

KENDALL COUNTY, TEXAS

**KENDALL COUNTY DEVELOPMENT RULES – AMENDMENTS &
GROUNDWATER AVAILABILITY REPORTING STANDARDS**



KENDALL COUNTY COMMISSIONERS COURT

COUNTY JUDGE

SHANE STOLARCZYK

COUNTY COMMISSIONERS

CHRISTINA BERGMANN, PRECINCT 1

ANDRA WISIAN, PRECINCT 2

RICHARD CHAPMAN, PRECINCT 3

CHAD CARPENTER, PRECINCT 4

On August 28, 2023, the Commissioners Court of Kendall County, Texas, met in regular session with the following members present and participating to-wit:

Shane Stolarczyk	County Judge, Presiding
Christina Bergmann	Commissioner, Precinct 1
Andra Wisian	Commissioner, Precinct 2
Richard Chapman	Commissioner, Precinct 3
Chad Carpenter	Commissioner, Precinct 4

During such session, the Court considered adoption of amendments to the Kendall County Development Rules and providing standards required by Kendall County Development Rules, Section 5.3 B. GROUNDWATER AVIALABILITY AND THE GROUNDWATER AVAILABILITY REPORT (GAR).

NOW THEREFORE, BE IT ORDERED by the Commissioners Court of Kendall County, Texas as follows:

1. Establishment and General Provisions

1.1. Authority

- (a) The Kendall County Commissioners Court, acting in its capacity as the governing body of Kendall County, adopts this Amendment and hereby incorporates these provisions into the Kendall County Development Rules.
- (b) Kendall County adopts this Amendment under the authority Texas Local Government Code, Chapters 232, 233, 240, and 580, and Texas Water Code, Chapter 35, as amended.
- (c) The purpose of this Amendment is to provide for the conservation, preservation, protection, recharging, and prevention of waste of the groundwater, and of groundwater reservoirs or their subdivisions, and to control subsidence caused by withdrawal of water from those groundwater reservoirs or their subdivisions, consistent with the objectives of Section 59, Article XVI, Texas Constitution. Groundwater management is essential to promote the health, safety, morals, or general welfare of Kendall County and the safe, orderly, and healthful development of the unincorporated area of Kendall County.
- (d) Kendall County is in a Priority Groundwater Management Area ("PGMA") and has determined that adoption of water availability requirements is necessary to prevent current or projected water use in the County from exceeding the safe sustainable yield of the County's water supply.
- (e) The Development Rules previously adopted by Commissioners Court shall be incorporated into this Amendment. Any conflict between the Development Rules and this Amendment shall be construed in favor of this Amendment. The Development Rules may be amended at any time by a majority vote of Commissioners Court.

1.2. Amendments to Rules.

- (a) Section 1.5.A. Civil Remedies is hereby amended as follows:

At the request of the Commissioners Court or on their own behalf, General Counsel to the County or another attorney representing the County shall file any civil actions in a court of competent jurisdiction that is available to the County to cure violations of the Rules and Regulations. Additionally, the County is entitled to seek whatever damages the County deems necessary to bring a Person into compliance with these Rules.

- (b) Section 1.5.B. Criminal Penalties is hereby amended as follows:

At the request of the County a referral shall be made to the Criminal District Attorney for enforcement of any violations of these Rules and Regulations. Additionally, the Criminal District Attorney may seek criminal enforcement of these Rules and Regulations without a referral from the County. The Criminal District Attorney is entitled to seek any criminal penalties deemed necessary to cure a violation of these Rules and Regulations.

(c) Section 1.8.B. Definitions is hereby amended as follows:

- (i) 2. Affidavit of Land Location is hereby struck in its entirety.
- (ii) 115. Rural Project – A rural project is a project where the average size of all lots is 10 or more acres, and no lot is smaller than 3 acres.
- (iii) 138. Urban Project – An urban project is a project where the average size of all lots is less than 10 acres, or any lot is smaller than 3 acres.

(d) Chapter 2 Platting and Land Subdivision of the Development Rules is hereby amended and shall read as follows:

- (i) 2.1 F.2.c.i. The property is at least twenty (20) acres before dividing, and the average size of all parts after dividing is ten (10) acres and no part is less than three (3) acres;
- (ii) 2.1 F.7. Required by Lender is hereby struck in its entirety.
- (iii) 2.1 F.9.a. The property is at least twenty (20) acres before dividing, and the average size of all parts after dividing is ten (10) acres and no part is less than three (3) acres;
- (iv) 2.1.F.10. is hereby struck in its entirety.
- (v) 2.1 F.11 Family Cemeteries is hereby struck in its entirety.
- (vi) 2.1 F.12. Transfer to Adjoining Landowner is hereby struck in its entirety.
- (vii) 2.1 G. EXCEPTIONS TO PLATTING REQUIREMENTS: AFFIDAVITS OF LAND LOCATION is hereby struck in its entirety.

(e) 5.2.A.1. Table 5-1 is hereby amended and replaced with the following table:

	Type of Water and Waste Disposal	Min. Lot Size	Min. Rd Frontage	Max. Density (acres per lot)	Front Setback ^{a,b}	Rear Setback	Side Setback
SINGLE- FAMILY RESIDENTIAL LOTS	Well and OSSF ^c	3 ac.	250 ft	10	50 ft	10 ft	10 ft
	Public Water and OSSF ^d	1 ac.	100 ft	1	25 ft	10 ft	10 ft
	Public Water and Wastewater ^d	N/A	50 ft	N/A	25 ft	10 ft/ 5 ft ^f	10 ft/ 5 ft ^f
ALL USES OTHER THAN ONE SINGLE- FAMILY RESIDENTIAL LOT	Well and OSSF ^{d,e}	3 ac.	250 ft	10	50 ft	25 ft	25 ft
	Public Water and OSSF ^{d,e}	1 ac	100 ft	1	25 ft	25 ft	25 ft
	Public Water and Wastewater ^{d,e}	N/A	50 ft	N/A	25 ft	25 ft	25 ft

(f) 5.11.G.2.b. Exception is amended and shall read as follows: Road and driveway requirements for any manufactured home rental community with 5 or fewer units on 10 or more acres of land shall be in accordance with the Kendall County Fire Code, as amended.

(g) 5.11.H.3.e.ii. Exception is hereby amended and shall read as follows: Any manufactured home rental community with 5 or fewer units on 10 or more acres shall be exempt from the ¼ acre minimum rental space requirement.

1.3. Effective Date.

(a) Upon adoption by Commissioners Court, this Amendment shall become effective August 31, 2023.

- 1.4. Construction, Precedents, and Interpretation.
 - (a) This Amendment shall be construed liberally to accomplish its purpose.
 - (b) The Commissioners Court shall resolve any question regarding any interpretation of this Amendment.
 - (c) In the event of any conflict between the Development Rules and this Amendment and a State law, a rule adopted under a State law, or a Municipal Ordinance, the stricter of the two provisions prevails.
- 1.5. Severability. If any provision of the Development Rules and this Amendment or the Application thereof to any person or circumstances is held invalid, the validity of the remainder of Development Rules and this Amendment and the Application thereof to other persons and circumstances shall not be affected.

2. Definitions.

- 2.1. As provided in this Amendment to the Kendall County Development Rules, the following definitions shall control when in conflict with the Kendall County Development Rules:
 - (a) Acre – A unit of area equal to 43,560 square feet. When calculation the acreage of any Lot, the gross square footage within the Lot shall be used, provided any area within a private roadway easement or an easement for a Shared Access Driveway shall be excluded.
 - (b) Applicant – A person seeking approval of an application submitted pursuant to these Rules.
 - (c) Application – A document or series of documents describing the Applicant, the property, the activity for which approval is sought, how the activity satisfies the requirements of these regulations, and which is filed with the intent of obtaining approval of the application.
 - (d) Groundwater Availability Certification or Groundwater Availability Report (“GAR”) – A statement prepared by a Texas licensed professional engineer or a Texas licensed professional geoscientist on the [form](#) prescribed the Texas Commission on Environmental Quality (“TCEQ”) that certifies that adequate groundwater is available for the subdivision. The Groundwater Availability Certification shall include all information required by this Amendment as provided by the Sections below.
 - (e) Contiguous Property(ies) – Land parcels, tracts or lots of real property that are immediately adjacent, connected to one another or share a common boundary, but may also include land separated only by a roadway, utility corridor or aquatic feature. Properties that are separated by a roadway, utility corridor or aquatic feature within two hundred feet are considered Contiguous Properties.
 - (f) Contributing Zone(s) of Kendall County Aquifer(s) – The area(s) or watershed(s) where runoff from precipitation flows downgradient to the recharge zone(s) of the Ellenberger, Trinity, Edwards-Trinity, San Saba, Hickory, and Marble Falls Aquifer(s) and any alluvial aquifers and are generally located upstream (upgradient) and north to northwest of the recharge zone(s). In the event an Applicant cannot determine with specificity the location of the boundary of the Contributing Zone(s) of the Ellenberger, Trinity Aquifer, Edwards-Trinity, San Saba, Hickory, and Marble Falls Aquifer(s) and any alluvial aquifers, the Applicant may submit appropriate maps and other evidence as may be requested by the County for assistance in such determination from the County.
 - (g) County – Kendal County, Texas. Where referenced herein, the County may include either the Commissioners Court or personnel, departments or agencies of the County acting under authority delegated to such personnel, departments, or agencies by the

Commissioners Court.

- (h) Development – Any manmade change to improved or unimproved real estate, included building and structures, paving, drainage, utilities, storage, and agricultural activities.
- (i) Development Agreement – A written agreement entered into between the County, the Permittee and/or the Owner(s) of the Subject Property that stipulates the conditions under which development activities on the Subject Property will be conducted. Development Agreements must have the approval of the Kendall County Commissioners Court.
- (j) Development Authorization – The approval by the Kendall County Commissioners Court or by departments, agents, or personnel delegated such approval authority by the Commissioners Court of one or more Applications for development activities governed by the Development Rules for a specific project or tract of land, as identified in such Application(s). Development Authorizations shall include approved preliminary plans, final plats, flood hazard area permits, on-site sanitary sewer facility permits, Manufactured Home Rental Community permits, permits for the Use of County Property or Facilities, a Land Use/Location Restriction license, combinations of any such permits or licenses, and any other approvals or authorizations issued under these Regulations. This term shall also apply to Development Authorizations or equivalent approvals issued by the County prior to the effective date of these Development Rules.
- (k) Firm yield - The firm yield of the water source is defined as the maximum yield that could be delivered without interruption or failure during the historical drought of record. In the future, Kendall County will experience droughts that are either more or less severe than the historical drought of record and the water source must be capable of providing water supply for non-discretionary uses in the residence or business and for firefighting purposes. In the future, Kendall County will experience droughts that are either more or less severe than the historical drought of record and the water source must be capable of providing water supply for non-discretionary uses in the residence or business and for firefighting purposes.
- (l) Groundwater – Water percolating below the surface of the earth including water obtained by pumping or extracting water from an aquifer native to Kendall County.
- (m) Availability – An adequate supply of water of sufficient quantity and quality is available to supply the number of lots proposed for the platted area.
- (n) Person – Any natural person, trust, estate, partnership, limited partnership, association, company, corporation, political subdivision, or other legal entity recognized by the Texas Secretary of State.
- (o) Permittee – A Person, including legal successors or assigns, to whom the County actually issues a Development Authorization and who is responsible for complying with the terms of said Development Authorization, including any representations, covenants and agreements included in the Application and any special provisions incorporated by the County into the Development Authorization. A Person indicated on an Application as a Permittee shall be considered a prospective Permittee until such time as a Development Authorization is issued to such Permittee.
- (p) Rural Project – A Rural Project is a project where the average size of all lots is 10 or more acres, and no lot is smaller than 3 acres.
- (q) Urban Project – An Urban Project is a project where the average size of all lots is less than 10 acres, or any lot is smaller than 3 acres.

3. Administrative Provisions

- 3.1. Unless excluded by this Amendment, a Groundwater Availability Certification/Report

("GAR") shall be required for every plat submittal. In accordance with Tex. Loc. Gov't Code Ann § 232.0025(d-1), a plat application is not considered complete when submitted to the County Engineer unless the Groundwater Availability Certification/Report ("GAR") is included with the plat application.

- 3.2. Exemptions. The Development Rules and this Amendment do not apply to the following:
 - (a) The exclusions provided Tex. Loc. Gov't Code Ann § 232.015, as amended, and adopted by Section 2.1 F. of the Development Rules.
- 3.3. Fees. The fees posted on the Kendall County Development Website shall be the fees required for platting, as amended by State law.
- 4. Groundwater Availability Requirements.**
- 4.1. In accordance with Tex. Water Code Ann. § 35.019, the Commissioners Court requires a person seeking approval of a plat to show:
 - (a) compliance the water availability requirements adopted by this Commissioners Court under this Amendment; and
 - (b) that a firm yield of sufficient quantity and quality is available to supply the number of lots proposed for the platted area.
- 4.2. A person attempting to sell a lot in a subdivision is required to notify a purchaser of a lot in the subdivision if an approved water supply for the subdivision does not exist.
 - (a) If the person attempts to build a water supply system to serve one or more lots within the subdivision they are required to:
 - (i) comply with federal, state, and local law, and
 - (ii) establish an entity to construct and operate the system.
- 4.3. A planned or operating water supply system serving one or more lots within a subdivision be built and operated in compliance with federal, state, and local laws and rules related to public drinking water.
- 4.4. The Commissioners Court is adopting industry accepted methods, standards and practices, including at a minimum but not limited to the methods, standards, and practices employed by the State in the development and updating of the State Water plan or the GMA 9 for use by the Cow Creek in the development of their Managed Available Groundwater (MAG) value) to determine whether an adequate water supply exists for the platted area.
- 5. Required Information for Groundwater Availability Certification.**
- 5.1. Administrative Information. At a minimum, the Certification of Groundwater Availability shall include the following information pertaining to the proposed subdivision for which groundwater under the land will be the source of water supply:
 - (a) the name of the proposed subdivision;
 - (b) any previous or other name(s) which identifies the tract of land;
 - (c) the name, address, phone number, and facsimile number of the property owner or owners;
 - (d) the name, address, phone number, and facsimile number of the person submitting the plat application;
 - (e) the name, address, phone number, facsimile number, and registration number of the licensed professional geoscientist preparing the certification as required in this chapter;
 - (f) the location and property description of the proposed subdivision; and
 - (g) the tax assessor parcel number(s) by book, map, and parcel.
- 5.2. Proposed Subdivision Information. At a minimum, the following information pertaining to the proposed subdivision shall be provided:
 - (a) the purpose of the proposed subdivision, for example, single family residential, multi-

- family residential, non-residential, commercial, or industrial;
- (b) the size of the proposed subdivision in acres;
- (c) the number of proposed lots within the proposed subdivision;
- (d) the average size (in acres) of the proposed lots in the proposed subdivision;
- (e) the anticipated method of water distribution to the proposed lots in the proposed subdivision including, but not limited to:
 - (i) an expansion of an existing public water supply system to serve the proposed subdivision (if groundwater under the subdivision is to be the source of water supply);
 - (ii) a new public water supply system for the proposed subdivision;
 - (iii) individual water wells to serve individual lots; or
 - (iv) a combination of methods;
- (f) if the anticipated method of water distribution for the proposed subdivision is from an expansion of an existing public water supply system or from a proposed public water supply system, evidence required under 30 Tex. Admin. Code § 290.39 (2020)(Tex. Comm. Env. Qual., Rules and Regulations for Public Water Systems) which shall be provided demonstrating that written application for service was made to the existing water providers within a 1/2-mile radius of the subdivision; and

5.3. Projected Water Demand Estimate.

- (a) Residential water demand estimates at full build out shall be provided. Residential demand estimates shall, at a minimum, be based on the current demand of any existing residential well including all known existing, abandoned, and inoperative wells within the proposed subdivision and:
 - (i) the number of proposed housing units at full build out;
 - (ii) the average number of persons per housing unit;
 - (iii) the gallons of water required per person per day;
 - (A) the total water demand per housing unit per year (acre feet per year); and
 - (B) the total expected residential water demand per year for the proposed subdivision (acre feet per year).
- (b) Non-residential water demand estimates at full build out shall be provided. Non-residential uses shall be specified by type of use and groundwater demand per year (acre feet per year) for each type of use. The estimate shall also include the existing total non-residential demand and non-discretionary water demand during drought conditions of any well including all known existing, abandoned, and inoperative wells.

5.4. Total Annual Water Demand Estimate.

- (a) An estimate of the total expected annual groundwater demand, including residential and non-residential estimates at full build out (acre feet per year), shall be provided.

5.5. Submission of Information.

- (a) The sources of information used and calculations performed to determine the groundwater demand estimates as required by this section shall be made available to the County.
- (b) The Applicant shall provide any additional groundwater demand information required by the County.

6. Aquifer(s) and Aquifer Testing.

- 6.1. Aquifer identification. Using Texas Water Development Board aquifer names, the aquifer(s) underlying the proposed subdivision which is planned to be used as the source of water for the subdivision shall be identified and generally described as required by Section 5.

- 6.2. To meet the requirements of the Development Rules and this Amendment, the following geologic and groundwater information shall be considered in planning and designing an aquifer test for obtaining site-specific groundwater data:
- (a) the stratigraphy of the geologic formations underlying the subdivision;
 - (b) the lithology of the geologic strata;
 - (c) the geologic structure;
 - (d) the characteristics of the aquifer(s) and their hydraulic relationships;
 - (e) the recharge to the aquifer(s), and movement and discharge of groundwater from the aquifer(s); and
 - (f) the ambient quality of water in the aquifer(s).

7. Site-Specific Groundwater Data.

- 7.1. This Section is applicable only if the proposed method of water distribution for the proposed subdivision is individual water wells on individual lots, on groundwater supplied by an existing public water system, or groundwater based on the creation of a new public water system. The information developed in meeting these requirements shall be attached to the form required under Section 5 of this Amendment.
- 7.2. Location of existing wells. All known existing, abandoned, and inoperative wells within the proposed subdivision shall be identified, located, and mapped by on-site surveys. Existing well locations shall be illustrated on the plat required by the County.
- 7.3. An aquifer test shall be conducted to characterize the aquifer(s) underlying the proposed subdivision. The aquifer test must provide sufficient information to allow evaluation of each aquifer that is being considered as a source of residential and non-residential water supply for the proposed subdivision. Appropriate aquifer testing shall be based on typical well completions. An aquifer test conducted under this section utilizing established methods shall be reported as specified in Section 5 of this Amendment and shall include, but not be limited to, the following items:
- (a) Test well and observation well(s)(collectively referred to as a well couple). At a minimum, one test well (i.e., pumping well) and one observation well, shall be required to conduct an adequate aquifer test under this section. Additional observation wells shall be used for the aquifer test if it is practical or necessary to confirm the results of the test. The observation well(s) shall be completed in the same aquifer or aquifer production zone as the test well. The locations of the test and observation well(s) shall be shown on the plat required by the municipal or county authority. The number of test wells required shall be in accordance with the following requirements:
 - (i) Developments up to and including 50 acres shall require one well couple.
 - (ii) Developments greater than 50 acres and up to and including 100 acres shall require a minimum of two well couples.
 - (iii) An additional well couple shall be required for each additional 100 acres or part thereof.
 - (b) Location of wells. The test and observation well(s) must be placed within the proposed subdivision and shall be located by latitude and longitude. The observation well(s) shall be located at a radial distance such that the time-drawdown data collected during the planned pumping period fall on a type curve of unique curvature. In general, observation wells in unconfined aquifers should be placed no farther than 300 feet from the test well, and no farther than 700 feet in thick, confined aquifers. The observation well should also be placed no closer to the test well than two times the thickness of the aquifer's production zone. The optimal location for the observation well(s) can be

determined by best professional judgement after completion and evaluation of the test well as provided in subsection 7.3.(d).

- (c) Lithologic and geophysical logs. The test and observation wells shall be lithologically and geophysically logged to map and characterize the geologic formation(s) and the aquifer(s) in which the aquifer test(s) is to be performed.
 - (i) A lithologic log shall be prepared showing the depth of the strata, their thickness and lithology (including size, range, and shape of constituent particles as well as smoothness), occurrence of water bearing strata, and any other special notes that are relevant to the drilling process and to the understanding of subsurface conditions.
 - (ii) Geophysical logs shall be prepared which provide qualitative information on aquifer characteristics and groundwater quality. At a minimum, the geophysical logs shall include an electrical log with shallow and deep-investigative curves (e. g., 16-inch short normal/64-inch long normal resistivity curves or induction log) with a spontaneous potential curve.
 - (iii) The County may, on a case-by-case basis, waive the requirement of geophysical logs as required under this section if it can be adequately demonstrated that the logs are not necessary to characterize the aquifer(s) for testing purposes.
- (d) Well development and performance. The test and observation well(s) shall be developed prior to conducting the aquifer test to repair damage done to the aquifer(s) during the drilling operation. Development shall ensure that the hydraulic properties of the aquifer(s) are restored as much as practical to their natural state.
 - (i) Well development procedures applied to the well(s) may vary depending on the drilling method used and the extent of the damage done to the aquifer(s).
 - (ii) During well development, the test well shall be pumped for several hours to determine the specific capacity of the well, the maximum anticipated drawdown, the volume of water produced at certain pump speeds and drawdown, and to determine if the observation well(s) are suitably located to provide useful data.
 - (iii) Water pumped out of the well during well development shall not be allowed to influence initial well performance results.
 - (iv) Aquifer testing required by this section shall be performed before any acidization or other flow-capacity enhancement procedures are applied to the test well.
- (e) Protection of groundwater. All reasonably necessary precautions shall be taken during construction of test and observation wells to ensure that surface contaminants do not reach the subsurface environment and that undesirable groundwater (water that is injurious to human health and the environment or water that can cause pollution to land or other waters) if encountered, is sealed off and confined to the zone(s) of origin.
- (f) Duration of aquifer test and recovery. The duration of the aquifer test depends entirely on local and geologic conditions. However, the test shall be of sufficient duration to observe a straight-line trend on a plot of water level versus the logarithm of time pumped. Water pumped during the test shall not be allowed to influence the test results. Aquifer testing shall not commence until water levels (after well development) have completely recovered to their pre-development level or at least to 90% of that level.
 - (i) At a minimum, a 72-hour uniform rate aquifer test shall be conducted. Testing shall continue long enough to observe a straight-line trend on a plot of water level versus the logarithm of time pumped. If necessary, the duration of the test should be extended beyond the 72-hour minimum limit until the straight-line trend is observed.

- (A) If it is impractical to continue the test until a straight-line trend of water level versus the logarithm of time pumped is observed within the 72-hour limit, the test shall continue at least until a consistent pumping-level trend is observed. In such instances, failure to observe the straight-line trend shall be recorded.
 - (B) If the pumping rates remain constant for a period of at least four hours and a straight-line trend is observed on a plot of water level versus the logarithm of time pumped before the 72-hour limit has been reached, the pumping portion of the test may be terminated.
 - (C) The frequency of water level measurements during the aquifer test shall be such that adequate definition of the time-drawdown curve is made available. As much information as possible shall be obtained in the first ten minutes of testing (i.e., pumping).
- (ii) Water-level recovery data shall be obtained to verify the accuracy of the data obtained during the pumping portion of the test. Recovery measurements shall be initiated immediately at the conclusion of the pumping portion of the aquifer test and shall be recorded with the same frequency as those taken during the pumping portion of the aquifer test. Time-recovery measurements shall continue until the water levels have recovered to pre-pumping levels or at least to 90% of that level. If such recovery is not possible, time-recovery measurements should continue until a consistent trend of recovery is observed.
- (g) Use of existing wells and aquifer test data.
- (i) An existing well may be utilized as an observation well under this section if sufficient information is available for that well to demonstrate that it meets the requirements of this section. The existing well may only be used if approved by CCGCD and Kendall County.
 - (ii) The County may accept the results of a previous aquifer test in lieu of a new test if:
 - (A) the previous test was performed on a well located within a 1/4-mile radius of the subdivision;
 - (B) the previous test fully meets all the requirements of this section;
 - (C) the previous test was conducted on an aquifer which is being considered as a source of water supply for the proposed subdivision; and
 - (D) aquifer conditions (e.g., water levels, gradients, etc.) during the previous test were approximately the same as they are presently.
- (h) Need for additional aquifer testing and observation wells. Best professional judgement shall be used to determine if additional observation wells or aquifer tests are needed to adequately demonstrate groundwater availability. The Theis and Cooper-Jacob nonequilibrium equations, and acceptable modifications thereof, are based on well documented assumptions. To determine if additional information is needed, best professional judgement shall be used to consider these assumptions, the site-specific information derived from the aquifer test required by this section, the size of the proposed subdivision, and the proposed method of water delivery.

7.4. Submission of information. The information, data, and calculations required by this section shall be made available to the County to document the requirements of this section as part of the plat application.

8. Determination of Groundwater Quality.

8.1. Water quality analysis. Water samples shall be collected near the end of the aquifer test for chemical analysis. Samples shall be collected from each aquifer being considered for water

supply for the proposed subdivision and reported as specified in Section 5.

- 8.2. For proposed subdivisions where the anticipated method of water delivery is from an expansion of an existing public water supply system or a new public water supply system, the samples shall be submitted for bacterial and chemical analysis as required by the Tex. Admin. Code, Ch. 290, Subchapter F.
- 8.3. For proposed subdivisions where the anticipated method of water delivery is from individual water supply wells on individual lots, samples shall be analyzed for the following:
 - (a) chloride;
 - (b) conductivity;
 - (c) fluoride;
 - (d) iron;
 - (e) nitrate (as nitrogen);
 - (f) manganese;
 - (g) pH;
 - (h) sulfate;
 - (i) total hardness;
 - (j) total dissolved solids; and
 - (k) presence/absence of total coliform bacteria.
- 8.4. Conductivity and pH values may be measured in the field, and the other constituents shall be analyzed in a laboratory accredited by the National Environmental Laboratory Accreditation Program ("NELAP") or accrediting body designated by TCEQ.

9. Determination of Groundwater Availability.

- 9.1. Time frame for determination of groundwater availability. At a minimum, both a short- and long-term determination of groundwater availability shall be made, each considering the estimated total water demand at full build out of the proposed subdivision. Groundwater availability shall be determined for ten (10) years and 50 years.
- 9.2. Groundwater availability determinations shall take into account the anticipated method of water delivery as identified under Section 5 of this Amendment and will be compared to annual demand estimates at full build out as determined by Section 5 of this Amendment.
- 9.3. Determination of aquifer parameters. The parameters of the aquifer(s) being considered to supply water to the proposed subdivision shall be determined utilizing the information considered under Section 5 of this Amendment and data obtained during the aquifer test required under Section 7 of this Amendment and reported as specified in Section 5. The time-drawdown and time-recovery data obtained during the aquifer test shall be used to determine aquifer parameters utilizing the nonequilibrium equations developed by Theis or Cooper-Jacob, or acceptable modifications thereof. The following aquifer parameters shall be determined:
 - (a) rate of yield and drawdown;
 - (b) specific capacity;
 - (c) efficiency of the pumped (test) well;
 - (d) transmissivity;
 - (e) coefficient of storage;
 - (f) hydraulic conductivity;
 - (g) recharge or barrier boundaries, if any are present; and
 - (h) thickness of the aquifer(s)
 - (i) Firm yield for all non-discretionary uses under drought of record conditions.
- 9.4. Determination of groundwater availability. Using the information and data identified and

determined in subsections 9.2 and 9.3 of this section, the following calculations shall be made.

- (a) Time-drawdown. The amount of drawdown at the pumped well(s) and at the boundaries of the proposed subdivision shall be determined for the time frames identified under subsection 9.1. Time drawdown shall be based on the minimum rate in gallons per minute the selected pump is capable of pumping.
- (b) Distance-drawdown. The distance(s) from the pumped well(s) to the outer edges of the cone(s)-of-depression shall be determined for the time frames identified under subsection 9.1. Time drawdown shall be based on the minimum rate in gallons per minute the selected pump is capable of pumping.
- (c) Well interference. For multiple wells in a proposed subdivision and within one (1) mile of the well, calculations shall be made to:
 - (i) determine how pumpage from multiple wells will affect drawdown in individual wells for the time frames identified under subsection 9.1; and
 - (ii) determine a recommended minimum spacing limit between individual wells and well yields from the wells that will allow for the continued use of the wells for the time frames identified under subsection 9.1. Recommended well spacing shall be included as a note on the plat.

10. Groundwater Availability and Usability Statements.

10.1. Based on the information developed under Section 9, the following information shall be provided:

- (a) the estimated drawdown of the aquifer at the pumped well(s) over a ten-year period and over a fifty-year period;
- (b) the estimated drawdown of the aquifer at the subdivision boundary over a ten-year period and over a fifty-year period;
- (c) the estimated distance from the pumped well(s) to the outer edges of the cone(s)-of-depression over a ten-year period and over a fifty-year period;
- (d) the recommended minimum spacing limit between wells and the recommended well yield;
- (e) the sufficiency of available groundwater quality to meet the intended use of the platted subdivision or the firm yield for non-discretionary uses under drought of record conditions; and
- (f) establish that there is an adequate supply of groundwater of suitable quality to provide the proposed development with potable water in the amount of at least 0.4 acre-feet (360 gallons per day) per ESFC on a permanent daily and continual basis in accordance with the parameters set forth in this section.

10.2. Groundwater availability determination conditions. The assumptions and uncertainties that are inherent in the determination of groundwater availability should be clearly identified as specified in Section 5. These conditions must be identified to adequately define the bases for the availability and usability statements. These bases may include, but are not limited to, uncontrollable and unknown factors such as:

- (a) future pumpage from the aquifer or from interconnected aquifers from area wells outside of the subdivision or any other factor that cannot be predicted that will affect the storage of water in the aquifer;
- (b) long-term impacts to the aquifer based on climatic variations; and
- (c) future impacts to usable groundwater due to unforeseen or unpredictable contamination.

10.3. Certification. Based on best professional judgement, current groundwater conditions, and the information developed and presented in the form specified by Section 1.4 and Section 5, the licensed professional geoscientist certifies by signature, seal, and date that adequate groundwater is available from the underlying aquifer(s) to supply the estimated demand of the proposed subdivision.

11. Sharing of Information.

11.1. The County shall provide all of the information required herein to CCGCD and any other State, and/or Federal agencies upon request.

12. Xeriscaping.

12.1. The County reserves the right to require the use of xeriscape to conserve water if the Commissioners Court determines that the water conservation benefits of the required use of xeriscaping would be significant relative to the cost of implementing that use.

13. Rainwater Harvesting.

13.1. The County desires to promote the use of rainwater harvesting at residential, commercial, and industrial facilities. No later than ninety (90) days after the effective date of this Amendment, Commissioners Court shall establish an advisory board to explore promoting the use of rainwater harvesting through incentives such as the provision at a discount of rain barrels or rebates for water storage facilities.

13.2. A rainwater harvesting system must comply with the minimum state standards established for such a system.