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## Central Valley Regional Water Quality Control Board

20 March 2017

Rick Staggs  
Wastewater Manager  
City of Fresno  
Department of Public Utilities  
5607 West Jensen Avenue  
Fresno, California 93706

**CERTIFIED MAIL**  
**7016 0750 0000 7453 2498**

### **NOTICE OF APPLICABILITY**

#### **STATE WATER RESOURCES CONTROL BOARD ORDER WQ 2016-0068-DDW WATER RECLAMATION REQUIREMENTS FOR RECYCLED WATER USE CITY OF FRESNO WATER RECYCLING PROJECT FRESNO COUNTY**

Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff reviewed the City of Fresno's 19 July 2016 Notice of Intent (NOI) for regulatory coverage under Water Quality Order WQ 2016-0068-DDW, *Water Reclamation Requirements for Recycled Water Use* (hereafter, General Order). The NOI included the *Title 22 Engineering Report for the Production, Distribution and Use of Recycled Water*, dated 2 November 2015 (2015 Title 22 Engineering Report). The NOI was also submitted to the State Water Resources Control Board, Division of Drinking Water (Division of Drinking Water). The City of Fresno submitted a revised Recycled Water Title 22 Report, dated 8 November 2016, in response to comments from the Division of Drinking Water.

In partnership with the City of Clovis, the City of Fresno (City) owns and operates the Fresno-Clovis Regional Wastewater Reclamation Facility (Reclamation Facility) at 5607 West Jensen Avenue in Fresno County. The Reclamation Facility is currently regulated under Waste Discharge Requirements Order 5-01-254 for the discharge of undisinfected secondary wastewater to surrounding percolation ponds and on-site reclamation areas.

The City is constructing a tertiary treatment and disinfection facility (Tertiary Treatment Facility) and proposes to administer a recycled water use program primarily for 1) agricultural irrigation for farms and dairies, 2) landscape irrigation (e.g., parks, cemeteries, schools, and highways), and 3) industrial uses (e.g., heating/cooling, dust control, and cleanup/wash down water).

On 7 June 2016, the State Water Resources Control Board adopted the General Order to regulate the use of recycled water for all Title 22 uses except groundwater recharge. In addition, the General Order delegates the responsibility of administering water recycling programs to a designated Administrator to the fullest extent possible. Based on the information provided in the NOI and in subsequent information submitted by the City, the proposed water recycling project satisfies the general and specific conditions of the General Order. Therefore,

this serves as formal notice that Order WQ 2016-0068-DDW is applicable to the site and discharge described below. The City will act as the Administrator of the Recycled Water Program for this discharge. You are hereby assigned **WQ 2016-0068-R5004** for this discharge. Please include this order number on all correspondence related to this discharge.

As previously mentioned, potential recycled water users may include dairies. **Prior to accepting recycled water**, dairies that wish to receive recycled water from the Tertiary Treatment Facility shall provide the City and the Central Valley Water Board with a revised Nutrient Management Plan and/or Waste Management Plan for their respective dairy, subject to Executive Officer approval. The dairy shall ensure compliance with the Dairy General Order R5-2013-0122 (if applicable) and manage all applications of recycled water correctly. Acting as the Administrator, the City has an obligation to remind dairies and other recycled water users to apply recycled water agronomically in accordance with the certified Nutrient Management Plan (if applicable).

As of the date of this Notice of Applicability (NOA), the City is completing the construction of the Tertiary Treatment Facility. On 25 September 2015, the Central Valley Water Board received a Report of Waste Discharge for an increase in permitted flow of undisinfected secondary-treated wastewater at the Reclamation Facility and for the proposed Tertiary Treatment Facility. Central Valley Water Board staff is currently working on drafting new waste discharge requirements that will regulate both the Reclamation Facility and the Tertiary Treatment Facility. Since the City has submitted a complete Report of Waste Discharge (over 140 days ago) and the necessary environmental documentation for California Environmental Quality Act has been approved (over 90 days ago), the City has satisfied the requirements in Section 13264 of the California Water Code to initiate the discharge of disinfected tertiary-treated wastewater to recycled water use areas.

**Prior to conveying disinfected tertiary-treated recycled water from the Tertiary Treatment Facility to any use area**, the City shall submit a post-construction report. The post-construction report shall include the following:

- 1) Certification, from a California registered civil engineer who supervised the construction of the Tertiary Treatment Facility, that the Facility was designed and constructed to produce disinfected tertiary-treated recycled water compliant with California Code of Regulations, title 22, division 4, chapter 3 (Uniform Statewide Recycling Criteria);
- 2) Certification, from the Tertiary Treatment Facility chief plant operator, that the Tertiary Treatment Facility will be operated in compliance with the Uniform Statewide Recycled Criteria; and
- 3) Certification from the Tertiary Treatment Facility chief plant operator that the Tertiary Treatment Facility's ultraviolet light disinfection system will be operated as recommended by the Division of Drinking Water in its 12 September 2016 letter (enclosed).

You should familiarize yourself with the entire General Order and its attachments enclosed with this letter, which describe mandatory discharge and monitoring requirements. Sampling, monitoring, and reporting requirements applicable to your recycled water project must be completed in accordance with the attached Monitoring and Reporting Program (MRP) WQ 2016-0068-R5004. This MRP was developed after review of your NOI as described in the enclosed Technical Memorandum.

## **WASTEWATER TREATMENT FACILITY**

The City is currently constructing Phase 1 of the Tertiary Treatment Facility at the Reclamation Facility. The initial phase will have a capacity of 5 MGD, but will be laid out for future expansion to an ultimate design capacity of 30 MGD. Primary effluent from Train C of the Reclamation Facility will be diverted to the Tertiary Treatment Facility. The primary effluent will be treated by fine screening at a new fine screen facility then conveyed to the Tertiary Treatment Facility. The Tertiary Treatment Facility will treat the fine screen effluent and produce tertiary-treated recycled water using a membrane bioreactor process. Membrane permeate will be disinfected by an in-pipe ultraviolet light disinfection system meeting Title 22 recycled water quality criteria.

The initial phase of the planned distribution system includes the design and construction of certain elements of the recycled water transmission mains referred to as the Southwest Quadrant, together with a related recycled water booster pump station.

## **RECYCLED WATER APPLICATION**

The City proposes to administer a recycled water use program for nearly 30 users with total estimated usage of nearly 2,800 acre-feet per year on 860 irrigable acres, primarily for agricultural irrigation for farms and landscape irrigation for cemeteries, parks, highways and a school. The City, as the date of this NOA, does not have final agreements with any potential recycled water users. As such, the use area site maps and use area supervisors are currently unknown.

## **ADDITIONAL SITE SPECIFIC CONDITIONS**

On 11 April 2013, the City Council adopted a resolution certifying the final Environmental Impact Report (EIR) and adopted the Recycled Water Master Plan. In December 2015, an addendum to the EIR was prepared to address changes in operating parameters, discharge and effluent limits, and permitted uses. The addendum provided documentation to support that the proposed project would not result in significant effects.

## **WATER RECYCLING PROGRAM ADMINISTRATION FOR AGRICULTURAL AND LANDSCAPE IRRIGATION AND OTHER USES**

The City, as the Administrator, will be responsible for the administration of the Recycled Water Program authorized pursuant to this General Order, including the requirements of Title 22. The City is also the recycled water Producer and Distributor and is responsible for all permit requirements related to the production and distribution of recycled water.

The NOI provided a detailed description of the City's water recycling program according to the following topics:

- Authority, Rules and Regulation, and User Agreements;
- Design and Implementation Program;
- Cross-Connection Testing Responsibilities and Procedures;
- Monitoring and Reporting Program;
- Use Area Inspection Program;
- Operations and Maintenance Program;
- Compliance Program;
- Recycled Water Site Supervisor; and
- Emergency Procedures and Notification.

## **DIVISION OF DRINKING WATER CONSIDERATIONS**

The City submitted the 2015 Title 22 Engineering Report for Division of Drinking Water approval. On 4 October 2016, the Division of Drinking Water provided the City a letter with conditional approval, but required that certain issues in the Report be revised and that the Title 22 Engineering Report be resubmitted as detailed in the enclosed Technical Memorandum. On 30 November 2016, the City submitted a revised Title 22 Engineering Report to address the Division of Drinking Water's 4 October 2016 comments. On 17 March 2017, the Division of Drinking water issued a letter approving the City's November 2016 Title 22 Engineering Report for the discharge of disinfected tertiary-treated wastewater to recycled water use areas.

As previously mentioned, the City does not have final agreements with any potential recycled water users. As such, the use area site maps and use area supervisors are unknown. The City is required to submit information to the Division of Drinking Water on each use area as it is developed and receive written approval from Division of Drinking Water prior to delivering recycled water to the new use area. As part of the submittal, the City shall include an addendum to its current Title 22 Engineering Report that describes the new use area in detail for Division of Drinking Water approval.

## **WATER RECYCLING USE REQUIREMENTS**

1. The production, distribution, and use of recycled water shall be managed in accordance with the NOI, the Title 22 Engineering Report approved by the Division of Drinking Water, and this NOA.
2. Application of recycled water shall be limited to the uses described in the NOI, the Title 22 Engineering Report approved by the Division of Drinking Water, and this NOA.
3. The use of recycled water shall not cause pollution or nuisance, as defined by Water Code section 13050.
4. The recycled water shall be disinfected tertiary recycled water as defined by Title 22, section 60301.230.
5. The City of Fresno shall promptly notify the Central Valley Water Board of any recycled water spills or unauthorized uses.

## **GENERAL INFORMATION AND REQUIREMENTS**

The City of Fresno shall comply with the Specifications, Water Recycling Administration Requirements, and General Provisions of the General Order.

Please review this NOA carefully to ensure that it completely and accurately reflects the proposed Recycled Water Program. If the discharge violates the terms or conditions, the Central Valley Water Board may take enforcement action, including the assessment of an administrative civil liability. Failure to abide by the conditions of the General Order, including MRP WQ 2016-0068-R5004, and this letter authorizing applicability could result in enforcement actions, as authorized by provisions of the California Water Code.

The required annual fee specified in the annual billing from the State Water Resources Control Board shall be paid until this NOA is officially terminated. The City of Fresno must submit in writing a Notice of Termination once the water recycling program has ended.

## DOCUMENT SUBMITTALS

The Central Valley Water Board have gone to a Paperless Office System. All regulatory documents, submissions, materials, data, monitoring reports, and correspondences shall be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents that are less than 50 MBs should be emailed to [centralvalleyfresno@waterboards.ca.gov](mailto:centralvalleyfresno@waterboards.ca.gov). Documents that are 50 MBs or greater should be transferred to a disc and mailed to the Central Valley Water Board at 1685 "E" Street, Fresno, CA 93706.

During the life of this General Order, either the State Water Resources Control Board or the Central Valley Water Board may require the Administrator to electronically submit reports using the State Water Resources Control Board's California Integrated Water Quality System (CIWQS) program, GeoTracker program, or similar system. Electronic submittal to CIWQS, when implemented, will meet the requirements of our Paperless Office System. Until directed otherwise, the City shall submit all documents using our Paperless Office System.

If you have any questions regarding this matter, please contact Alex Mushegan at (559) 488-4397 or at [Alexander.Mushegan@waterboards.ca.gov](mailto:Alexander.Mushegan@waterboards.ca.gov).



*for* Pamela C. Creedon  
Executive Officer

- Enclosures: (1) State Water Resources Control Board Order WQ 2016-0068-DDW, Water Reclamation Requirements for Recycled Water Use (Discharger Only)  
(2) Monitoring and Reporting Program WQ 2016-0068-R5004  
(3) Technical Memorandum of the City of Fresno's Notice of Intent  
(4) Division of Drinking Water Ultraviolet Light Spot Check Bioassay Test Report

cc via email: Timothy O'Brien, State Water Resources Control Board, Sacramento (via email)  
Kassy Chauhan, State Water Resources Control Board, Division of Drinking Water, Fresno (via email)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. WQ 2016-0068-R5004

FOR

THE CITY OF FRESNO  
FRESNO COUNTY

This monitoring and reporting program (MRP) describes requirements for monitoring a recycled water system. This MRP is issued pursuant to Water Code section 13267. The City of Fresno (Administrator) shall not implement any changes to this MRP unless and until a revised MRP is issued by the California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) Executive Officer.

The Administrator has applied for and received coverage for the recycled water system that is subject to the notice of applicability (NOA) of Water Quality Order 2016-0068-DDW (WQ 2016-0068-R5004). The reports are necessary to ensure that the Administrator complies with the NOA and General Order. Pursuant to California Water Code section 13267, the Administrator shall implement this MRP and shall submit the monitoring reports described herein.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The name of the sampler, sample type (grab or composite), time, date, location, bottle type, and any preservative used for each sample shall be recorded on the sample chain of custody form. The chain of custody form must also contain all custody information including date, time, and to whom samples were relinquished. If composite samples are collected, the basis for sampling (time or flow weighted) shall be approved by Regional Water Board staff.

Field test instruments (such as those used to test pH, dissolved oxygen, and electrical conductivity) may be used provided that they are used by a California Environmental Laboratory Accreditation Program (ELAP) certified laboratory or:

1. The user is trained in proper use and maintenance of the instruments;
2. The instruments are field calibrated prior to monitoring events at the frequency recommended by the manufacturer;
3. Instruments are serviced by the manufacturer or authorized representative at the recommended frequency; and
4. Field calibration reports are maintained and available for at least three years.

Monitoring requirements listed below may duplicate existing requirements under other orders including WDRs or waivers of WDRs that regulate agricultural discharges from irrigated lands. Duplication of sampling and monitoring activities are not required if the monitoring activity satisfies the requirements of this General Order. Collecting composite samples is acceptable in most cases. The facility may continue using existing sampling collection equipment that is consistent with the applicable facility order. However, due to short sample holding times, bacteriological samples collected to verify disinfection effectiveness must be grab samples. In addition to submitting the results under another order, the results shall be submitted in the reports required by this General Order.

All of the monitoring listed below may not be applicable to all recycled water projects. Consult the NOA or Central Valley Water Board staff to determine applicable requirements.

### RECYCLED WATER MONITORING

If recycled water is used for irrigation of landscape areas<sup>1</sup>, priority pollutant monitoring is required at the production facility. The frequency of monitoring corresponds to the flow rate of the recycled water use. Sampling shall be consistent with the following:

Constituent	Treatment System Flow Rate	Sample Frequency	Reporting Frequency
Priority Pollutants <sup>1</sup>	< 1 mgd <sup>2</sup>	5 years	The next annual report.
	≥ 1 mgd	Annually	Annually

<sup>1</sup> Priority pollutants are listed in Appendix A of Code of Federal Regulations, Part 423.

<sup>2</sup> mgd denotes million gallons per day.

### DISINFECTION SYSTEM MONITORING

Samples shall be collected downstream of the ultraviolet light disinfection system and analyzed by an approved laboratory per Title 22, section 60321(a). The Authority shall conduct the following monitoring:

Constituent/Parameter	Units	Sample Type	Sample Frequency	Reporting Frequency
Total Coliform Bacteria	MPN/100 mL <sup>1</sup>	Grab	1/Day	Monthly <sup>2</sup>
Turbidity	NTU <sup>1</sup>	Meter	Continuously	Monthly <sup>2</sup>

<sup>1</sup> MPN/100 mL denotes most probable number per 100 mL sample. NTU denotes nephelometric turbidity unit.

<sup>2</sup> Summarize monthly reports and include in the Annual Report due April 1<sup>st</sup>.

### USE AREA MONITORING

The Administrator shall monitor use areas(s) at a frequency appropriate to determine compliance with this General Order and the Administrator's recycled water use program requirements. An Administrator may assign monitoring responsibilities to a User as part of the Water Recycling Use Permit program. The Administrator retains responsibility to ensure the data is collected, prepared, and submitted in the Annual Report.

The following shall be recorded for each User with additional reporting for use areas as appropriate. The frequency of use area inspections shall be based on the complexity and risk of each use area. Use areas may be aggregated to combine acreage for calculation or observation purposes. Use area monitoring shall include the following parameters:

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<sup>1</sup> Landscape areas are defined as parks; greenbelts, playgrounds; school yards; athletic fields; golf courses; cemeteries; residential landscaping; common areas; commercial landscaping (except eating areas); industrial landscaping (except eating areas); freeway, highway, and street landscaping.

Parameter	Units	Sample Type	Sampling Frequency <sup>1</sup>	Reporting Frequency
Recycled Water User	--	--	--	Annually
Recycled Water Flow	gpd <sup>2</sup>	Meter <sup>3</sup>	Monthly	Annually
Acreage Applied <sup>4</sup>	Acres	Calculated	--	Annually
Application Rate	inches/acre/year	Calculated	--	Annually
Soil Saturation/Ponding	--	Observation	Quarterly	Annually
Nuisance Odors/Vectors	--	Observation	Quarterly	Annually
Discharge Off-Site	--	Observation	Quarterly	Annually
Notification Signs <sup>5</sup>	--	Observation	Quarterly	Annually

<sup>1</sup> Or less frequently if approved by the Regional Water Board Executive Officer.

<sup>2</sup> gpd denotes gallons per day.

<sup>3</sup> Meter requires meter reading, a pump run time meter, or other approved method.

<sup>4</sup> Acreage applied denotes the acreage to which recycled water is applied.

<sup>5</sup> Notification signs shall be consistent with the requirements of California Code of Regulations, title 22, section 60310 (g).

### REPORTING

In reporting monitoring data, the Administrator shall arrange the data in tabular form so that the date, data type (e.g., flow rate, bacteriological, etc.), and reported analytical or visual inspection results are readily discernible. The data shall be summarized to illustrate compliance with this General Order and NOA as applicable. The results of any monitoring done more frequently than required at the locations specified in the MRP shall be reported in the next regularly scheduled monitoring report and shall be included in calculations as appropriate.

The Central Valley Water Board have gone to a Paperless Office System. All regulatory documents, submissions, materials, data, monitoring reports, and correspondences shall be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents that are less than 50 MBs should be emailed to [centralvalleyfresno@waterboards.ca.gov](mailto:centralvalleyfresno@waterboards.ca.gov). Documents that are 50 MBs or greater should be transferred to a disc and mailed to the Central Valley Water Board at 1685 "E" Street, Fresno, CA 93706.

During the life of this General Order, either the State Water Resources Control Board (State Water Board) or the Central Valley Water Board may require the Administrator to electronically submit reports using the State Water Board's California Integrated Water Quality System (CIWQS) program, GeoTracker program, or similar system. Electronic submittal to CIWQS, when implemented, will meet the requirements of our Paperless Office System. Until directed otherwise, the Administrator shall submit reports using our Paperless Office System.

#### A. Annual Report

Annual Reports shall be submitted to the Central Valley Water Board by **April 1<sup>st</sup> following the monitoring year**. The Annual Report shall include the following:

1. A summary table of all recycled water Users and use areas. Maps may be included to identify use areas. Newly permitted recycled water Users and use areas shall be identified. When applicable, identify any modifications to the approved Title 22 Engineering Report and include the State Water Board's letter approving such modifications.
2. A summary table of all inspections and enforcement activities initiated by the Administrator. Include a discussion of compliance and the corrective action taken, as well as any planned or proposed actions needed to bring the discharge into compliance with the NOA and/or General



Order. Copies of documentation of any enforcement actions taken by the Administrator shall be provided.

3. An evaluation of the performance of the recycled water treatment facility, including discussion of capacity issues, system problems, and a forecast of the flows anticipated in the next year.
4. Tabular and graphical summaries of all monitoring data collected during the year, including priority pollutant monitoring, if required.
5. The name and contact information for the recycled water operator responsible for operation, maintenance, and system monitoring.

A letter transmitting the annual report shall accompany each report. The letter shall summarize the numbers and severity of violations found during the reporting period and actions taken or planned to correct the violations and prevent future violations. The transmittal letter shall contain the following penalty of perjury statement and shall be signed by the Administrator or the Administrator's authorized agent:

*"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of the those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."*


The Administrator shall implement the above monitoring program as of the date of this MRP.


Ordered by:


*Alex L. Rodgers*  
for PAMELA C. CREEDON, Executive Officer  
3/20/2017  
DATE

**Central Valley Regional Water Quality Control Board**

**TO:** Clay L. Rodgers  
Assistant Executive Officer

Lonnie M. Wass  
Supervising Engineer 

**FROM:** Scott J. Hatton  
Senior Engineer  
RCE 67889 

Alexander S. Mushegan   
Water Resource Control Engineer  
RCE 84208

**DATE:** 20 March 2017

**SUBJECT: APPLICABILITY OF COVERAGE UNDER STATE WATER RESOURCES CONTROL BOARD ORDER WQ 2016-0068-DDW, WATER RECLAMATION REQUIREMENTS FOR RECYCLED WATER USE, CITY OF FRESNO, FRESNO COUNTY**

Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff received a 19 July 2016 Notice of Intent (NOI) from the City of Fresno (City) for regulatory coverage under the *State Water Resources Control Board Order WQ 2016-0068-DDW, Water Reclamation Requirements for Recycled Water Use (General Order)*. The NOI included the *Title 22 Engineering Report for the Production, Distribution and Use of Recycled Water*, dated 2 November 2015 (2015 Title 22 Engineering Report). The 2015 Title 22 Engineering Report was signed by Karl E. Kienow, a California registered professional civil engineer with Blair Church & Flynn Consulting Engineers. The NOI was also submitted to the State Water Resources Control Board, Division of Drinking Water (Division of Drinking Water). This memorandum provides a summary of Central Valley Water Board staff's review of the NOI and evaluates if the City's proposed discharge of disinfected tertiary-treated wastewater for recycled water uses is eligible for enrollment under the General Order.

**DESCRIPTION OF DISCHARGE**

In partnership with the City of Clovis, the City of Fresno (City) owns and operates the Fresno-Clovis Regional Wastewater Reclamation Facility (Regional Facility) at 5607 West Jensen Avenue in Fresno County. The Regional Facility is currently regulated under Waste Discharge Requirements Order 5-01-254 for the discharge of undisinfectated secondary wastewater to surrounding percolation ponds and on-site reclamation areas.

Given California's frequent drought conditions, the City is constructing a tertiary treatment and disinfection facility (Tertiary Treatment Facility) at the Regional Facility and proposes to administer a recycled water use program. The proposed recycled water use program will

KARL E. LONGLEY ScD, P.E., CHAIR | PAMELA C. CREEDON P.E., BCÉE, EXECUTIVE OFFICER

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consist of approximately 30 recycled water users, with a total estimated usage of approximately 2,800 acre-feet per year on approximately 860 acres. The proposed recycled water uses primarily consist of 1) agricultural irrigation for farms and dairies, 2) landscape irrigation (e.g., parks, cemeteries, schools, and highways), and 3) industrial uses (e.g., heating/cooling, dust control, and cleanup/wash down water).

As of the date of this memorandum, the City is completing the construction of the Tertiary Treatment Facility. On 25 September 2015, the Central Valley Water Board received a Report of Waste Discharge for the increase permitted flow of undisinfected secondary-treated wastewater from the Regional Facility and for the proposed Tertiary Treatment Facility. Central Valley Water Board staff is currently working on drafting new waste discharge requirements that will regulate both the Reclamation Facility and the Tertiary Treatment Facility. Since the City has submitted a complete Report of Waste Discharge (over 140 days ago) and the necessary environmental documentation for California Environmental Quality Act has been approved (over 90 days ago), the City has satisfied the requirements in Section 13264 of the California Water Code to initiate the discharge of disinfected tertiary-treated wastewater to recycled water use areas.

The City, prior to conveying disinfected tertiary-treated recycled water to use areas, must certify that the Tertiary Treatment Facility was designed and constructed to produce disinfected tertiary-treated recycled water compliant with California Code of Regulations, title 22, division 4, chapter 3 (Uniform Statewide Recycling Criteria).

According to the City, the City's December 2010 Recycled Water Master Plan states that the objectives for a recycled water production and distribution system are:

- Protect and improve groundwater quality by reducing the use of the Regional Facility's percolation ponds;
- Increase the use of recycled water through urban reuse, groundwater recharge, and agricultural reuse to help meet increasing water demands in the region; and
- Offset potable water use to enhance the sustainability of the City's water supply.

Potential recycled water users may include dairies. Any dairies requesting to receive recycled water from the Tertiary Treatment Facility, must provide the City and Central Valley Water Board with a revised Nutrient Management Plan and/or Waste Management Plan for their respective dairy. The dairy should ensure compliance with the Dairy General Order R5-2013-0122 (if applicable) and manage all applications of recycled water correctly. Acting as the Administrator, the City is obligated to remind dairies and other recycled water users to apply recycled water agronomically in accordance with a certified Nutrient Management Plan (if applicable).

The City will assume the roles and responsibilities of the Administrator under the General Order, provide training to recycled water users, and require them to submit a recycled water use permit application for approval.

## **DIVISION OF DRINKING WATER CONSIDERATIONS**

The City submitted the 2015 Title 22 Engineering Report to the Division of Drinking Water for review of the proposed recycled water use program. On 4 October 2016, the Division of

Drinking Water sent the City a letter with conditional approval and required that certain issues in the 2015 Title 22 Engineering Report be revised and that the Title 22 Engineering Report be resubmitted. The issues include the following:

- The City does not have final agreements with any potential recycled water users. As such, the use area site maps and use area supervisors are unknown. The City is required to submit information to the Division of Drinking Water on each use area as it is developed and receive written approval from Division of Drinking Water prior to the delivery of recycled water to the new use area. As part of the submittal, the City shall include an addendum to its Title 22 Engineering Report that describes the new use area in detail for approval from the Division of Drinking Water.
- The City must ensure that there are safeguards in place to ensure that the equipment used on the recycled water system is not interchanged with the equipment used on the potable water supply system.
- The City must demonstrate that the ultraviolet light low intensity, ultraviolet light dose failure, and ultraviolet light transmission alarms are functional and can shut the Tertiary Treatment Facility down if necessary.

On 30 November 2016, the City submitted a revised Title 22 Engineering Report to address the Division of Drinking Water's 4 October 2016 comments. On 17 March 2017, the Division of Drinking Water issued a letter approving the City's Title 22 Engineering Report.

#### **MONITORING REQUIREMENTS**

Monitoring requirements included in the following sections of Attachment B of the General Order are appropriate for this discharge:

- Recycled Water Monitoring,
- Disinfection System Monitoring, and
- Use Area Monitoring.

## State Water Resources Control Board

Division of Drinking Water

September 12, 2016

Scott J. Hatton, PE  
Senior Engineer  
CA Regional Water Quality Control Board  
1685 E Street  
Fresno, CA 93706  
[scott.hatton@waterboards.ca.gov](mailto:scott.hatton@waterboards.ca.gov)

### FRESNO CLOVIS REGIONAL WASTEWATER RECLAMATION FACILITY UV SPOT CHECK BIOASSAY TEST REPORT August 2016

Dear Mr. Hatton,

The purpose of this letter is to make recommendations for the permit and evaluate the results from the 2016 spot-check bioassay testing of the ultraviolet light (UV) disinfection system at the Fresno Clovis Regional Wastewater Reclamation Facility (FCRWRF) located at the City of Fresno. As part of the tertiary treatment system four TrojanUVFit™ 72AL75 UV disinfection reactors were installed, downstream of a membrane filter. As a whole the UV system consists of three duty and one redundant reactor that stand side by side in parallel. Each reactor has an integral sensor. The TrojanUVFit™ 72AL75 is a low-pressure high-output (LPHO) closed vessel reactor with 72 UV lamps per UV reactor that utilizes 250-W LPHO lamps (Trojan part number 794447 manufactured by Heraeus Noblelight).

To verify performance of the FCRWRF UV system at several flows and UVTs, an on-site spot check bioassay using seeded MS2, was conducted. Results, documenting virus disinfection performance of the UV system compared to the standards found in Title 22 of the California Code of Regulations, was submitted to Division of Drinking Water (DDW) for acceptance. The report "Fresno-Clovis Regional Wastewater Reclamation Facility TrojanUVFit™ 72AL75 Spot Check Bioassay Test Report" (Moreland Consulting LLC, August 2016) contains the bioassay results of the testing on-site at the plant.

Eight tests were conducted at various flow rates (0.857 to 3.005 MGD) and UVTs (64% to 77%). These eight "spot checks" were compared to the dose predicted by the operating equations developed and documented in the "Addendum – TrojanUVFit™ 72AL75 Validation Report 2012 NWRI Analysis of the TrojanUVFit™ 72AL75 Reactor Validation Data". For only one of the eight test runs (12.5%), the dose measured was greater than or equal to the dose predicted by the TrojanUVFit™ 72AL75 dose operating equation, which controls the power and dosage level applied. The Spot Check Bioassay Test Report states, "The UV chambers tested did not perform as expected and should be operated with the 2012 NWRI updated algorithm with a 0.815 (SF) multiplier for control." Instead of operating to deliver a minimum UV dose of 80 mJ/cm<sup>2</sup> for a

Fresno Clovis Regional Wastewater Reclamation Facility UV Spot Check Bioassay Test Report

membrane plant, the preferred alternative is to provide a minimum UV dose of 98 mJ/cm<sup>2</sup> at all times.

The following recommendations are based on the equipment cited in the report. These applicable recommendations should be incorporated into the final permit for the UV system. Approval for the use of any and all water recycling applications is granted through the Regional Water Quality Control Board's Water Reclamation permitting process.

1. Each UV reactor at the FCRWRF must be operated independently to deliver a minimum UV dose of 98 mJ/cm<sup>2</sup> at all times.
2. The equations below must be used for each UV reactor as part of the automatic UV disinfection control system for calculating UV dose and should be specified as a permit provision. They are from the "Addendum – TrojanUVFit™ 72AL75 Validation Report 2012 NWRI Analysis of the TrojanUVFit™ 72AL75 Reactor Validation Data".

$$S_o = ([1.05509 \times 10^{-7} \times 100] - 4.9730 \times 10^{-6}) \times UVT^{2.7691}$$

$$RED_{calc} = CR \times 10^{2.7060} \times UVA^{[-1.9050 \times UVA + 9.3234 \times UVA^2]} \times [S/S_o]^{0.8234} \times Q^{-0.8415}$$

Where:

UVT = UV transmittance at 254 nm, expressed as a whole number, e.g., 64 to 81,

S = Measured UV sensor value (mW/cm<sup>2</sup>)

S<sub>o</sub> = Calculated intensity from new lamp at full power (at same UVT) with clean sleeves, typically expressed as a function of UVT (mW/cm<sup>2</sup>).

RED<sub>calc</sub> = UV dose calculated independently for each reactor operated in parallel that is online, using the 2012 NWRI analysis UV dose-monitoring equation (mJ/cm<sup>2</sup>)

CR = Confidence factor = 0.909

UVA = UV absorbance at 254 nm (cm<sup>-1</sup>), e.g., between 0.1918 and 0.091<sup>1</sup>.

Q = Flow rate, (million gallons per day [MGD]) per reactor

3. The FCRWRF UV disinfection system is limited to the following operational parameter ranges:
  - a. Permit total plant flow up to 9.015 MGD (3.005 MGD per UV reactor).
  - b. UVTs at or above 64 percent,
  - c. UV sensor intensities ranging from 0.49 to 1.8 mW/cm<sup>2</sup>.
4. On-line monitoring of UV intensity, flow, and UVT must be provided at all times.
5. Flow meters, UV intensity sensors, and UVT monitors must be properly calibrated to ensure proper disinfection.

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<sup>1</sup> At UVT values above 81 percent, the value (81 UVT, or UVA = 0.091) should be used as the default value in the S<sub>o</sub> and RED calculations respectively.

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6. At least monthly, all duty UV intensity sensors must be checked for calibration against a reference UV intensity sensor.
7. For all UV intensity sensors in use, the ratio of the duty UV sensor intensity to the reference UV sensor intensity must be less than or equal to 1.2. If the calibration ratio is  $>1.2$ , the failed duty UV sensor must be replaced by a properly calibrated sensor and recalibrated by a qualified facility. The reference UV intensity sensors shall be recalibrated at least annually by a qualified facility using a National Institute of Standards and Technology (NIST) traceable standard.
8. UVT meter must be inspected and checked against a reference bench-top unit weekly to document accuracy.
9. If the on-line analyzer UVT reading varies from the bench-top spectrophotometer UVT reading by 2% or more, the on-line UVT analyzer must be recalibrated by a procedure recommended by the manufacturer.
10. Flow meters measuring the flow through a UV reactor must be verified to determine accuracy at least monthly via checking the flow reading against other flow determination methods.
11. Each UV reactor at the FCRWRF UV system must be designed with built-in automatic reliability features that must be triggered by critical alarm setpoints.
12. Conditions triggering an alarm and startup the redundant reactor include the following:
  - a. the UV dose goes below  $103 \text{ mJ/cm}^2$ ,
  - b. ballast failure, and
  - c. multiple lamp failure
13. Conditions that should divert effluent to waste include the following:
  - a. UV dose is below the minimum UV dose of  $98 \text{ mJ/cm}^2$ ,
  - b. UVT is below the minimum UVT commissioned of 64%,
  - c. UV intensity below the minimum validated of  $0.49 \text{ mW/cm}^2$
  - d. complete UV reactor failure, and
  - e. flow above the maximum flow commissioned of 3.005 MGD per reactor.
14. The FCRWRF should be operated in accordance with an approved operations plan, which specifies clearly the operational limits and responses required for critical alarms. The operations plan should be submitted and approved prior to issuance of the operating permit. A copy of the approved operations plan should be maintained at the treatment plant and be readily available to operations personnel and regulatory agencies. A quick

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reference plant operations data sheet should be posted at the treatment plant and include the following information:

- a. The alarm set points for flow, UV dose, UV intensity, and UVT.
  - b. The values of flow, UV dose, UV intensity, and UVT when effluent must be diverted to waste.
  - c. The required frequency of verification and calibration for all meters/analyzers measuring flow, UV intensity, and UV transmittance.
  - d. The required frequency of mechanical cleaning and equipment inspection.
  - e. The UV lamp hour tracking procedures and replacement intervals.
15. This UV dose equation assumes that the intensity sensors would measure the decline as the lamps age. Since there is one UV Intensity sensor for 72 lamps, the lamp with the highest number of hours should be closest to the UV sensor.
16. Equivalent or substitutions of equipment, including lamps, are not acceptable without an adequate demonstration of equivalent disinfection performance.

Should you have any questions regarding the content of this letter, please feel free to contact me at ([brian.bernados@waterboards.ca.gov](mailto:brian.bernados@waterboards.ca.gov); 619.525.4497) or Randy Barnard ([randy.barnard@waterboards.ca.gov](mailto:randy.barnard@waterboards.ca.gov); 619.525.4022).

Sincerely,

**Original signed by**

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Technical Specialist

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