plans are accessible at the following links: <https://www.twdb.texas.gov/waterplanning/rwp/regions/>

and <https://texasstatewaterplan.org/statewide>. Based on the 2021 Interactive State Water Plan Viewer, the following deficits are projected:

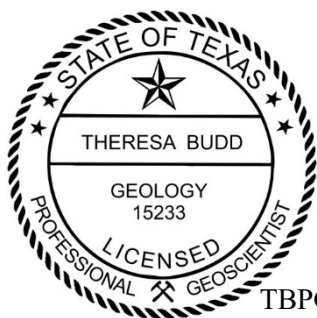
- Region C: A shortfall of 250,000 acre-feet by 2030, increasing to a 1.24 million acre-feet deficit by 2070.
- Region G: A shortfall of 100,000 acre-feet by 2040, increasing up to a 300,000 acre-feet deficit by 2070.
- Region K: A shortfall of 40,000 acre-feet by 2040, increasing to a 100,000 acre-feet deficit by 2070.
- Region L: A shortfall of 50,000 acre-feet by 2030, increasing to a 210,000 acre-feet deficit by 2070.
- Region H: A shortfall of 210,000 acre-feet by 2030, increasing to 700,000 acre-feet deficit by 2070.

Greater deficits are expected based on 2026 planning data, which is currently under development. According to the 2021 Interactive State Water Plan Viewer, there is no water deficit projected in Henderson County from the present until 2070. The water to be produced from the Queen City Sand, as detailed in this report, is crucial for serving the populations in regions of Texas that face severe water shortages.

LRE appreciates the opportunity to provide you with this Hydrogeologic Report on behalf of Pine Bliss, LLC. If you have any questions, please do not hesitate to contact us.

Sincerely,

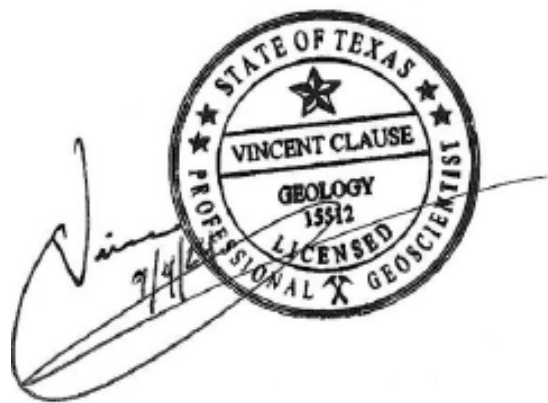
LRE Water



9/5/2024

TBPG Firm #50516

Theresa Budd, PG
Senior Project Hydrogeologist



Vince Clause, PG, GISP
Texas Groundwater Lead

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- Hutchinson, W.R., 2021c, Desired Future Conditions Explanatory Report (Final) Carrizo-Wilcox/Queen City/Sparta Aquifers for Groundwater Management Area 11.
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Appendix A –
Location of Proposed Queen City Sand Wells on the Bluebonnet Property

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Appendix A – Location of Proposed Queen City Sand Wells

Proposed Well	Latitude (NAD83) Decimal Degrees	Longitude (NAD83) Decimal Degrees	Latitude (NAD83) Degrees Minutes Seconds	Longitude (NAD83) Degrees Minutes Seconds	Proposed Pumping Rate (gpm)	Proposed Production (ac-ft/yr)
QC-1	32.14490928	-95.55097848	32°8' 41.673" N	95°33' 3.523" W	225	364
QC-2	32.1296435	-95.52145003	32°7' 46.717" N	95°31' 17.220" W	225	364
QC-3	32.14534574	-95.52726859	32°8' 43.245" N	95°31' 38.167" W	300	485
QC-4	32.16083798	-95.53079299	32°9' 39.017" N	95°31' 50.855" W	425	687
QC-5	32.16819386	-95.53099677	32°10' 5.498" N	95°31' 51.588" W	500	809
QC-6	32.17248575	-95.52296726	32°10' 20.949" N	95°31' 22.682" W	625	1,011
QC-7	32.13898922	-95.54622819	32°8' 20.361" N	95°32' 46.421" W	200	323
QC-8	32.14516331	-95.56676811	32°8' 42.588" N	95°34' 0.365" W	200	323
QC-9	32.14591851	-95.54036538	32°8' 45.307" N	95°32' 25.315" W	225	364
QC-10	32.15350507	-95.53058632	32°9' 12.618" N	95°31' 50.111" W	325	526
QC-11	32.13307166	-95.53444711	32°7' 59.055" N	95°32' 4.010" W	225	364
Total Combined Annual Production in the Queen City Sand					3,475	5,620

"NAD83" indicates North American Datum of 1983, "gpm" indicates gallons per minute, "ac-ft/yr" indicates acre-feet per year.

Appendix B –
Surrounding Wells Within 1-Mile of the Bluebonnet Property

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Appendix B – Surrounding Wells Within 1-Mile of the Bluebonnet Property

Map ID	Well ID (NTVGCD Permit Number, Well Report Tracking Number, or State Well Number)	Source ID (NTVGCD, SDR, TWDB Database)	Latitude (NAD83)	Longitude (NAD83)	Well Name/Owner	Well Depth/ Borehole Depth (ft)	Well Use	LRE- Designated Aquifer
1	663395	SDR	32.12619	-95.50659	JOHN TYLER	80	Domestic	Queen City
2	652256	SDR	32.12533	-95.50135	ILC-OWP, LP	680	Irrigation	Upper Wilcox
3	636994	SDR	32.16932	-95.50476	TENDALLA LTD	300	Domestic	Reklaw/Carrizo
4	629584	SDR	32.17185	-95.5385	TIM BAKER	380	Domestic	Upper Wilcox
5	615439	SDR	32.12824	-95.51113	RICHARD MCCARTY	60	Domestic	Queen City
6	586696	SDR	32.16447	-95.51559	HALLMAN INVESTMENT LLC	440	Domestic	Upper Wilcox
7	582738	SDR	32.12028	-95.57583	TYRONE MILLER	62	Domestic	Queen City
8	-	SDR	32.11068	-95.52674	MARK WAGLEY	168	Agriculture	Queen City
9	570066	SDR	32.14969	-95.51999	HILL AG ENTERPRISES	480	Domestic	Upper Wilcox
10	563374	SDR	32.1286	-95.5566	ANITA FEHERTY	540	Domestic	Upper Wilcox
11	546901	SDR	32.13203	-95.55311	THREE MILLER RANCH	130	Agriculture	Queen City
12	532177	SDR	32.1286	-95.5566	ANITA FEHERTY	480	Domestic	Upper Wilcox
13	523795	SDR	32.13611	-95.50889	MICHAEL HILL	78	Domestic	Queen City
14	517593	SDR	32.12528	-95.50722	BRENT MCCARTY	80	Domestic	Queen City
15	486956	SDR	32.16888	-95.50466	TENDALLA LTD	640	Domestic	Upper Wilcox
16	437282	SDR	32.11581	-95.51301	C. M. MORTON	83	Domestic	Queen City
17	430474	SDR	32.11861	-95.50083	JERRY JONES	75	Domestic	Queen City
18	-	SDR	32.13575	-95.5705	VIRGIL WILDRICK	620	Domestic	Upper Wilcox
19	H0087 / 187619	NTVGCD / SDR	32.157778	-95.5775	MOORE STATION WSC 4	1,006	Public Supply	Carrizo
20	H0005 / 73677	NTVGCD / SDR	32.19	-95.517222	AQUA SOURCE LAKE PALESTINE 5	1,130	Public Supply	Middle Wilcox
21	673473	SDR	32.143286	-95.532547	Pine Bliss LLC	1,220	Irrigation	Middle Wilcox
22	37785	SDR	32.186667	-95.523055	F.J. Richardson	78	Domestic	Queen City
23	44450	SDR	32.137222	-95.502778	THORNTON DESIGN & CONST INC	460	Domestic	Carrizo Reklaw
24	86539	SDR	32.1875	-95.511112	L.M. Becker	111	Domestic	Queen City
25	98275	SDR	32.1425	-95.510001	MAC McCLELLAN	225	Irrigation	Queen City
26	98276	SDR	32.138611	-95.508612	MAC McCLELLAN	230	Irrigation	Queen City
27	110809	SDR	32.147778	-95.554167	BILL RUSSELL	270	Domestic	Queen City
28	127878	SDR	32.136945	-95.568889	Jimmy Dial	81	Domestic	Queen City

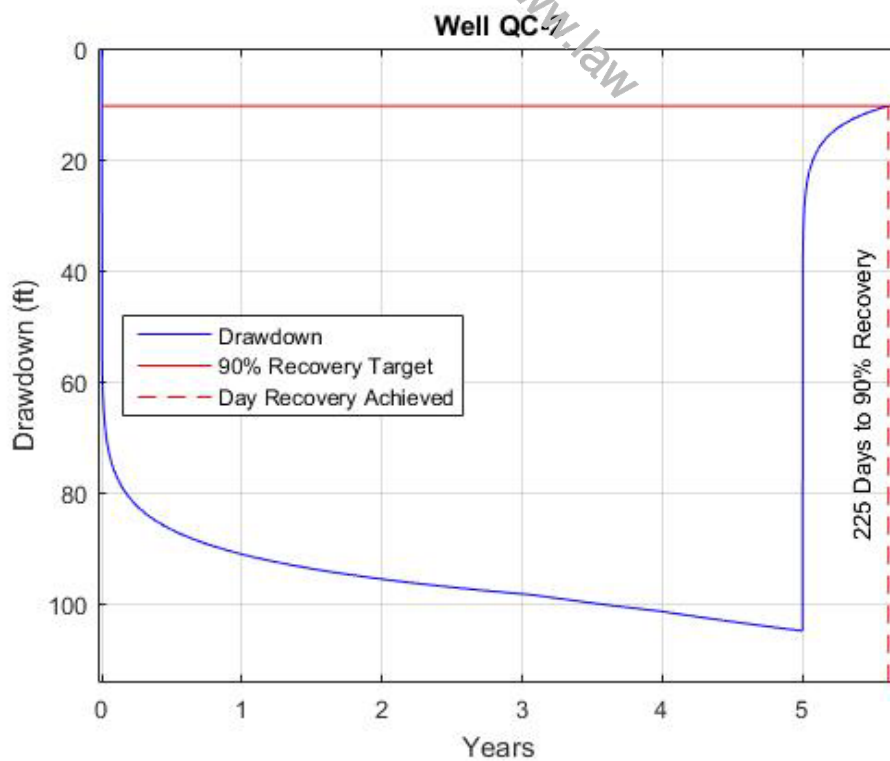
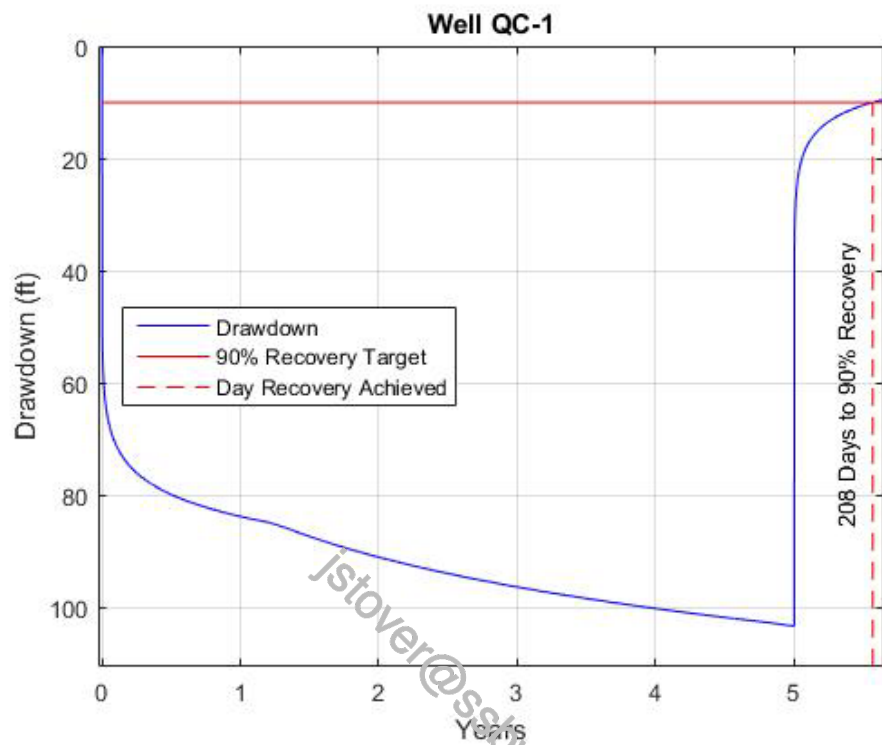
Map ID	Well ID (NTVGCD Permit Number, Well Report Tracking Number, or State Well Number)	Source ID (NTVGCD, SDR, TWDB Database)	Latitude (NAD83)	Longitude (NAD83)	Well Name/Owner	Well Depth/ Borehole Depth (ft)	Well Use	LRE- Designated Aquifer
29	183721	SDR	32.176389	-95.512778	Loyed Wellesley	108	Domestic	Queen City
30	184269	SDR	32.176944	-95.509445	D. Whisenhunt	100	Domestic	Queen City
31	212710	SDR	32.179722	-95.506112	ED MORVANT	50	Domestic	Queen City
32	305233	SDR	32.189445	-95.512501	Marie Wellesley	98	Domestic	Queen City
33	308359	SDR	32.143334	-95.504167	Ronald Bruton Farms	142	Irrigation	Queen City
34	308362	SDR	32.165556	-95.564167	Ben Haynes	150	Domestic	Queen City
35	468983	SDR	32.178598	-95.515672	Aqua Texas Inc.	1,425	Public Supply	Middle Wilcox
36	580789	SDR	32.176111	-95.535	Brandon Wilbanks	222	Domestic	Queen City
37	641945	SDR	32.110839	-95.547395	David Dickerson	105	Domestic	Queen City
38	34355	SDR	32.138611	-95.510001	Dale Williams	78	Domestic	Queen City
39	3452603	TWDB	32.174722	-95.530833	Badie Warren	40	Domestic	Queen City
40	3452608	TWDB	32.188334	-95.515556	Stanler McCurley (Parkside Shores)	860	Public Supply	Upper Wilcox
41	3452803	TWDB	32.160556	-95.561112	A.C. Prestwood	38	Unused	Queen City
42	3452804	TWDB	32.129444	-95.572778	Jack Barton	51	Unused	Queen City
43	3452703	TWDB	32.159167	-95.585	Homer Earl	162	Domestic	Queen City

"NAD83" indicates North American Datum of 1983, "ft" indicates feet, LRE-designated aquifer classification based on well depth and/or screen intervals.

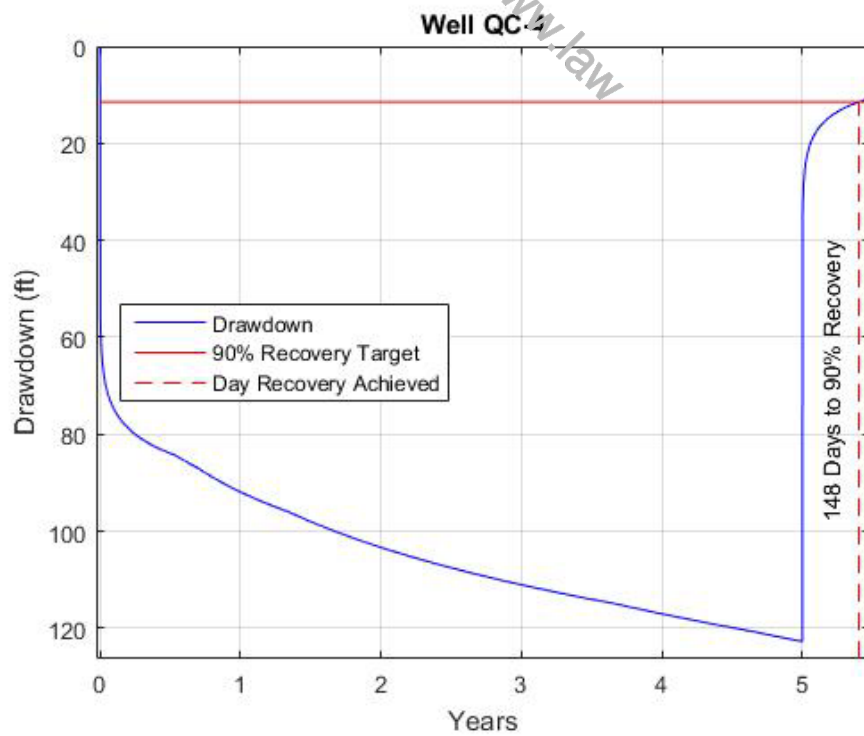
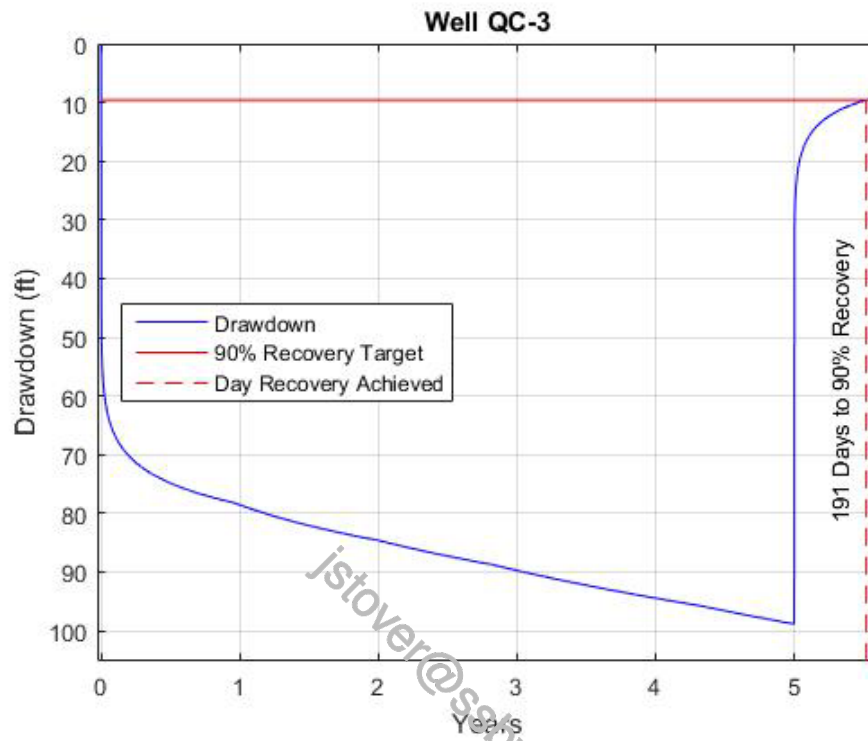
Appendix C –
Pumping and Recovery Hydrographs from Analytical Modeling

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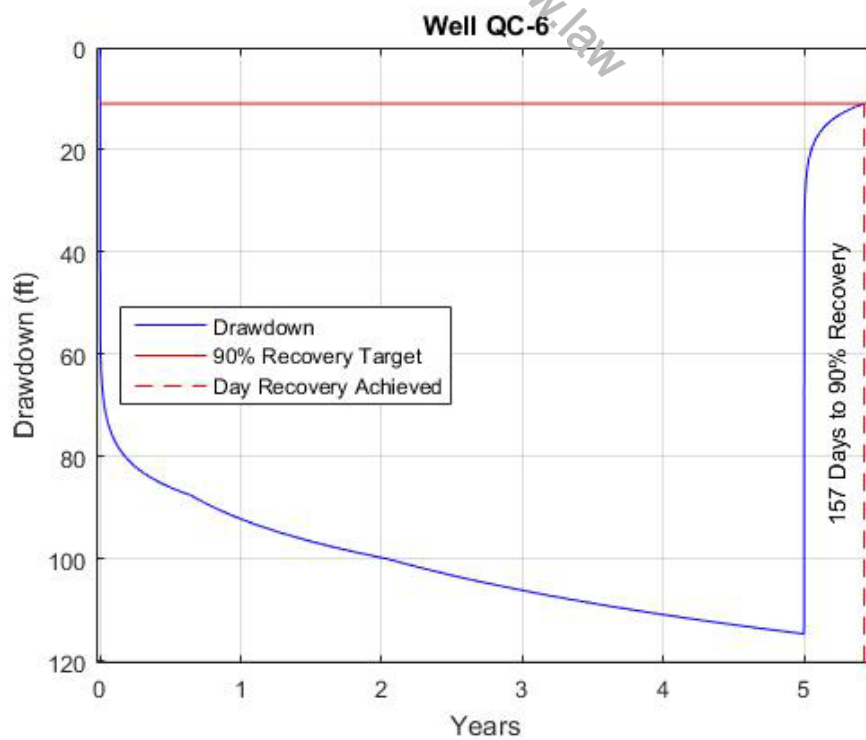
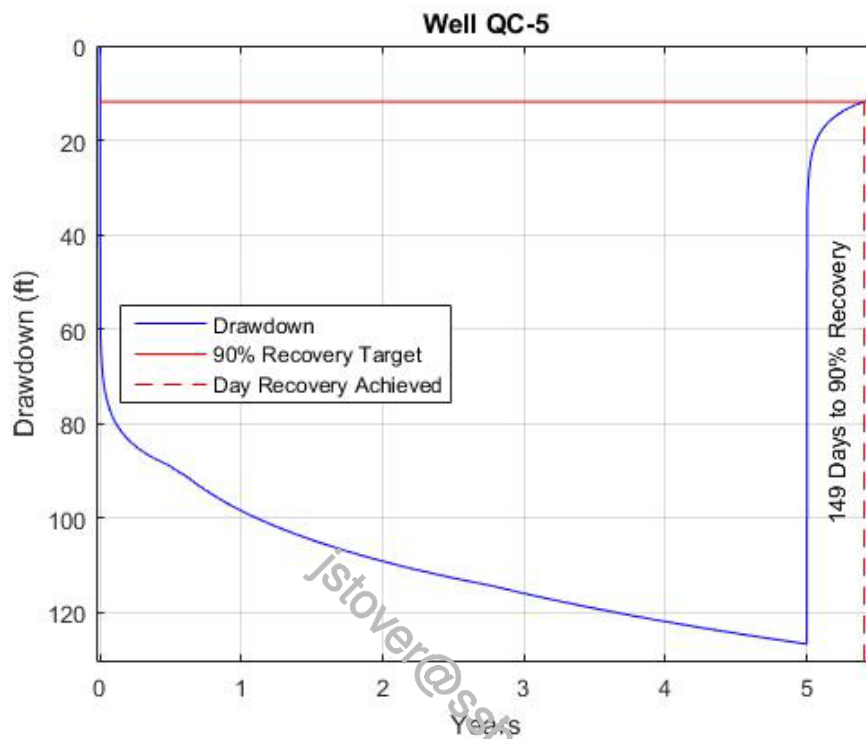
Appendix C – Pumping and Recovery Hydrographs



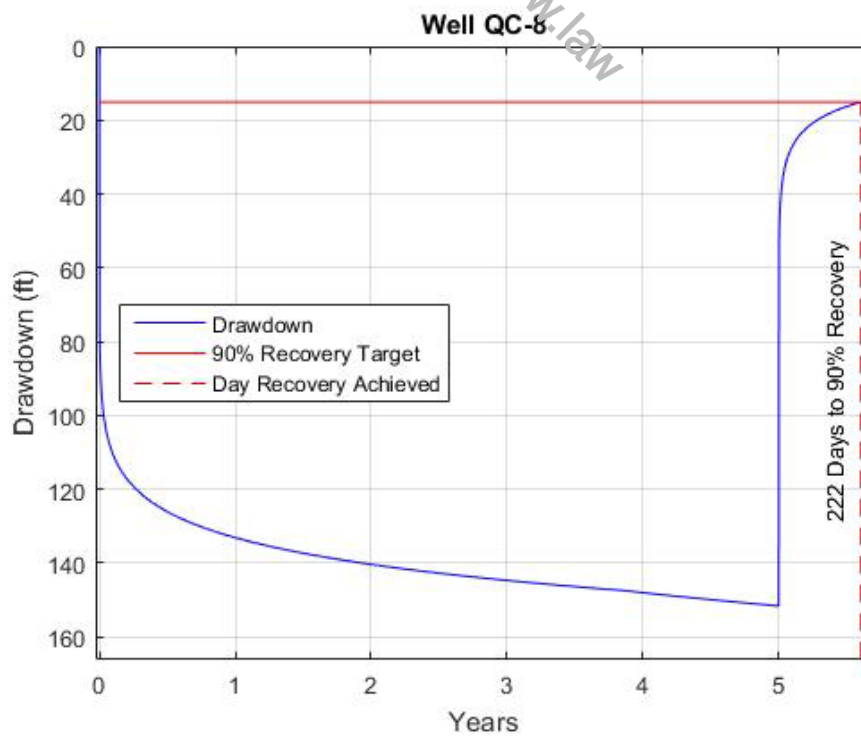
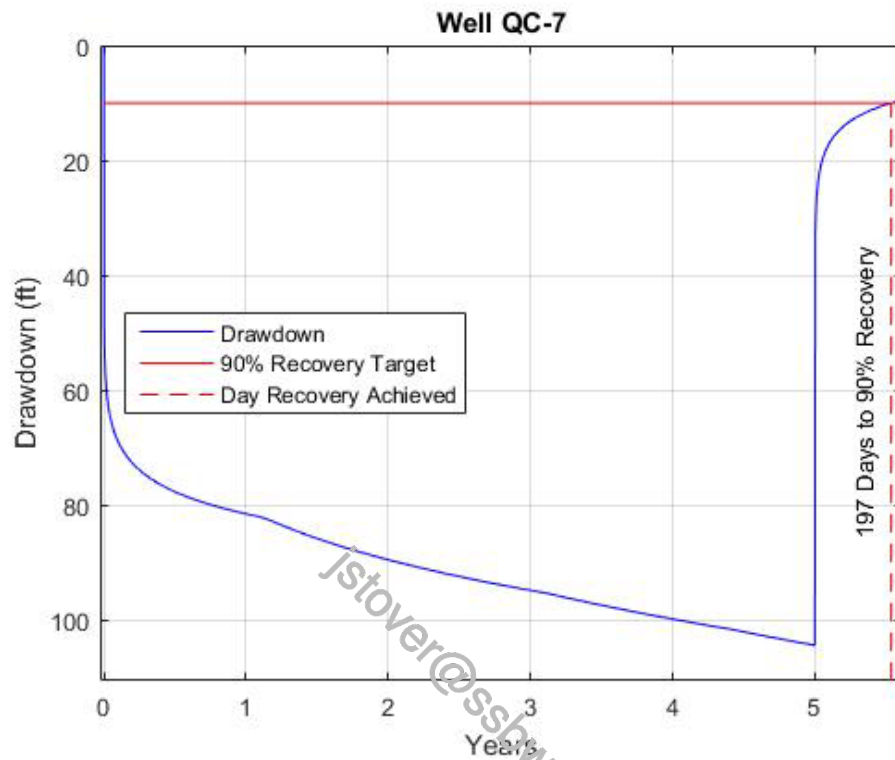
Appendix C – Pumping and Recovery Hydrographs



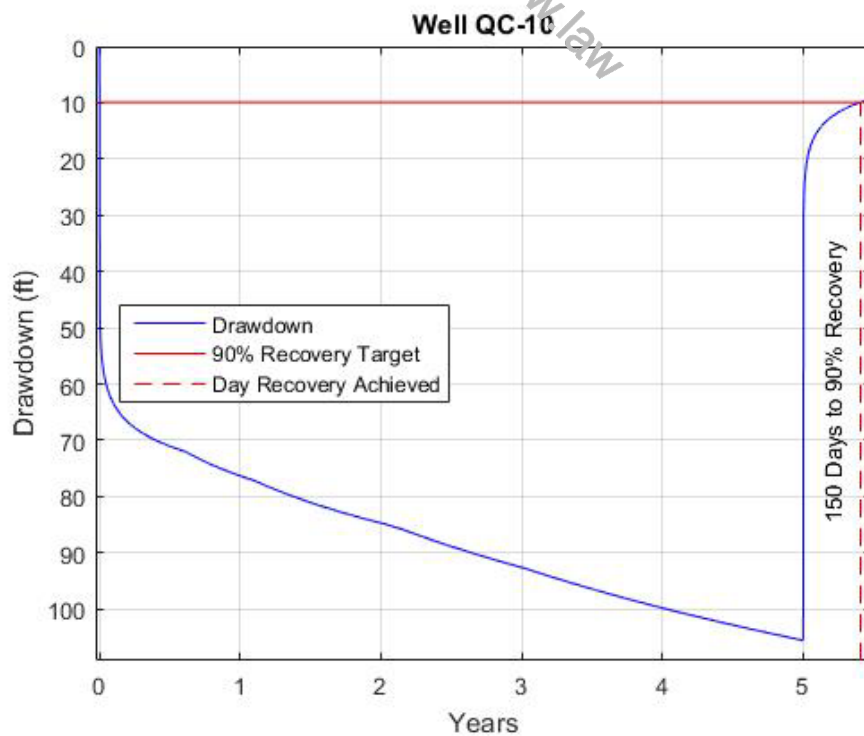
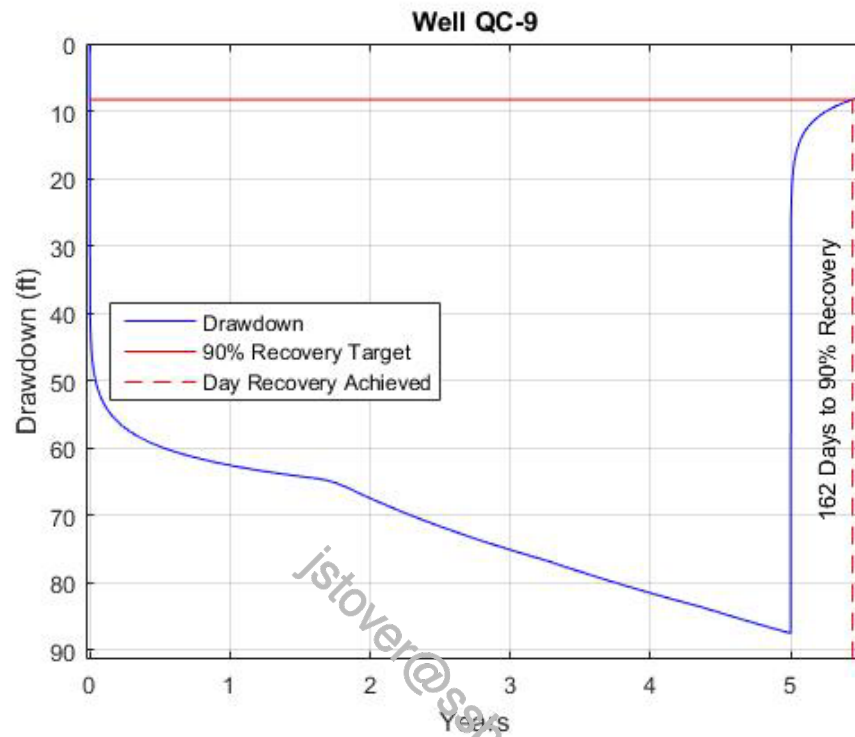
Appendix C – Pumping and Recovery Hydrographs



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