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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 16, 2020

Mr. Curtis R. Steger, P.E.
Steger Bizzell
1978 South Austin Avenue
Georgetown, Texas 78626

Re: Aqua Water Supply Corporation (WSC) - Public Water System ID No. 0110013
Emergency Water Well - Replacement of ER 1 Well (G0110013F)
Engineer Contact Telephone: (512) 930-9412
Plan Review Log No. P-01092020-068
Bastrop County, Texas

CN: 600610828; RN: 100805274

Dear Mr. Steger:

On January 9, 2020, the Texas Commission on Environmental Quality (TCEQ) received your request to construct a proposed water well on an emergency basis for the above referenced public water system. We have received confirmation of your emergency from Mr. Chad Ahlgren with the Region 11 Office in Austin and the request to construct a proposed well is **authorized**. **Approval of this well for use requires TCEQ review of additional information** to confirm that the well meets the minimum requirements of Title 30 Texas Administrative Code (TAC) Chapter 290 - Rules and Regulations for Public Water Systems.

We have enclosed the following:

- Proposed Water Supply Well Construction Checklist (Step 1)
- Public Well Completion Data Checklist for Interim Approval (Step 2)

Please use these checklists to assist you in constructing a well that meets the applicable minimum standards in Chapter 290 of the TCEQ's Rules and Regulations for Public Water Systems. The required information shown on the "Proposed Water Supply Well Construction Checklist (Step 1)" must be submitted by a qualified, registered professional engineer licensed to practice in Texas in the form of sealed construction drawings and specifications. The completion data on the "Public Well Completion Data Checklist for Interim Approval (Step 2)" does not have to be prepared by an engineer but must also be included with the engineering materials. **The information shall be submitted within two months of the date of this letter. If the material is not available to be submitted within the allowed time frame, please contact the plan reviewer mentioned at the closing of this letter by phone or email.**

Please make sure that your well driller is aware of the following minimum requirements:

1. Livestock in pastures shall not be allowed within 50 feet of water supply wells as required in 30 TAC Section 290.41(c)(1)(D).

2. The casing material used in the construction of wells for public use shall be new carbon steel, high-strength low-alloy steel, stainless steel or plastic and shall conform to American Water Works Association (AWWA) standards. The top of the casing shall extend a minimum of 18 inches above the elevation of the finished floor of the pump room or natural ground surface and a minimum of one inch above the sealing block or pump motor foundation block when provided. The casing shall also extend at least to the depth of the shallowest water formation to be developed and deeper, if necessary, to eliminate all undesirable water-bearing strata. Well construction materials containing more than 0.25% lead are prohibited as required in 30 TAC Section 290.41(c)(3)(B).

3. The space between the casing and borehole shall be sealed by using enough cement under pressure to completely fill and seal the annular space between the casing and the borehole. The well casing shall be cemented in this manner from the top of the shallowest formation to be developed to the earth's surface as required by TAC 30 Section 290.41(c)(3)(C). The driller shall utilize a pressure cementation method in accordance with the latest revision of the AWWA Standard for Water Wells (A100-15), Appendix C: Section C.2 (Positive Displacement Exterior Method); Section C.3 (Interior Method Without Plug); Section C.4 (Positive Placement, Interior Method, Drillable Plug); and Section C.5 (Placement Through Float Shoe Attached to Bottom of Casing). The grouting mixture used to pressure cement the annular space shall be neat cement as specified in the latest revision of the AWWA Standard for Water Wells and to which a maximum of 6%, by dry weight, bentonite and 2%, by dry weight, calcium chloride may be added. The minimum annular space between the outside diameter of the casing and the borehole shall be no less than 1 1/2 inches in radial thickness or three inches in net diametrical difference and the pressure grouting shall be from the bottom upward utilizing one of the methods listed above. A cement bonding log, as well as any other documentation deemed necessary, may be required by the executive director to assure complete sealing of the annular space.

4. Three corrosive indices (Langelier Saturation Index, Ryznar Stability Index and the Aggressive Index) will be used to calculate corrosivity of the water from new source(s). Corrosive or aggressive water could result in aesthetic problems, increased levels of toxic metals, and deterioration of household plumbing and fixtures. If the water appears to be corrosive, the system will be required to conduct a study and submit an engineering report that addresses corrosivity issues or may choose to install corrosion control treatment before use may be granted. All changes in treatment require submittal of plans and specifications for approval by TCEQ.

5. The submitted letter dated January 8, 2020, indicates that the existing 150-feet sanitary control easement for the existing well will maintain the easement for this new replacement well which will be approximately 20-feet away for the existing well (ER 1). Please be reminded that if any portion of the land that is within the 150-feet form this new well which is not covered by the existing 150-feet sanitary control easement, water system must secure the easement for that additional portion of the land. Also, if any portion of the land that is within 150-feet from this new well that falls within the right-of-way of any road(s), water system must secure the easement for the right-of-way form appropriate authority before we can approve this well for use. Please submit the scaled site map showing the well locations and property boundaries with necessary easement documents in your future submittal for this well.

6. The submittal indicates that the failed well (ER 1) will be plugged. Please include a State of Texas Well Plugging Report in your future submittal for this well.

The project is located within the existing plant site approximately 0.12 miles north of the intersection of Highway 95 and Dogwood Trail (west of Highway 95) in Bastrop County, Texas.

If this well or pressure cementation is 100 feet deep or less, the public water system **will be required** to submit raw water samples for bacteriological analysis for 24 consecutive months **after use is granted.** TCEQ will require these samples in addition to the routine monthly distribution samples. The raw water samples must be collected directly from the wellhead before the point of disinfection, identified as sample type "Raw Well", and submitted to a TCEQ laboratory accredited to perform the required analysis in accordance with 30 TAC §25 of the TCEQ rules. The sample results must be submitted in the same manner as the results of the monthly distribution bacteriological samples. The public water system must keep the sample reports with their records for review by TCEQ personnel upon request. If these samples suggest additional treatment or testing is necessary, TCEQ will notify the public water system.

Texas Water Code Section 36.0015 allows for the creation of groundwater conservation districts (GCDs) as the preferred method of groundwater management. GCDs manage groundwater in many counties and are authorized to regulate production and spacing of water wells. **Public water systems drilling wells within an existing GCD are responsible for meeting the GCD's requirements.** The authorization provided in this letter does not affect GCD authority to manage groundwater or issue permits.

The design engineer or water system representative is required to notify the Plan Review Team in writing by fax at (512) 239-6972 or emailing kamal.adhikari@tceq.texas.gov and cc: vera.poe@tceq.texas.gov at least 48 hours before the well casing pressure cementing begins. If pressure cementing is to begin on Monday, then they must give notification on the preceding Thursday. If pressure cementing is to begin on Tuesday, then they must give notification on the preceding Friday.

Please refer to the Plan Review Team's Log No. **P-01092020-068** in all correspondence for this project.

Please complete a copy of the most current Public Water System Plan Review Submittal form for any future submittals to TCEQ. Every blank on the form must be completed to minimize any delays in the review of your project. The document is available on TCEQ's website at the address shown below. You can also download the most current plan submittal checklists and forms from the same address.

https://www.tceq.texas.gov/drinkingwater/udpubs.html

For future reference, you can review part of the Plan Review Team's database to see if we have received your project. This is available on TCEQ's website at the following address:

https://www.tceq.texas.gov/drinkingwater/planrev.html/#status

You can download the latest revision of 30 TAC Chapter 290 – Rules and Regulations for Public Water Systems from this site.

If you have any questions concerning this letter or need further assistance, please contact Kamal Adhikari at (512)239-0680 or by email at kamal.adhikari@tceq.texas.gov or by correspondence at the following address:

Plan Review Team, MC-159
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Sincerely,

John Lock, P.E.
Plan Review Team
Plan and Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality

Vera Poe, P.E., Team Leader
Plan Review Team
Plan and Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality

VP/JL/KA/db

Enclosures: "Proposed Water Supply Well Construction Checklist (Step 1)"
"Public Well Completion Data Checklist for Interim Approval (Step 2)"

cc: Aqua WSC - Attn: Water Utilities Official, P.O. Box P, Bastrop, Texas 78602-1989

bcc: TCEQ Central Records PWS File 0110013 (Aqua WSC/P-01092020-068)
TCEQ Region No. 11 Office - Austin
TCEQ PWSINVEN, MC-155

Proposed Water Supply Well Construction Checklist (Step 1)

Texas Commission on Environmental Quality
Water Supply Division
Plan Review Team MC-159
P.O. Box 13 087, Austin, Texas 78711-3087

Public Water System I.D. No._____
TCEQ Log No. P-_____

The following list is a brief outline of the "Rules for Public Water Systems", 30 TAC Chapter 290 regarding proposed Water Supply Well Construction. Sealed plans and specifications meeting, but not limited to, the minimum requirements cited here shall be prepared under the supervision of a Texas licensed professional engineer and submitted to TCEQ for approval. This list is not a substitute for the rules and this checklist cannot be accepted in lieu of the required engineering submittals. Failure to submit the following items may delay project approval. Copies of the rules may be obtained from Texas Register, 1019 Brazos St, Austin, TX, 78701-2413, Phone: (512) 463-5561 or downloaded from the website: http://www.tceq.texas.gov/rules/indxpdf.html

1. ☐ Site map(s) with appropriate scale showing the following: [§290.41(c)(3)(A)]
   - ☐ (i) Proposed location of the well with coordinates;
   - ☐ (ii) Named roadways;
   - ☐ (iii) All property boundaries within 150 feet of the proposed well location and the property owners' names;
   - ☐ (iv) Concentric circles with the proposed well location as the center point with radii of 10 foot, 50 foot, 150, foot, and ¼ mile;
   - ☐ (v) Any site improvements and existing buildings;
   - ☐ (vi) Any existing or potential pollution hazards; and
   - ☐ (vii) Map must be scalable with a north arrow.
2. ☐ Site plan and proposed well profile drawings showing the following: [§290.41(c)(3)(A)]
   - ☐ (i) Proposed well pump and setting depth;
   - ☐ (ii) Bore hole diameter(s) (must be 3" larger than casing OD) and total well depth;
   - ☐ (ii) Casing size, length, and material (e.g. 200 lf of 12" PVC SDR-17);
   - ☐ (iii) Length and material of any screens, blanks, and/or gravel packs utilized;
   - ☐ (iv) Flow meter and sampling cock prior to treatment;
   - ☐ (v) Well casing vent with a 16-mesh or finer corrosion-resistant screen;
   - ☐ (vi) Concrete sealing block extending at least 3 feet in all directions, with a minimum thickness of 6 inches and slope no less than 0.25 inches per foot for draining;
   - ☐ (vii) Disinfection injection point on the well discharge pipe and the location of the disinfection facilities; and
   - ☐ (viii) Intruder-resistant fence and an all-weather access road.
3. ☐ A sealed engineer's report that sizes the well capacity based on connections or people to be served. See §290.45 for the minimum capacity requirements; [§290.39(e)(1)]
4. ☐ A pollution hazard survey identifying all existing or potential pollution hazards: [§290.41(c)(1)(A)-(E)]
   - ☐ (i) Within 50 feet, identify any tile or concrete sanitary sewers, sewerage appurtenances, septic tanks, storm sewers, cemeteries, or livestock in pastures;
   - ☐ (ii) Within 150 feet, identify any septic tank perforated drainfields, areas irrigated by low dosage, low angle spray on-site sewage facilities, absorption beds, evapotranspiration beds, water wells that do not meet Public Drinking Water Standards, or underground fuel or petrochemical storage tanks or

Proposed Water Supply Well Construction Checklist (Step 1)

pipelines;

- ☐ (iii) Within 300 feet, identify any sewage wet wells, sewage pump stations, or drainage ditches which contain industrial waste or sewage treatment waste;
- ☐ (iv) Within 500 feet, identify any sewage treatment plants, livestock and animal feed lots, solid waste disposal sites, lands on which sewage plant or septic tank sludge is applied, or lands irrigated by sewage plant effluent; and
- ☐ (v) Within ¼ mile, identify any abandoned or inoperative wells and any other existing or potential pollution hazards.

5. ☐ A copy of the recorded deed of the property on which the well is located; [§290.41(c)(1)(F)(iv)]
6. ☐ Drafts of sanitary control easements covering land within 150 feet of the well not owned by the public water system; [§290.41(c)(1)(F)]
7. ☐ The premises, materials, tools, and drilling equipment shall be maintained so as to minimize contamination of the groundwater during drilling operation: [§290.41(c)(2)]
   - ☐ (i) Water used in any drilling operation shall be of safe sanitary quality. Water used in the mixing of drilling fluids or mud shall contain a chlorine residual of at least 0.5 milligrams per liter (mg/L);
   - ☐ (ii) The slush pit shall be constructed and maintained so as to minimize contamination of the drilling mud; and
   - ☐ (iii) No temporary toilet facilities shall be maintained within 150 feet of the well being constructed unless they are of a sealed, leakproof type.
8. ☐ Well casing requirements: [§290.41(c)(3)(B)]
   - ☐ (i) The material shall conform to AWWA standards;
   - ☐ (ii) The casing shall extend a minimum of 18 inches above the elevation of the finished floor or the natural ground surface and a minimum of one inch above the sealing block or pump motor foundation block when provided;
   - ☐ (iii) The casing shall extend at least to the depth of the shallowest water formation to be developed and deeper, if necessary, in order to eliminate all undesirable water-bearing strata;
   - ☐ (iv) Well construction materials may not contain more than 0.25% lead; and
   - ☐ (v) Cementing depth and pressure method (one of the methods in latest revision of AWWA Standard A-100, Appendix C, excluding the dump bailer and tremie methods).
9. ☐ When a gravel packed well is constructed, all gravel shall be of selected and graded quality and shall be thoroughly disinfected with a 50 mg/L chlorine solution as it is added to the well cavity; [§290.41(c)(3)(D)]
10. ☐ Safeguards shall be taken to prevent possible contamination of the water or damage by trespassers following the completion of the well and prior to installation of permanent pumping equipment; [§290.41(c)(3)(E)]
11. ☐ Upon well completion, the well shall be disinfected in accordance with current AWWA standards for well disinfection except that the disinfectant shall remain in the well for at least six hours; [§290.41(c)(3)(F)]
12. ☐ Well head and sealing slab:
    - ☐ (i) Concrete sealing block extending at least three feet from the well casing in all directions, with a minimum thickness of six inches and sloped to drain away at not less than 0.25 inches per foot shall be provided around the wellhead; [§290.41(c)(3)(J)]
    - ☐ (ii) Wellheads and pump bases shall be sealed by a gasket or sealing compound; [§290.41(c)(3)(K)]
    - ☐ (iii) Wellheads and well vents shall be at least two feet above the highest known watermark or 100-year flood elevation; [§290.41(c)(3)(K)]
    - ☐ (iv) If a well blow-off line is provided, its discharge shall terminate in a downward direction and at a point which will not be submerged by flood

Proposed Water Supply Well Construction Checklist (Step 1)

waters; [§290.41(c)(3)(L)]

☐ (v) A suitable sampling cock shall be provided on the discharge pipe of each well pump prior to any treatment; and [§290.41(c)(3)(M)]

☐ (vi) Flow-measuring devices shall be provided for each well to measure production yields and provide for the accumulation of water production data. [§290.41(c)(3)(N)]

13. ☐ All completed well units shall be protected by intruder-resistant fences or shall be enclosed in locked, ventilated well houses to exclude possible contamination or damage to the facilities by trespassers; and [§290.41(c)(3)(O)]

14. ☐ An all-weather access road shall be provided to each well site. [§290.41(c)(3)(P)]

LIST OF COUNTIES WHERE RADIONUCLIDE TESTING IS REQUIRED

Please be aware that we have added the requirement for analysis for radionuclides for high risk counties. For elevated levels of any contaminants found in a test well, treatment or blending may be required.

Table 1: List of Counties where Radionuclide Testing is required

COUNTY				
Atascosa	Bandera	Bexar	Bosque	Brazoria
Brewster	Burnet	Concho	Culberson	Dallam
Dawson	Erath	Fort Bend	Frio	Garza
Gillespie	Gray	Grayson	Harris	Hudspeth
Irion	Jeff Davis	Jim Wells	Kendall	Kent
Kerr	Kleberg	Liberty	Llano	Lubbock
McCulloch	Mason	Matagorda	Medina	Midland
Montgomery	Moore	Parker	Pecos	Polk
Presidio	Refugio	San Jacinto	San Saba	Tarrant
Travis	Tyler	Upton	Val Verde	Victoria
Walker	Washington	Wichita	Williamson	Zavala

Public Well Completion Data Checklist for Interim Approval (Step 2)

Texas Commission on Environmental Quality
Water Supply Division
Plan Review Team MC-159
P.O. Box 13087, Austin, Texas 78711-3087

Public Water System I.D. No._____
TCEQ Log No. P-_____

The following list is a brief outline of the "Rules for Public Water Systems", 30 TAC Chapter 290 regarding proposed Water Supply Well Completion. Failure to submit the following items may delay project approval. Copies of the rules may be obtained from Texas Register, 1019 Brazos St, Austin, TX, 78701-2413, Phone: (512) 463-5561 or downloaded from the website: http://www.tceq.texas.gov/rules/indxpdf.html

Any well proposed as a source of water for a public water supply must have plans approved for construction by TCEQ. Please include the well construction approval letter with your submittal of well completion data listed below must be submitted for TCEQ evaluation. Based on this submitted data, interim approval may be given for use of the well.

1. ☐ Site map(s) at appropriate scales showing the following: [§290.41(c)(3)(A)]
   - ☐ (i) Final location of the well with coordinates;
   - ☐ (ii) Named roadways;
   - ☐ (iii) All property boundaries within 150 feet of the final well location and the property owners' names;
   - ☐ (iv) Concentric circles with the final well location as the center point with radii of 10 feet, 50 feet, 150 feet, and ¼ mile;
   - ☐ (v) Any site improvements and existing buildings;
   - ☐ (vi) Any existing or potential pollution hazards; and
   - ☐ (vii) Map must be scalable with a north arrow.
2. ☐ A copy of the recorded deed of the property on which the well is located showing the Public Water System (PWS) as the landowner, and/or any of the following: [§290.41(c)(1)(F)(iv)]
   - ☐ (i) Sanitary control easements (filed at the county courthouse and bearing the county clerk's stamp) covering all land within 150 feet of the well not owned by the PWS (for a sample easement see TCEQ Form 20698);
   - ☐ (ii) For a political subdivision, a copy of an ordinance or land use restriction adopted and enforced by the political subdivision which provides an equivalent or higher level of sanitary protection to the well as a sanitary control easement; and/or
   - ☐ (iii) A copy of a letter granting an exception to the sanitary control easement rule issued by TCEQ's Technical Review and Oversight Team.
3. ☐ Construction data on the completed well: [§290.41(c)(3)(A)]
   - ☐ (i) Final installed pump data including capacity in gallons per minute (gpm), total dynamic head (tdh) in feet, motor horsepower, and setting depth;
   - ☐ (ii) Bore hole diameter(s) (must be 3" larger than casing OD) and total well depth;
   - ☐ (iii) Casing size, length, and material (e.g. 200 lf of 12" PVC ASTM F480 SDR-17);
   - ☐ (iv) Length and material of any screens, blanks, and/or gravel packs utilized;
   - ☐ (v) Cementing depth and pressure method (one of the methods in latest revision of AWWA Standard A-100, Appendix C, excluding the dump bailer and tremie methods);
   - ☐ (vi) Driller's geologic log of strata penetrated during the drilling of the well;
   - ☐ (vii) Cementing certificate; and

Public Well Completion Data Checklist for Interim Approval (Step 2)

- ☐ (viii) Copy of the official State of Texas Well Report (some of the preceding data is included on the Well Report).

4. ☐ A U.S. Geological Survey 7.5-minute topographic quadrangle map (include quadrangle name and number) or a legible copy showing the location of the completed well; [§290.41(c)(3)(A)]
5. ☐ Record of a 36-hour continuous pump test on the well showing stable production at the well's rated capacity. Include the following: [§290.41(c)(3)(G)]
   - ☐ (i) Test pump capacity in gpm, tdh in feet, and horsepower of the pump motor;
   - ☐ (ii) Test pump setting depth;
   - ☐ (iii) Static water level (in feet); and
   - ☐ (iv) Draw down (in feet).
6. ☐ Three bacteriological analysis reports for samples collected on three successive days showing raw well water to be free of coliform organisms. Reports must be for samples of raw (untreated) water from the disinfected well and submitted to a laboratory accredited by TCEQ, accredited to perform these test; and [§290.41(c)(3)(F)(i)]
7. ☐ Chemical analysis reports for well water samples showing the water to be of acceptable quality for the most problematic contaminants listed below. Reports must come from a laboratory accredited by TCEQ; accredited to perform these tests. Maximum contaminant level (MCL) and secondary constituent level (SCL) units are in milligrams per liter (except arsenic which is in micrograms per liter). [§290.41(c)(3)(G) and§290.104 and §290.105]

Table 1: Primary Constituents with Maximum Contaminant Level (MCL)

PRIMARY	MCL
Nitrate	10 (as N)
Nitrite	1 (as N)
Arsenic	10
Fluoride	4.0

Table 2: Secondary Constituents with Secondary Contaminant Level (SCL)

SECONDARY	MCL
Aluminum	0.2
Copper	1.0
Iron	0.3
Manganese	0.05
Zinc	5.0
Total Dissolved Solids	1,000
Fluoride	2.0
Lead	N/A
Sulfate	300
Chloride	300
pH	> 7.0

Public Well Completion Data Checklist for Interim Approval (Step 2)

Table 3: Water Quality Parameters

PARAMETER	UNITS
Alkalinity as CaCO3	mg/L
Calcium as CaCO3	mg/L
Sodium	mg/L

All systems located in a high-risk county (see page 3) shall submit radiological analysis reports for water samples showing the water to be of acceptable quality for the contaminants listed below. Reports must come from a TCEQ accredited laboratory for interim use of the well.

Table 4: Radionuclides with Maximum Contaminant Level (MCL)

CONTAMINANT	MCL
Gross alpha	15 pCi/L
Radium-226/228	5 pCi/L
Beta particle	50 pCi/L
Uranium	30 µg/L

WHERE: pCi/L = pico curies per liter, µg/L = micrograms per liter

Please be aware when you review your radiological data that if the report has gross alpha over 15 pCi/L and individual uranium isotopes are not reported, you will have to resample or reanalyze and resubmit radionuclide results. If you see gross alpha plus radium-228 over 5 pCi/L, and don't have radium-226, you will have to resample or reanalyze and resubmit complete results.

List of Counties Where Radionuclide Testing Is required

Please be aware that we have added the requirement for analysis for radionuclides for high risk counties. For elevated levels of any contaminants found in a test well, treatment or blending may be required.

Table 5: List of Counties where Radionuclide Testing is required

COUNTY				
Atascosa	Bandera	Bexar	Bosque	Brazoria
Brewster	Burnet	Concho	Culberson	Dallam
Dawson	Erath	Fort Bend	Frio	Garza
Gillespie	Gray	Grayson	Harris	Hudspeth
Irion	Jeff Davis	Jim Wells	Kendall	Kent
Kerr	Kleberg	Liberty	Llano	Lubbock
McCulloch	Mason	Matagorda	Medina	Midland
Montgomery	Moore	Parker	Pecos	Polk
Presidio	Refugio	San Jacinto	San Saba	Tarrant
Travis	Tyler	Upton	Val Verde	Victoria
Walker	Washington	Wichita	Williamson	Zavala