TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 12, 2023

Md Saidul Borhan, Ph.D
Texas Department of Transportation
6230 East Stassney Lane
Austin, TX 78740

Re: Texas Department of Transportation (TXDOT) Concho County SRA - Public Water System ID No. 0480017
Proposed Reverse Osmosis (R0) Unit for Nitrate Removal
Engineer Contact Telephone: (737) 270-2822
Plan Review Log No. P-05092023-061
Concho County, Texas

CN: 600803456 RN: 101205649

Dear Mr. Borhan:

On May 9, 2023, the Texas Commission on Environmental Quality (TCEQ) received planning material for the proposed reverse osmosis treatment system. Based on our review of the information submitted, we are **unable to approve** the proposed project at this time. Please provide additional information showing how the requirements of Title 30 Texas Administrative Code (TAC) Chapter 290 – Rules and Regulations for Public Water Systems will be met:

1. TCEQ rules require final and complete engineering plans and specification and engineering reports be properly signed, sealed, and dated by a Texas registered professional engineer. Each plan sheet must clearly indicate the engineering firm name and registration number for any engineer that is not employed by TXDOT. The engineering report, flow diagram, and exhibit 6-7 showing the RO system configuration were not signed and sealed. Additionally, the domestic water piping schematic as submitted does not have sufficient detail for TCEQ staff to review to determine if the proposed design complies with TCEQ rules and regulations. **Please provide signed and sealed specifications along with plan and profile views of all proposed equipment (RO system, booster pumps, flow meters, pressure measuring and recording devices, water softeners, dechlorination facilities, etc.). The plans must be of sufficient detail to be used by a contractor to modify the existing system and install the proposed improvements.**

2. The signed and sealed engineering report and plans and specifications must address all the items listed on the attached membrane construction checklist (Step 1). The engineering report must include the RO membrane specifications, including loading flux (gpd/sf); fouling factor; ion concentrations, raw water quality, permeate water quality, blended water quality with any needed treatment for potentially corrosive water. The checklists are intended as informational tools for the engineer to know what rules are applicable for a particular facility. Checking the boxes on the checklist is not a sufficient substitute for signed and sealed engineering documents.

3. The RO system design must incorporate the conditions listed in the attached TCEQ Technical Review and Oversight exception letter dated March 31, 2023, regarding the pressure measuring requirements.

4. The submittal discussed the installation of chemical feed systems to adjust PH and inhibit the formation and precipitation of crystal mineral salts on the filter surface; however, no detailed drawings of those chemical feed systems including the chemical storage tanks (day and bulk), secondary containments and feed pumps were included in the submittal. **Please provide detailed plans and specifications for each chemical feed system which address the items on the enclosed chemical storge and feed facilities checklist.**

5. Please provide the projected water quality at the entry point to the distribution system and the method(s) used to make the water quality projections; [§290.39(e)(6)(G)]. When blending is proposed, provide the blending ratio, source of the water to be blended, and the calculations showing the concentrations of regulated constituents in the finished water; [§290.39(e)(6)(H)].

6. The submittal must include the results of the membrane manufacturers modeling tool. Please see No. 3 in the attached membrane construction checklist (step 1)

7. Title 30 TAC Section 290.42(e)(2) requires that the point of application for disinfectant must be **prior to storage.** The RO system shall not discharge directly into the distribution system and must be designed such that the RO final permeate is disinfected prior to being discharged into the ground storage tanks.

8. Provide details on how the RO concentrate will be disposed. Regarding the RO concentrate into the On-Site Sewage Facility (OSSF), the industrial permit team had indicated that they usually don't authorize the discharge of Reverse Osmosis (RO) concentrate to an OSSF. The RO concentrate is considered an industrial waste which is excluded from OSSF. Sewage is primarily organic and biodegradable or decomposable and originates as human, animal, or plant waste from certain activities, including the use of toilet facilities, washing, bathing, and preparing food. RO concentrate is very different from sewage. An OSSF may not be capable of treating RO concentrate. The applicant may need to apply for general permits for waste discharge or a consolidated permit such as TPDES or TLAP. You may contact Water Quality Division staff directly if more clarification is needed or review the regulations in this link:

   https://www.tceq.texas.gov/assets/public/legal/rules/rules/pdflib/285a.pdf

Please be advised if any of the proposed components does not meet any of the applicable TCEQ requirements, an exception to that requirement must be submitted to TCEQ for review and approval before submitting plans and specifications for the project. The request for exception shall precede the submission of engineering plans and specifications for a proposed project for which an exception is being requested. Written exception request must be submitted to the TROT at PTRS@TCEQ.Texas.Gov or mailed to the following address:

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

For information about the exception process, please go to the URL below:

http://www.tceq.texas.gov/drinkingwater/trot/exception

If after you have reviewed the information available at the webpage above you have a question regarding the exception process, please call (512) 239-4691 and ask to speak to a member of TROT about the exception process.

The submittal consisted of 1 sheet of engineering drawings and manufacturers literature. The proposed project consists of:

- One (1) two stage, single pass with one element per stage, CULLIGAN® Series E2 Plus Reverse Osmosis Water Treatment System.

The TXDOT Concho County SRA public water supply system provides water treatment.

The project is located on Highway 87 approximately seven miles west of Eden in Concho County, Texas.

If the submittal was hardcopy, please note that we are only able to retain these documents for **100 calendar days** from the date of this letter. Revisions or additional information must be submitted to the TCEQ (Plan Review Team, MC-159) within that time, or the entire package must be resubmitted for review**.** If an electronic submittal, please note that certain information may become dated and TCEQ may request updated information at the time of resubmittal. A new log number will be assigned to the response submittal, whether in hard copy or electronic format, and we will begin a new review timeframe of 60 days.

Please refer to the Plan Review Team's Log No. **P-05092023-061** 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 Brian D. Dickey at (512) 239-0963 or by email at brian.dickey@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,

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

Craig A. Stowell, P.E., Team Leader
Plan Review Team
Plan and Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality

CAS/VP/bdd/av

Attachments: Membrane Construction Checklist (step 1)
Chemical Storage and Feed Facilities Checklist
TCEQ letter dated March 31, 2023

cc: Texs Department of Transportion, Attn: Mr. Brent Johnson, P.E., 6230 E Stassney Ln, Austin, TX 78744-3147

bcc: TCEQ Central Records PWS File 0480017 (P-05092023-061/TXDOT Concho County Sra)
TCEQ Region No. 8 Office - San Angelo

Chemical Storage and Feed Facilities Checklist

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 Chemical Storage and Feed facilities. Sealed plans, engineering calculations, 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. ☐ The calculations for sizing feed pump(s) and chemical storage tank(s) must be submitted to demonstrate that a project meets chemical feed and storage capacity requirements. [§290.39(e)(8)]
2. ☐ Chemical storage facilities shall be designed to ensure a reliable supply of chemicals to the feeders, minimize the possibility and impact of accidental spills, and facilitate good housekeeping. [§290.42(f)(1)]
3. ☐ Bulk storage facilities at the plant shall be adequate to store at least a 15-day supply of all chemicals needed to comply with minimum treatment technique and maximum contaminant level (MCL) requirements. The capacity of these bulk storage facilities shall be based on the design capacity of the treatment plant. However, the executive director may require a larger stock of chemicals based on local resupply ability. [§290.42(f)(1)(A)]
4. ☐ Day tanks shall be provided to minimize the possibility of severely overfeeding liquid chemicals from bulk storage facilities. Day tanks will not be required if adequate process control instrumentation and procedures are employed to prevent chemical overfeed incidents. [§290.42(f)(1)(B)]
5. ☐ Every chemical bulk storage facility and day tank shall have a label that identifies the facility's or tank's contents and a device that indicates the amount of chemical remaining in the facility or tank. [§290.42(f)(1)(C)]
6. ☐ Dry chemicals shall be stored off the floor in a dry room that is located above ground and protected against flooding or wetting from floors, walls, and ceilings. [§290.42(f)(1)(D)]
7. ☐ Bulk storage facilities and day tanks must be designed to minimize the possibility of leaks and spills. [§290.42(f)(1)(E)]
    a) ☐ The materials used to construct bulk storage and day tanks must be compatible with the chemicals being stored and resistant to corrosion. [§290.42(f)(1)(E)(i)]
    b) ☐ Except as provided in this clause, adequate containment facilities shall be provided for all liquid chemical storage tanks. [§290.42(f)(1)(E)(ii)]
        i) ☐ Containment facilities for a single container or for multiple interconnected containers must be large enough to hold the maximum amount of chemical that can be stored with a minimum freeboard of six vertical inches or to hold 110% of the total volume of the container(s), whichever is less. [§290.42(f)(1)(E)(ii)(I)]
        ii) ☐ Common containment for multiple containers that are not interconnected must be large enough to hold the volume of the largest container with a

minimum freeboard of six vertical inches or to hold 110% of the total volume of the container(s), whichever is less. [§290.42(f)(1)(E)(ii)(II)]

iii) ☐ The materials used to construct containment structures must be compatible with the chemicals stored in the tanks. [§290.42(f)(1)(E)(ii)(III)]

iv) ☐ Incompatible chemicals shall not be stored within the same containment structure. [§290.42(f)(1)(E)(ii)(IV)]

v) ☐ No containment facilities are required for hypochlorite solution containers that have a capacity of 55 gallons or less. [§290.42(f)(1)(E)(ii)(V)]

vi) ☐ On a site-specific basis, the executive director may approve the use of double-walled tanks in lieu of separate containment facilities. [§290.42(f)(1)(E)(ii)(VI)]

8. ☐ Chemical transfer pumps and control systems must be designed to minimize the possibility of leaks and spills. [§290.42(f)(1)(F)]
9. ☐ Piping, pumps, and valves used for chemical storage and transfer must be compatible with the chemical being fed. [§290.42(f)(1)(G)]

Feed Facilities

10. ☐ Chemical feed and metering facilities shall be designed so that chemicals shall be applied in a manner which will maximize reliability, facilitate maintenance, and ensure optimal finished water quality. [§290.42(f)(2)]
11. ☐ Each chemical feeder that is needed to comply with a treatment technique or MCL requirement shall have a standby or reserve unit. Common standby feeders are permissible, but generally, more than one standby feeder must be provided due to the incompatibility of chemicals or the state in which they are being fed (solid, liquid, or gas). [§290.42(f)(2)(A)]
12. ☐ Chemical feed equipment shall be sized to provide proper dosage under all operating conditions. [§290.42(f)(2)(B)]
13. ☐ Devices designed for determining the chemical feed rate shall be provided for all chemical feeders. [§290.42(f)(2)(B)(i)]
14. ☐ The capacity of the chemical feeders shall be such that accurate control of the dosage can be achieved at the full range of feed rates expected to occur at the facility. [§290.42(f)(2)(B)(ii)]
15. ☐ Chemical feeders shall be provided with tanks for chemical dissolution when applicable. [§290.42(f)(2)(B)(iii)]
16. ☐ Chemical feeders, valves, and piping must be compatible with the chemical being fed. [§290.42(f)(2)(C)]
17. ☐ Chemical feed systems shall be designed to minimize the possibility of leaks and spills and provide protection against backpressure and siphoning. [§290.42(f)(2)(D)]
18. ☐ If enclosed feed lines are used, they shall be designed and installed so as to prevent clogging and be easily maintained. [§290.42(f)(2)(E)]
19. ☐ Dry chemical feeders shall be located in a separate room that is provided with facilities for dust control. [§290.42(f)(2)(F)]
20. ☐ Coagulant feed systems shall be designed so that coagulants are applied to the water prior to or within the mixing basins or chambers so as to permit their complete mixing with the water. [§290.42(f)(2)(G)]

    a) ☐ Coagulant feed points shall be located downstream of the raw water sampling tap. [§290.42(f)(2)(G)(i)]

    b) ☐ Coagulants shall be applied continuously during treatment plant operation. [§290.42(f)(2)(G)(ii)]

21. ☐ Chlorine feed units, ammonia feed units, and storage facilities shall be separated by

solid, sealed walls. [§290.42(f)(2)(H)]

22. ☐ Chemical application points shall be provided to achieve acceptable finished water quality, adequate taste and odor control, corrosion control, and disinfection. [§290.42(f)(2)(I)]

Membrane 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 membrane treatment systems. Engineering report, 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

Once all the information outlined in this checklist has been submitted, TCEQ will review. If construction approval is granted, the Public Water System may proceed with installation of the membrane but may not send water treated by the membrane to distribution. Completion data must be submitted to TCEQ – see the "Membrane Use Checklist (Step 2)".

For public water systems using reverse osmosis or nanofiltration membranes, the engineering report must include the requirements specified in 30 TAC §290.39(e)(1)(A) - (H) of this subsection, and additionally must provide sufficient information to ensure effective treatment. Specifically: [§290.39(e)(6) and §290.39(e)(8)]

1. ☐ Provide a clear identification of the proposed raw water source; [§290.39(e)(6)(A)]
2. ☐ Provide a description of the pretreatment process; [§290.39(e)(6)(B)]

Submittal must have either 3, 4 or 5:

3. ☐ The design of a reverse osmosis or nanofiltration membrane system shall be based on the standard modeling tools of the manufacturer [§290.39(e)(6)(C)]. The model must be run for both new membranes and end-of-life membranes. The model shall provide:
   - (i) ☐ System flow rate;
   - (ii) ☐ System recovery;
   - (iii) ☐ Number of stages;
   - (iv) ☐ Number of passes;
   - (v) ☐ Feed pressure;
   - (vi) ☐ System configuration with the number of vessels per stage, the number of passes (if applicable), and the number of elements per vessel;
   - (vii) ☐ Flux (in gallons per square foot per day) for the overall system;
   - (viii) ☐ Selected fouling factor for new and end-of-life membranes; and
   - (ix) ☐ Ion concentrations in the feed water for all constituents required by the manufacturer's model and the projected ion concentrations for the permeate water and concentrate water.
4. ☐ Instead of Model- a pilot study or similar full-scale data in accordance with §290.42(g); or [§290.39(e)(6)(D)]
5. ☐ For flow rates less than 300 gallons per minute, the design specifications can be based on the allowable operating parameters of the manufacturer; [§290.39(e)(6)(D)]

Membrane Construction Checklist (Step 1)

6. ☐ Provide documentation that the components and chemicals for the proposed treatment process conform to American National Standards Institute/NSF International (ANSI/NSF) Standard 60 for Drinking Water Treatment Chemicals and ANSI/NSF Standard 61 for Drinking Water System Components; [§290.39(e)(6)(E)]
7. ☐ Provide the details for post-treatment and re-mineralization to reduce the corrosion potential of the finished water. If carbon dioxide and/or hydrogen sulfide is present in the reverse osmosis permeate, include the details for a degasifier for post-treatment; [§290.39(e)(6)(F)]
8. ☐ Provide the projected water quality at the entry point to the distribution system and the method(s) used to make the water quality projections; [§290.39(e)(6)(G)]
9. ☐ When blending is proposed, provide the blending ratio, source of the water to be blended, and the calculations showing the concentrations of regulated constituents in the finished water; [§290.39(e)(6)(H)]
10. ☐ Provide a description of the disinfection byproduct formation potential based on total organic carbon and other precursor sample results; [§290.39(e)(6)(I)]
11. ☐ Identify specific parameters and set points that indicate when membrane cleaning, replacement, and/or inspection is necessary; and [§290.39(e)(6)(J)]
12. ☐ The calculations for sizing feed pump(s) and chemical storage tank(s) must be submitted to demonstrate that a project meets chemical feed and storage capacity requirements. See Chemical Storage and Feed Facilities Checklist[§290.39(e)(8)]

Design Requirements:

Reverse osmosis or nanofiltration membrane systems used for the treatment of primary and secondary contaminants defined in Subchapter F of this chapter (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems), must meet the design criteria in subparagraphs (A) - (L) of this paragraph: [§290.42(b)(9)]

13. ☐ The design for all reverse osmosis and nanofiltration membrane systems must be in accordance with the findings of the engineering report. Variations from the engineering report must be explained and shall not compromise public health. Minimum engineering report requirements are found in §290.39(e)(1) and (6) of this title (relating to General Provisions); [§290.42(b)(9)(A)]
14. ☐ The reverse osmosis and nanofiltration membrane systems must be designed to ensure adequate cleaning of the membrane system; [§290.42(b)(9)(B)]
15. ☐ The reverse osmosis or nanofiltration membrane systems must be designed to operate at flux rates which assure effective filtration at all times based on at least one of the following: [§290.42(b)(9)(C)]

    (i) ☐ Manufacturer's computer models for new and end-of-life membranes;
    (ii) ☐ Site-specific pilot study;
    (iii) ☐ Comparable design data from an alternative site; or
    (iv) ☐ The manufacturer's allowable operating parameters, if the membrane unit's capacity is rated less than 300 gallons per minute.

Membrane Construction Checklist (Step 1)

16. ☐ Pretreatment shall be provided such that the feed water quality to the membrane units shall meet the minimum allowable requirements of the membrane manufacturer. Pretreatment processes shall be sized correctly for the flow of the plant, and the components and chemicals used for pretreatment in contact with the water must conform to American National Standards Institute/NSF International (ANSI/NSF) Standard 60 for Drinking Water Treatment Chemicals or ANSI/NSF Standard 61 for Drinking Water System Components. Other pretreatment processes will be reviewed on an individual basis in accordance the innovative/alternate treatment requirements specified in subsection (g) of this section. Acceptable pretreatment techniques include: [§290.42(b)(9)(D)]
    - (i) ☐ Bags, cartridge filters or screens for particulate removal;
    - (ii) ☐ Chemical addition that will not adversely affect the reverse osmosis or nanofiltration membrane;
    - (iii) ☐ Filters for iron and manganese removal in accordance with paragraph (2)(A) of this subsection;
    - (iv) ☐ Aeration or degasification; and
    - (v) ☐ Ion exchange softening.
17. ☐ The treatment plant must include post-treatment facilities for corrosivity control, re-mineralization and the removal of dissolved gases, such as carbon dioxide and hydrogen sulfide, if necessary to meet the system's water quality goals. The treatment must be sized correctly for the flow of the plant, and the components and chemicals used for treatment must conform to ANSI/NSF Standard 60 for Drinking Water Treatment Chemicals or ANSI/NSF Standard 61 for Drinking Water System Components; [§290.42(b)(9)(E)]
18. ☐ Pipes and pipe galleries shall meet the minimum requirements specified in subsection (d)(12) and (13) of this section; [§290.42(b)(9)(F)]
19. ☐ Each reverse osmosis or nanofiltration membrane unit shall be equipped to measure conductivity or total dissolved solids in the feed and the permeate water; [§290.42(b)(9)(G)]
20. ☐ Chemical storage and chemical feed facilities shall comply with subsection §290.42(f) of this section; [§290.42(b)(9)(H)]
21. ☐ Provide cross-connection protection for common piping used for cleaning and normal production modes [§290.42(b)(9)(I)]. This may be accomplished by the installation of a double block and bleed valving arrangement, a removable spool system or other alternative methods approved by the executive director;
22. ☐ Provide flow meters on the pipes for feed, permeate, and concentrate water. Additional metering devices shall be provided as appropriate to monitor the flow rate through specific treatment processes; [§290.42(b)(9)(J)]
23. ☐ The water system must provide pressure measuring and recording devices before and after each membrane stage; and [§290.42(b)(9)(K)]
24. ☐ The water system must provide equipment to monitor the temperature of the water. The temperature of the water must be measured using a thermometer or thermocouple with a minimum accuracy of plus or minus 0.5 degrees Celsius. [§290.42(b)(9)(L)]

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 31, 2023

Dr. Md Saidul Borhan, Ph.D.
Environmental Specialist
Texas Department of Transportation
6230 East Stassney Lane
Austin, Texas 78744

Re: TXDOT Concho County SRA – PWS ID No. 0480017
Request for an Exception to the RO Membrane Pressure Measuring Requirement
Request for an Exception to Use Innovative/Alternate Treatment for Nitrate Removal
Plant – 7447 US Highway 87 W (TCEQ Facility ID No. TP2580)
Well No. 1 (TCEQ Facility ID No. G0480017A)
Concho County, Texas
RN101205649 | CN600803456

Dear Dr. Borhan:

On November 29, 2022, the Texas Commission on Environmental Quality (TCEQ) received your letter dated November 28, 2022, requesting an exception to the following requirements specified in Title 30 of the Texas Administrative Code (30 TAC) for the TXDOT Concho County SRA public Water system (PWS):

- 30 TAC §290.42(b)(9)(K): An exception to the pressure measuring and recording devices before and after each reverse-osmosis (RO) membrane stage requirement; and
- 30 TAC §290.42(g): The request for the approval to conduct a full-scale demonstration study of a nitrate removal system.

The requests were submitted for the Plant – 7447 US Highway 87 W (TCEQ Facility ID No. TP2580) treatment facility, which is located on the median of Highway 87 approximately 6 miles west of Eden, Texas in Concho County. The facility will use a proposed RO-membrane unit, a Culligan E2-2 Plus, for the treatment of Well No. 1 (TCEQ Facility ID No. G0480017A). Well No. 1 exceeds the 10 milligram per liter (mg/L) nitrate maximum contaminant level (MCL). The requests are discussed separately below.

The TCEQ review noted that the submittal included plans for raw water from Well No. 1 to be diverted for non-potable use in restroom toilets and urinals. The non-potable use line will tee off of the raw water line upstream of the water softener and RO unit.

The requests are discussed below.

RO Membrane Pressure Measuring Requirement – 30 TAC §290.42(b)(9)(K)

The submittal notes that the RO-membrane unit, a Culligan E2-2 Plus, is a two-stage single-pass RO process with one RO element per stage designed for a permeate flow rate of up to 7,689 gallons per day. Each RO element is separately housed and the unit is manufactured as a pre-assembled and ready to use system. The intent of the rule is to know the pressure between stages, which would be useful in troubleshooting problems and evaluating system performance. However, based on our review of the design and specifications for this device, we agree that it is not practical to retrofit a pressure measuring device between the two RO stages due to the unit being pre-assembled by the manufacturer. However, we are requiring that pressure measuring and recording devices be installed before the first stage and after the second stage of the RO unit. Therefore, the TCEQ is **granting your request** for an exception to the pressure measuring and recording device requirement between the 1st and 2nd RO stages.

Conditions of Approval for the Granted Exception.:
This granted exception is contingent on the following conditions of approval:

Condition 1:

- **The Culligan E2-2 Plus unit must be equipped to measure pressure on the feed to the first RO stage and after the second RO stage.**

Condition 2:

- **The PWS operator must measure the pressure of the Culligan E2-2 Plus RO unit on the feed to the first RO stage and after the second RO stage and record the pressure measurements in a log each day. The RO system log must be kept onsite and available for TCEQ staff upon request.**

  The TCEQ review notes that the Culligan E2-2 Plus RO unit is equipped with a pre-filter pressure gauge.

Condition 3:

- **The PWS must have an Operations and Maintenance (O&M) manual onsite that details the standard operating procedures (SOPs) so that the RO unit is operated in accordance with the allowable operating parameters of the manufacturer. In accordance with this requirement, the RO-membrane systems' pressure, temperature, and conductivity data must be maintained in a daily log and adjustments made as required to ensure reliable water production. This O&M manual must be kept onsite and made available to TCEQ staff upon request.**

  The SOP must include pressure, temperature, and conductivity limits used to determine the need for maintenance or servicing of the RO treatment unit.

Condition 4:

- **Engineering plans and specifications for the proposed RO-membrane system are required to be submitted to the TCEQ's Plan Review Team (PRT) for review and approval of construction as specified in 30 TAC §290.39(h)(1).**

  Please submit engineering plans and specifications and a copy of this exception letter via email to PTRS@tceq.texas.gov.

  You may also find submittal instructions on the PRT web page at:

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

  Prior to installing any other proposed water system facilities or modifying existing water system facilities, please contact the PRT for submittal instructions.

Any PWS failing to meet the requirements specified in 30 TAC §290.39(h)(1) for submitting engineering plans and specifications of proposed or existing facilities to the PRT per 30 TAC §290.39(j), for review and approval prior to construction and operation, may be subject to enforcement action.

Condition 5:

- **The PWS must establish a cross-connection control program to satisfy the backflow and customer service inspection requirements specified in 30 TAC §290.44(h) and 30 TAC §290.46(j), respectively. Documentation for the program must include an up-to-date schematic of raw water lines to be used to prevent a cross-connection in the event that potable water plumbing repairs need to be performed.**

The TCEQ noted that the PWS will be configured such that non-potable water and potable water lines will be located within the same structure. Due to the potential cross-connection hazard associated with raw water lines within a structure with potable water lines, the following guidance is provided.

In order to document compliance with the backflow, siphonage requirements specified in 30 TAC §290.44(h), the PWS should perform the following:

1. Should any exterior hose bib discharge raw untreated water, signage must be posted alerting the public to not consume water from any affected hose bib, such as DO NOT DRINK or NON-POTABLE WATER. Signage must be prominently posted.
2. Obtain the services of a TCEQ licensed Customer Service Inspector (CSI) to perform a customer service inspection of the PWS property, as per the requirements specified in 30 TAC §290.46(j). A TCEQ licensed CSI can be found on the TCEQ website below by selecting "CUSTOMER SERVICE INSPECTOR" from the "Type and Level" dropdown menu:

   https://www2.tceq.texas.gov/lic_dpa/index.cfm?fuseaction=licall.searchgp

   A TCEQ licensed CSI shall provide a customer service inspection certificate after completion of an inspection. The inspection must be documented on TCEQ Form Number 20699, found on the TCEQ website:

   https://www.tceq.texas.gov/publication/search_forms.html

3. Isolate any hazards identified on a customer service inspection certificate form by installing the specific type of backflow prevention assembly identified in 30 TAC §290.47(f) Appendix F. Appendix F can be found on the TCEQ website:

   https://texreg.sos.state.tx.us/fids/201502634-6.html

   A testable backflow prevention assembly must be inspected and tested after installation by a TCEQ licensed backflow prevention assembly tester (BPAT). A TCEQ licensed BPAT can be found on the TCEQ website below by selecting "BACKFLOW PREVENTION ASSEMBLY TESTER" from the "Type and Level" dropdown menu:

   https://www2.tceq.texas.gov/lic_dpa/index.cfm?fuseaction=licall.searchgp

4. Should the customer service inspection certificate identify a health hazard, as specified in 30 TAC §290.38(35), a backflow prevention assembly installed on a health hazard must be inspected and tested annually by a TCEQ licensed BPAT.

A TCEQ licensed BPAT must provide a backflow prevention assembly test and maintenance report after testing a backflow prevention assembly. The inspection is to be documented on TCEQ Form Number 20700, found on the TCEQ website:

https://www.tceq.texas.gov/publications/search_forms.html

5. Recordkeeping: Backflow prevention assembly test and maintenance reports are required to be retained for three (3) years, as per the requirements specified in 30 TAC §290.46(f)(3)(B)(v). Customer service inspection certificates are required to be retained for ten (10) years, as per the requirements specified in 30 TAC §290.46(f)(3)(E)(iv). The TCEQ recommends that a customer service inspection certificate be retained indefinitely to prevent the loss of records necessary to document compliance with backflow prevention requirements.

Submittal of backflow, siphonage documentation to the TCEQ is not required. Records documenting compliance with backflow, siphonage requirements must be made available to TCEQ staff upon request.

Additionally, should you need further assistance with backflow prevention program requirements, the TCEQ Cross-Connection Control Program can be contacted by sending an email to PTRS@tceq.texas.gov and has a website:

https://www.tceq.texas.gov/drinkingwater/cross-connection

Use Innovative/Alternate Treatment for Nitrate Removal – 30 TAC §290.42(g)

Due to the PWS proposal to use RO filtration to remove nitrates, an exception request for the use of innovative/alternate treatment is **no longer needed**. Reverse osmosis is not considered an innovative/alternate treatment process under the requirements specified in 30 TAC §290.42(g). Requirements for an RO system proposed for the treatment of a primary contaminant (nitrate) are detailed in 30 TAC §290.42(b)(9). The following information is provided as technical guidance for the documentation that will need to be submitted to the TCEQ Plan Review Team (PRT) for approval to use the proposed RO system.

- Plans and specifications for the RO system can be submitted by a licensed Texas professional engineer to the TCEQ PRT for their review and approval, as per Condition 4 above.
- Enclosure 1: TCEQ Membrane Construction Checklist (Step 1) is included to assist with the gathering of documents needed for the submittal of plans and specifications to the TCEQ PRT.

A copy of this letter must be maintained with the water system's records for as long as this exception is valid. These records must be made available to TCEQ staff upon request.
All exceptions are subject to review. If new information indicates that this exception compromises the public health or degrades service or water quality, the exception may be revoked as specified in 30 TAC §290.39(l)(2).

All exceptions are subject to review. If new information indicates that any granted exception compromises the public health or degrades service or water quality, that exception may be revoked as specified in 30 TAC §290.39(l)(2). Noncompliance with any condition stated in this exception letter may result in enforcement action as specified in 30 TAC §290.39(l)(5). Granted exceptions only waive compliance to the 30 TAC Chapter 290 requirements explicitly stated in the TCEQ exception letter. Granted exceptions cannot be used as a defense of an enforcement action resulting from noncompliance with other requirements of 30 TAC Chapter 290.

If you have questions concerning this letter, or if we can be of additional assistance, please contact Mr. Richard Bosch at richard.bosch@tceq.texas.gov, by telephone at (512) 239-3465, or any member of the Technical Review and Oversight Team at PTRS@tceq.texas.gov.

Sincerely,

Stephanie Escobar

Stephanie Escobar, Team Leader
Technical Review and Oversight Team
Plan and Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality

SJE/rb

Enclosure 1: *TCEQ Membrane Construction Checklist (Step 1)*

cc: Mr. Justin E. Obinna, P.E., Engineer, Texas Department of Transportation, 6230 East Stassney Lane, Austin, Texas 78744-3147

bcc: TCEQ San Angelo Regional Office – R8
Julianne Matthews – TCEQ Enforcement Coordinator - Julianne.matthews@tceq.texas.gov

Instructions for Positive Bacteriological Samples

If multiple raw water samples are found to be **positive** for total coliform and **negative** for *E. coli* and other fecal indicators, a new exception with revised conditions may be required. TCEQ personnel recommend reviewing the sample collection protocol to ensure proper sample collection methods are in place. Personnel also recommend well disinfection according to American Water Works Association (AWWA) well disinfection standards.

If a raw water sample is found to be **positive** for total coliform and **positive** for *E. coli* or other fecal indicators, Groundwater Rule requirements include:

A. Issuance of a Public Notice to water system customers in accordance with 30 TAC §290.122(a) within 24 hours of being notified of the positive result.
B. Notification to all consecutive systems served by the well within 24 hours of being notified of the positive result.
C. Notification to TCEQ Drinking Water Assessment Team personnel at 512-239-4691 or GWRdata@tceq.texas.gov within 24 hours of being notified of the positive result.
D. Implementation of one or more of the Corrective Actions described in 30 TAC §290.116 as indicated by TCEQ Drinking Water Assessment Team personnel.

Additionally, the current exception may be revoked and a new exception with revised conditions may be required

Information on the Groundwater Rule can be found by calling 512-239-4691 and asking to speak to a member of the Drinking Water Assessment Team or at the following website:

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