



Texas Commission on Environmental Quality
Protecting Texas by Reducing and Preventing Pollution

September 5, 2013

Mr. Kerry D. Maroney, P.E.
Biggs & Mathews, Inc.
2500 Brook Avenue
Wichita Falls, Texas 76301

Re: City of Wichita Falls - Public Water System ID No. 2430001
Conditional Approval to Conduct a Full-Scale Verification Test for a Temporary Direct
Potable Reuse Water Treatment Plant
Temporary Exception Requests
- Treated Wastewater Effluent as a Public Water System Raw Water Source
- Pre-formed Chloramines for Predisinfection
- Hollow Fiber Microfiltration Membrane Treatment
- Use of Reverse Osmosis Membrane Treatment
- pH Adjustment
Preliminary Engineering Report for Temporary Reuse of Wastewater Effluent as a
Source of Direct Potable Reuse (DPR)
Engineer Contact Telephone: (940) 766-0156
Plan Review Log No. P-07172013-114
Wichita County, Texas

RN 105598759; CN 600129316

Dear Mr. Maroney:

On April 25, 2013, the Texas Commission on Environmental Quality (TCEQ) received your letter dated April 23, 2013 requesting temporary exceptions to the minimum requirements in Title 30 of the Texas Administrative Code (30 TAC) Chapter 290, Subchapter D for public water systems. Due to the ongoing drought conditions, the City of Wichita Falls (City) has requested approval to modify the City's Cypress 2008 and 2010 Surface Water Treatment Plants (SWTPs) to treat the City's River Road Wastewater Treatment Plant (RR WWTP) effluent to a safe level for human consumption. On May 13, 2013, the TCEQ received your letter dated May 9, 2013, including a preliminary engineering report (PER) and a Full-Scale Verification Test Protocol (Protocol) for the City's proposed Direct Potable Reuse Water Treatment Plant (DPR WTP). These documents were submitted to support the temporary exception requests for the City's proposed temporary reuse of wastewater effluent as a raw water source for the City's public water system and related modifications to the Cypress surface water treatment facility. In addition, responses to TCEQ questions, concerns, and requests for more detailed information were submitted in your letters dated June 27, 2013, July 16, 2013, July 25, 2013, July 31, 2013, and in numerous emails.

Because of the drought emergency nature of this project, we reviewed the exception requests regarding wastewater effluent as a source of water for a public water system, the site-specific temporary exceptions for the temporary Cypress DPR WTP, the Protocol requirements, and the PER concurrently. The TCEQ encourages the City to take reasonable measures to increase conservation and extend water supplies. Your Drought Contingency Plan (DCP) is an important tool in conserving and managing your water supply during emergency drought conditions. We encourage you to review your DCP and be prepared to move to the next stage of restrictions, if necessary. You are required to notify TCEQ when you change stages in your DCP. The temporary exception requests, Protocol, and PER are addressed under separate headings below.

Because of the drought emergency nature of this project, the review of future submittals will continue to be expedited. Please note that failure to provide all of the monitoring data required by the TCEQ can result in part of the verification testing having to be redone or more stringent operating conditions for approval to discharge treated RR WWTP effluent to the City's distribution system for human consumption. In addition, failure to submit the data collected in the formats specified in this letter and enclosures will result in a delay of the TCEQ's review.

Project Description

The City proposes to augment its water supply with the implementation of temporary reuse of wastewater effluent from the RR WWTP as source water for the DPR WTP for a period to last no longer than six months. The project proposed to utilize the existing Cypress SWTPs as a part of the temporary DPR WTP project. The treated wastewater from the RR WWTP will be delivered to the 2008 SWTP facility via a proposed temporary pump skid located at the RR WWTP. From the temporary pump station, the treated wastewater is delivered to the Cypress WTPs through approximately 12-miles of 32-inch high density polyethylene temporary above-ground transmission line. The effluent will enter the treatment process through an existing flow control vault located prior to the 2008 SWTP Microfiltration/Reverse Osmosis (MF/RO) clarifier. Both the above-ground transmission line and temporary pump skid were approved by TCEQ's Water Quality Division letter dated April 8, 2013. The project proposes to blend treated wastewater effluent from the RR WWTP and raw surface water from the Secondary Reservoir that will be fed from Lake Arrowhead and Lake Kickapoo before the existing raw water splitter box. A maximum of five (5.0) million gallons per day (MGD) partially treated RR WWTP effluent from the 2008 MF/RO SWTP will be utilized to blend with the raw surface water from the Secondary Reservoir. The blending is proposed at a ratio of 50-percent partially treated RR WWTP effluent and 50.0 percent Lake Arrowhead and Lake Kickapoo surface water from the Secondary Reservoir. The blended water will then be treated through the existing 2010 SWTP prior to distribution. As stated in TCEQ's response to the City's concept paper for this project, if the City determines that the DPR WTP will be needed on a recurring or more permanent basis, the TCEQ will request that the City install additional barrier(s) to inactivate *Cryptosporidium* oocysts and control any organic compounds that are not removed by the RO membranes.

Requested Temporary Exceptions

The proposed use of WWTP effluent as a raw water source and the associated treatment processes for a DPR WTP require exceptions to 30 TAC Chapter 290, Subchapter D regulations. The TCEQ staff review requests for exceptions to ensure that a public water system will provide a safe quality and adequate quantity of drinking water to their customers as required by the *Texas Health and Safety Code* (THSC) §341.0315(a).

According to 30 TAC §290.39(l), exception requests and approvals must precede the submission of engineering plans and specifications. According to 30 TAC §290.42(g), on-site studies are required for exception approval for the innovative treatment processes proposed for this project. Due to ongoing drought considerations, the TCEQ has agreed to conditionally grant temporary exceptions needed to construct the proposed temporary DPR treatment process. As a condition of approval, the City must conduct a Full-Scale Verification Test after construction is complete and submit a TCEQ-acceptable Full-Scale Verification Test Report (Report) to the TCEQ for review. The Full-Scale Verification Test must be conducted with adequate monitoring to demonstrate that the proposed temporary DPR WTP can continuously produce safe potable water that meets the drinking water standards in 30 TAC Chapter 290, Subchapter F and TCEQ-specified treatment technique requirements. The Full-Scale Verification Test must be performed following the TCEQ-approved Protocol, incorporating all conditions put in place by the TCEQ's approval. After review of a TCEQ-acceptable Report, the TCEQ will determine the conditions for operation of the City's proposed six months of temporarily discharging the DPR WTP effluent to the distribution system for human consumption.

The conditional granting of the temporary exceptions listed below and approval to construct do not grant approval for the water from the proposed temporary DPR WTP facility to be discharged to the City's potable water distribution system. The City is required to discharge all water generated from the proposed temporary DPR WTP to waste until it receives written TCEQ approval to discharge the treated effluent to distribution for human consumption.

Please be aware that these conditionally granted temporary exceptions, and any exceptions granted in the future, **are subject to TCEQ revision or revocation if:**

- Monitoring results, on-site alarms, or other data indicate that the temporary Cypress DPR WTP is producing a finished water quality—after all removal, chemical treatment and blending—that is a potential risk to public health;
- The U.S. Environmental Protection Agency (EPA) revises the allowable maximum contaminant levels for existing regulated contaminants or establishes maximum contaminant levels or treatment technique requirements for chemical or microbiological contaminants that are currently unregulated;
- Substantiated data becomes available establishing a public health risk for one or more unregulated contaminants at a specified concentration level in drinking water; or
- The City fails to comply with one or more of the conditions of the temporarily granted exceptions.

Below are listed the City's requested temporary exceptions and some additional temporary exceptions that the TCEQ staff have determined are necessary for the TCEQ to issue approval to construct the proposed modifications for converting two of the Cypress facility's SWTPs into a temporary DPR WTP. Exceptions are required for:

- The use of RR WWTP effluent in lieu of groundwater or surface water as a source of water for a public water system [30 TAC §290.41];
- Isolation of the Cypress 1961 and 1987 SWTPs' equipment and piping from the temporary Cypress DPR WTP equipment and piping during the verification testing to prevent potential contamination of these facilities and a risk to public health when the Cypress 2008 and 2010 SWTPs are returned to normal operation treating only raw surface water [30 TAC §290.42(d)(2)];

- The use of pre-formed chloramines as a pre-disinfectant [30 TAC §290.42(e)(3)(G)];
- The use of chloramines for inactivation credit [30 TAC §290.42(e)(3)(G)];
- MF membranes for removal of pathogens [30 TAC §290.42(g)(3)];
- RO membranes for the removal of primary and secondary drinking water chemical contaminants [30 TAC §290.42(g)]; and
- Post-RO membrane pH adjustment [30 TAC §290.42(g)].

The above **temporary exceptions are conditionally granted** provided the City complies with all of the conditions contained in this letter and enclosures:

1. These temporary exceptions shall be revoked once the City has completed a TCEQ acceptable Full-Scale Verification Test. Approval of additional temporary exceptions will be considered during the TCEQ's review of a TCEQ-acceptable Report.
 - a. The conditional granting of the temporary exceptions is valid for a period of two years from the date of this letter or until the City completes a TCEQ-acceptable Full-Scale Verification Test, whichever occurs first. If the City fails to complete construction of the TCEQ-approved modifications in accordance with all TCEQ requirements, conduct a TCEQ-approved Full-Scale Verification Test of the DPR WTP, and submit a TCEQ-approvable Report within two years of the date of this letter, all temporary exceptions will be revoked. If the City wishes to pursue the DPR WTP project after the revocation of these temporary exceptions, all temporary exception requests and supporting documentation must be resubmitted for TCEQ review.
 - b. The conditional granting of the above temporary exceptions is valid only for the approval to construct the TCEQ-approved modifications to the Cypress SWTPs and conduct verification testing of the proposed temporary Cypress DPR WTP treatment process contained in the City's Concept Paper for the Emergency Reuse of Wastewater Effluent as a Source for Direct Potable Reuse in Wichita Falls (received November 13, 2012) and Preliminary Engineering Report For Temporary Direct Potable Reuse Project For City of Wichita Falls, Texas (dated May 2013).
2. The City must adopt and comply with all TCEQ-required amendments and revisions to the City's proposed Protocol as specified in this letter and enclosures for the verification testing of the temporary Cypress DPR WTP. Failure to comply with one or more of the conditions of this letter and its enclosures may result in the City being required to shut down the Full-Scale Verification Test and possibly restart it in order to accomplish the TCEQ's minimum required test duration while complying with the TCEQ conditions.

RR W WTP Effluent as Public Water System Source Water

3. During the required verification testing, the effluent from the proposed temporary Cypress DPR WTP cannot be discharged to the City's potable water distribution system. Instead, this effluent must be discharged through a permitted outfall in accordance with the RR WWTP TPDES wastewater discharge permit or reused in accordance with a TCEQ issued reclaimed water reuse authorization.

4. Only effluent from the RR WWTP that meets all the requirements in the City's Chapter 210 reclaimed water reuse authorization and in the RR WWTP's wastewater discharge Permit No. WQ00104419-000 can be sent to the temporary Cypress DPR WTP. In addition, pursuant to the provision No. 11, under "Monitoring and Reporting Requirements" of the RR WWTP's wastewater discharge Permit, all publicly owned treatment works (POTWs) must provide adequate notice to the executive director (with a copy to the Regional Office), of any substantial change in volume or character of pollutants being introduced into the POTW by a source introducing pollutants at the time of issuance of the permit. As such, prior to the effluent from the proposed temporary Cypress DPR WTP being discharged, during the verification testing, via a permitted outfall in No. WQ00104419-000, proper notification to TCEQ central office and the appropriate regional office must be provided.
5. During the TCEQ-approved verification test period (interrupted only during backwashing of filters and membranes and cleaning procedures for the membranes), the temporary Cypress DPR WTP must continuously demonstrate it can produce a safe quality of water. A minimum total treatment of 9.0-log for viruses, 7.0-log for *Giardia* and 5.5-log for *Cryptosporidium* must be provided. The requirements are:
 - a. Effluent water quality from the 2010 SWTP clearwell that does not exceed:
 - i. Any maximum contaminant level for any regulated primary or secondary drinking water standards contained in 30 TAC Chapter 290, Subchapter F; and
 - ii. 10.0 milligrams per liter (mg/L) for nitrate.
 - b. A minimum 4.0-log removal of viruses;
 - c. A minimum 6.0-log removal of *Giardia* cysts;
 - d. A minimum 5.5-log removal of *Cryptosporidium* oocysts; and
 - e. Sufficient inactivation through disinfection throughout the proposed DPR WTP that under varying source water qualities and with the 10.0-million gallon (MG) GST in service (at a minimum 50.0-percent volume) to demonstrate that the following will be achieved:
 - i. A minimum of 5.0-log inactivation of viruses; and
 - ii. A minimum of 1.0-log inactivation of *Giardia* cysts must be provided at all times regardless of the amount of removal achieved.
6. Prior to beginning the verification testing, **automatic shut-down controls and alarms** for summoning the operators must have been constructed and tested for taking:
 - a. The RR WWTP effluent transfer pumps (to the Cypress facility) out of service when the effluent exceeds the Chapter 210 reclaimed water reuse authorization discharge requirements;
 - b. A MF membrane unit out of service when its filtrate turbidity level is greater than 0.100 nephelometric turbidity units (NTU) for two consecutive five-minute readings;
 - c. Waste Lagoon No. 3's reuse pumps out of service when the partially treated RR WWTP flow rate is greater than the Secondary Reservoir's raw surface water flow rate to the Cypress Splitter Box;
 - d. A gravity media filter out of service when the individual filter effluent turbidity level exceeds 0.3 NTU (or 0.15 NTU if additional removal credit is being sought) for two consecutive 15-minute readings;

- e. All the 2010 SWTP clearwell's transfer pumps out of service when the volume of filtered water in the 2010 SWTP clearwell is less than 50.0-percent of the reported full operating capacity.
- f. All the 10.0-MG GST's high service pumps out of service when:
 - i. The nitrate level in the 10.0 MG GST's effluent is greater than 10.0 mg/L; or
 - ii. The 10.0-MG GST's volume of water is less than 50.0-percent of the reported full operating capacity.
- 7. The results of the above testing of the automatic shutdown triggers and controls must be included in the Full-Scale Verification Test Report.
- 8. *Giardia* and *Cryptosporidium* levels (enumeration) in the RR WWTP effluent, water in different stages of treatment, and the effluent from the 2010 SWTP clearwell must be monitored and reported using a real-time, on-site quantitative polymerase chain reaction (qPCR) analytical method, reported as being currently used by the City, and an off-site EPA Method 1623 at the frequencies specified in Enclosure A: Full-Scale Verification Test Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates. When samples are collected for analysis at an off-site laboratory using EPA Method 1623, a portion of the same water (split sample) must also be collected for analysis using the on-site qPCR method.

The City has reported that it has been using the qPCR method on-site, but has some concerns about the validity of the results and interferences when analyzing the RR WWTP effluent. The City uses the MoBio RapidWater® DNA Isolation Kit, which includes a disclaimer in the manual, stating that the kit is for research purposes only. Splitting samples and comparing the results from the two analytical methods will provide the TCEQ and the City with data from both methods to review and compare. After the Full-Scale Verification Test is complete, the TCEQ will determine the appropriate application of the data.

In addition, the City has reported that it would like to use an alternate real-time, on-site analytical method or possible surrogate for representing the number of *Giardia* cysts and *Cryptosporidium* oocysts in the RR WWTP effluent and water after different stages of treatment. However, the City has not provided a TCEQ-acceptable alternative for review at this time. If the City desires to evaluate an alternate analytical method or surrogate during the verification testing, the City will need to collect split samples at the same time as the on-site qPCR samples are collected. The results of these City tests will need to be submitted with the Report in comparison tables and graphs with the above required qPCR and EPA Method 1623 results as specified in Enclosure E: Full-Scale Verification Test Report Format.

As noted in the TCEQ's July 17, 2013-email, a TCEQ-acceptable real-time, on-site monitoring method must be used by the City when the proposed temporary DPR WTP is discharging effluent to the distribution system. Without a TCEQ acceptable real-time, on-site monitoring method, additional measures will have to be implemented to verify that the public's health is being continuously protected.

- 9. The flow rate of the partially treated RR WWTP effluent from waste Lagoon No. 3 to the influent of the Cypress Splitter Box must continuously be 50.00-percent, or less, of the total flow rate after blending with the Secondary Reservoir raw surface water.

10. Continuous flow monitoring, flow control, alarms and automatic shut-down controls must be in place to prevent the blended flow from the Splitter Box from containing greater than 50.00-percent partially treated RR WWTP effluent from waste Lagoon No. 3.
11. All treatment chemicals and media used in the treatment of the RR WWTP effluent and Secondary Reservoir raw surface water must conform to American National Standard Institute/National Sanitation Foundation (ANSI/NSF) Standard 60 for direct additives and ANSI/NSF Standard 61 for indirect additives and must be certified by an organization accredited by ANSI. This includes the disinfectants, acids, caustics, fluosilicic acid, and all chemicals used in the cleaning of the MF and RO membranes.

Approval of a temporary, six-month exception for use of RR WWTP effluent as public water system source water will be contingent on submittal of scientifically-sound documentation addressing the following:

- *A total 9.0-log removal and/or inactivation of viruses has been achieved;*
- *A total 7.0-log removal and/or inactivation (including at least 1.0-log of inactivation) of Giardia has been achieved;*
- *A total 5.5-log removal and/or inactivation of Cryptosporidium has been achieved;*
- *The total culturable virus concentration is no greater than 2.222×10^{-7} most probable number (MPN)/L;*
- *The Giardia cyst concentration is no greater than 7.000×10^{-6} cysts/L;*
- *The Cryptosporidium oocyst concentration is no greater than 2.999×10^{-5} oocysts/L;*
- *No E. coli is present; and*
- *The levels for all primary and secondary drinking water standards do not exceed the regulatory levels in 30 TAC Chapter 290, Subchapter F.*

Even if the water meets the above-listed criteria, it may not be sent to distribution without further written approval from the TCEQ. During the Full-Scale Verification Test, and until written approval for distribution is received from the TCEQ, the water from the 2010 SWTP clearwell shall be discharged via a current TPDES-permitted outfall. This could be accomplished either through the Cypress Water Treatment Plant RO discharge TPDES Permit No. WQ0004419000, the WQ River Road WWTF discharge TPDES Permit No. WQ001059001, or the North Side WWTF discharge TPDES Permit No. WQ0010509005, based on permitted flow capacity remaining. If the water from the 2010 SWTP clearwell is discharged through the Cypress Water Treatment Plant RO discharge TPDES Permit No. WQ0004419000, the water shall be de-chlorinated to less than 0.1 mg/l chlorine residual and the City shall monitor chlorine residual daily by grab sample after the de-chlorination process.

Required Isolation of Water in Different Stages of Treatment and Equipment Not Used in the Treatment of RR WWTP Effluent

12. Because of concerns regarding introducing contamination into the Lake Kemp/Headquarters Road Reservoir raw water line, 1961 SWTP and 1987 SWTP treatment equipment and associated clearwells and piping, the 3.0-MG, 5.0-MG and 10.0-MG GSTs, and associated appurtenances, the following conditions must be met:
 - a. The 2008 SWTP flow control vault's valve located on the Lake Kemp/Headquarters Road Reservoir pipeline must remain closed at all times during the verification testing (and during the proposed six-month temporary discharge of potable water to the distribution system). The City must take the following actions:

- i. The valve and flow meter after the valve and before the tee must be inspected at least once each eight-hour shift;
 - ii. If leaking of the RR WWTP effluent back into the Headquarters Road transmission pipeline is noted, immediate corrective actions must be taken to stop the leaking and prevent the exposure of the pipeline to the RR WWTP effluent; and
 - iii. The results of the eight-hour visual inspections and any corrective actions must be recorded and included with the Report.
- b. The weir gates in the Cypress Splitter Box to the 1961 and 1987 SWTPs must be maintained closed and:
 - i. Visually inspected at least once each eight-hour shift for leakage;
 - ii. If leaking from either of these two weir gates is noted, immediate corrective actions must be taken to stop the leaking and prevent the exposure of the 1961 and 1987 SWTPs' pretreatment facilities to the partially treated RR WWTP effluent;
 - iii. As proposed by the City in your July 29, 2013 email, the drain valve in the 1961 SWTP settling basin must be maintained open during the verification testing (and during the proposed six-month temporary discharge to the potable water distribution system);
 - iv. The drain valve in the 1987 SWTP Parshall flume must be maintained open during the verification testing (and during the proposed six-month temporary discharge to the potable water distribution system); and
 - v. The results of the eight-hour visual inspections and any corrective actions must be recorded and included with the Report.
- c. As shown in Detail No. 1 on Sheet 2 of the engineering drawings in the PER's Appendix N, also included with your July 16, 2013 letter, the RO membrane permeate 36-inch pipeline from the RO permeate tanks to the 2010 and 1961 SWTP clearwells must be cut (or an appropriate fitting removed) after the RO permeate flow meter and connected to the proposed temporary above-ground, 24-inch pipeline to waste Lagoon No. 3. The 36-inch pipe to the clearwells must have a blind flange installed or be capped to prevent the entrance of contaminants during the DPR WTP's verification testing.
- d. Detail No. 2 on Sheet 2 of the engineering drawings in the PER's Appendix N, also included with your July 16, 2013 letter, must be modified to require a minimum separation distance of nine (9) inches from the bottom of the 24-inch pipe to the top elevation of the waste Lagoon No. 3's berm.
- e. A 42-inch, 90-degree elbow must be removed (as proposed by the City in your email dated July 29, 2013) from the 2010 SWTP transfer pumps' discharge and the discharge piping connected to the temporary 12-inch, above-ground pipe discharging into the manhole that drains to the 2010 SWTP recovery well located on waste Lagoon No. 2. A blind flange or cap must be installed on the 42-inch pipe to the 3.0-MG, 5.0-MG and 10.0-MG GSTs to prevent the entrance of contaminants during the DPR WTP's verification testing and TCEQ-approved temporary operation.
- f. Detail No. 4 on Sheet 2 of the engineering drawings in the PER's Appendix N, also included with your July 16, 2013 letter, must be modified to require a minimum separation distance of nine (9) inches from the bottom of the 12-inch pipe to the top elevation of the manhole.

- g. The backwash supply pipe for the 2010 SWTP gravity media filters must be disconnected from the backwash pumps' pipe coming from the Cypress High Service Pump Station during the verification testing. The pipe from the pump station will need to be temporarily plugged or capped at the point of disconnection to prevent the entrance of contaminants. During the verification testing, the City will need to use one of the following methods to supply backwash water for the 2010 SWTP gravity media filters by temporarily connecting the backwash supply pipe at the 2010 SWTP gravity media filters either:
 - i. To a pipe from the temporary 2010 SWTP transfer pumps' discharge header (going to waste) with necessary flow and pressure control valves to prevent blowing media out of the filters;
 - ii. Directly to the discharge of one of the 2010 SWTP transfer pumps with any necessary flow and pressure control valves solely for the purpose of backwashing the tested 2010 SWTP gravity media filters; or
 - iii. To a temporary dedicated pump and any necessary flow and pressure control valves that is taking suction from either:
 - 1. The 2010 SWTP clearwell; or
 - 2. An acceptable temporary storage tank that will be filled with gravity media filtered water or water from the 2010 SWTP clearwell transfer pumps.
- 13. All of the above referenced valve and gate closures and piping modifications must be completed prior to the RR WWTP transfer pumps being turned on after connecting the wastewater effluent piping to the temporary Cypress DPR WTP. TCEQ staff will inspect the DPR WTP to confirm isolation as described in Item No. 12 has been completed. The inspection must occur before the Full-Scale Verification Test may begin.
- 14. As noted in the TCEQ letters approving exceptions for the use of membranes and construction for the Cypress 2008 SWTP, each individual MF membrane unit's and RO membrane skid's piping must be equipped with cross-connection protection in the form of an air gap, double block-and-bleed valve system, isolation valves with removable pipe spools, or another TCEQ-approved method. The following piping must have cross-connection protection:
 - a. Feed water piping;
 - b. MF filtrate piping;
 - c. RO permeate piping;
 - d. Backwash supply piping;
 - e. Backwash waste piping;
 - f. RO concentrate piping;
 - g. Maintenance clean solution feed piping;
 - h. Maintenance clean recirculation piping;
 - i. Maintenance clean solution waste piping;
 - j. Clean-in-place (CIP) solution feed piping;
 - k. CIP solution recirculation piping; and
 - l. CIP solution waste piping.

Pre-formed Chloramines as a Pre-disinfectant

15. The City must provide an additional 1.0-log viral inactivation when using pre-formed chloramines (ammonia before chlorine) as a pre-disinfectant. Based on consultation with EPA Region 6 staff, the TCEQ has concluded that 1.0-log of additional viral log inactivation will provide an equivalent safety factor to that provided when chlorination precedes ammonia addition. Therefore, using pre-formed chloramines will require at least 9.0-log of total viral removal and inactivation through the temporary Cypress DPR WTP.
16. The City must monitor for cyanide at the effluent of the 2010 SWTP clearwell during the verification testing as specified in Enclosure A: Full-Scale Verification Test Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates.

Please note that during the six months of temporary operation of the Cypress DPR WTP, regulatory compliance monitoring will have to be conducted in accordance with 30 TAC §290.106 for cyanide at the entry point to distribution.

Chloramines for Inactivation of Pathogens at Subsequent Disinfection Zones

17. The City must monitor and use the monochloramine residual to calculate the inactivation credit for a disinfection zone where chloramines—specifically monochloramine—are the disinfectant during the verification testing. (This monitoring and reporting of inactivation will also be required during the six months of temporary operation when the City is subsequently discharging to the distribution system.)
18. During the verification testing, the free ammonia, free chlorine, total chlorine and nitrite levels while treating the RR WWTP effluent must be monitored at the locations and frequencies specified in Enclosure A: Full-Scale Verification Test Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates. The following analytical methods must be used:
 - a. Free ammonia: EPA 350.1 or SM* 4500-NH₃-G;
 - b. Free chlorine: One of the methods in 30 TAC §290.110(d)(1) except that a color comparator cannot be used;
 - c. Monochloramine: SM* 4500-Cl D or SM* 4500-Cl F;
 - d. Total chlorine: One of the methods in 30 TAC §290.110(d)(1) except that a color comparator cannot be used; and
 - e. Nitrite: EPA 300.0 or EPA 353.2.

* Standard Methods for the Examination of Water and Wastewater, APHA

Microfiltration Membranes

19. The temporary exception to use MF membranes in the treatment of the RR WWTP effluent is specifically and exclusively for the Siemens Memcor (previously distributed by USFilter) S10V MF membranes for which an exception was previously granted and for which the City received TCEQ approval to construct on August 19, 2004. The following conditions remain in place:
 - a. A feed-side surface area of 334.9 square-feet (sf);
 - b. A nominal pore size of 0.2-micron;
 - c. Maximum transmembrane pressure (TMP) of -12 pounds per square-inch (psi);

- d. Water temperature range of 1° to 40° C; and
- e. pH tolerance range of 2 to 12.

Further, these specific membranes were approved for operation with:

- f. Five tanks containing 504 submerged MF membrane elements;
 - g. A maximum instantaneous flux rate of 19.6 gallons per square-foot per day (gfd) at 20° C;
 - h. A three-minute backwash duration once every 25 minutes;
 - i. A 32-minute maintenance clean once per day; and
 - j. A CIP procedure once every 30 days.
20. The City submitted a 2004 MWH Challenge Study prepared for the California Department of Health Services. Based on this study and the previously submitted direct integrity testing, TCEQ can approve a 2.8-log removal for *Cryptosporidium* and *Giardia* for the installed membranes. A separate letter will be prepared and mailed to the City with a response to the Challenge Study submittal.
21. Unless superseded by a more current TCEQ letter, the City must conduct a direct integrity test (DIT) on each MF membrane unit treating water during the verification testing using the **test pressure (P_{test}) of 16.5 pounds per square-inch (psi)** and **upper control limit (UCL) of 1.65 psi/minute** specified in the TCEQ's April 30, 2012 letter:
- a. At least once each 24-hour period;
 - b. After each CIP procedure;
 - c. After failing a preceding DIT; and
 - d. Before a MF membrane unit being tested is returned to service after being removed for repair and/or removed from service for exceeding 0.100 NTU for two consecutive five-minute readings.
22. The City can use a lower control limit (LCL) that is less than 1.65 psi/minute, such as the 0.65 psi/minute noted in your letter dated July 31, 2013. Whether the City uses the TCEQ-approved UCL or a selected LCL, the pressure sensors/gauges must have a plus-minus error small enough to ensure that the measured P_{test} is high enough and pressure decay rate is less than the approved UCL.
23. When any one of the MF membrane units used during the verification testing has an individual filtrate turbidity level greater than 0.100 NTU for two consecutive five-minute readings, the MF membrane unit must automatically shut-down, an audible alarm be sounded to summon the operators, the membrane repaired, and the unit must pass a TCEQ-approved DIT before being returned to service.
24. If the selected MF membrane unit for verification testing cannot be repaired, cannot pass a TCEQ-approved DIT, or exceeds the 0.100 NTU limit for two consecutive five-minute readings in a one-hour period after being returned to service, then the verification testing must be temporarily halted and the City must contact the TCEQ Technical Review & Oversight Team at (512) 239-4691 to discuss the problem.
25. The selected MF membrane unit's influent and effluent water qualities and operating parameters must be monitored, analyzed, and recorded as specified in the Full-Scale Verification Test Protocol section of this letter, Enclosure A: Full-Scale Verification Test Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates, and

Enclosure B: Full-Scale Verification Test Protocol Monitoring and Reporting of Operating Processes.

Reverse Osmosis Membranes

26. The temporary exception to use RO membranes for the removal of chemical contaminants from the RR WWTP is only for the eight-inch diameter by 40-inch long Hydranautics RO elements currently installed, that previously received an exception and approval to construct, based on:
 - a. Six RO units/skids with two-stages per unit; and
 - b. Operated at a maximum permeate flux rate of 14.9 gfd (average of the two stages flux rates).
27. The selected RO membrane skid's influent and effluent water qualities and operating parameters must be monitored, analyzed, and recorded during the verification testing as specified in the TCEQ's:
 - a. Enclosure A: Full-Scale Verification Test Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates; and
 - b. Enclosure B: Full-Scale Verification Test Protocol Monitoring and Reporting of Operating Processes.

pH Adjustment

28. The 2010 SWTP clearwell's effluent:
 - a. Must have a pH level of 7.0 or greater;
 - b. Cannot be corrosive; and
 - c. The Langelier Saturation Index (LSI) and pH levels must be monitored and reported as specified in Enclosure A: Full-Scale Verification Test Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates of this letter.

Fluoride Addition

29. The filtered water discharge from the 2010 SWTP clearwell must be monitored, analyzed, and the results recorded as specified in the Enclosure A: Full-Scale Verification Test Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates, and Enclosure D: Design, Operating and Monitoring Requirements for Fluoride Adjustment during the verification testing.

All Temporary Exceptions

30. Continuous coagulation and flocculation must be maintained for the 2008 SWTP radial flow clarifier and 2010 SWTP Accelator clarification basins during the verification testing.
31. The 2008 SWTP radial flow clarifier basin cannot be operated at a surface overflow rate greater than 0.6 gpm/sf.
32. The 2010 SWTP Accelator clarification basin cannot be operated at a surface overflow rates greater than 1.0 gpm/sf.

33. If one of the 2010 SWTP gravity media filter's effluent exceeds 0.3 NTU for two consecutive 15-minute readings during the verification testing:

- a. The filter must be automatically taken out of service;
- b. An alarm must sound to summon the operators;
- c. The filter must be backwashed; and
- d. The effluent discharged to filter-to-waste until the turbidity level is less than 0.3 NTU before returning to service.

If the City wishes to optimize the gravity media filters' individual performance during the verification testing for additional log removal credits, then a 2010 SWTP gravity media filter's effluent that exceeds 0.15 NTU for two consecutive 15-minute readings during the verification testing:

- e. Must be automatically taken out of service;
- f. An alarm must sound to summon the operators;
- g. The filter must be backwashed; and
- h. The effluent discharged to filter-to-waste until the turbidity level is less than 0.15 NTU before returning to service.

34. Surface Water Monthly Operation Reports (SWMORs) must be completed for the Secondary Reservoir raw surface water and RR WWTP effluent sources using the TCEQ temporary CT Templates in Enclosure F: Full-Scale Verification Test Temporary CT Templates and submitted with the Report.

Since the 10.0-MG GST will not be included in the verification testing, the TCEQ has created these templates with the City's proposed Disinfection Zone 5 split into two disinfection zones: Temporary Blended Disinfection Zone 5 for the 2010 SWTP clearwell and Temporary Blended Disinfection Zone 6 for the 10.0-MG GST. The TCEQ understands that the minimum required inactivations for virus and *Giardia* probably will not be met at the effluent of the 2010 SWTP clearwell during the Full-Scale Verification Test period, even at the reduced flow rate of the verification test. Therefore, for the City to demonstrate the effectiveness of its final Disinfection Zone 5, the City staff will need to take the following actions once each eight-hour period during a day to simulate the inactivation being achieved in the 10.0-MG GST:

- a. Collect a sample of water from the 2010 SWTP clearwell's effluent;
- b. Record the flow rate at the 2010 SWTP clearwell's effluent when the water sample is collected;
- c. Calculate the hydraulic detention time for the 10.0-MG GST using the 50-percent volume and the recorded flow rate;
- d. Calculate the T_{10} in minutes (theoretical disinfectant contact time based on the design of a basin/unit) for the 10.0-MG GST using the hydraulic detention time calculated in condition c above and a baffling factor of 0.3;
- e. Maintain the water samples collected in Condition No. 32.a in a manner that simulates storage in the 10.0-MG GST (for example, at ambient water temperature and in the dark) for a duration not less than the calculated T_{10} from condition d;
- f. After the water has resided in the sample container for the calculated T_{10} from condition d, measure:

- i. The monochloramine residual;
 - ii. pH level; and
 - iii. Water temperature.
 - g. For each day (midnight to midnight as specified for reporting on the TCEQ's SWMOR), the City must calculate the simulated virus and *Giardia* inactivation achieved for each of the three samples;
 - h. Enter the sample set results (flow rate, monochloramine residual, pH level and water temperature) that achieved the lowest inactivation for virus and *Giardia* on the SWMORs for both the Secondary Reservoir raw surface water and RR WWTP effluent sources; and
 - i. Record the results from this simulated inactivation for TCEQ Sample Sets 41A and 42A of Enclosure A: Full-Scale Verification Test Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates.
35. No gravity media filter backwash waste, MF and RO membrane backwash or chemical cleaning waste, or clarifier blow-down waste can be discharged to waste Lagoon No. 3.
36. All liquid and solid waste generated during the verification testing must be disposed of in accordance with the TCEQ permits, rules and regulations.

All exceptions are subject to periodic review and may be revoked or amended if warranted. A copy of this letter and all related monitoring data must be maintained with your records for as long as these exceptions are in effect. These records must be made available to TCEQ staff upon request.

Please note that these exceptions are not intended to waive compliance with any other TCEQ requirement in 30 TAC Chapter 290. These exceptions cannot be used as a defense in any enforcement action resulting from noncompliance with any other requirement of 30 TAC Chapter 290.

Full-Scale Verification Test Protocol

The TCEQ is approving the City's requested Full-Scale Verification Test Protocol (Protocol) under the following conditions:

1. The verification test period must include:
 - a. At least one continuous operation period of no less than 30 days with at least one of each of the treatment processes in operation. At least one MF membrane unit, RO membrane unit, and gravity media filter must be tested at the City's selected maximum flow rates and operating parameters. The City may be required to start the Full-Scale Verification Test period over if:
 - i. Monitoring results, on-site alarms, or other data indicate that the temporary Cypress DPR WTP is producing a filtered water quality that indicates a potential risk to public health or an inadequate supply of water for human consumption will be produced;
 - ii. Monitoring of the RR WWTP effluent for pathogens indicates that a greater removal and/or inactivation is required than the City has received TCEQ approval for;

- iii. The U.S. EPA revises the allowable maximum contaminant levels for existing regulated contaminants or establishes maximum contaminant levels or treatment technique requirements for chemical or microbiological contaminants that are currently unregulated;
 - iv. The U.S. EPA adopts requirements, guidance or begins rule making for treatment of reclaimed wastewater for human consumption;
 - v. Substantiated data becomes available establishing a public health risk for one or more unregulated chemical or microbiological contaminants at a specified concentration level in drinking water;
 - vi. The City fails to comply with one or more of the conditions of the temporarily granted exceptions or one of the TCEQ approved Protocol requirements; or
 - vii. Any other event or procedure that the TCEQ determines could affect the temporary DPR WTP effluent quality and create a potential public health risk, such as, but not limited to, change in flux rates, blending ratio, hydraulic loading rates, backwash/cleaning procedures, chemicals used, chemical injection locations, etc.
- b. Performing a CIP procedure on the selected MF and RO membrane units;
 - c. Continuation of the verification testing at the same selected maximum flow rates and operating parameters for at least ten (10) more days after the CIP to verify that the CIP procedures were effective in flux recovery; and
 - d. A CIP procedure performed on the selected RO membrane skid at the same time as the MF membrane unit(s) CIP procedure is performed.

Please note that the City may choose to conduct the verification testing for a longer duration, but not less.

2. During the verification testing, the City must monitor and record verification data 24 hours a day and seven days a week at the specified frequencies listed in the TCEQ's Enclosure A: Full-Scale Verification Testing Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates and Enclosure B: Full-Scale Verification Test Protocol Monitoring and Reporting of Operating Processes.

If acceptable monitoring taps, on-line monitors or flow indicators are not currently installed at acceptable locations to collect the data in the TCEQ's Enclosures A and B, the City must submit engineering drawings and specifications for the TCEQ's review and approval of these modifications prior to beginning the verification testing.

3. Prior to beginning the Full-Scale Verification Test, the Protocol must be amended to include:
 - a. All conditions for the granting of temporary exceptions listed above in the Requested Temporary Exceptions section of this letter;
 - b. All requirements in the Pretreatment Requirements section of this letter listed below;
 - c. All of the requirements in this letter's enclosures and methods to comply with the requirements within each enclosure:
 - i. Enclosure A: Full-Scale Verification Testing Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates;
 - ii. Enclosure B: Full-Scale Verification Test Protocol Monitoring and Reporting of Operating Processes;

- iii. Enclosure C: Acceptable Analytical Methods, Calibration Methods and Calibration Frequencies;
 - iv. Enclosure D: Design, Operating and Monitoring Requirements for Fluoride Adjustment;
 - v. Enclosure E: Full-Scale Verification Test Report Format; and
 - vi. Enclosure F: Temporary Full-Scale Verification Test CT Templates
4. Any planned simulated distribution system (SDS) testing for potential increases in disinfection byproduct levels within the City's and purchased water systems' distribution systems. It is recommended that the Uniform Formation Conditions method specified by the Information Collection Rule (ICR) be used.

Once these changes have been made to the Protocol and the other conditions in this letter have been met, the Full-Scale Verification Test may be conducted.

TCEQ Review of Preliminary Engineering Report and Plans

The requirements for the DPR WTP are not addressed in state and federal regulations. Based on the information of the PER, the project generally addresses the conditions set by the TCEQ's letter dated February 8, 2013—TCEQ's review of the City's Concept Paper for the Emergency Reuse of Wastewater Effluent as Source for Direct Potable Reuse (DPR). **We look forward to the receipt of a sealed final engineering report and detailed engineering plans and specifications for review and approval of the temporary site piping and modifications at least 45 days prior to beginning the Full-Scale Verification Test.** The final plans shall include the following items for review:

1. The final report and plans shall include page numbers and an appendix that lists all conditions from this letter with cross references to the page number(s) that show compliance with each condition of the temporary exceptions and preliminary plan review.
2. The partially treated wastewater effluent that will be blended from the 2008 MF/RO SWTP shall not exceed five MGD and the flow rate of the raw surface water from the Secondary Reservoir. The blended water from RR WWTP and Lake Arrowhead and Lake Kickapoo raw surface water from the Secondary Reservoir shall not exceed a blending ratio of 50.0 percent. A blending report with a detailed description for monitoring the process controls of the required ratio must be submitted for review with the final engineering plans and specifications.
3. Provision shall be made for the 2008 MF/RO SWTP and 2010 SWTP plant carrying treated wastewater effluent to be separated from the Lake Kemp raw surface water, the 1961 and 1987 SWTPs, and Cypress ground storage tanks. Please submit scaled detailed plans with the final engineering report and plans demonstrating the complete isolation of the facilities as detailed in Condition No. 12 under "Required Isolation of Water in Different Stages of Treatment and Equipment Not Used in the Treatment of RR WWTP Effluent" section of this letter.
4. The final plans and specification must address all the terms and conditions, including but not limited to, requirements for air gaps, flow monitoring, flow control, monitoring locations, alarms and automatic shutdown and control mechanisms, for the proposed temporary DPR WTP as indicated above in the Temporary Exceptions.

5. Any additional chemical storage and feed system for pH adjustment, fluoride addition and additional chlorine demand that is required during the operation of proposed temporary DPR WTP must comply with the requirements of 30 TAC Section 290.42(f).

The proposed temporary piping at the 2010 SWTP is **approved for construction and full scale testing but NOT for use** if it consists of:

- Modifications of an existing 36-inch waterline upstream of an existing RO meter vault with a cap to isolate the treated wastewater to prevent it flowing to the clearwell of the 1961 SWTP and 2010 SWTP; approximately 3,800 linear feet (l.f) of proposed 24-inch above-ground waterline to divert the treated RR WWTP wastewater to an existing storage Lagoon No. 3 with a nine-inch vertical separation between the bottom of the pipe and the top of the lagoon's berm. To be approved the line to storage Lagoon No. 3 must be modified as stated in Condition No. 12.d.
- Modifications of a waterline upstream of the 2010 SWTP transfer pumps with the removal of a 42-inch 90-degree elbow to isolate the DPR WTP water from the existing Cypress ground storage tanks; approximately 4,400 l.f. of 12-inch above-ground waterline from the 2010 SWTP transfer pumps to a manhole with air gap; ; To be approved the line must be modified as stated in Condition No. 10.f;
- Modifications of an existing 2010 SWTP lagoon valve vault with approximately 2,100 l.f. of proposed 24-inch above-ground waterline to discharge the blended water to the river; and
- Related valves, fittings and appurtenances.

The submittal received on April 25, 2013 consisted of a preliminary engineering report which included two sheets of schematic diagrams of temporary piping modifications. Supplemental sheets were provided later to address review questions.

Full-Scale Verification Test Report

Failure to provide all of the monitoring data required by the TCEQ can result in part of the verification testing having to be redone or more stringent operating conditions for approval to discharge treated RR WWTP effluent to the City's distribution system for human consumption. In addition, **failure to submit the data collected in the formats specified will result in a delay of the TCEQ's review.**

- The Report must contain all of the verification testing data at the specified monitoring frequencies listed in:
 - o Enclosure A: Full-Scale Verification Test Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates;
 - o Enclosure B: Full-Scale Verification Test Protocol Monitoring and Reporting of Operating Processes; and
 - o Enclosure D: Design, Operating and Monitoring Requirements for Fluoride Adjustment.
- The Report must contain documentation demonstrating that the analytical methods used during the verification testing comply with those specified in Enclosure C: Acceptable Analytical Methods, Calibration Methods and Calibration Frequencies.
- The verification testing results must be presented in the formats specified in Enclosure E: Full-Scale Verification Test Report Format.

- A list of all on-line monitors and benchtop equipment with the manufacturers' names , model numbers, and analytical methods must be included.
- The Report must include a flow diagram and a list of all locations grab samples were collected.
- The Report must include a flow diagram with the locations of all on-line water quality and flow monitors with triggers for:
 - o Alarms only; and
 - o Alarms with automatic shut-down controls.
- Provide a list of the equipment that will be taken out of service for each automatic shut-down controller in the Report.
- The Report must contain the following documents for TCEQ review and approval for the temporary six-month operation of the DPR WTP sending water to distribution for human consumption:
 - o Revised Monitoring Plan;
 - o Revised Operation & Maintenance Manual;
 - o Method of providing "Public Notice" to the City's retail service and purchased water system customers;
 - o A current list of the members and who they represent for the City's:
 - DPR Task Force;
 - Disease Surveillance and Response Program; and
 - Water Quality Task Force.
 - o A current revised (as a result of past TCEQ comments and the verification testing) list of triggers that will activate each of the above health groups and actions that will be taken; and
 - o A list of triggers for when the City will notify the TCEQ Water Supply Division and Abilene Regional Office staff and the method of notification.
- All of the verification test data must be submitted with the Report.

The City's proposal contained in your July 13, 2013 letter to submit the Report in five parts over a time frame of approximately two months will not afford the TCEQ the opportunity to review a comprehensive Full-Scale Verification Test study; as such, TCEQ cannot accept this proposed submittal timeline. Recognizing the drought conditions that the City faces, TCEQ staff can start review of the Report without the radionuclide and last viral results.

- The City must submit the number of completed Reports to the following TCEQ staff at addresses under the TCEQ Contacts section of this letter below:
 - o Two copies to the Technical Review & Oversight Team;
 - o One copy to the Utilities Technical Review Team; and
 - o One copy to the Water Quality Division.

Required DPR WTP CT Studies

Based on the results of the Full-Scale Verification Test, the City may wish or find it necessary to revise the previously submitted CT Templates and proposed disinfection protocols for one or both source waters. Please submit complete CT Study requests for both sources of water after completion of the verification testing for the operation of the temporary DPR WTP, even if the City does not have any changes. Please note that the City will need a TCEQ-approved CT Study for both sources of water to be used in the DPR WTP before water from the proposed DPR WTP's effluent can be discharged to the distribution system for human consumption.

The TCEQ has conducted a review of the City's CT Templates for the Secondary Reservoir raw surface water (from Lake Arrowhead and Lake Kickapoo) and the RR WWTP effluent sources. Staff noted some discrepancies and lack of supporting documentation for the submitted data. We have enclosed the TCEQ's modifications and corrections in Enclosure H: CT Templates for an Operational DPR WTP. Since the CT Template does not readily allow tracking of changes, we have listed these revisions and questions below:

- For the Secondary Reservoir raw surface water CT Workbook:
 - o On the Calculator Worksheet the log inactivations for the raw surface water source required for:
 - "Giardia Lamblia Cysts" must be 0.5, not 1.0 as was entered; and
 - "Viruses" must be 2.0, not 5.0 as was entered.
 - o On the Calculator Worksheet the disinfectant for disinfection zones (DZ) Nos. 2 and 3 should be chlorine dioxide, not chloramines.
 - o Please note that since chlorine and ammonia are injected in the Cypress splitter box side-by-side, a measurable chlorine dioxide residual must always be measured at the end of DZ 1. Therefore, the TCEQ's revised Calculator Worksheet residual for DZ 1 shows 0.05 as a residual.
 - o The Schematic Worksheet must match the description for disinfection zones. The Description Worksheet describes three (3) disinfection zones for the pipeline from the Secondary Reservoir to the Cypress splitter box, but the Schematic Worksheet only shows one disinfection zone.
- For the RR WWTP source water CT Workbook:
 - o On the Schematic Worksheet please revise the zones shown as DZ 3A and DZ 3B into a single disinfection zone, DZ 3.
 - o On the T10 Details Worksheet under DZ 1, the pipe diameter was changed from 30 inches to 27 inches to reflect the actual inside diameter, water volume, and resulting T10 value. This change was based on the information provided to the TCEQ in your email dated August 29, 2013 after the TCEQ discovered a discrepancy between the City's CT Template, which had a 30-inch diameter, and the TCEQ Water Quality Division's April 8, 2013 letter, which approved a 32-inch diameter transmission line from the RR WWTP to the Cypress 2008 SWTP.
 - o On the T10 Details Worksheet under DZ 2, the unit description for the radial flow clarifier only had the volume listed. This unit has never been claimed for CT credit by the City in the past. No reference was listed in the adjacent "Comment" cell for how the submitted volume was calculated. After review of the engineering drawings for the proposed DPR WTP, this section was revised as noted in Enclosure H. The TCEQ staff determined that:

➤ A volume of 3,875,583 gallons is a valid CT volume for this unit, not 5,000,000 gallons.

- o On the T10 Details Worksheet under DZ 3, the unit description for the MF membrane feed trough only had the volume listed. This unit also has never been claimed for CT credit by the City in the past. No reference was listed in the adjacent “Comment” cell for how the submitted volume was calculated. Since this is a rectangular basin, that “shape” from the available drop down box was selected, and we entered the width, length and side-water depth. After review of the old Cypress 2008 SWTP engineering drawings for the proposed DPR WTP, this section was revised as noted in Enclosure H. The TCEQ staff determined that:

➤ A volume of 5,508 gallons is a valid CT volume for this unit, not 30,637 gallons; and

➤ A “Baffling Factor” of 0.1 is representative of the flow characteristics, not 0.5

- o On the T10 Details Worksheet under DZ 3, the unit description for the MF membrane tank only had a volume. This unit has also never been claimed for CT credit by the City in the past. No reference was listed in the adjacent “Comment” cell for how the submitted volume was calculated. After review of the engineering drawings for the proposed DPR WTP, this section was revised as noted in Enclosure H. The TCEQ staff determined that:

➤ A volume of 9,557 gallons is a valid CT volume for this unit replacing the submitted volume of 9,208 gallons;

➤ A maximum flow rate of 2,297 gpm per MF tank should be used, not 1,936 gpm; and

➤ The submitted reference for each MF membrane tanks’ maximum flow rate is inaccurate. The TCEQ’s approved MF membrane filtrate capacity in our August 19, 2004 letter was for a net filtrate available for RO feed water. This is the gross filtrate produced (504 membranes × 339.4 sf/membrane × 19.6 gfd/1440) minus the filtrate used for backwash and maintenance cleans each day. While this quantity of filtrate would not be available as RO feed water, as noted in the TCEQ’s August 5, 2002 exception letter, it is the quantity of filtrate needed to supply the RO membranes and meet the cleaning needs of the MF membranes.

The TCEQ approved flux rate of 19.6 gfd is for a water temperature of 20° C. A higher flow could be achieved at higher temperatures, but lower flow rates will occur at lower temperatures during the verification testing using a TCEQ temperature correction equation, but a lower flux rate will also result at lower temperatures. Also, this is based on the TCEQ exception conditions for using the MF membranes that include the frequency and duration for the backwash and maintenance clean events. Since the City will now be treating the RR WWTP effluent, the frequencies and durations of the backwash and maintenance clean events could increase and result in less net filtrate available for RO feed water.

- o The flow rate through each MF tank must be monitored and the highest flow rate entered for DZ 3 on the Calculator Worksheet.
- On the T10 Detail Worksheet for both CT Templates in Enclosure H, please note:
 - o The flow rates were revised to accurately indicate and use 5.000 MGD, 7.5 MGD, 10.000 MGD, etc. in the CT calculations. This was done by entering flow rates on the T10 Details Worksheet using the following equation:

= $Q \cdot 10^6 / 1440$, where Q is the flow rate in MGD.

- o On the T10 Details Worksheets under DZ 4, the unit description for the gravity media filters, the “Number of Units” was changed to “4” to correctly reflect the City’s operation of four filters on-line with a fifth filter either on standby or in backwash. Please note that for the Calculator Worksheet to correctly reflect the inactivation of the gravity media filters, four gravity media filters must always be operated together and at equal flow rates.
- o When the two CT Study requests are submitted, please clarify the “Comment” in Cell-G1335 of both T10 Details Worksheets. It is unclear what was meant by:
“100% of 10 MGD Max at Cypress (7 MGD).”
- Please review the TCEQ’s added details on the both CT Templates’ Description Worksheet for correctness and clarification.
- To facilitate the TCEQ’s review and response, please ensure that the DPR WTP CT Study requests include all of the necessary engineering drawings with all dimensions, and side-water depths. At a minimum, those engineering drawings referenced on the Enclosure H CT Templates must be included. For odd shaped basins (such as the MF tank) used for CT credit that the CT Template does not have provisions for entering all the dimensions, include the volume calculations with the previously approved submitted engineering drawings.

Industrial Contributions to the RR WWTP

There is a concern regarding the variability and unpredictability of certain industrial discharges into the headworks of the RR WWTP during the operation of the temporary direct portable reuse facility. In order to increase the pretreatment measures in place to protect the supply of drinking water, human health, and the environment, the TCEQ recommends that the City of Wichita Falls take the following actions related to industrial discharges into the RR WWTP:

- Do not accept hauled waste at the RR WWTP during the operation of the temporary direct portable reuse facility.
- Do not accept Underground Storage Tank (UST) clean-up waste at the River Road WWTP during the operation of the temporary direct portable reuse facility
- Either do not accept waste streams from the Liquid Waste Processing (LWP) Facility at the River Road WWTP during the operation of the temporary direct potable reuse facility or implement additional precautions, such as follows:
 - o Provide additional monitoring capabilities at the LWP;
 - o Provide additional safeguards to prevent untreated waste from escaping the facility;
 - o Have the facility submit copies of manifests of every load of waste delivered to the facility;
 - o Increase sampling frequency for biochemical oxygen demand (BOD) and require the facility to sample for fats, oils, and grease (FOG);
 - o Increase inspection frequency of the facility;
 - o Require the LWP facility to perform a comprehensive evaluation of each wastestream source for existing waste streams and evaluate how such wastestreams impact the LWP’s treatment process and its ability to comply with local limits;

- o Require the LWP facility to inform the city of the results of the evaluation and obtain written approval from the city prior to accepting new waste streams. The city should verify the categorical determination of LWP and revise the industrial discharge permit as necessary to reflect accurate categorization, effluent permit limit limits, and other conditions or requirements; and
 - o The city should pay close attention to the definition of centralized waste treatment (CWT) wastewater and CWT wastewater sources.
- Minimize any new users discharging to the RR WWTP during the operation of the temporary direct potable reuse facility. All new industrial contributions, if any, must complete a Baseline Monitoring Report of their wastewater and be evaluated for their ability to meet the City's technology-based effluent limits (TBLLs). The City should require additional pretreatment facilities at the industry, as necessary, to comply with those limits. If the Baseline Monitoring Report shows that compliance with TBLLs cannot be met, new industries shall not be allowed to enter the RR WWTP collection system.
- Require all Significant Industrial Users (SIUs) to notify the City in advance of any planned action to substantially increase the volume or change the characteristic of their discharges to the River Road WWTP. The City must carefully evaluate these notifications and determine whether the proposed changes may cause problems. In such cases, these changes should be denied.
- Demonstrate how the current TBLLs are still protective of the RR WWTP and receiving streams before the beginning of the diversion of the effluent to be used as a supply source for the DPR WTP.
- Continue to inspect, on a regular basis, the Sheppard Air Force Base (SAFB) to be aware of all the waste streams in each building including those operated by any tenants located at SAFB. Please pay close attention to any medical operations. Coordinate the investigation with the TCEQ Pretreatment Coordinator of TCEQ's Region 4 Office. Please provide copies of inspection reports to TCEQ that include all the waste streams in each building that discharge and how each waste stream is or will be managed before the end of the full scale verification study.
- Continue to require the facilities permitted and regulated under the Metal Finishing Point Source Category (40 CFR Part 433) to submit and implement a Toxic Organics Management Plan (TOMP) on an annual basis and obtain written approval from the city. The City should also continue to inspect these facilities for the absence or presence of toxic organic chemicals. The industries shall provide required certifications each month during the operation of the temporary direct portable reuse facility. The TOMP will aide to manage toxic organics and prevent their discharge to the sanitary sewer system. During the inspections of these type of industries, the city should also conduct a thorough review of chemicals used to ensure that no chemicals are being used or stored at the facilities that contain any TTOs and verify procedures stated in the TOMP are adequate and are being followed. The City needs to require the industry to make any modifications necessary in order to ensure that toxic organics will not be introduced into the sanitary sewer system. Modifications to the TOMP need to be reviewed and approved by the City before the industries make the changes to their operations.
- Continue to require all permitted SIUs to develop and implement a Slug Discharge Control Plan (SDCP) that includes detailed accidental spill cleanup and notification requirements. For facilities that currently have an approved SDCP, evaluate its effectiveness and require modifications as needed to ensure that slug loads will be prevented and that adequate procedures exist to respond to worst-case accidental spills and notification procedures to the City's pretreatment program and RR WWTP personnel if a slug discharge or accidental spill occurs. The city shall approve all SDCPs and revisions to them in writing.

- Continue to require a Spill Prevention, Control, and Countermeasures (SPCC) Plan of every industry permitted by the City.
- Notify all permitted or regulated industrial users (IUs) of the project, reinforce the need to comply with all the pretreatment regulations, and make them aware of potential implications that changes in their process could impact the City's ability to use wastewater effluent as a source of water. The City shall keep documentation of notifications to each regulated IU.
- Encourage all permitted or regulated IUs to seek ways to minimize waste, reduce use of raw materials by increasing the efficiency of their production activities (e.g., maximizing product yield and minimizing by-products), improve the efficiency of their wastewater treatment system, substitute less-toxic chemicals, and implement any other pollution prevention activities that will reduce the volume and concentration of pollutants discharged to the sanitary sewer system. Continue to encourage pollution prevention measures and best management practices in all industrial permits.
- During the Full-Scale Verification Test, the City of Wichita Falls will be subject to an increased frequency of pretreatment compliance inspections (PCIs) by regional inspectors and pretreatment audits by central office staff.

TCEQ Contacts

- If you have any questions or need further assistance regarding the City's Chapter 210 reclaimed water reuse authorization, the RR WWTP Permit, operation of the wastewater collection system, and RR WWTP monitoring and operation during the verification testing for the temporary Cypress DPR WTP, please contact Ms. Jaya Zyman-Ponebshek, P.E., by email at Jaya.Zyman-Ponebshek@tceq.texas.gov or by telephone at (512) 239-2012 or by correspondence at the following address:

Water Quality Division - MC 145
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

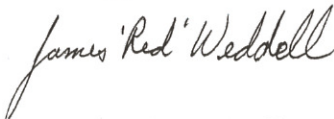
- If you have any questions concerning this letter or need further assistance regarding the conditions for the temporary exceptions, Protocol and Report, please contact Mr. James "Red" Weddell by email at james.weddell@tceq.texas.gov or by telephone at (325) 481-8056 or by correspondence at the following address:

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

- If you have any questions concerning this letter or need further assistance regarding the TCEQ's review of the PER and approval to construct, please contact Vera Poe at (512) 239-6988 or by email at vera.poe@tceq.texas.gov or by correspondence at the following address:

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

Sincerely,



James "Red" Weddell, P.E.
Technical Review & Oversight Team
Plan and Technical Review Team
Water Supply Division
Texas Commission on Environmental Quality



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



Linda Brookins, Director
Water Supply Division
Office of Water
Texas Commission on Environmental Quality

LB/VP/PT/JSW/av

Enclosures: Enclosure A: Full-Scale Verification Test Protocol Minimum Monitoring and Reporting of Water Qualities and Flow Rates
 Enclosure B: Full-Scale Verification Test Protocol Monitoring and Reporting of Operating Processes
 Enclosure C: Acceptable Analytical Methods, Calibration Methods and Calibration Frequencies
 Enclosure D: Design, Operating and Monitoring Requirements for Fluoride Adjustment
 Enclosure E: Full-Scale Verification Test Report Format
 Enclosure F: Temporary Full-Scale Verification Test CT Templates
 Enclosure G: Long Term 2 Enhanced Surface Water Treatment Rule Bin Classification Letter
 Enclosure H: CT Templates for an Operational DPR WTP

Mr. Kerry D. Maroney
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September 5, 2013

cc: Honorable Glenn Barham, Mayor, City of Wichita Falls, P.O. Box 1431, Wichita Falls, TX 76307-1431
Mr. Darron Leiker, City Manager, 1300 7th Street Room, Wichita Falls, TX 76301
Mr. Russell Schreiber, P.E., Director of Public Works, City of Wichita Falls, P.O. Box 1431, Wichita Falls, TX 76307
Mr. Daniel K. Nix, Utilities Operations Manager, City of Wichita Falls, P.O. Box 1431, Wichita Falls, TX 76307