CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2018-0080

WASTE DISCHARGE REQUIREMENTS

FOR
CITIES OF FRESNO AND CLOVIS
REGIONAL WASTEWATER RECLAMATION FACILITY
FRESNO COUNTY

The California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) finds that:

1. On 6 October 2015, the City of Fresno submitted a Report of Waste Discharge (RWD) to apply for revised waste discharge requirements (WDRs) for the Fresno-Clovis Regional Wastewater Reclamation Facility (Facility), an existing publicly-owned wastewater treatment facility (WWTF) serving the Cities of Fresno and Clovis, the Pinedale Water District, the Pinedale Utilities District, and some unincorporated areas of Fresno County (i.e., not within Fresno and Clovis city limits).

2. The City of Clovis maintains the rights and capacity to discharge 9.3 million gallons per day (mgd) to the Facility. The City of Fresno is responsible for the day-to-day Facility operations, and is therefore specifically referred to herein as "Operator." For the purposes of this Order, the cities of Clovis and Fresno will be collectively and jointly referred to as "Discharger" (in singular form). Except as otherwise expressly provided herein, the Cities of Clovis and Fresno are each jointly responsible for compliance with the WDRs prescribed herein.

3. The Facility is at 5607 W. Jensen Avenue in Fresno (Section 22, Township 14 South, Range 19 East, Mount Diablo Base & Meridian). The Facility occupies the following Assessor's Parcel Numbers (APN) as shown on **Attachment A (Site Map)**, which is incorporated herein.

327-021-04T	327-030-38T	327-040-11ST	327-050-03T
327-021-05T	327-030-41T	327-040-26T	327-050-19T
327-021-45T	327-030-44U	327-040-31T	327-200-28ST
327-030-22ST	327-040-07T	327-040-39T	327-200-34ST
327-030-23ST	327-040-09T	327-050-01T	327-200-38ST
327-030-24T	327-040-10T	327-050-02T	

4. WDRs Order 5-01-254, adopted by the Central Valley Water Board on 19 October 2001, prescribes requirements for the Facility. Order 5-01-254 allows an annual monthly average daily discharge flow of 80 mgd of undisinfected secondary-treated wastewater to onsite disposal ponds. Since 2001, the Operator has completed multiple projects to improve the Facility's treatment capabilities and overall capacity. This included adding a third secondary treatment train in 2009, and adding a tertiary treatment system in 2017. The Operator also ceased discharging stillage from wineries at the Facility in 2003. Therefore, Order 5-01-254 is out of date and no longer reflects current Facility operations.

Order 5-01-254 will be rescinded and replaced with this Order upon the effective date of this Order.

Existing Facility and Discharge

5. The Facility treats domestic, commercial, and industrial wastewater from the service area described above. The City of Fresno's sewer collection system consists of approximately 24,151 manholes, 15 lift stations, 11.5 miles of force mains, and 1,601 miles of gravity sewers (excluding abandoned/out of service segments and private facilities). In addition, the City of Fresno's sewer collection system receives domestic wastewater from the City of Clovis at, primarily, four connection points.

6. The Facility previously consisted of two separate wastewater treatment plants, referred to as Plant 1 and Plant 2. Plant 2, a 6 mgd trickling filter plant, was demolished in 2008. Plant 1, an activated sludge treatment plant, is still in service but was expanded in 2009. Prior to the 2009 expansion, the activated sludge treatment plant had two treatment trains and had a design treatment capacity of 88 mgd.

7. The Operator completed an organics upgrade project in 2009 to increase the Facility's treatment capacity. The purpose of the upgrades was to provide additional treatment facilities to meet an increase in organic loadings at the Facility. The upgrades included the addition of a new primary effluent flow split structure, a secondary treatment train (Train C), and one new anaerobic digester.

8. The Operator, in an effort to increase the reuse of treated wastewater, completed the construction of Phase I of the tertiary treatment system at the Facility in 2017. The tertiary treatment system is planned in three phases. The current design flow for the tertiary treatment system is 5.0 mgd but can be expanded in two subsequent phases to 15 mgd (Phase II) and ultimately 30 mgd (Phase III).

9. The Facility now includes preliminary, primary, secondary, and tertiary units with disinfection. Preliminary and primary treatment consists of bar screens, grit removal tanks, and six primary clarifiers. Secondary treatment consists of three treatment trains (Trains A, B, and C) that operate as three separate activated sludge systems. Each treatment train contains aeration basins and secondary clarifiers. Train A includes three complete-mix square aeration basins and four secondary clarifiers. Train B includes four plug-flow rectangular aeration basins and eight secondary clarifiers. Train C includes two plug-flow aeration basins and four secondary clarifiers. The tertiary treatment system receives primary-treated effluent diverted immediately upstream of Train C's aeration basins. The tertiary treatment system includes a fine screen, two pre-aeration basins, four membrane bioreactor tanks, and four in-vessel ultraviolet light disinfection system trains. The Facility also includes an Anaerobically Digestible Material receiving station and a station to receive material from the Discharger's sewer cleaning vehicles. A facility layout is included in **Attachment B**, which is attached hereto and made a part of this Order by reference.

10. Included within the Facility property are 1,720 acres of disposal ponds **(Discharge Point 001)**. The 1,720 acres of disposal ponds consist of 83 ponds that collectively provide a total storage capacity of 10,890 acre-feet. Order 5-01-254 limited the discharge

of undisinfected secondary-treated wastewater to 80 mgd as an annual monthly average and 88 mgd as a maximum monthly average.

11. In addition to disposing undisinfected secondary-treated wastewater to the onsite disposal ponds, the Discharger also conveys undisinfected secondary-treated wastewater to farmers for restricted irrigation of nonfood crops on agricultural land on the Facility property and on surrounding properties **(Discharge Point 002)**. The onsite recycling of undisinfected secondary-treated wastewater is conducted by local farmers under lease agreements on approximately 748 acres (hereinafter referred to as Onsite Use Areas). The discharge of undisinfected secondary-treated wastewater from the Facility to surrounding offsite croplands is authorized under separate water reclamation requirements (collectively, Offsite Use Areas). Based on data from 2009 to 2013, an average of 9,933 acre-feet per year of undisinfected secondary-treated effluent was used for direct agricultural irrigation.

12. On 19 July 2016, the Operator submitted a Title 22 Engineering Report and application for State Water Resources Control Board's *Water Reclamation Requirements for Recycled Water Use Order WQ 2016-0068-DDW* (General Reclamation Order) for the reclamation of disinfected tertiary-treated wastewater to unrestricted recycled water Use Areas **(Discharge Point 003)**. On 20 March 2017, the Operator was enrolled under the General Reclamation Order.

13. Due to the extensive use of disposal ponds over the past decades, a substantial groundwater mound persists at the Facility. The mound is approximately 10 to 20 feet high and extends beyond the perimeter of the Facility's property.

14. The Fresno Irrigation District (FID) covers 245,000 acres in central Fresno County, which extends from Pine Flat Dam along the Kings River to the Kerman area, and includes the Fresno-Clovis metropolitan area.

15. In 1974, the Operator established an agreement with FID that allows the Operator to discharge extracted groundwater into FID's canal system. The Operator specifically discharges extracted groundwater into FID's Dry Creek and Houghton Canals during the growing season for agricultural use on the western side of FID. Each canal can convey up to 200 cubic feet per second. The 1974 agreement includes the following stipulations:

    a. The Operator must discharge a minimum of 100,000 acre-feet of extracted groundwater to FID during any ten-year period;

    b. The Operator may discharge a maximum of 30,000 acre-feet of extracted groundwater to FID in any given year;

    c. Every acre-foot of extracted groundwater the Operator discharges to FID, the Operator is entitled to receive 0.46 acre-feet of surface water from FID;

    d. Any increase in the discharge of extracted groundwater to FID beyond that stipulated in the 1974 agreement is subject to FID approval; and

    e. The Operator cannot extract groundwater from beneath the Facility in volumes that will cause the groundwater level to drop below levels observed in the previous year.

16. The Operator currently has 22 operational reclamation wells on the Facility the property. The wells extract water from depths ranging from 80 to 200 feet below ground surface (bgs). In 2016, the Operator discharged approximately 9,000 acre-feet of extracted groundwater to FID's canals and approximately 22,600 acre-feet in 2015. The Operator's RWD estimates that 19 to 43 percent of the Facility's percolated effluent is extracted and delivered to FID.

17. WDRs Order 5-01-254 required the Discharger to evaluate the degree of treatment the underlying soil provided on percolating wastewater. In September 2015, the Operator submitted a report titled *Demonstration of Filtration and Disinfection Compliance Through Soil-Aquifer Treatment* (2015 Soil-Aquifer Treatment Study) prepared by the WateReuse Research Foundation in cooperation with the United States Bureau of Reclamation, the cities of Fresno and Dinuba, and Carollo Engineers. The evaluation included developing a more sensitive, high-volume, low-level method for virus enumeration to evaluate the treatment provided by percolating unfiltered secondary wastewater. As part of the 2015 Soil-Aquifer Treatment Study, total coliform, *E. coli*, particle size distribution, ultraviolet light transmittance, and turbidity were analyzed. The high-volume, low-level virus enumeration method demonstrated approximately 6-log removal of male-specific type 2 coliphage. The 2015 Soil-Aquifer Treatment Study concluded that the results demonstrated that soil treatment provided by the recharge and extraction operation at the Facility is equivalent to the tertiary recycled water disinfection requirements in Title 22 of California Code of Regulations (Title 22).

18. The Operator began disposing winery stillage to a 95-acre area of the Facility in 1974 and added another 50 acres for stillage disposal in 1998. The Discharger disposed stillage directly to land, bypassing the Facility's treatment system. WDRs Order 5-01-254 regulated the discharge of stillage to the 145-acre site at the Facility. In 2003, the Operator ceased the direct land discharge of untreated stillage at the Facility.

19. The disposal of stillage directly to land over the decades has resulted in groundwater degradation, specifically due to the accumulation of nitrogen in the stillage disposal area soils. To mitigate the impacts on water quality, Order 5-01-254 prohibited the discharge of stillage by 31 December 2003 and required the Discharger to plant and harvest crops on the former stillage disposal area. Beginning in 2005, the Operator began farming the former stillage disposal area at the Facility. According to submitted monitoring reports, from 2005 to 2016, this farming has resulted in the removal of approximately 1,800 pounds of nitrogen per acre (total of 125 acres). This Order prohibits the discharge of untreated stillage to land at the Facility and continues to require the Operator to implement measures to provide nutrient uptake in the former stillage disposal area (i.e., systematic cropping and harvesting) and conduct lysimeter monitoring for the area.

20. The Operator, in its October 2015 RWD, submitted a treatment capacity analysis report (2015 Capacity Report) for the Facility. The 2015 Capacity Report evaluated the Facility's secondary treatment system (all three treatment trains) and Phase I of the tertiary treatment system which, at the time, was still under construction. The 2015 Capacity Report concluded that the Facility's secondary treatment system has an annual average treatment capacity of 87 mgd. Train A has 30 mgd treatment capacity and Trains B and C, combined, have a treatment capacity of 57 mgd. Phase I of Facility's tertiary treatment

system has a treatment capacity of 5 mgd. Therefore, the 2015 Capacity Report concluded that the Facility's total treatment capacity is 92 mgd (as an annual average).

21. The October 2015 RWD also included a water balance evaluating the Facility's discharge capacity. As discussed in **Findings 10 – 12**, the Operator currently has three means to discharge treated wastewater from the Facility: (1) discharging undisinfected secondary-treated wastewater to 1,720 acres of on-site disposal ponds (Discharge Point 001), (2) discharging undisinfected secondary-treated wastewater to on-site and off-site farmland for restricted irrigation of crops (Discharge Point 002); and (3) discharging disinfected tertiary-treated wastewater to Use Areas under the Reclamation General Order (Discharge Point 003). The Facility's water balance is summarized below.

Facility Water Balance

Discharge Location	Approximate Volume (acre-feet/year)	Annual Average Daily Flow (mgd)	% of Total Flow
On-Site Disposal Ponds [1]	90,000	80 [1]	87.4%
Restricted Agricultural Irrigation (Secondary-Treated Wastewater) [2,3]	9,400	8.4	9.2%
Unrestricted Tertiary Irrigation (Phase I) [4]	3,500	3.1	3.4%
Total	102,900	91.5	100%

[1] The pond's maximum annual average percolation capacity is 80 mgd. (See **Finding 22**.)
[2] Based on the restricted irrigation discharge data and monthly crop patterns for 2013.
[3] The RWD also included a nitrogen balance, using 2013 data. The nitrogen balance demonstrated that the estimated nitrogen loading to the croplands of 546,000 pounds (if 9,400 acre-feet/year of secondary treated wastewater was reclaimed on the croplands) does not exceed the maximum allowable total nitrogen loading of 897,366 pounds. Thus, the Discharger is restricted by the water needed for crop demand.
[4] The RWD used the Clovis Sewage Treatment and Water Reuse Facility's recycled water demand curve to estimate the unrestricted tertiary irrigation demand for the Facility.

22. The onsite disposal ponds have a maximum annual average capacity of 80 mgd. The controlling factor for the pond system capacity is the groundwater mound beneath the Facility. The RWD included a Groundwater Mounding Analysis prepared by Ken Schmidt and Associates which evaluated the groundwater elevation conditions under the existing discharge conditions (63 mgd) as well under increased discharge conditions (both 80 mgd and 92 mgd). The analysis demonstrated that if the Facility discharged 92 mgd to the on-site disposal ponds, "shallow groundwater levels could be at or close to the pond bottoms over a considerable area beneath the percolation ponds." This could reduce infiltration and the degree of soil treatment. Consequently, the RWD acknowledges that the flow limit to the onsite disposal should remain at 80 mgd.

23. Influent flows to the Facility have remained fairly consistent, with a slight decrease in flows over the past few years. The annual average influent flows in 2015 and 2016 were 56.84 mgd and 55.86 mgd, respectively.

24. The following tables summarize the Facility's annual average influent and effluent concentrations.

Influent Monitoring Data (2012 - 2016)

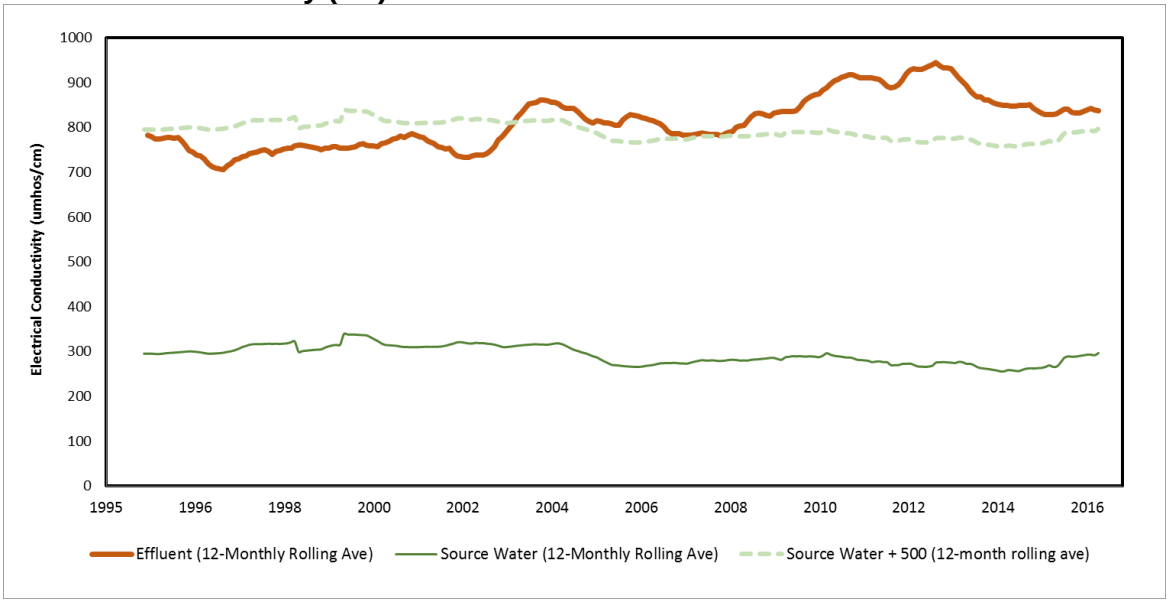
Constituent	Units	Annual Average				
		2012	2013	2014	2015	2016
Biochemical Oxygen Demand	mg/L	324	327	349	371	372
Total Suspended Solids	mg/L	307	318	298	301	317
Settleable Solids	mL/L	12	10	10	12	14
pH	s.u.	6.6	6.5	6.6	6.7	6.6
Electrical Conductivity (EC)	µmhos/cm	1,072	1,074	1,038	1,052	1,057

Effluent Monitoring Data (2012 - 2016)

Constituent	Units	Annual Average				
		2012	2013	2014	2015	2016
Biochemical Oxygen Demand	mg/L	17	17	13	15	14
Total Suspended Solids	mg/L	4	5	4	4	5
ph	s.u.	6.6	6.5	6.7	6.8	6.8
Electrical Conductivity (EC)	µmhos/cm	930	903	850	828	837
Total Dissolved Solids	mg/L	470	493	503	495	514
Chloride	mg/L	105	115	109	105	112
Sodium	mg/L	93	97	94	99	95
Sulfate	mg/L	38	38	40	40	38
Ammonia (as N)	mg/L	21	13	6	6	5
Nitrate (as N)	mg/L	4	6	12	13	15
Total Nitrogen (as N)	mg/L	26	21	19	20	20

25. From 2012 to 2016, the electrical conductivity (EC) 12-month rolling average source water based effluent limit, calculated as the EC of source water plus 500 µmhos/cm, ranged from approximately 750 µmhos/cm to 800 µmhos/cm. The Facility's effluent EC has consistently exceeded the 12-month rolling average source water limit since approximately 2004. The following graph compares the Facility's effluent EC concentrations to the source water plus 500 µmhos/cm limit from 1995 to 2016.

Electrical Conductivity (EC) – Effluent vs. Source Water



Planned Changes in the Facility and Discharge

26. In its 2010 Urban Water Master Plan, the Operator established a goal to reuse 25,000 acre-feet of recycled water per year by 2025 to offset potable water use. As part of this effort, the Operator identified possible opportunities where potable water demand could be supplemented and/or replaced with disinfected tertiary-treated recycled water from the Facility. In the near future, the Operator plans to implement recycled water delivery for urban irrigation, industrial and commercial reuse, and agricultural reuse. The Operator divided its city limits into four subareas (southwest, southeast, northwest, and northeast) for phasing the implementation of the recycled water use. The Operator will begin developing a recycled water distribution system in the southwest subarea due to its proximity to the Facility. Potential major users in the southwest subarea include city/county parks, cemeteries, schools, Highway 180, industrial users, and existing/future residential and commercial development.

27. The Facility's tertiary treatment system is designed to provide a higher level of wastewater treatment than previously provided at the Facility. Phase I of the tertiary system is designed to treat up to 5 mgd of wastewater to Title 22 disinfected tertiary recycled water standards. The Operator plans to upgrade the Facility's treatment system in two subsequent phases, to 15 mgd (Phase II) and ultimately 30 mgd (Phase II), when the recycled water demand warrants the upgrades. The October 2015 RWD states that the Facility's tertiary treatment system is designed to meet the following level of treatment.

Proposed Effluent Concentrations for the Tertiary Treatment System

Constituent	Units	Monthly Average	Weekly Average	Daily Maximum
Biochemical Oxygen Demand (BOD)	mg/L	10	15	20
Total Suspended Solids (TSS)	mg/L	10	15	20
Settleable Solids	mL/L	--	--	0.1
Total Nitrogen (as N)	mg/L	10	--	--
BOD and TSS % Removal	%	90		
Total Coliform Organisms	MPN/100 mL	23 [1]	2.2 [2]	240 [3]

[1] More than once in any 30-day period.
[2] 7-day median.
[3] At any time.

28. The RWD states that the Operator is considering modifying its 1974 agreement with FID to increase the current annual maximum allowed discharge of extracted groundwater into FID's canal system. **Finding 15** above describes the stipulations included in the 1974 agreement. The Operator is currently restricted to a maximum of 30,000 acre-feet of extracted groundwater to FID's canal system in any given year.

Industrial Pretreatment Program

29. Industrial discharges to publicly owned wastewater treatment facilities can cause one or more of the following problems if not adequately controlled:

    a. *Interference or Upset.* Discharges of high volumes or concentrations of certain pollutants can inhibit or interfere with the proper operation of the wastewater treatment facility, causing it to do an inadequate job of treating wastes. As a result, the facility could be prevented from meeting its permit requirements.

    b. *Sludge Management.* Industrial pollutants, particularly metals and other toxic pollutants, can limit the sludge management alternatives available to the Discharger and increase the cost of sludge management and disposal. Additionally, biosolids contaminated with toxic pollutants could be rendered unsuitable for use as a soil amendment.

    c. *Pass-through.* Some industrial pollutants may not receive adequate treatment and pass through the treatment system in concentrations that can could unreasonably degrade groundwater quality and/or prevent recycling of domestic wastewater.

       Additionally, the discharge of explosive, reactive, or corrosive wastes can cause damage to the wastewater collection system or the treatment works and may also pose a threat to worker or public safety.

30. The Operator has implemented an industrial pretreatment program to regulate the discharge of industrial wastes into the wastewater collection system or treatment works to prevent damage to the sewer system or treatment works, inhibit or disrupt the treatment process, or cause violation of the effluent or groundwater limits of this Order. The Central Valley Water Board originally approved the Discharger's industrial pretreatment program on 17 June 1984. The Discharger has revised the program since 1984, most recently in 2009. The last industrial pretreatment compliance inspection was conducted on 27/28 January 2016.

31. According to the Operator's 2017 3rd Quarter Pretreatment Report, 41 significant industrial users discharge into the Facility's collection system and include the following industry types: industrial launderers, metal finishers, slaughter house, dairy, winery, rendering facility, poultry processors, beverage processors, and food processors. This Order contains provisions that require the Discharger continue to implement the program, periodically review and update the program as appropriate, and report any proposed new industrial discharges.

Site-Specific Conditions

32. Source water for the cities of Clovis and Fresno is obtained from both groundwater supply wells and surface water treatment facilities. The 2015 to 2016 flow-weighted average electrical conductivity and total dissolved solids concentration of source water was 275 µmhos/cm and 188 mg/L, respectively. The City of Fresno's Northeast Surface Water Treatment Plant currently has a treatment capacity of 30 mgd. By 2020, the City of Fresno intends to double the Northeast Surface Water Treatment Plant treatment capacity to 60 mgd. In addition, by 2019, the City of Fresno plans to bring the Southeast Surface Water Treatment Plan online, which is designed to have a treatment capacity of 80 mgd. The City of Clovis also has a 22.5 mgd surface water treatment plant, which is expandable to 45 mgd.

33. The land surface in the vicinity of the Facility is generally flat with a slight slope to the southwest. The approximate elevation at the Facility is 250 feet above mean seal level (MSL). The nearest surface water body is FID's Dry Creek Canal, which runs through the Facility.

34. Based on the 18 February 2009 Federal Emergency Management Agency, Flood Insurance Rate Maps (Map Numbers 06019C2100H and 06019C2085H) the Facility property, excluding the farmland and disposal ponds, is in Zone X, an area determined to be outside the 500-year floodplain (< 0.2% annual chance of flooding). The rest of the Facility property is also primarily in Zone X, with the exception of a few peripheral disposal ponds and a relatively small section of farmland where secondary effluent is used for irrigation.

35. Areal soils consist of unconsolidated alluvial deposits of interbedded layers of sand, gravel, silt, sandy clay, clay and localized cobble zones. Soils in the vicinity of the Facility include Hanford, Delhi, and Tujunga soils. According to the Web Soil Survey published by the United States Department of Agriculture, Natural Resources Conservation Service, soils at the Facility property are primarily comprised of sandy loam, with Hesperia being the predominate soil series (approximately 60%).

36. The Fresno/Clovis area is characterized as semi-arid with hot dry summers and cool winters. Annual precipitation in the vicinity of the Facility averages approximately 11.5 inches, the 100-year total annual precipitation is approximately 21.6 inches, and the reference evapotranspiration is approximately 53 inches per year.

37. Surrounding land use is primarily agricultural. Irrigation water is either supplied by groundwater wells or by FID via a network of surface water canals. FID delivers surface water from Kings River and the San Joaquin River (via the Friant-Kern Canal) for agriculture irrigation, to groundwater recharge basins, and, currently, to two surface water treatment plants. In a technical report dated 6 June 2002, the Operator identified the types of crops irrigated with water from the Houghton and Dry Creek canals (canals which extracted groundwater is discharged to). The major types of crops identified included alfalfa, almond, bean, corn, cotton, grape, and oat/wheat.

38. In 2005, the Operator conducted a survey of the area around the Facility to determine the crops that were affected by groundwater impacted by the Facility's discharge. The 2005 survey found that the following crops cover approximately 92 percent of the land area over the groundwater that is influenced by the Facility's discharge to its disposal ponds.

Crops Grown in Area Influenced by Facility's Discharge to Disposal Ponds

Crop	Percent of Land Area
Grapes (table, wine, and raisin)	42 %
Almonds	16 %
Alfalfa	20 %
Corn (fodder)	14 %
Cotton	4 %

Groundwater Conditions

39. The Operator's 2002 *Technical Report on Groundwater Conditions at and near the Cities of Fresno and Clovis WWTF* describes the subsurface geologic and hydrogeologic conditions at and the near vicinity of the Facility. The uppermost 100 feet of soils underneath the disposal ponds are predominately compromised of fine-grained deposits. In some areas, sand is more predominant, specifically the former unlined sludge drying bed area. The geologic cross-sections included in the 2002 report also indicate a local shallow confining bed below some of the disposal ponds. The top of this clay layer averages about 45 feet deep, with an average thickness of 50 feet. A major confining bed exists below portions of the Facility's disposal ponds in the interval between approximately 300 to 360 feet in depth.

40. As mentioned in **Finding 13** above, a groundwater mound exists underneath the Facility's disposal ponds due to the extensive historic use of the disposal ponds. Based on October 2016 groundwater data, depth to groundwater at the Facility ranges from approximately 80 to 90 feet bgs. Groundwater generally flows southwest.

41. In 1975, the Operator installed 21 reclamation wells within the Facility property. Since then, the Operator has added one additional reclamation well and replaced several of the wells with "flowpath" wells, which are designed to extract water at shallower depths than

the original extraction wells. Currently, the Operator has 22 operational wells within the Facility's property. The reclamation wells extract water from depths ranging from 80 to 270 feet bgs. The Operator, as required by previous Order 5-01-254, conducts monitoring of the extracted groundwater. The extracted groundwater monitoring data suggests that the extracted groundwater is primarily percolated effluent and not regional groundwater.

42. To evaluate the impact the proposed reuse of disinfected tertiary-treated recycled water within its city limits, the Operator submitted a report titled *Impact of Use of Recycled Water for Irrigation in the City of Fresno* dated February 2015. In the report, the City of Fresno was divided into quadrants and the subsurface geologic and hydrogeologic conditions were evaluated for each quadrant. The following table summarizes the conditions in each quadrant.

City of Fresno Subsurface Geologic and Hydrogeologic Conditions

Quadrant	Geologic Conditions	Hydrogeologic Conditions
Southwest	• Top layer consisting of alluvial deposits (average depth between 250 to 400 feet) • Confining bed present at depths ranging from about 150 to 250 feet	• Depth to groundwater between 84 to 128 feet (June 2014) • General groundwater flow to the north-northeast (April 2006)
Southeast	• Top layer consisting of alluvial deposits, specifically coarse-grain deposits (average depth between 300 to 500 feet) • Confining bed at average depth between 200 to 300 feet	• Depth to groundwater between 84 to 114 feet (June 2014) • General groundwater flow to the northwest (April 2006)
Northwest	• Top layer consisting of alluvial deposits (average depth between 250 to 300 feet) • Confining bed at average depth between 250 to 300 feet	• Depth to groundwater between 92 to 147 feet (June 2014) • General groundwater flow to the southwest (April 2006)
Northeast	• Top layer consisting of alluvial deposits (average depth between 225 to 275 feet) • Fine-grained deposits predominate beneath alluvial deposits	• Depth to groundwater between 133 to 178 feet (June 2014) • General groundwater flow to the south-southeast (April 2006)

43. The Operator's groundwater monitoring well network currently consists of approximately 24 monitoring well locations, comprised of both cluster and individual wells, and a total of 49 individual monitoring wells. The network monitors groundwater in the top unconfined aquifer at two different zones, Zone A (shallow) and Zone B (intermediate). The perforation depth for Zone A (shallow) wells ranges from 20 to 130 feet bgs and 150 to 250 feet bgs for Zone B (intermediate) wells. The Operator also has monitoring wells in the underlying confined aquifer (400+ feet bgs).

44. From 2001 to 2016, groundwater elevations have decreased by approximately 40 feet. For the 4th quarter of 2016, the Operator was only able to collect groundwater samples for 20 of the 49 monitoring wells. Due to the decreasing groundwater table and the presence of

dairies and other land uses that impact groundwater quality around the Facility, the Operator's groundwater monitoring well network needs to be evaluated to determine if the network is effectively characterizing the impact the Facility's discharge has on underlying groundwater.

45. The current groundwater monitoring well network consists of four upgradient monitoring wells, at two different locations. Groundwater monitoring wells MW-10A and MW-16A monitor shallow groundwater, MW-10B monitors intermediate groundwater, and MW-16B monitors deep groundwater. Due to the decreasing groundwater table, the Operator, as of 2016, has not been able to collect a groundwater sample at monitoring well MW-10A since July 2015 and at MW-16A since July 2013. **Attachment A** includes a map of the groundwater monitoring well network. The following table summarizes the recent groundwater quality at these upgradient monitoring wells.

Upgradient Groundwater Quality

Constituent	Units	MW-10A (July 2015)	MW-16A (July 2013)	MW-10B (October 2016)	MW-16B (July 2016)
Total Coliform	MPN/100mL	<1.0	2	<1.0	<1.0
pH	s.u.	7.2	7	7.4	7.3
Electrical Conductivity (EC)	µmhos/cm	1,025	2,060	532	683
Total Dissolved Solids	mg/L	709	1,390	364	463
Chloride	mg/L	66	89	27	35
Boron	mg/L	0.046	0.064	0.026	0.02
Sodium	mg/L	33	88	21	26.5
Sulfate	mg/L	97	231	43	38
Arsenic	µg/L	2.5	2.5	1.8	2.9
Iron	µg/L	<50	<50	5	4
Manganese	µg/L	<2.5	<2.5	0.3	0.3
Ammonia as Nitrogen	mg/L	<0.5	<0.5	<0.4	<0.5
Nitrate as Nitrogen	mg/L	26	58	10	11
Total Nitrogen	mg/L	26	58	10	11

46. The following table summarizes the downgradient shallow and intermediate groundwater conditions.

Downgradient Groundwater Quality (2011 through 2016)

Constituent	Units	Shallow[1] (2011–2016 Avg.)	Upper-Intermediate[2] (2011–2016 Avg.)	Lower-Intermediate[3] (2011–2016 Avg.)
Total Coliform	MPN/100mL	3.5	10	29
pH	s.u.	6.8	7	7.2
Electrical Conductivity (EC)	µmhos/cm	1,200	940	890
Total Dissolved Solids	mg/L	760	590	590
Chloride	mg/L	100	87	78
Boron	µg/L	240	180	79
Sodium	mg/L	88	75	53
Sulfate	mg/L	83	44	43
Arsenic	µg/L	7.5	7.6	3.5
Iron	µg/L	26	25	25
Manganese	µg/L	1,300	250	3.7
Ammonia as Nitrogen	mg/L	3.1	0.67	<0.50
Nitrate as Nitrogen	mg/L	15	4.7	7

Constituent	Units	Shallow[1] (2011–2016 Avg.)	Upper-Intermediate[2] (2011–2016 Avg.)	Lower-Intermediate[3] (2011–2016 Avg.)
Total Nitrogen	mg/L	18	5.3	7

[1] Approximate groundwater elevation range = 20 to 130 feet bgs. Data from the following monitoring wells were used to summarize shallow downgradient groundwater conditions: MW-1A, 2A, 4A, 5A, 6A, 9A, 12A, 13A, 14A, 15A, 17A, 1002-1, and 1003-1. Due to the decreasing groundwater monitoring table, the majority of these monitoring wells went dry by the end of the 2016 calendar year.

[2] Approximate groundwater elevation range = 162 to 225 feet bgs. Data from the following monitoring wells were used to summarize upper-intermediate downgradient groundwater conditions: MW-1B, 2B, 5B, 6B, 11B, 13B, 14B, 15B, 17B, 18B, 22B, 23B, 1002-2, and 1003-2.

[3] Approximate groundwater elevation range = 221 to 250 feet bgs. Data from the following monitoring wells were used to summarize lower-intermediate downgradient groundwater conditions: MW-12B, 19B, 20B, and 21B.

47. Arsenic and manganese concentrations in select groundwater monitoring wells underlying and downgradient of the Facility exceed the applicable primary MCL (10 µg/L) and secondary MCL (50 µg/L) for arsenic and manganese, respectively. The arsenic and manganese concentrations in groundwater above the applicable MCL are likely due to excessive organic loading and reducing conditions beneath the Facility's disposal ponds.

48. On 14 December 2009, the Operator submitted a report titled *Best Practicable Treatment and Control Comprehensive Evaluation* (2009 BPTC Report) which, in part, evaluated the arsenic and manganese concentrations observed in the underlying groundwater. The 2009 BPTC Report concluded that the source of the high arsenic and manganese groundwater concentrations is alluvium beneath the Facility's disposal ponds. A core sampling study verified the presence of arsenic and manganese in crystallized form in the alluvium. The 2009 BPTC Report evaluated various above-ground best management practices (e.g., conducting a pond cycling study to investigate if wet/dry cycling could reduce concentrations), but concluded that "[a]bove ground management practices such as enhanced effluent treatment and pond cycling will not substantially decrease concentrations of arsenic and manganese in the groundwater." The Operator's plan to increase the reclamation of the Facility's treated wastewater will diminish the hydraulic burden on the ponds, the size and extent of the mound, and diminish the organic carbon loading to underlying groundwater. This Order requires the Discharger to evaluate the extent of the elevated concentrations for arsenic and manganese and the potential impact these concentrations are having on downgradient water supply wells.

Basin Plan, Beneficial Uses, and Regulatory Considerations

49. The *Water Quality Control Plan for the Tulare Lake Basin, Third Edition (revised May 2018)* (Basin Plan) designates beneficial uses, establishes water quality objectives (WQOs), contains implementation plans and policies for protecting waters of the basin, and incorporates, by reference, plans and policies adopted by the State Water Resources Control Board (State Water Board). In accordance with Water Code section 13263, subdivision (a), these WDRs implement the Basin Plan.

50. The Facility is in Detailed Analysis Unit (DAU) No. 233, within the Kings Basin. The Basin Plan designated the beneficial uses of water in DAU No. 233 as municipal and domestic supply (MUN), agricultural supply (AGR), industrial service supply (IND), industrial process supply (PRO), contact water recreation (REC-1), and non-contact water recreation (REC-2).

51. The Basin Plan establishes narrative WQOs for chemical constituents, tastes and odors, and toxicity in groundwater. It also sets forth a numeric WQO for total coliform organisms.

52. The Basin Plan's numeric WQO for bacteria requires the most probable number (MPN) of coliform organisms over any seven-day period shall be less than 2.2 per 100 mL in MUN-designated groundwater.

53. The Basin Plan identifies the greatest long-term problem facing the entire Tulare Lake Basin is the increase in salinity in groundwater, which has accelerated due to the intensive use of soil and water resources by irrigated agriculture. The Basin Plan establishes several salt management requirements, including:

    a. The incremental increase in salts from use and treatment must be controlled to the extent possible. The maximum electrical conductivity (EC) in the discharge shall not exceed the EC of the source water plus 500 µmhos/cm. When the source water is from more than one source, the EC shall be a weighted average of all sources.

    b. Discharges to areas that may recharge good quality groundwater shall not exceed an EC of 1,000 µmhos/cm, a chloride content of 175 mg/L, or a boron content of 1.0 mg/L.

54. The Basin Plan's narrative WQOs for chemical constituents, at a minimum, require MUN-designated waters to meet the maximum contaminant levels (MCLs) specified in Title 22. The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

55. In 1979, the United States Environmental Protection Agency (USEPA) designated the groundwater aquifer serving the Fresno-Clovis metropolitan area a sole source of drinking water pursuant to section 1424 of the Safe Drinking Water Act.

56. The narrative toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, animal, plant, or aquatic life associated with designated beneficial uses.

57. Quantifying a narrative WQO requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses. The Basin Plan states that when compliance with a narrative objective is required to protect specific beneficial uses, the Central Valley Water Board will, on a case-by-case basis, adopt numerical limitations in order to implement the narrative objective.

58. In the absence of specific numerical water quality limits, Basin Plan methodology is to consider any relevant published criteria. General salt tolerance guidelines, such as *Water Quality for Agriculture* by Ayers and Westcot and similar references indicate that yield reductions in nearly all crops are not evident when irrigation water has an electrical conductivity (EC) less than 700 µmhos/cm. There is, however, an eight- to ten-fold range in salt tolerance for agricultural crops, and the appropriate salinity values to protect agriculture in the Central Valley are considered on a case-by-case basis. It is possible to achieve full yield potential with waters having EC up to 3,000 µmhos/cm if the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop.

59. The list of crops in **Findings 37 and 38** is not intended as an exclusive or exhaustive inventory of crops that are or could be grown in the area, but it is representative of current and historical agricultural practices in the area.

60. In 2005, as part of the Operator's effort to develop the 2009 BPTC Report, a report titled *Evaluation of Interim Groundwater Quality Limits (EC, TDS, B, Cl, and NA) For the Fresno Wastewater Treatment Plant to Protect Irrigated Agriculture"* was developed by Dr. Grattan and Dr. Isidoro-Ramirez, from University of California, Davis (2005 Grattan and Isidoro-Ramirez Report). The 2005 Grattan and Isidoro-Ramirez Report's objective was to determine interim groundwater limits for salinity (EC and total dissolved solids) and potentially toxic ions (chloride and sodium) protective of irrigated agriculture, taking into account site-specific conditions near the Facility (e.g., soil type, irrigation management practices, crop evapotranspiration, and rainfall) while protecting the most sensitive dominant crops in the area.

    The 2005 Grattan and Isidoro-Ramirez Report proposed irrigating with water containing EC of 1,400 µmhos/cm, as the sole source of irrigation, would be protective of the most sensitive crops in the area (almonds and grapes). Based on a 1,400 µmhos/cm limit, the 2005 Grattan and Isidoro-Ramirez Report proposed a total dissolved solids limit of 766 mg/L and a sodium limit of 161 mg/L (assuming a salinizing ratio of 1:1 sodium to calcium, the 1,400 µmhos/cm EC limit translates to a sodium limit of 161 mg/L). For chloride, the 2005 Grattan and Isidoro-Ramirez Report proposed an interim limit of 175 mg/L to be protective of the most sensitive crop, almonds. For boron, the 2005 Grattan and Isidoro-Ramirez Report recognizes that the model used for the study was "not appropriate to predict soil boron behavior nor could it be readily adapted to account for complex soil boron chemistry." As a result, it recommended boron concentrations in irrigation water not to exceed 1.0 mg/L. At these thresholds, the 2005 Grattan and Isidoro-Ramirez Report contends that yield potential for the salt-sensitive crops in the area would be maintained above 90 percent over 90 percent of the years.

CV-SALTS Reopener

61. The Central Valley Water Board adopted Basin Plan amendments incorporating new programs for addressing ongoing salt and nitrate accumulation in the Central Valley at its 31 May 2018 Board Meeting. These programs, once effective, could change how the Central Valley Water Board permits discharges of salt and nitrate. For nitrate, dischargers that are unable to comply with stringent nitrate requirements will be required to take on alternate compliance approaches that involve providing replacement drinking water to persons whose drinking water is affected by nitrates. Dischargers could comply with the new nitrate program either individually or collectively with other dischargers. For salinity, dischargers that are unable to comply with stringent salinity requirements would instead need to meet performance-based requirements and participate in a basin-wide effort to develop a long-term salinity strategy for the Central Valley. This Order may be amended or modified to incorporate any newly-applicable requirements.

62. The stakeholder-led Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has been coordinating efforts to implement new salt and nitrate management strategies. The Board expects dischargers that may be affected by new salt and nitrate management policies to coordinate with the CV-SALTS initiative.

63. The Operator submitted an application, dated 12 May 2015, for an electrical conductivity (EC) effluent limitation exception pursuant to Section 4.1.4.1., *Exception to Discharge Requirements related to the Implementation of Water Quality Objectives for Salinity* (Salinity Exception Policy). In the application, the Operator justifies the need for the salinity exception; describes implemented salinity control measures (e.g., surface water treatment, "Salt is Serious" campaign, and implementing a recycled water program); discusses how the drought and water conservation impacts have caused the electrical conductivity to increase (e.g., substantial decrease in potable water use after full implementation of residential water metering program); and summarizes the Operator's previous and continued participation in CV-SALTS.

64. The Operator's May 2015 Salinity Exception Policy application proposed an interim performance-based effluent limit for electrical conductivity (EC) of 1,104 µmhos/cm. The limit was calculated using a statistical best-fit regression line for the 12-month rolling average effluent EC from January 2005 to June 2014 to project the Facility's effluent EC concentration ten years in the future. Since June 2014, the Facility's effluent EC has decreased. Using the same statistical approach used in the application, but with an updated date set (January 2006 to December 2016), the projected EC is 960 µmhos/cm. Therefore, this Order includes a 1,000 µmhos/cm effluent limitation (12-month rolling average), but does not include the Basin Plan 500 µmhos/cm plus source water EC limitation.

Antidegradation Analysis

65. The State Water Board's *Statement of Policy with Respect to Maintaining High Quality Waters in California*, Resolution 68-16 (Antidegradation Policy), prohibits degradation of groundwater unless it is demonstrated that such degradation:

    a. Will not unreasonably affect present and anticipated beneficial uses;

    b. Will not result in water quality less than that prescribed in state and regional policies, (including violation of one or more WQOs);

    c. Will be minimized by the discharger through best practicable treatment or control (BPTC) to minimize degradation; and

    d. Will be consistent with the maximum benefit to the people of the State.

66. Order 5-01-254 limited the Facility's discharge to its disposal ponds to an annual average of 80 mgd, and a max monthly average of 88 mgd. In its RWD, the Operator requested that new waste discharge requirements include flow limits of 91.5 mgd (annual average) and 101 mgd (monthly average) for the Facility's total discharge, but still maintain the 80 mgd annual average discharge flow limit to the disposal ponds. The Operator included an antidegradation analysis in its RWD for the requested flow limits and an antidegradation analysis for its tertiary recycled water program, dated June 2015. The discharge of tertiary recycled water to recycled water Use Areas is permitted under the Reclamation

General Order and the discharge of secondary recycled water to offsite cropland surrounding the Facility is covered under separate water reclamation requirements.

67. As mentioned in **Finding 48**, the Operator submitted a BPTC Report on 14 December 2009. The findings from the 2009 BPTC Report were included in the Discharger's October 2015 RWD. The 2009 BPTC Report was the culmination of a six-year study to identify waste constituents that threaten to degrade the groundwater and provide recommendations on how these constituents should be treated and controlled in the discharge. The Operator initially evaluated over 100 constituents in the underlying groundwater. The BPTC Report eventually concluded that the primary constituents of concern at the Facility and in underlying groundwater are salinity, nitrogen, arsenic, and manganese. For each constituent, the BPTC Report evaluated alternative control measures that might reduce or eliminate the concentration in underlying groundwater at the Facility.

68. Based on the data presented in the BPTC Report and submitted monitoring data, the constituents of concern that have the potential to degrade groundwater at the Facility include salts (primarily EC, total dissolved solids [TDS], sodium, and chloride), arsenic, manganese, nutrients, and total coliform organisms, as discussed below.

	Average Concentration (2011 – 2016)[1]							
		Upgradient Groundwater Quality			**Downgradient Groundwater Quality**			
Constituent	**Effluent[2]**	Shallow[3]	Upper-Intermediate[4]	Lower-Intermediate[5]	Shallow[3]	Upper-Intermediate[4]	Lower-Intermediate[5]	**Potential WQO**
EC (µmhos/cm)	870	1,600	350	590	1,200	940	890	900[6] 1,400[8]
TDS (mg/L)	490	1,000	270	390	760	590	590	500[6] 766[8]
Sodium (mg/L)	95	53	17	25	88	75	53	161[8]
Chloride (mg/L)	108	70	11	26	100	86	78	250[6] 175[8]
Arsenic (µg/L)	0.88	2.5	2.0	3.0	7.5	7.6	3.5	10[7]
Manganese (µg/L)	40	3.5	2	3	1,300	253	3.7	50[9]
Nitrate as N (mg/L)	9.5	50	6.1	5.6	14.7	4.7	7.0	10[7]

1 Average concentration of data reported from 2011 through 2016.
2 Undisinfected secondary-treated wastewater.
3 Data from monitoring wells 10A and 16A were used to summarize shallow upgradient groundwater conditions. Data from the following monitoring wells were used to summarize shallow downgradient groundwater conditions: MW-1A, 2A, 4A, 5A, 6A, 9A, 12A, 13A, 14A, 15A, 17A, 1002-1, and 1003-1. Due to the decreasing groundwater monitoring table, the majority of these monitoring wells were dry by the end of the 2016 calendar year.
4 Data from monitoring well 10B were used determine upper-intermediate upgradient groundwater conditions. Data from the following monitoring wells were used to summarize upper-intermediate downgradient groundwater conditions: MW-1B, 2B, 5B, 6B, 11B, 13B, 14B, 15B, 17B, 18B, 22B, 23B, 1002-2, and 1003-2.
5 Data from monitoring well 16B were used determine lower-intermediate upgradient groundwater conditions. Data from the following monitoring wells were used to summarize lower-intermediate downgradient groundwater conditions: MW-12B, 19B, 20B, and 21B.
6 Recommended Secondary MCL
7 Primary MCL
8 2005 Grattan and Isidoro-Ramirez Report (see **Finding 60**)
9 Secondary MCL

a. **Salinity (EC, TDS, Sodium, and Chloride).** The average EC and TDS concentration in the shallow upgradient groundwater monitoring wells exceed the recommended secondary MCLs for electrical conductivity (900 µmhos/cm) and total dissolved solids (500 mg/L). The average chloride concentrations in upgradient wells do not exceed the recommended secondary MCL of 250 mg/L. For chloride and sodium, the average upgradient groundwater concentrations do not exceed the respective 2005 Grattan and Isidoro-Ramirez Report limits.

For TDS and EC, the shallow upgradient groundwater concentrations are significantly higher than the Facility's effluent concentrations, while shallow downgradient groundwater concentrations range between the upgradient groundwater and effluent concentrations. However, for EC, TDS, sodium, and chloride, some intermediate downgradient groundwater wells have concentrations exceeding intermediate upgradient concentrations, indicating that that the Facility's discharge has contributed to groundwater degradation for salinity.

The Operator has and continues to implement various measures to reduce the salinity loading on underlying groundwater at the Facility. These measures include increasing the Operator's surface water treatment capacity, constructing a tertiary treatment system in conjunction with implementing a recycled water program, implementing a salinity outreach program, and implementing an industrial pretreatment program. As noted in **Finding 32**, the Operator plans to increase its surface water treatment supply from 30 mgd (current capacity) to 140 mgd. The Operator's tertiary recycled water program will increase the treatment level for a portion of the Facility's wastewater and reduce the loading to the onsite disposal ponds. The Operator began implementing an outreach program ("Salt is Serious" campaign) in 2007 to promote waste minimization. This campaign included television and radio commercials and distributing informational materials at home shows and in residential utility bills. As of 2009, the Operator states that it has spent over $100,000 on the "Salt is Serious" campaign. In 2008, the Operator received the National Association of Clean Water Agencies' National Environmental Achievement Award for Public Information Education in recognition of the Operator's salinity outreach program. The Operator also implements an industrial pretreatment program in the cities of Fresno and Clovis that includes salinity source control.

As discussed in **Finding 63**, the City of Fresno requested an exception to the EC effluent limit in accordance with the Basin Plan's Salinity Exception Policy. This Order grants a 10-year exception to the EC limit specified in the Basin Plan and establishes an interim performance-based EC effluent limit. Pursuant to the Salinity Exception Policy, the Discharger is required to continue to participate in the CV-SALTS. In addition, this Order requires the Operator to develop and implement a Salinity Reduction Study Workplan. The treatment and control measures described above, in combination with the requirements of this Order, represent BPTC.

b. **Arsenic and Manganese.** The average arsenic and manganese concentrations in the upgradient groundwater monitoring wells are below the applicable MCLs for arsenic (primary MCL of 10 µg/L) and manganese (secondary MCL of 50 µg/L). The Facility's effluent arsenic and manganese concentrations are generally below the respective MCL. However, excessive organic and hydraulic loading of the disposal ponds can deplete oxygen, resulting in anoxic conditions that can solubilize naturally occurring

metals in soil. The groundwater monitoring data indicate that the Facility's discharge of secondary-treated wastewater to the disposal ponds has degraded groundwater quality with respect to manganese and arsenic in the immediate vicinity of the disposal ponds.

The Operator's 2009 BPTC Report evaluated the arsenic and manganese groundwater concentrations and potential treatment and controls. This included evaluating above-ground management practices and conducting a pond cycling study to investigate whether wet/dry cycling would significantly improve the arsenic and manganese groundwater concentrations. The results from the pond cycling study indicated a slight decrease in arsenic groundwater concentrations, but no apparent trend in manganese concentrations downgradient of the ponds used for the study. The 2009 BTPC Report concluded that as groundwater moves laterally away from the Facility, into oxygenated zones, arsenic and manganese in the groundwater naturally precipitate out and return to the solid phase.

By implementing a recycled water master plan for the City of Fresno, the Operator will consequently reduce the effluent loading to the onsite disposal ponds. This could potentially result in reduced arsenic and manganese groundwater concentrations at the Facility. This Order includes a time schedule for the Discharger to further evaluate the arsenic and manganese concentrations in underlying groundwater and designate/establish groundwater monitoring wells to determine compliance with the arsenic and manganese groundwater limits included in this Order (Provision J.1.a).

c. **Nitrate.** For nutrients such as nitrate, the potential for groundwater degradation depends on wastewater quality, crop uptake, and the ability of the vadose zone below the cropland and disposal ponds to support nitrification and denitrification to convert the nitrogen to nitrogen gas before it reaches the water table. The nitrate concentrations in the shallow upgradient groundwater monitoring wells significantly exceed the nitrate (as N) primary MCL of 10 mg/L. Recent nitrate concentrations in the intermediate upgradient groundwater monitoring wells were at or above the 10 mg/L primary MCL. The high upgradient nitrate concentrations are likely reflective of surrounding land uses (e.g., irrigated agriculture and dairies).

For purposes of this analysis, the Basin Plan's Controllable Factors Policy is applicable because the upgradient groundwater nitrate (as N) concentration generally exceeds 10 mg/L, the water quality objective for nitrate. The Controllable Factors Policy does not allow further degradation of water quality in instances where other factors have already resulted in water quality objectives being exceeded.

The Facility's secondary-treated effluent total nitrogen concentration averages approximately 20 mg/L. The Discharger's RWD included a report titled *Technical Memorandum on Nitrogen Removal for Percolation from Ponds* prepared by Kenneth D. Schmidt and Associates, which concluded that secondary effluent discharged to the Facility's disposal ponds receives approximately 70 percent reduction in total nitrogen during percolation. The new tertiary treatment system is designed to treat total nitrogen in wastewater to below 10 mg/L (as N). The Operator proposes to continue to discharge secondary-treated wastewater to the disposal ponds; however, by expanding the City of Fresno's recycled water program, the Operator will reduce the nitrogen loading to the disposal ponds. To ensure compliance with the Controllable Factors Policy, this Order

prescribes a nitrate groundwater limit of 10 mg/L (as N) or in excess of natural upgradient quality, whichever is greater.

d. **Total Coliform Organisms.** For coliform organisms, the potential for exceedance of the Basin Plan's numeric WQO depends on the ability of vadose zone soils below the disposal ponds to provide adequate filtration. Historically, some groundwater water monitoring wells have had sporadic total coliform detections. In 2007 and in 2009, the Operator evaluated the physical condition of the monitoring wells. During both evaluations, the Operator identified possible sources of contamination that could contribute to positive coliform results (e.g., animal activity, runoff water entering the well, presence of nearby dairy lagoons). After corrective measures were implemented, the groundwater quality data for total coliform improved, generally to non-detect levels. In addition, from 2011 to 2016, no downgradient monitoring well had total coliform concentration detections greater than 30% of the time. This indicates that previous total coliform detections were likely a result of contaminated or compromised wells or poor sampling techniques. The approximate 75-foot unsaturated zone consisting of fine grained soils is expected to be sufficient to filter out coliform organisms and to prevent groundwater degradation.

69. This Order establishes effluent and groundwater limitations for the Facility that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds WQOs set forth in the Basin Plan.

    a. For nitrate, groundwater monitoring data indicates that groundwater has not been degraded beyond upgradient groundwater quality by the previous discharge and the discharge does not pose a threat of degradation in the future. The requirements of this Order do not allow any further degradation to occur.

    b. For salinity constituents (i.e., EC, TDS, sodium, and chloride), current groundwater monitoring data indicates that groundwater has been degraded by the Facility's discharge. The Discharger has and continues to implement BPTC. In addition, this Order requires the Discharger to conduct a Salinity Reduction Study Workplan or a salinity-based watershed management plan and includes salinity effluent and groundwater limits to ensure the Facility's discharge does not cause further degradation.

    c. For arsenic and manganese, current groundwater monitoring data indicates that the discharge has caused exceedance of applicable WQOs. The provisions of this Order require that the Discharger implement BPTC and comply with a time schedule to evaluate the arsenic and manganese area of influence due to the Facility's discharge.

70. The Discharger provides BPTC of the discharge that incorporates:

    a. Completing upgrades to the Facility's secondary treatment system, including constructing a third secondary treatment train;

    b. Recycling secondary-treated wastewater on surrounding croplands;

    c. Decommissioning the old 6-mgd trickling filter plant at the Facility;

d. Ceasing the direct land discharge of untreated stillage waste at the Facility;

e. Farming the former stillage site to remove nitrogen from underlying soil;

f. Constructing a tertiary treatment system at the Facility with future plans to upgrade the Facility's tertiary treatment system to increase the system's design flow;

g. Developing a Title 22 Engineering Report and enrolling under the Reclamation General Order to recycle tertiary-treated wastewater from the Facility on Use Areas in the City of Fresno;

h. Implementing a pretreatment program that includes effective salinity source control;

i. Shifting more of the City of Fresno's municipal supply water to surface water;

j. Providing sludge treatment and removal on concrete-lined surfaces;

k. Recycling treated wastewater at loading rates unlikely to cause unacceptable groundwater degradation; and

l. Conducting groundwater monitoring to monitor the potential impact of the Facility's discharge on underlying groundwater.

71. Generally, limited degradation of groundwater by some of the typical waste constituents of concern (e.g., EC and nitrate) discharged from a municipal wastewater utility, after effective source control and treatment, is consistent with maximum benefit to the people of the State. The technology, energy, water recycling, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impacts on water quality will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and, therefore, sufficient reason to accommodate growth and some groundwater degradation provided terms of the Basin Plan are met. Generally, the degradation will not unreasonably affect present and anticipated beneficial uses of groundwater or result in water quality less than WQOs.

72. With respect to manganese and arsenic, groundwater degradation has occurred. Therefore, this Order does not authorize any continued degradation beyond that which exists today for those constituents. This Order includes groundwater limitations for arsenic and manganese and contains a time schedule to evaluate the extent of the arsenic and manganese area of influence to ensure that the highest water quality consistent with the maximum benefit to the people of the State. Following completion of the time schedule, this Order will be reopened if necessary to reconsider effluent limitations and other requirements to comply with the Antidegradation Policy. Based on the existing record, the discharge authorized by this Order is consistent with the Basin Plan.

Water Recycling Regulatory Considerations

73. Undisinfected domestic wastewater contains human pathogens that are typically measured using total or fecal coliform organism as indicator organisms. The State Water Resources Control Board, Division of Drinking Water, which has primary statewide responsibility for protecting water quality and the public health, has established statewide criteria for the use of recycled water. (See Title 22, § 60301 et seq.)

74. On 3 February 2009, the State Water Board adopted Resolution 2009-0011, *Adoption of a Policy for Water Quality Control for Recycled Water* (Recycled Water Policy). The Recycled Water Policy promotes the use of recycled water to achieve sustainable local water supplies and reduce greenhouse gases.

75. On 23 April 2009, the Central Valley Water Board adopted Resolution R5-2009-0028, *In Support of Regionalization, Reclamation, Recycling and Conservation for Wastewater Treatment Plants*. Resolution R5-2009-0028 encourages water recycling, water conservation, and regionalization of wastewater treatment facilities. It requires the municipal wastewater treatment agencies to document:

    a. Efforts to promote new or expanded wastewater recycling opportunities and programs;

    b. Water conservation measures; and

    c. Regional wastewater management opportunities and solutions (e.g., regionalization).

    Recycling of the Facility's effluent (both undisinfected secondary and disinfected tertiary recycled wastewater) by the Operator is consistent with the intent of State Water Board Resolution 2009-0011 and Central Valley Water Board Resolution R5-2009-0028.

76. The Discharger submitted an *Engineering Report Update for the Fresno – Clovis Regional Wastewater Reclamation Facility* dated 2 June 2016 (2016 Title 22 Engineering Report) to the Central Valley Water Board and the Division of Drinking Water. This report provided an update to the *Title 22 Engineering Report Reclamation System Overview* dated January 2001. The 2016 Title 22 Engineering Report was submitted pursuant to Title 22 for recycling of undisinfected secondary recycled water as defined by Title 22, section 60301.900. The Division of Drinking Water reviewed the 2016 Title 22 Engineering Report in a letter dated 28 April 2017 and provided various comments. The Operator responded to these comments on 31 May 2017, and the 2016 Title 22 Engineering Report was subsequently approved by the Division of Drinking Water on 1 June 2017.

77. As discussed in **Finding 12**, the Operator was enrolled under the General Reclamation Order on 20 March 2017 for the reuse of disinfected tertiary-treated wastewater. To satisfy Title 22 disinfection requirements, an on-site spot check bioassay test was performed in August 2016 to verify performance of the Facility's ultraviolet light disinfection system. Based on the results of the test, the Division of Drinking Water issued a letter dated 12 September 2016 recommending, in part, that the Facility's ultraviolet light disinfection system be operated to ensure that each ultraviolet light reactor deliver a minimum ultraviolet light dosage of 98 millijoules per square centimeter (mJ/cm^2) at all times.

Other Regulatory Considerations

78. Pursuant to Water Code section 106.3, subdivision (a), it is "the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." Although this Order is not necessarily subject to Water Code section 106.3 because it does not revise, adopt or establish a policy, regulation or grant criterion (see § 106.3, subd. (b)), it nevertheless promotes that policy by requiring discharges to meet MCLs designed to protect human health and ensure that water is safe for domestic use.

79. Based on the threat and complexity of the discharge, the Facility is determined to be classified as 1A as defined below:

    a. Category 1 threat to water quality, defined as: "*Those discharges of waste that could cause the long-term loss of a designated beneficial use of the receiving water. Examples of long-term loss of a beneficial use include the loss of drinking water supply, the closure of an area used for water contact recreation, or the posting of an area used for spawning or growth of aquatic resources, including shellfish and migratory fish*."

    b. Category A complexity, defined as: "*Any discharge of toxic wastes; any small volume discharge containing toxic waste; any facility having numerous discharge points and groundwater monitoring; or any Class 1 waste management unit*."

80. This Order, which prescribes WDRs for discharges of sewage and wastewater, is exempt from Title 27 of the California Code of Regulations, title 27 (Title 27) requirements for the treatment, storage, processing, and disposal of solid waste. (See Title 27, § 20090, subds. (a)-(b).)

81. The statistical data analysis methods specified in the USEPA's 2009 *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance) are appropriate for determining whether the discharge complies with Groundwater Limitations of this Order. The USEPA published *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (hereafter "Unified Guidance") in 2009. As stated in the Unified Guidance, the document:

    > …is tailored to the context of the RCRA groundwater monitoring regulations …
    > [however, t]here are enough commonalities with other regulatory groundwater monitoring programs … to allow for more general use of the tests and methods in the Unified Guidance… Groundwater detection monitoring involves either a comparison between different monitoring stations … or a contrast between past and present data within a given station… The Unified Guidance also details methods to compare background data against measurements from regulatory compliance points … [as well as] techniques for comparing datasets against fixed numerical standards … [such as those] encountered in many regulatory programs.

The statistical data analysis methods in the Unified Guidance are appropriate for determining whether the discharge complies with Groundwater Limitations of this Order.

82. The State Water Board adopted Order 2014-0057-DWQ (NPDES General Permit CAS000001) specifying waste discharge requirements for discharges of storm water associated with industrial activities and requiring submittal of a Notice of Intent by all affected industrial dischargers. The Discharger indicates that the Facility has a design capacity of more than 1.0 mgd, and all stormwater is collected and disposed onsite. The Discharger is therefore not required to obtain coverage under NPDES General Permit CAS000001.

83. On 2 May 2006, the State Water Board adopted Statewide General Waste Discharge Requirements for Sanitary Sewer Systems General Order 2006-0003-DWQ (the General Order). The General Order requires all public agencies that own or operate sanitary sewer systems greater than one mile in length to comply with the General Order. The Discharger's collection system exceeds one mile in length and the Discharger is enrolled under the General Order.

84. Water Code section 13267(b)(1) states:

> In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

The technical reports required by this Order and the attached Monitoring and Reporting Program (MRP) **R5-2018-0080** are necessary to ensure compliance with these waste discharge requirements. The Discharger owns and operates the wastewater treatment facility that discharges the waste subject to this Order.

85. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 74-81* (December 1981). These standards, and any more stringent standards adopted by the state or county pursuant to Water Code section 13801, apply to all monitoring wells used to monitor the impacts of wastewater storage or disposal governed by this Order.

86. The City of Fresno certified a programmatic Environmental Impact Report (EIR) in April 2013 for the implementation of the City's Recycled Water Master Plan in accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). The April 2013 EIR analyzed the potential environmental impacts of the construction and operation of the City of Fresno's Recycled Water Master Plan.

The Recycled Water Master Plan lists several opportunities for recycling disinfected tertiary-treated wastewater from the Facility, including: (1) offsetting existing and future use of potable supplies for landscape irrigation, and industrial heating and cooling; (2) expanding agricultural reuse; and (3) groundwater recharge to supplement groundwater supplies. The Master Plan includes a plan for installing and operating a treatment, storage, and distribution infrastructure to serve the proposed project areas with recycled water. Due to Fresno's geographic size (105 square miles), the Master Plan divided Fresno into four quadrants for evaluating reuse options and implementing the plan. The implementation of a recycled water treatment and distribution system would facilitate the City of Fresno's goal, established in the 2008 Urban Water Management Plan, to provide 25,000 acre-feet per year of recycled water to offset potable water use by year 2025.

87. The City of Fresno certified a Mitigated Negative Declaration (MND) in June 2014 for the construction of the Facility's new tertiary treatment system in accordance with CEQA. The June 2014 MND evaluated the construction and operation of a tertiary treatment and disinfection system at the Facility. The new treatment system, as described in the June 2014 MND, includes a 5-mgd membrane bioreactor system, ultraviolet disinfection system, recycled water storage basin, and new recycled water pipelines. The MND specifically states that the document only evaluates the proposed phase 1 capacity of 5 mgd.

88. The April 2013 EIR evaluated the potential impacts to groundwater quality and found that compliance with WDRs, including implementing Best Practicable Treatment or Control (BPTC) in accordance with Antidegradation Policy, will ensure that impacts to water quality due to the implementation of the Recycled Water Master Plan would be minimized.

89. The USEPA-promulgated biosolids reuse regulations, codified as 40 C.F.R. part 503 (*Standard for the Use or Disposal of Sewage Sludge*), establishes management criteria for protection of ground and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria. These regulations are used as guidelines in this Order, as the Central Valley Water Board is not the implementing agency under 40 C.F.R. part 503. The Discharger may have separate and/or additional compliance, reporting, and permitting responsibilities to the USEPA.

90. Pursuant to Water Code section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

Public Notice

91. The Discharger and interested agencies and persons have been notified of the Central Valley Water Board's intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity to submit written comments and an opportunity for a public hearing.

92. All comments pertaining to the discharge were heard and considered in a public hearing.

93. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.

IT IS HEREBY ORDERED that WDRs Order 5-01-254 is rescinded and that, pursuant to Water Code sections 13263 and 13267, the cities of Fresno and Clovis (collectively, Discharger), their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the Water Code and regulations promulgated thereunder, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited.

2. Discharge of waste classified as "hazardous," as defined in Title 22, section 66261.1 et seq., is prohibited.

3. Treatment system bypass of untreated or partially treated waste is prohibited, except as allowed by Standard Provision E.2 of the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements,* dated 1 March 1991 (SPRRs), the entirety of which is incorporated herein.

4. Discharge of waste at a location or in a manner different from that described in the Findings is prohibited.

5. The Discharger shall not allow toxic substances to be discharged into the wastewater treatment system such that biological treatment mechanisms are disrupted.

6. Discharge of stillage at the Facility is prohibited.

7. Grazing of animals producing milk for human consumption within areas irrigated with undisinfected secondary-treated effluent is prohibited.

B. Flow Limitations

1. **Discharge Point 001.** The discharge of treated effluent (undisinfected secondary-treated wastewater and/or disinfected tertiary-treated wastewater) to the onsite disposal ponds shall not exceed the following:

Flow Measurement	Flow Limit
Total Annual Flow [1]	80 mgd
Maximum Monthly Flow [2]	87.1 mgd

[1] As determined by the total flow for the calendar year divided by the number of days in the year.
[2] As determined by the total flow during the calendar month divided by the number of days in that month.

2. **Discharge Points 001, 002, and 003.** The total discharge of treated effluent (undisinfected secondary-treated wastewater and disinfected tertiary-treated wastewater) from the Facility shall not exceed the following:

Flow Measurement	Flow Limit
Total Annual Flow [1]	91.5 mgd
Maximum Monthly Flow [2]	101 mgd

[1] As determined by the total flow for the calendar year divided by the number of days in the year.
[2] As determined by the total flow during the calendar month divided by the number of days in that month.

C. Effluent Limitations

1. **Discharge Points 001 and 002.** Treated effluent discharged from the Facility's undisinfected secondary-treated system to the onsite disposal ponds and restricted irrigation Use Areas shall not exceed the following limits:

   a. The effluent limitations specified below:

Constituent	Units	Monthly Average	Daily Maximum
BOD_5 [1]	mg/L	40	80
TSS [2]	mg/L	40	80

[1] 5-day biochemical oxygen demand at 20˚C.
[2] Total Suspended Solids

   b. The arithmetic mean of BOD_5 and TSS in effluent samples collected over a monthly period shall not exceed 20 percent of the arithmetic mean of BOD_5 and TSS in influent samples collected at approximately the same time during the same period (80 percent removal).

   c. The following electrical conductivity effluent limitations:

      i) **Effective immediately and until 7 December 2028**, the 12-month rolling average electrical conductivity of the discharge shall not exceed 1,000 µmhos/cm. Compliance with this effluent limitation shall be determined monthly.

      ii) **On 7 December 2028**, the electrical conductivity limit specified in the current revision of the Basin Plan[1].

[1] Current revision of the Basin Plan means the version of the Basin Plan that is in effect after 10 years from the adoption of the tentative WDRs and any other future revisions to the Basin Plan.

2. **Discharge Point 003.** Treated effluent discharged from the Facility's disinfection tertiary-treated system to the unrestricted recycled water Use Areas shall not exceed the following limits:

   a. The effluent limitations specified below:

Constituent	Units	Monthly Average	Daily Maximum
BOD_5 [1]	mg/L	10	20
TSS [2]	mg/L	10	20
Nitrate (as N)	mg/L	10	--

[1] 5-day biochemical oxygen demand at 20˚C.
[2] Total Suspended Solids

   b. The arithmetic mean of BOD_5 and TSS in effluent samples collected over a monthly period shall not exceed 10 percent of the arithmetic mean of BOD_5 and TSS in influent samples collected at approximately the same time during the same period (90 percent removal).

   c. The following electrical conductivity effluent limitations:

      i) **Effective immediately and until 7 December 2028**, the 12-month rolling average electrical conductivity of the discharge shall not exceed 1,000 µmhos/cm. Compliance with this effluent limitation shall be determined monthly.

      ii) **On 7 December 2028**, the electrical conductivity limit specified in the current revision of the Basin Plan[1].

   d. The median concentration of total coliform bacteria in the disinfected tertiary recycled water shall not exceed any of the following:

      i) 2.2 most probably number (MPN) per 100 mL as a 7-day median;

      ii) 23 MPN/100 mL more than once in any calendar month; and

      iii) 240 MPN/100 mL at any time.

D. Discharge Specifications

1. No waste constituent shall be released, discharged, or placed where it will cause a violation of the Groundwater Limitations of this Order.

2. Wastewater treatment, storage, and disposal shall not cause a condition of pollution or nuisance as defined by Water Code section 13050.

3. The discharge shall remain within the permitted waste treatment/containment structures and recycled water Use Areas at all times.

4. The Operator shall operate all systems and equipment to optimize the quality of the discharge.

5. All conveyance, treatment, storage, and disposal systems shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

6. Public contact with wastewater at the Facility shall be prevented through such means as fences, signs, or acceptable alternatives.

7. Objectionable odors as a result of operation of the Facility shall not be perceivable beyond the limits of the Facility property at an intensity that creates or threatens to create nuisance conditions.

8. As a means of discerning compliance with Discharge Specification D.7, the dissolved oxygen (DO) content in the upper one foot of any wastewater treatment or storage pond shall not be less than 1.0 mg/L for three consecutive sampling events. If the DO in any single pond is below 1.0 mg/L for three consecutive sampling events, the Operator shall report the findings to the Central Valley Water Board in writing within 10 days and shall include a specific plan to resolve the low DO results within 30 days.

9. The Operator shall operate and maintain all ponds sufficiently to protect the integrity of containment dams and berms and prevent overtopping and/or structural failure. Unless a California-registered civil engineer certifies (based on design, construction, and conditions of operation and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically from the lowest possible point of overflow). As a means of management and to discern compliance with this requirement, the Operator shall install and maintain in each pond a permanent staff gauge with calibration marks that clearly show the water level at design capacity and enable determination of available operational freeboard.

10. Wastewater treatment, storage, and disposal ponds or structures shall have sufficient capacity to accommodate allowable wastewater flow, design seasonal precipitation, and ancillary inflow and infiltration during the winter while ensuring compliance with all requirements of this Order. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

11. On or about **1 October** of each year, available capacity shall at least equal the volume necessary to comply with Discharge Specifications D.9 and D.10.

12. All ponds and open containment structures shall be managed to prevent breeding of mosquitoes. Specifically:

    a. An erosion control program shall be implemented to ensure that small coves and irregularities are not created around the perimeter of the water surface.

    b. Weeds shall be minimized through control of water depth, harvesting, or herbicides.

c. Dead algae, vegetation, and debris shall not accumulate on the water surface.

d. The Operator shall consult and coordinate with the local Mosquito Abatement District to minimize the potential for mosquito breeding as needed to supplement the above measures.

13. Newly constructed or rehabilitated berms or levees (excluding internal berms that separate ponds or control the flow of water within a pond) shall be designed and constructed under the supervision of a California Registered Civil Engineer.

14. Wastewater contained in any unlined pond shall not have a pH less than 6.0 or greater than 9.0.

15. The Operator shall monitor sludge accumulation in the onsite disposal ponds at least once every five years, beginning in 2019, and shall periodically remove sludge as necessary to maintain adequate storage capacity. Specifically, if the estimated volume of sludge in an onsite disposal pond exceeds five percent of the permitted disposal ponds' capacity, the Operator shall complete sludge cleanout within 12 months after the date of the estimate.

16. The Operator shall continue to regularly plant and harvest crops in the former stillage area to reduce the nitrogen content in the stillage disposal area soils and conduct lysimeter monitoring for the area. The Operator may cease this practice after providing sufficient demonstration to the Central Valley Water Board, for Executive Officer approval, that the nitrogen content, and any other constituents of concern, in the former stillage disposal area has been reduced to a level that will no longer threaten to degrade underlying groundwater quality.

E. Ultraviolet Disinfection System Operating Specifications

The following specifications are based on the disinfection system cited in Division of Drinking Water's spot-check bioassay test report (dated 12 September 2016). No equivalents or substitutions will be accepted without DDW and the Central Valley Water Board Executive Officer approval of equivalent disinfection performance. The Operator shall comply with the following ultraviolet light (UV) disinfection system specifications at the Facility when recycling disinfected tertiary-treated wastewater unless otherwise approved by Division of Drinking Water and the Central Valley Water Board Executive Officer:

1. Filtered effluent turbidity shall not exceed any of the following:

   i. 0.2 Nephelometric Turbidity Units (NTUs), more than 5 percent of the time within a 24-hour period;

   ii. 0.5 NTUs, at any time.

2. The minimum UV dose per reactor shall be 98 millijoules per square centimeter (mJ/cm^2) at all times.

3. The minimum UV transmittance (at 254 nanometers) in the wastewater shall not fall below 64 percent.

4. The UV sensor intensities shall operate in a range from 0.49 to 1.8 milliwatts per square centimeter (mW/cm^2).

5. The following two equations shall be used for each UV reactor as part of the automatic UV disinfection control system for calculating UV dose:

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

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

Where:

UVT = UV transmittance at 254 nanometers, expressed as a whole number
S = Measured UV sensor value (mW/cm^2)
S_o = Calculated intensity from new lamp at full power (at the same UVT) with clean sleeves, typically expressed as a function of UV transmittance (mW/cm^2)
RED_{calc} = UV dose calculated independently for each reactor operated in parallel that is online, using the 2012 NWRI[1] analysis UV dose-monitoring equation (mJ/cm^2)
CR = Confidence factor of 0.909
UVA = UV absorbance at 254 nanometers (cm^{-1})
Q = Flow rate (million gallons per day)

6. The UV dose equations assume that the intensity sensors will 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.

7. On-line monitoring of UV intensity, flow, and UV transmittance must be provided at all times.

8. Flow meters, UV intensity sensors, and UV transmittance monitors must be properly calibrated to ensure proper disinfection.

9. At least monthly, all duty UV intensity sensors must be checked for calibration against a reference UV intensity sensor.

10. 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 great than 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.

[1] National Water Research Institute (NWRI)/American Water Works Association Research Foundation (AWWARF) (August 2012). *Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse*, (Third Edition).

11. UV transmittance meters must be inspected and checked against a reference bench-top unit weekly to document accuracy.

12. If the on-line analyzer UV transmittance reading varies from the bench-top spectrophotometer UV transmittance reading by 2 percent or more, the on-line UV transmittance analyzer must be recalibrated by a procedure recommended by the manufacturer.

13. Each UV reactor must be designed with built-in automatic reliability features that must be triggered by critical alarm set points. Conditions triggering an alarm and the startup of the redundant reactor must include the following:

    a. UV dosage dropping below 103 mJ/cm^2;

    b. Ballast failure, and

    c. Multiple lamp failures.

14. Under any of following conditions, the Operator shall divert effluent from the UV disinfection system either to the influent of the Facility's treatment system, the onsite disposal ponds (Discharge Point 001), or restricted irrigation Use Areas (Discharge Point 002):

    a. UV dose dropping below the minimum required UV dosage of 98 mJ/cm^2;

    b. UV transmittance dropping below 64 percent;

    c. UV intensity dropping below 0.49 mW/cm^2;

    d. Complete UV reactor failure; and/or

    e. Flow above the maximum flow commissioned of 3.005 mgd per reactor.

15. The Facility's UV system should be operated in accordance with an approved operations plan, which specifies clearly the operational limits and responses required for critical alarms. A copy of the approved operations plan should be maintained at the Facility and be readily available to operations personnel and regulatory agencies. A quick reference operations data sheet should be posted at the Facility and include the following information:

    a. The alarm set points for flow, UV dose, UV intensity, and UV transmittance;

    b. The values of flow, UV dose, UV intensity, and UV transmittance 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.

F. Groundwater Limitations

Release of waste constituents from any portion of the Facility, including but not limited to any treatment, reclamation, or storage component associated with the discharge of treated wastewater from the Facility, shall not cause or contribute to groundwater:

1. Containing constituent concentrations in excess of the concentrations specified below or in excess of natural background quality, whichever is greater:

    a. Nitrate (as nitrogen) of 10 mg/L.

    b. Arsenic of 10 µg/L.

    c. Manganese of 50 µg/L.

    d. Total coliform organisms level of 2.2 MPN/100 mL for any 7-day period.

    e. For constituents identified in Title 22, the MCLs quantified therein.

2. Containing taste or odor-producing constituents, toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.

G. Recycled Water Specifications (Discharge Point 002)

The following recycled water specifications apply to the reclamation of undisinfected secondary-treated wastewater on Use Areas within the Facility's boundary (Discharge Point 002). Offsite reclamation of undisinfected secondary recycled water and disinfected tertiary recycled water from the Facility are covered by separate reclamation requirements.

1. For the purpose of this Order, "Use Area" means an area with defined boundaries where recycled water is used or discharged within the Facility's boundaries.

2. Notwithstanding the following requirements, the production, distribution, and use of recycled water shall conform to an Engineering Report prepared pursuant to Title 22, section 60323 and approved by the Division of Drinking Water.

3. Recycled water shall be at least undisinfected secondary water as defined in Title 22, section 60301.

4. Recycled water shall be used in compliance with Title 22, section 60304. Specifically, uses of recycled water shall be limited to those set forth in Title 22, 60304(d). However, undisinfected secondary recycled water shall <u>not</u> be discharged to orchard or vineyard crops;

5. Tailwater runoff and spray of recycled water shall not be discharged outside of the Use Areas.

6. Application rates of recycled water to the Use Areas shall be at reasonable agronomic rates and shall consider soil, climate, and plant demand. In addition, application of recycled water and use of fertilizers shall be at a rate that takes into consideration

nutrient levels in recycled water and nutrient demand by plants. As a means of discerning compliance with this requirement:

a. Crops shall be grown on the Use Areas, and cropping activities shall be sufficient to take up the nitrogen applied, including any fertilizers and manure.

b. Hydraulic loading of recycled water and supplemental irrigation water (if any) shall be managed to:

   i. Provide water only when water is needed and in amounts consistent with that need;

   ii. Maximize crop nutrient uptake;

   iii. Maximize breakdown of organic waste constituents in the root zone; and

   iv. Minimize the percolation of waste constituents below the root zone.

The Central Valley Water Board recognizes that some leaching of salts is necessary to manage salt in the root zone of crops for production. Leaching shall be managed to minimize degradation of groundwater, maintain compliance with the groundwater limitations of this Order, and prevent pollution.

7. Irrigation of the Use Areas shall occur only when appropriately trained personnel are on duty.

8. The Operator shall conduct periodic inspections of the recycled water Use Areas to determine compliance with the requirements of this Order. If an inspection reveals noncompliance or threat of noncompliance with this Order, the Operator shall temporarily stop recycled water use immediately and implement corrective actions to ensure compliance with this Order.

9. Discharge of recycled water to the Use Areas shall not be performed during rainfall or when the ground is saturated.

10. Discharge of storm water runoff from the Use Areas to off-site land or surface water drainage courses is prohibited. All storm water runoff from the Use Areas shall be captured and recycled for irrigation or allowed to percolate within the Use Areas.

11. The irrigation with recycled water shall be managed to minimize erosion within the Use Areas.

12. The Use Areas shall be managed to prevent breeding of mosquitoes or other vectors.

13. Use Areas and recycled water impoundments shall be designed, maintained, and operated to comply with the following setback requirements:

Setback Definition	**Minimum Irrigation Setback (feet)**
Edge of use area to domestic water supply well	150

Setback Definition	Minimum Irrigation Setback (feet)
Toe of recycled water impoundment berm to domestic water supply well	150
Edge of Use Area to residence	100
Edge of Use Area using spray irrigation to public park, playground, school yard, or similar place of potential public exposure	100

14. Spray irrigation with recycled water is prohibited when wind speed (including gusts) exceeds 30 mph.

15. Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities.

16. Public contact with recycled water shall be controlled using fences, signs, and other appropriate means.

17. Use areas that are accessible to the public shall be posted with signs that are visible to the public and no less than four inches high by eight inches wide. Signs shall be placed at all areas of public access and around the perimeter of all use areas and at above-ground portions of recycled water conveyances to alert the public of the use of recycled water. All signs shall display an international symbol similar to that shown in **Attachment C**, which is attached and forms part of this Order, and shall include the following wording:

"RECYCLED WATER – DO NOT DRINK"
"AGUA DE DESPERDICIO RECLAMADA – NO TOME"

Alternative language will be considered by the Executive Officer if approved by the Division of Drinking Water.

18. All recycling equipment, pumps, piping, valves, and outlets shall be marked to differentiate them from potable water facilities. Quick couplers, if used, shall be different than those used in potable water systems.

19. Recycled water controllers, valves, and similar appurtenances shall be equipped with removable handles or locking mechanisms to prevent public access or tampering.

20. Hose bibs and unlocked valves, if used, shall not be accessible to the public.

21. No physical connection shall exist between recycled water piping and any potable water supply system (including domestic wells), or between recycled water piping and any irrigation well that does not have an approved air gap or reduced pressure principle device.

22. Horizontal and vertical separation between pipelines transporting recycled water and those transporting potable water shall comply with Title 22, section 64572, except to the extent that the Division of Drinking Water has specifically approved a variance.

23. No physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water or auxiliary water source system.

24. A public water supply shall not be used as backup or supplemental source of water for a recycled water system unless the connection between the two systems is protected by an air gap separation which complies with the requirements of California Code of Regulations, title 17 (Title 17), sections 7602(a) and 7603(a).

25. All recycled water piping and appurtenances in new installations and appurtenances in retrofit installations shall be colored purple or distinctively wrapped with purple tape in accordance with Health and Safety Code section 116815.

26. Any backflow prevention device installed to protect a public water system shall be inspected and maintained in accordance with Title 17, section 7605.

H. Solids Disposal Specifications

For the purposes of this Order, “sludge” means the solid, semisolid, and liquid residues removed during primary, secondary, or advanced wastewater treatment processes; “solid waste” refers to grit and screenings generated during preliminary treatment; “residual sludge” means sludge that will not be subject to further treatment at the Facility; and “biosolids” refers to sludge that has been treated and tested and shown to be capable of being beneficially used as a soil amendment for agriculture, silviculture, horticulture, and land reclamation activities pursuant to federal and state regulations.

1. Sludge and solid waste shall be removed from screens, sumps, ponds, and clarifiers as needed to ensure optimal plant operation.

2. Any handling and storage of residual sludge, solid waste, and biosolids at the Facility shall be temporary (i.e., no longer than six months) and controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate the groundwater limitations of this Order.

3. Residual sludge, biosolids, and solid waste shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27. Removal for further treatment, disposal, or reuse at disposal sites (i.e., landfills, wastewater treatment facilities, composting sites, soil amendment sites) operated in accordance with valid waste discharge requirements issued by a regional water board will satisfy this specification.

4. Use of biosolids as a soil amendment shall comply with valid WDRs issued by a Regional Water Quality Control Board or the State Water Board except in cases where a local (e.g., county) program has been authorized by a regional water board. In most cases, this will mean the General Biosolids Order (State Water Board Water Quality Order 2004-0012-DWQ, *General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities*). For a biosolids use project to be covered by Order 2004-0012-DWQ, the Operator must file a complete Notice of Intent and receive a Notice of Applicability for each project.

5. Use and disposal of biosolids shall comply with the self-implementing federal regulations of 40 C.F.R. part 503 (subject to USEPA enforcement), not the Central Valley Water Board. If during the life of this Order, the State accepts primacy for implementation of part 503, the Central Valley Water Board may also initiate enforcement where appropriate.

6. Any proposed change in sludge use or disposal practice shall be reported in writing to the Executive Officer at least **90 days** in advance of the change.

I. Pretreatment Provisions

1. The Discharger shall implement the necessary legal authorities, programs, and controls to ensure that the following wastes are not introduced to the treatment system:

    a. Wastes which create a fire or explosion hazard in the wastewater collection system or treatment works;

    b. Wastes which will cause corrosive structural damage to treatment works;

    c. Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;

    d. Any waste, including oxygen demanding pollutants (BOD, etc.), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and/or loss of treatment efficiency;

    e. Heat in amounts that inhibit or disrupt biological activity in the treatment works unless the treatment works is designed to accommodate such heat;

    f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through; and

    g. Any trucked or hauled wastewater or septage, except at points predesignated by the Discharger and subject to above conditions.

2. The Discharger shall implement the legal authorities, programs, and control necessary to ensure that industrial discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:

    a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or

    b. Inhibit or disrupt treatment process or treatment system operations and either cause a violation of this Order or prevent water recycling, biosolids reuse, or sludge disposal.

3. The Discharger shall provide the requisite funding and personnel to implement the pretreatment program, conduct inspections and sampling and analysis of industrial discharges as needed, and use any available legal means to ensure compliance with the pretreatment program.

4. The Discharger shall periodically review the pretreatment program and make any changes that are needed to ensure compliance with this Order. Any update to the Discharger's pretreatment program shall be submitted for approval by the Executive Officer. Until any revised pretreatment program is approved, the Discharger shall implement the existing pretreatment program.

5. The Discharger's approved pretreatment program (as described in **Findings 30 and 31**) and its components, such as city ordinances, local limits, and control mechanisms, among others, are hereby made enforceable condition of this Order until such time as they are revised.

J. Provisions

1. The following reports shall be submitted pursuant to Water Code section 13267 and shall be prepared as described in **Provisions J.3 and J.4**.:

    a. The Operator shall comply with **Groundwater Limitations F.1 and F.2** in accordance with the following compliance schedule below.

Task	Description	Due Date
i.	**Arsenic and Manganese Groundwater Compliance Assessment Workplan** Submit a workplan to conduct an Arsenic and Manganese Groundwater Compliance Assessment. The workplan shall include an implementation schedule for: 1) Evaluating the horizontal and vertical extent of the elevated arsenic and manganese concentrations in groundwater beneath and downgradient of the Facility; 2) Evaluating the potential impacts the elevated concentrations may have on downgradient beneficial uses. This shall include conducting a survey of domestic wells within an appropriate radius of the Facility. The results of the well survey shall be included in the Workplan along with a proposed strategy and schedule for sampling wells that could be impacted by the discharge; 3) Proposing monitoring locations (new or existing wells) to determine compliance with the arsenic and manganese groundwater limitations in this Order. The assessment must demonstrate that the distances of the proposed compliance monitoring well locations from the Facility are as small as practicable.	**10 December 2019**
ii.	**Arsenic and Manganese Groundwater Compliance Assessment Report**	**Footnote 1**

Task	Description	Due Date
	Submit the final Arsenic and Manganese Groundwater Compliance Assessment Report in accordance with the approved Workplan submitted pursuant to **Task i** of **Provision J.1.a**. If it is determined through the assessment that elevated arsenic and manganese concentrations have or threaten to impact downgradient domestic wells, the Report shall propose corrective actions (e.g., supplying drinking water to the user(s) of the impacted wells).	
iii.	Annually, submit a technical report that includes: 1) An update on the preparation/implementation of the Arsenic and Manganese Groundwater Compliance Assessment Report, 2) An analysis of the groundwater quality for arsenic and manganese, and an evaluation whether the arsenic and manganese concentrations at the approved compliance wells are below the applicable arsenic and manganese groundwater limits.	**1 February of each year (beginning February 2021)**

[1.] In accordance with the approved Task i time schedule but no later than **7 June 2021**.

b. By **10 December 2019**, the Operator shall submit a ***Groundwater Monitoring Well Network Evaluation and Well Installation Workplan*** that evaluates the current monitoring network and proposes new monitoring wells to replace existing wells that have gone dry and to ensure adequate monitoring upgradient and downgradient of all disposal ponds and all surrounding restricted irrigation Use Areas. The workplan shall evaluate the adequacy of the current groundwater network and its ability to characterize upgradient groundwater quality and to assess potential groundwater impacts attributable to the Facility's operations and discharge. The workplan shall be prepared in accordance with, and include the items listed in, the first section of Attachment D (*Requirements for Monitoring Well Installation Workplans and Monitoring Well Installation Reports*) which is incorporated herein.

Finding 44 notes that approximately 29 groundwater monitoring wells were dry in December 2016. The Operator is not required, as part of this Workplan, to replace each monitoring well that has gone dry, provided that is can demonstrate to the Executive Officer that the proposed additional monitoring wells will ensure the Facility's monitoring well network is adequate for evaluating the Facility's impacts on underlying groundwater.

c. Within **12 months of receiving Executive Officer approval** of the Groundwater Monitoring Network Evaluation and Well Installation Workplan, the Operator shall submit a ***Groundwater Monitoring Well Installation Report*** for the new groundwater monitoring wells constructed to comply with **Provision J.1.b**. The report shall be prepared in accordance with, and include the items listed in, the second section of Attachment D. The report shall describe the installation and development of all new monitoring wells and explain any deviation from the approved workplan.

d. By **10 December 2019**, the Operator shall submit a Salinity Reduction Study Workplan. The Operator shall prepare and implement a Salinity Reduction Study Workplan to identify and address sources of salinity to and from the Facility. The Salinity Reduction Study Workplan shall at a minimum include the following:

   i. Data on current influent and effluent salinity concentrations;

   ii. Identification of known salinity sources;

   iii. Description of current plans to reduce/eliminate known salinity sources;

   iv. Preliminary identification of other potential sources;

   v. A proposed schedule for evaluating sources; and

   vi. A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

   Implementation progress of the Salinity Reduction Study Workplan shall be reported each year in the Annual Monitoring Report required pursuant to Monitoring and Reporting Program R5-2018-0080 (MRP).

2. By **7 June 2019,** the Operator shall develop and implement standard operating procedures (SOPs) for the Facility's Anaerobically Digestible Material receiving station. The SOPs shall address material handling (including unloading, screening, and other processing) prior to anaerobic digestion, transportation, spill prevention, and spill response. In addition, the SOPs shall address avoidance of the introduction of materials that could cause interference, pass-through, or upset of the treatment processes; avoidance of prohibited material; vector control; odor control; operation and maintenance; and the disposition of any solid waste segregated from the material prior to its introduction to the digester. The Operator shall provide training to its staff on the SOPs and shall maintain records for three years of each load received, describing the hauler, waste type, and quantity received.

3. In accordance with Business and Professions Code sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for investigations and studies, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall bear the professional's signature and stamp.

4. The Discharger shall submit the technical reports and workplans required by this Order for consideration by the Executive Officer, and incorporate comments the Executive Officer may have in a timely manner, as appropriate. Unless expressly stated otherwise in this Order, the Discharger shall proceed with all work required by the foregoing provisions by the due dates specified.

5. The Discharger shall comply with Monitoring and Reporting Program (MRP) R5-2018-0080, which is part of this Order, and any revisions thereto as ordered by the Executive Officer. The submittal dates of self-monitoring reports shall be no later than the submittal dates specified in the MRP.

6. The Discharger shall comply with the attached SPRRs, which are incorporated herein.

7. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports. On or before each report due date, the Discharger shall submit the specified document to the Central Valley Water Board or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, then the Discharger shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board in writing when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

8. The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger when the operation is necessary to achieve compliance with the conditions of this Order.

9. The Discharger shall use the best practicable cost-effective control technique(s), including proper operation and maintenance, to comply with this Order.

10. The Discharger shall provide certified wastewater treatment plant operators in accordance with Title 23, division 3, chapter 26.

11. As described in the Standard Provisions, the Discharger shall report promptly to the Central Valley Water Board any material change or proposed change in the character, location, or volume of the discharge.

12. In the event that the Discharger reports toxic chemical release data to the State Emergency Response Commission (SERC) pursuant to section 313 of the Emergency Planning and Community Right to Know Act (42 U.S.C. § 11023), the Discharger shall also report the same information to the Central Valley Water Board within 15 days of the report to the SERC.

13. The Discharger shall comply with the requirements of the Statewide General Waste Discharge Requirements (General WDRs) for Sanitary Sewer Systems (Water Quality Order 2006-0003), the Revised General WDRs Monitoring and Reporting Program (Water Quality Order 2013-0058-EXEC), and any subsequent revisions thereto. Water Quality Order 2006-0003 and Order 2013-0058-EXEC require the Discharger to notify the Central Valley Water Board and take remedial action upon the reduction, loss, or failure of the sanitary sewer system resulting in a sanitary sewer overflow.

14. The Discharger shall not allow pollutant-free wastewater to be discharged into the wastewater collection, treatment, and disposal systems in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

15. At least **90 days** prior to termination or expiration of any lease, contract, or agreement involving disposal or recycling areas or off-site reuse of effluent, used to justify the capacity authorized herein and assure compliance with this Order, the Discharger shall notify the Central Valley Water Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.

16. In the event of any change in control or ownership of the Facility, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.

17. To assume operation as a Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 of the SPRRs and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. If approved by the Executive Officer, the transfer request will be submitted to the Central Valley Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.

18. Copies of this Order (including all attachments, Information Sheet and SPRRS) and the operative MRP shall be kept at the Facility for reference by operating personnel. Key operating personnel shall be familiar with the contents of this Order.

19. If the Central Valley Water Board determines that waste constituents in the discharge have reasonable potential to cause or contribute to an exceedance of an objective for groundwater, this Order may be reopened for consideration of addition or revision of appropriate numerical effluent or groundwater limitations for potential constituents.

20. The Central Valley Water Board will review this Order periodically and will revise requirements when necessary.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to $10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this Central Valley Water Board action may petition the State Water Board for review in accordance with Water Code section 13320 and Title 23, section 2050 et seq. The State Water Board must receive the petition by 5pm on the 30th day after the date of this Order; if the 30th day falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5 pm on the next business day. Copies of the law and regulations applicable to filing petitions are available on the Internet (at the address below), and will be provided upon request.

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

I, PATRICK PULUPA, Executive Officer, do hereby certify that the foregoing is a full true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 7 December 2018.

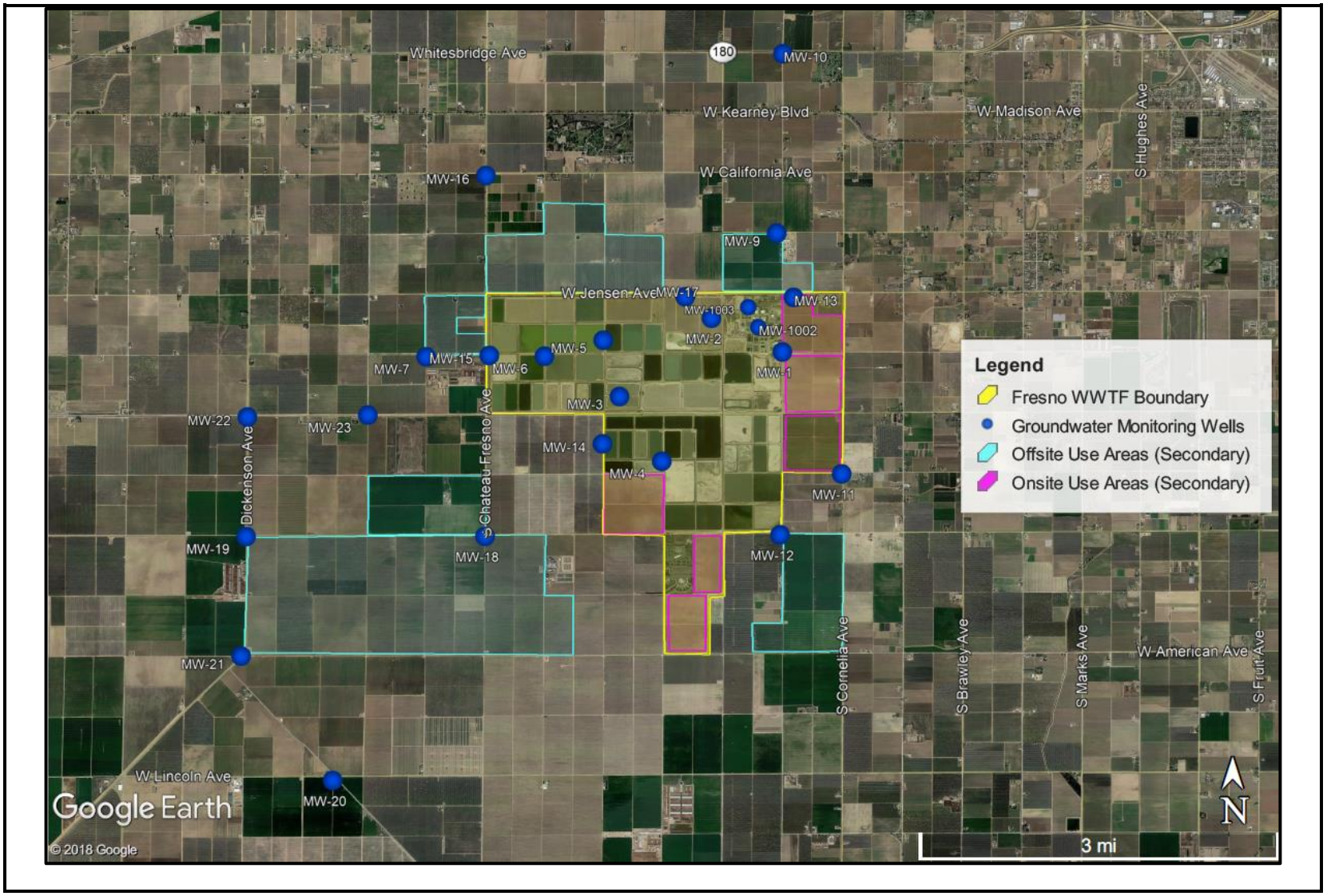
ORIGINAL SIGNED BY

PATRICK PULUPA, Executive Officer

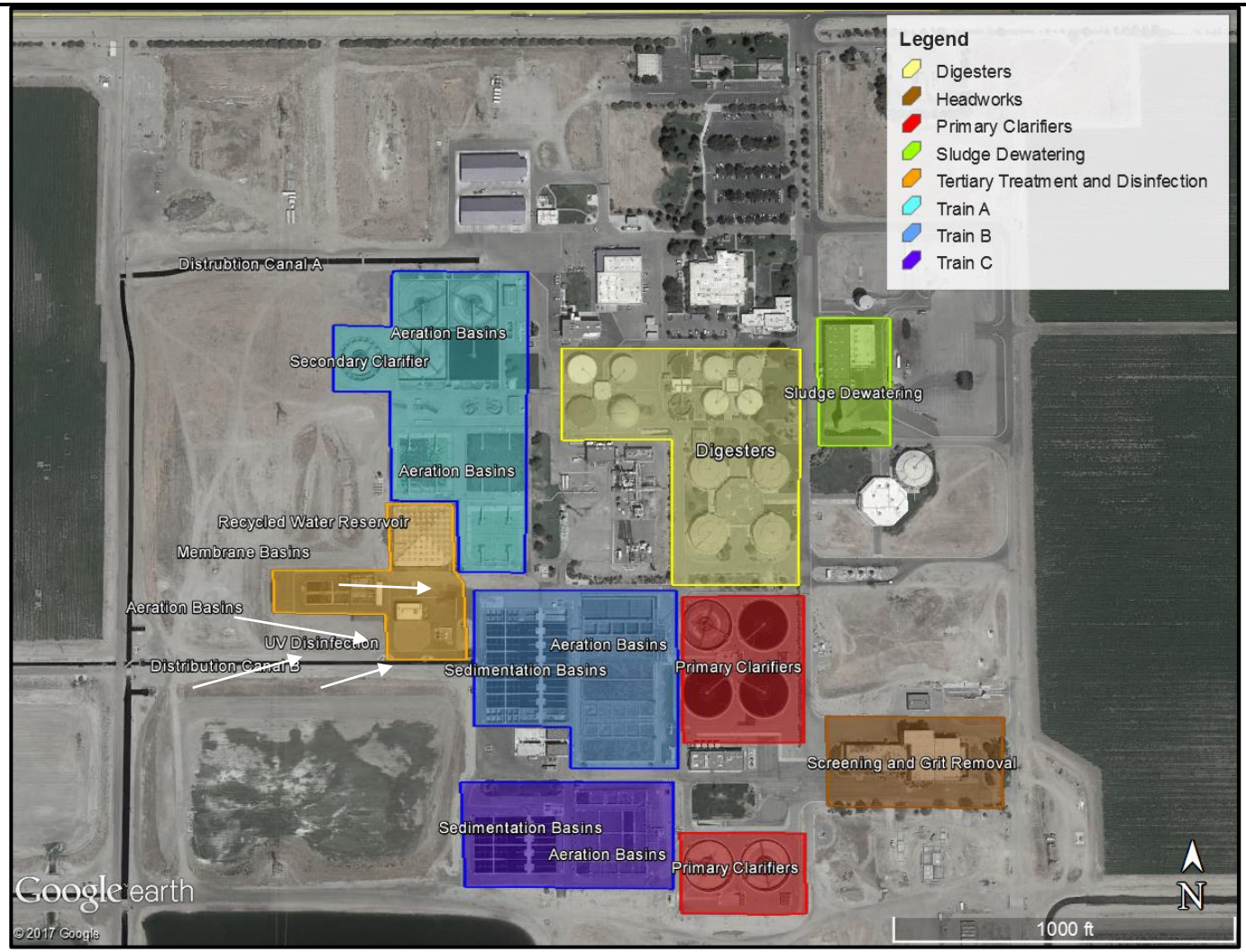
Order Attachments:

- Attachment A – Site Map
- Attachment B – Facility Layout
- Attachment C – Recycled Water Signage
- Attachment D – Requirements for Monitoring Well Installation Workplans and Monitoring Well Installation Reports
- Monitoring and Reporting Program R5-2018-0080
- Information Sheet
- SPRRs (1 March 1991)

Attachment A – Site Map



Attachment B – Facility Layout



Attachment C – Recycled Water Signage

Source: Title 22, California Code of Regulations, Figure 60310-A

ATTACHMENT D

REQUIREMENTS FOR MONITORING WELL INSTALLATION WORKPLANS AND MONITORING WELL INSTALLATION REPORTS

Prior to installation of groundwater monitoring wells, the Discharger shall submit a workplan containing, at a minimum, the information listed in Section 1, below. Wells may be installed after staff approves the workplan. Upon installation of the monitoring wells, the Discharger shall submit a well installation report which includes the information contained in Section 2 below. All workplans and reports must be prepared under the direction of, and signed by, a registered geologist or civil engineer licensed by the State of California.

SECTION 1 - Monitoring Well Installation Workplan and Groundwater Sampling and Analysis Plan

The monitoring well installation workplan shall contain the following minimum information:

A. General Information:

- Purpose of the well installation project
- Brief description of local geologic and hydrogeologic conditions
- Proposed monitoring well locations and rationale for well locations
- Topographic map showing facility location, roads, and surface water bodies
- Large scaled site map showing all existing on-site wells, proposed wells, surface drainage courses, surface water bodies, buildings, waste handling facilities, utilities, and major physical and man-made features

B. Drilling Details:

- Description of the on-site supervision of drilling and well installation activities
- Description of drilling equipment and techniques
- Equipment decontamination procedures
- Soil sampling intervals (if appropriate) and logging methods

C. Monitoring Well Design (in narrative and/or graphic form):

- Diagram of proposed well construction details:
  - Borehole diameter
  - Casing and screen material, diameter, and centralizer spacing (if needed)
  - Type of well caps (bottom cap either screw on or secured with stainless steel screws)
  - Anticipated depth of well, length of well casing, and length and position of perforated interval
  - Thickness, position and composition of surface seal, sanitary seal, and sand pack
  - Anticipated screen slot size and filter pack

D. Well Development (not to be performed until at least 48 hours after sanitary seal placement):

- Method of development to be used (i.e., surge, bail, pump, etc.)
- Parameters to be monitored during development and record keeping technique
- Method of determining when development is complete
- Disposal of development water

E. Well Survey (precision of vertical survey data shall be at least 0.01 foot):

- Identify the Licensed Land Surveyor or Civil Engineer that will perform the survey
- Datum for survey measurements
- List well features to be surveyed (i.e. top of casing, horizontal and vertical coordinates, etc.)

F. Schedule for Completion of Work

G. Appendix: Groundwater Sampling and Analysis Plan (SAP)

The Groundwater SAP shall be included as an appendix to the workplan, and shall be utilized as a guidance document that is referred to by individuals responsible for conducting groundwater monitoring and sampling activities.

Provide a detailed written description of standard operating procedures for the following:

- Equipment to be used during sampling
- Equipment decontamination procedures
- Water level measurement procedures
- Well purging (include a discussion of procedures to follow if three casing volumes cannot be purged)
- Monitoring and record keeping during water level measurement and well purging (include copies of record keeping logs to be used)
- Purge water disposal
- Analytical methods and required reporting limits
- Sample containers and preservatives
- Sampling
  - General sampling techniques
  - Record keeping during sampling (include copies of record keeping logs to be used)
  - QA/QC samples
- Chain of Custody
- Sample handling and transport

SECTION 2 - Monitoring Well Installation Report

The monitoring well installation report must provide the information listed below. In addition, the report must also clearly identify, describe, and justify any deviations from the approved workplan.

A. General Information:

- Purpose of the well installation project

- Brief description of local geologic and hydrogeologic conditions encountered during installation of the wells
- Number of monitoring wells installed and copies of County Well Construction Permits
- Topographic map showing facility location, roads, surface water bodies
- Scaled site map showing all previously existing wells, newly installed wells, surface water bodies, buildings, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details (in narrative and/or graphic form):

- On-site supervision of drilling and well installation activities
- Drilling contractor and driller's name
- Description of drilling equipment and techniques
- Equipment decontamination procedures
- Soil sampling intervals and logging methods
- Well boring log (including the following):
  - Well boring number and date drilled
  - Borehole diameter and total depth
  - Total depth of open hole (same as total depth drilled if no caving or back-grouting occurs)
  - Depth to first encountered groundwater and stabilized groundwater depth
  - Detailed description of soils encountered, using the Unified Soil Classification System

C. Well Construction Details (in narrative and/or graphic form).

- Well construction diagram, including:
  - Monitoring well number and date constructed
  - Casing and screen material, diameter, and centralizer spacing (if needed)
  - Length of well casing, and length and position of perforated interval
  - Thickness, position and composition of surface seal, sanitary seal, and sand pack
  - Type of well caps (bottom cap either screw on or secured with stainless steel screws)

D. Well Development:

- Date(s) and method of development
- How well development completion was determined
- Volume of water purged from well and method of development water disposal
- Field notes from well development should be included in report

E. Well Survey (survey the top rim of the well casing with the cap removed):

- Identify the coordinate system and datum for survey measurements
- Describe the measuring points (i.e. ground surface, top of casing, etc.)
- Present the well survey report data in a table
- Include the Registered Engineer or Licensed Surveyor's report and field notes in appendix.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2018-0080

FOR

CITY OF FRESNO AND CLOVIS
REGIONAL WASTEWATER RECLAMATION FACILITY
FRESNO COUNTY

This Monitoring and Reporting Program (MRP) is issued by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) pursuant to Water Code section 13267, subd. (b)(1), which provides in pertinent part as follows:

> [T]he regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

The cities of Fresno and Clovis (collectively, Discharger) are <u>each</u> responsible for compliance with this MRP, and shall not implement any changes without written approval from the Central Valley Water Board or its Executive Officer in the form of a revised MRP. The reports required under this MRP are necessary to verify the Discharger's compliance with the operative waste discharge requirements (WDRs).

Pursuant to Water Code section 13268, subdivisions (a)(1) and (b)(1), failure to furnish the reports required under this MRP (and also under the operative WDRs), or falsifying information submitted in such reports, constitutes a misdemeanor and may result in the imposition of up to $10,000 in administrative civil liability for each day of noncompliance.

A glossary of terms used in this MRP is included on the last page.

I. GENERAL MONITORING REQUIREMENTS

A. FLOW MONITORING

Hydraulic flow rates shall be measured at the monitoring points specified in this MRP. Central Valley Water Board Executive Officer shall approve any proposed changes to flow monitoring locations prior to implementation of the change. All flow monitoring systems shall be appropriate for the conveyance system (i.e., open channel flow or pressure pipeline) and liquid type. Unless otherwise specified, each flow meter shall be equipped with a flow totalizer to allow reporting of cumulative volume as well as instantaneous flow rate. Flow meters shall be calibrated at the frequency recommended by the manufacturer; typically at least once per year and records of calibration shall be maintained for review upon request.

B. MONITORING AND SAMPLING LOCATIONS

Samples shall be obtained at the monitoring points specified in this MRP. Central Valley Water Board staff shall approve any proposed changes to sampling locations prior to implementation of the change.

The Discharger shall monitor the following locations to demonstrate compliance with the requirements of this Order:

Discharge Point	Monitoring Location	Monitoring Location Description
--	INF-001	Location where a representative sample of the influent into the Facility can be collected prior to any plant return flows or treatment processes (besides the addition of ferric chloride)
001 & 002	EFF-001	Undisinfected secondary-treated effluent, prior to discharge to the disposal ponds and/or Use Areas, where most representative of the effluent
003	EFF-002	Tertiary-treated effluent, prior to or after the ultraviolet light disinfection system treatment system, where most representative of the effluent
--	UVS-001	Ultraviolet light disinfection system
001	PND-001 through PND-XXX	Onsite disposal ponds
002	LAA-001 through LAA-0XX	Agricultural land that receives undisinfected secondary-treated effluent (Onsite and Offsite Use Areas)
--	STL-001 through STL-0XX	Lysimeters at the former stillage disposal area
--	MW-01A through MW-21B, and all future wells added to the approved network	Groundwater monitoring well locations
--	RW-01 through RW-22, and all future wells added to the extraction system	Reclamation wells used to extract groundwater to discharge into Fresno Irrigation District's canal system
--	BIO-001	Sludge monitoring
--	SPL-001	Source water supply monitoring

C. SAMPLING AND SAMPLE ANALYSIS

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. Except as specified otherwise in this MRP, grab samples will be considered representative of water, wastewater, soil, solids/sludges and groundwater.

The time, date, and location of each sample shall be recorded on the sample chain of custody form. All analyses shall be performed in accordance with the *Standard Provisions and Reporting Requirements for WDRs*, dated 1 March 1991 (SPRRs).

Field test instruments (such as those used to measure pH, temperature, electrical conductivity, dissolved oxygen, wind speed, and precipitation) may be used provided:

1. The operator is trained in proper use and maintenance of the instruments;

2. The instruments are field calibrated at the frequency recommended by the manufacturer; and

3. The instruments are serviced and/or calibrated by the manufacturer or by the Discharger's authorized and qualified staff at the recommended frequency.

Laboratory analytical procedures shall comply with the methods and holding times specified in the following (as applicable to the medium to be analyzed):

- *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (USEPA);
- *Test Methods for Evaluating Solid Waste* (USEPA);
- *Methods for Chemical Analysis of Water and Wastes* (USEPA);
- *Methods for Determination of Inorganic Substances in Environmental Samples* (USEPA);
- *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and
- *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125).

Approved editions shall be those that are approved for use by the United States Environmental Protection Agency (USEPA) or the State Water Resources Control Board (State Water Board), Division of Drinking Water's Environmental Laboratory Accreditation Program (ELAP). The Discharger may propose alternative methods for approval by the Executive Officer. Where technically feasible, laboratory reporting limits shall be lower than the applicable water quality objectives for the constituents to be analyzed.

If monitoring consistently shows no significant variation in a constituent concentration or parameter after at least 24 months of monitoring, the Discharger may request this MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency.

II. SPECIFIC MONITORING REQUIREMENTS

A. INFLUENT MONITORING

The Discharger shall monitor the influent to the Facility at Monitoring Location INF-001. At a minimum, influent shall be monitored as specified below:

Constituent/Parameter	Units	Sample Type	Monitoring Frequency
Flow	mgd	Meter	Continuous
pH	pH Units	Meter	Continuous
Electrical Conductivity (EC) @ 25 ˚C	µmhos/cm	24-hour composite	3/Week
BOD_5	mg/L	24-hour composite	2/Week
Total Suspended Solids	mg/L	24-hour composite	2/Week

B. UNDISINFECTED SECONDARY-TREATED EFFLUENT MONITORING

The Discharger shall monitor undisinfected secondary-treated wastewater at Monitoring Location EFF-001. At a minimum, effluent shall be monitored as specified below:

Constituent/Parameter	Units	Sample Type	Monitoring Frequency
Flow	mgd	Calculated	Daily
pH	pH Units	Meter	Continuous
Electrical Conductivity (EC) @ 25 ˚C	µmhos/cm	24-hour composite	3/Week
BOD_5	mg/L	24-hour composite	2/Week
Total Suspended Solids	mg/L	24-hour composite	2/Week
Ammonia Nitrogen (as N)	mg/L	24-hour composite	1/Week
Nitrate Nitrogen (as N)	mg/L	24-hour composite	1/Week
Nitrite Nitrogen (as N)	mg/L	24-hour composite	1/Week
Total Kjeldahl Nitrogen (as N)	mg/L	24-hour composite	1/Week
Total Nitrogen	mg/L	24-hour composite	1/Week
Total Dissolved Solids	mg/L	24-hour composite	1/Month
Sodium	mg/L	24-hour composite	1/Month
Chloride	mg/L	24-hour composite	1/Month
Boron	µg/L	24-hour composite	1/Month
Standard Minerals[1]	Various	24-hour composite	1Month
Priority Pollutants[2]	Various	24-hour composite/Grab	1/Year

[1] Standard minerals shall include, at a minimum, the following elements/compounds: aluminum, calcium, chloride, iron, magnesium, manganese, phosphorus, potassium, sodium, sulfate, total alkalinity (including

alkalinity series), hardness, and include verification that the analysis is complete (i.e., cation/anion balance).

[2] See Table 1 at the end of this MRP for the list of priority pollutants and sampling instructions.

C. DISINFECTED TERTIARY-TREATED EFFLUENT MONITORING

The Discharger shall monitor disinfected tertiary-treated wastewater discharged to the recycled water use sites at Monitoring Location EFF-002. At a minimum, effluent shall be monitored as specified below:

Constituent/Parameter	Units	Sample Type	Monitoring Frequency
Flow	mgd	Meter	Continuous
pH	pH Units	Meter	Continuous
Electrical Conductivity (EC) @ 25 ˚C	µmhos/cm	24-hour composite	3/Week
BOD_5	mg/L	24-hour composite	2/Week
Total Suspended Solids	mg/L	24-hour composite	2/Week
Ammonia Nitrogen (as N)	mg/L	24-hour composite	1/Week
Nitrate Nitrogen (as N)	mg/L	24-hour composite	1/Week
Nitrite Nitrogen (as N)	mg/L	24-hour composite	1/Week
Total Kjeldahl Nitrogen (as N)	mg/L	24-hour composite	1/Week
Total Nitrogen	mg/L	24-hour composite	1/Week
Total Dissolved Solids	mg/L	24-hour composite	1/Month
Sodium	mg/L	24-hour composite	1/Month
Chloride	mg/L	24-hour composite	1/Month
Boron	µg/L	24-hour composite	1/Month
Standard Minerals[1]	Various	24-hour composite	1/Month
Priority Pollutants[2]	Various	24-hour composite/Grab	1/Year

[1] Standard minerals shall include, at a minimum, the following elements/compounds: aluminum, calcium, chloride, iron, magnesium, manganese, phosphorus, potassium, sodium, sulfate, total alkalinity (including alkalinity series), hardness, and include verification that the analysis is complete (i.e., cation/anion balance).

[2] See Table 1 at the end of this MRP for the list of priority pollutants and sampling instructions.

D. ULTRAVIOLET LIGHT (UV) DISINFECTION SYSTEM MONITORING

The UV disinfection system shall be monitored at Monitoring Location UVS-001 as specified below:

Constituent/Parameter	Units	Sample Type	Monitoring Frequency
Flow	mgd	Meter Reading	Continuous [1]
Turbidity	NTU	Meter [2]	Continuous [1,3]
UV trains in operation	Number	Observation	Continuous [1]
UV Transmittance	Percent (%)	Meter Reading	Continuous [1]
UV Power Setting	Percent (%)	Meter Reading	Continuous [1]
UV Dose [4]	mJ/cm^2	Calculated	Continuous [1]
Total Coliform Organisms	MPN/100 mL	Grab [5]	1/Day

1 For continuous analyzers, the Discharger shall report documented routine meter maintenance activities, including date, time of day, and duration of periods in which the analyzer(s) is(are) not in operation.
2 The turbidity meter shall be stationed immediately after the filters, prior to the UV disinfection process.
3 Report daily average turbidity and maximum turbidity. If the turbidity exceeds 0.5 NTU, collect a sample for total coliform organisms immediately after the UV disinfection system and report the duration of the turbidity exceedance. The additional total coliform organisms sample shall be in addition to the normally required daily total coliform organisms sample specified in this table. If the Discharger diverts the wastewater to the onsite disposal ponds prior to the turbidity reaching 0.5 NTU, the Discharger is not required to collect an additional total coliform organisms sample.
4 Report daily minimum hourly average UV dose and daily average UV dose. The daily minimum hourly average UV dose shall consist of the lowest hourly average dose provided in any train that had at least one bank of lamps operating during the hour interval. For trains that did not operate for the entire hour interval, the dose should be averaged based on the actual operation time. If effluent received less than the minimum UV dose, report the duration and dose calculation variables associated with each incident.
5 The sample shall be collected immediately after the UV disinfection system.

E. POND MONITORING

The onsite disposal ponds shall be monitored at Monitoring Locations PND-001 through PND-XXX as specified below:

Constituent/Parameter	Units	Sample Type	Monitoring Frequency
Dissolved Oxygen [1]	mg/L	Grab[1]	As required[2]
Temperature [1]	°F	Grab	As required[2]
pH [1]	Standard	Grab	As required[2]
Freeboard [3]	Nearest ¼ Foot	Measurement	[4]
Odors	--	Observation	1/Day
Berm condition	--	Observation	1/Day

1 The samples shall be collected opposite of the pond inlet at a depth of one foot.
2 The Discharger shall conduct the monitoring in each pond from which offensive odors are detected. The Discharger shall monitor the affected pond(s) daily for temperature, pH, and dissolved oxygen until the dissolved oxygen is greater than 1.0 mg/L.

[3] Freeboard shall be measured vertically from the surface of the pond water to the lowest elevation of the surrounding berm and shall be measured to the nearest 0.25 feet.

[4] The Discharger shall measure the freeboard of the perimeter ponds (i.e., ponds located at the edge of the Facility property) daily and the internal ponds weekly.

In addition, the Discharger shall inspect the condition of the ponds once per week and document visual observations. Notations shall include observations of:

a. Presence of weeds in the water or along the berm;

b. Accumulations of dead algae, vegetation, scum, or debris on the pond surface;

c. Animal burrows in the berms; and

d. Evidence of seepage from the berms or downslope of the ponds.

F. LAND APPLICATION AREA MONITORING

1. Onsite Use Area Observations

The Discharger shall inspect each discrete Onsite Use Area (LAA-001 through LAA-0XX) at least once a month prior to and following irrigation events to identify any equipment malfunction or other circumstance that might allow recycled water to runoff the Use Area and/or create ponding conditions that violate the WDRs. Evidence of erosion, field saturation, irrigation runoff, or the presence of nuisance conditions (if any) shall be noted. Specifically, the following items shall be documented for each inspection:

a. Evidence of erosion;

b. Containment berm condition;

c. Condition of above-ground pipes, flow control valves, sprinklers, and/or drip emitters (as applicable);

d. Soil saturation;

e. Ponding;

f. Irrigation supply and tailwater ditch condition and potential for runoff to off-site areas;

g. Potential and actual discharge of waste to surface water;

h. Odors that have the potential to be objectionable at or beyond the property boundary;

i. Insects (e.g., flies, mosquitoes); and

j. Any corrective actions needed or taken based on observations made.

A log of these inspections shall be kept at the Facility and a copy of entries made in the log during each month shall be submitted as part of the Quarterly Monitoring Report. If no irrigation with wastewater takes place during a given quarter, then the monitoring report shall state so.

2. **Onsite and Offsite Use Area Monitoring**

The Discharger shall perform the following routine monitoring and loading calculations for each discrete undisinfected secondary-treated Onsite and Offsite Use Area (LAA-001 through LAA-0XX) each day water is applied to the area(s).

Constituent/Parameter	Units	Sample Type	Monitoring Frequency
Precipitation	inches	Rain Gauge Reading [1]	1/Month
Acreage Irrigated	acres	Calculated	1/Month
Water Application Rate a. Wastewater b. Supplemental Irrigation Water c. Total	gallons & Inches	Meter Reading & Calculation	1/Month
Nitrogen Loading Rate	lbs/ac/month	Calculated [2]	1/Month

[1] Data obtained from the nearest National Weather Service rain gauge is acceptable.
[2] Nitrogen loading rates shall be calculated using the method specified in the Reporting Section of this MRP.

G. GROUNDWATER MONITORING

The Discharger shall maintain the groundwater monitoring well network. If a groundwater monitoring well is dry for more than four consecutive sampling events or is damaged, the Discharger shall submit a workplan and proposed time schedule to replace the well. The well shall be replaced following approval of the workplan by the Central Valley Water Board Executive Officer. Once installed, all new wells shall be added to the existing groundwater monitoring network (which currently consists of Monitoring Wells MW-01A through MW-21B).

Groundwater Sampling and Analysis

Prior to purging or sampling, the groundwater depth shall be measured in each well to the nearest 0.01 feet. Groundwater elevations shall then be calculated to determine groundwater gradient and flow direction.

Low or no-purge sampling methods are acceptable, if described in an approved Sampling and Analysis Plan. Otherwise, each monitoring well shall be purged of at least 3 to 5 casing volumes until pH, electrical conductivity, and turbidity have stabilized prior to sampling. Groundwater monitoring at Monitoring Locations MW-01A through MW-21B, and any new groundwater wells, shall include, at a minimum, the following:

Constituent/Parameter	Units	Sample Type	Monitoring Frequency
Depth to Groundwater	0.01 feet	Measurement	1/Quarter
Groundwater Elevation [1]	0.01 feet	Calculation	1/Quarter
Gradient	feet/foot	Calculation	1/Quarter
Gradient Direction	degrees	Calculation	1/Quarter
pH	standard units	Grab	1/Quarter
Ammonia Nitrogen (as N)	mg/L	Grab	1/Quarter
Nitrate Nitrogen (as N)	mg/L	Grab	1/Quarter
Total Kjeldahl Nitrogen (as N)	mg/L	Grab	1/Quarter
Total Nitrogen (as N)	mg/L	Grab	1/Quarter
Total Organic Carbon	mg/L	Grab	1/Quarter
Electrical Conductivity (EC) @ 25 ˚C	µmhos/cm	Grab	1/Quarter
Total Dissolved Solids	mg/L	Grab	1/Quarter
Chloride	mg/L	Grab	1/Quarter
Standard Minerals [2]	various	Grab	1/Quarter
Dissolved Oxygen	mg/L	Grab	1/Quarter
Total Coliform Organisms	MPN/100 mL	Grab	1/Quarter
Metals [3, 4]	various	Grab	1/Quarter

1 Groundwater elevations shall be determined based on depth-to-water measurements using a surveyed elevation reference point on the well casing.
2 Standard Minerals shall include, at a minimum, the following: boron, calcium, chloride, magnesium potassium, sodium, sulfate, total alkalinity (including alkalinity series), hardness, and include verification that the analysis is complete (i.e., cation/anion balance).
3 Samples for metals shall be filtered prior to preservation and digestion using a 0.45-micron filter.
4 Metals analysis shall include, at a minimum: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, silver, thallium, vanadium, and zinc.

H. RECLAMATION WELL MONITORING

Groundwater monitoring at Monitoring Locations RW-01A through RW-22, and any new reclamation wells, shall include, at a minimum, the following:

Constituent/Parameter	Units	Sample Type	Monitoring Frequency
Flow	million gallons	meter	1/Month
pH	standard units	Grab	1/Quarter
Ammonia Nitrogen (as N)	mg/L	Grab	1/Quarter
Nitrate Nitrogen (as N)	mg/L	Grab	1/Quarter
Total Kjeldahl Nitrogen (as N)	mg/L	Grab	1/Quarter

Constituent/Parameter	Units	Sample Type	Monitoring Frequency
Total Nitrogen (as N)	mg/L	Grab	1/Quarter
Total Phosphorus	mg/L	Grab	1/Quarter
Total Organic Carbon	mg/L	Grab	1/Quarter
Electrical Conductivity (EC) @ 25 ˚C	µmhos/cm	Grab	1/Quarter
Total Dissolved Solids	mg/L	Grab	1/Quarter
Chloride	mg/L	Grab	1/Quarter
Standard Minerals [2]	various	Grab	1/Quarter
Dissolved Oxygen	mg/L	Grab	1/Quarter
Total Coliform Organisms	MPN/100 mL	Grab	1/Quarter
Metals [3, 4]	various	Grab	1/Quarter

[1] Groundwater elevations shall be determined based on depth-to-water measurements using a surveyed elevation reference point on the well casing.
[2] Standard Minerals shall include, at a minimum, the following: boron, calcium, chloride, magnesium, potassium, sodium, sulfate, total alkalinity (including alkalinity series), hardness, and include verification that the analysis is complete (i.e., cation/anion balance).
[3] Samples for metals shall be filtered prior to preservation and digestion using a 0.45-micron filter.
[4] Metals analysis shall include, at a minimum: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, silver, thallium, vanadium, and zinc.

I. SLUDGE/BIOSOLIDS MONITORING

A composite sample of dewatered sludge/biosolids shall be collected at Monitoring Location BIO-001 when sludge/biosolids is removed from the Facility for disposal in accordance with USEPA's *POTW Sludge Sampling and Analysis Guidance Document*, August 1989, and tested for the metals listed in Title 22. Sampling records shall be retained for a minimum of 5 years. A log shall be kept of sludge quantities generated and of handling, application, and disposal activities. The frequency of entries is discretionary; however, the log should be complete enough to serve as a basis for part of the Annual Monitoring Report.

J. WATER SUPPLY MONITORING

The Discharger shall monitor the public water supply at Monitoring Location SPL-001. In addition, the Discharger shall submit a copy of the most current Division of Drinking Water Consumer Confidence Report as part of the Annual Monitoring Report.

Constituent/Parameter	Units	Monitoring Frequency
Total Dissolved Solids [1]	mg/L	1/Quarter
Electrical Conductivity [1]	µmhos/cm	1/Quarter
Standard Minerals [2]	various	1/Three Years

[1] Reported results shall be based on a flow-weighted average of all operating water supply wells and surface water treatment systems.

[2] Standard Minerals shall include, at a minimum, the following: calcium, chloride, iron, magnesium, manganese, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness.

K. FORMER STILLAGE DISPOSAL AREA LYSIMETER MONITORING

The Discharger shall collect vadose zone samples at Monitoring Locations STL-001 through STL-0XX. At a minimum, the vadose zone shall be monitored as specified below. Upon successful demonstration, pursuant to Discharge Specification 16 of the Order, that the nitrogen content (and any other constituents of concern) in the former stillage disposal area has been reduce to a level that will no longer threaten to degrade underlying groundwater quality, the Discharger may cease monitoring the lysimeters in the former stillage disposal area.

Constituent/Parameter	Units	Sample Type	Monitoring Frequency
pH	standard units	Grab	1/Year
Total Alkalinity	mg/L	Grab	1/Year
Ammonia Nitrogen (as N)	mg/L	Grab	1/Year
Nitrate Nitrogen (as N)	mg/L	Grab	1/Year
Total Kjeldahl Nitrogen (as N)	mg/L	Grab	1/Year
Total Nitrogen (as N)	mg/L	Grab	1/Year
Potassium	mg/L	Grab	1/Year
Sulfate	mg/L	Grab	1/Year
Chloride	mg/L	Grab	1/Year
Sodium	mg/L	Grab	1/Year
Total Organic Carbon	mg/L	Grab	1/Year
Electrical Conductivity @ 25 ˚C	µmhos/cm	Grab	1/Year
Total Dissolved Solids	mg/L	Grab	1/Year
Iron	µg/L	Grab	1/Year
Manganese	µg/L	Grab	1/Year

III. Reporting

All monitoring reports should be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents that are less than 50MB should be emailed to*:* centralvalleyfresno@waterboards.ca.gov.

Documents that are 50 MB or larger should be transferred to a CD, DVD, or flash drive and mailed to the following address:

Central Valley Regional Water Quality Control Board
1685 “E” Street
Fresno, California 93706

To ensure that your submittal is routed to the appropriate staff person, the following information should be included in any email used to transmit documents to this office:

Program: Non-15;
WDID: 5D100105001;
Facility: Cities of Fresno and Clovis Regional Wastewater Reclamation Facility;
Order: R5-2018-0080

A transmittal letter shall accompany each monitoring report. The letter shall include a discussion of all violations of the WDRs, including this MRP, during the reporting period and actions taken or planned for correcting each violation. If the Discharger has previously submitted a report describing corrective actions taken and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. Pursuant to Section B.3 of the SPRRs, the transmittal letter shall contain a statement by the Discharger, or the Discharger’s duly authorized representative, certifying under penalty of perjury that the report is true, accurate, and complete to the best of the signer’s knowledge.

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., effluent, pond, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with WDRs and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported in the next scheduled monitoring report.

Laboratory analysis reports do not need to be included in the monitoring reports; however, all laboratory reports must be retained for a minimum of three years, in accordance with Standard Provision C.3 of the SPRRs. For a Discharger conducting any of its own analyses, reports must also be signed and certified by the chief of the laboratory.

In addition to the requirements of Standard Provision C.3 of the SPRRs, monitoring information shall include the method detection limit (MDL) and the Reporting limit (RL) or practical quantitation limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated.

All monitoring reports that involve planning, investigation, evaluation or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to Business and Professions Code sections 6735, 7835, and 7835.1.

A. Quarterly Monitoring Reports

Quarterly Monitoring Reports shall be submitted to the Central Valley Water Board by the **1st day of the second month after the quarter** (i.e., the January-March quarterly report is due by May 1st). Each Quarterly Monitoring Report shall include the following:

1. Results of the **Influent Monitoring** (Section II.A. of the MRP).
2. Results of the **Effluent Monitoring** (Sections II.B and C of the MRP).
3. Results of the **UV Disinfection System Monitoring** (Section II.D. of the MRP)
4. Results of the **Pond Monitoring** (Section II.E. of the MRP), including:
    i. A map of the Facility's ponds with each pond labeled using the naming convention PND-XXX. The map (or a separate list) shall indicate which ponds were in use during the quarter.
    ii. A summary of the weekly visual observations of the ponds
5. Results of the **Land Application Area Monitoring** (Section II.F. of the MRP), including:
    i. A summary of the monthly inspection activities conducted by the Discharger for each Onsite Use Area.
    ii. A map of the Onsite and Offsite Use Areas showing which Use Areas received undisinfected secondary-treated effluent each month.
    iii. The mass of total nitrogen applied to each discrete undisinfected secondary-treated Onsite and Offsite Use Area on a 12-month rolling average basis shall be calculated using the following formula and compared to published crop demand for the crops actually grown:

$$M = \sum_{i=1}^{12} \frac{(8.345(C_i V_i) + M_x)}{A}$$

Where:
- M = mass of nitrogen applied to the Use Area in lbs/ac/yr
- C_i = monthly average concentration of total nitrogen for month i in mg/L
- V_i = volume of wastewater applied to the Use Area during calendar month i in million gallons
- A = area of the Use Area irrigated in acres
- i = the number of the month (e.g., January = 1, February = 2, etc.)
- M_x = nitrogen mass from other sources (e.g., fertilizer and compost) in pounds
- 8.345 = unit conversion factor

6. Results of the **Groundwater Monitoring** (Section II.G of the MRP), including:

    i. A narrative description of all preparatory, monitoring, sampling, and sample handling for groundwater monitoring.

    ii. A field log for each well documenting depth to groundwater; sample preparation (e.g., filtering); and sample preservation. For each sampling event, the Operator may provide a table summarizing this information for all groundwater monitoring wells sampled in lieu of providing a field log for each well. The field logs should be made available on request of the Regional Board.

    iii. Calculation of the groundwater elevation at each monitoring well, and determination of groundwater flow direction and gradient on the date of measurement.

    iv. Summary data tables of analytical results collected during the quarter and the current water table elevations.

7. Results of the **Reclamation Well Monitoring** (Section II.H of the MRP), including:

    i. The total volume of extracted groundwater discharged each month to Dry Creek Canal and to the Houghton Canal each month (a separate total for each canal).

8. Results of the **Sludge/Biosolids Monitoring** (Section II.I of the MRP) completed during the quarter, and (if applicable) verification of classification of biosolids as nonhazardous per Title 22, Article 11, Criteria for Identification of Hazardous and Extremely Hazardous Waste (California Assessment Manual procedures).

9. Results of the **Water Supply Monitoring** (Section II.J of the MRP), including:

    i. For each month of this quarter, calculation of the flow-weighted 12-month rolling average electrical conductivity of the source water using flow data and source water electrical conductivity values for the most recent four quarters.

10. Data presented in a tabular format.

11. A comparison of monitoring data to the flow limitations, effluent limitations and discharge specifications and an explanation of any violation of those requirements.

12. If requested by Central Valley Water Board staff, copies of the laboratory analytical reports(s).

13. A copy of calibration log page(s) verifying calibration of all hand-held monitoring instruments performed during the quarter.

B. Annual Monitoring Reports

An Annual Monitoring Report shall be submitted by **1 February of each year** and shall include the following:

1. The average monthly wastewater flows (influent and effluent) for each month of the year.

2. Concentration vs. time graphs for each monitored groundwater constituent, using all historic groundwater monitoring data. Each graph shall show the background groundwater concentration range and the applicable groundwater limitation as horizontal lines.

3. Summary data tables of historical and current water table elevations and analytical results.

4. An evaluation of the groundwater quality beneath the site and determination of whether any groundwater limitations were exceeded in any compliance well at any time during the calendar year.

5. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells, surface waters, and groundwater elevation contours referenced to an appropriate datum (e.g., NGVD).

6. An annual update to the Arsenic and Manganese Groundwater Compliance Report (as required by Task iii. of Provision J.1.a. of the WDRs).

7. A summary of all biosolids/sludge analytical data and verification of compliance with the biosolids/sludge monitoring requirements.

8. The Facility's annual sludge production in dry tons and percent solids.

9. A summary of information on the disposal of sludge and/or solid waste during the calendar year.

10. Analytical results for any water supply monitoring conducted and the Discharger's Consumer Confidence Report.

11. Analytical results of the lysimeter monitoring at the former stillage disposal area (Section II.K. of the MRP)

12. An evaluation of the performance of the Facility, including discussion of capacity issues, infiltration and inflow rates, nuisance conditions, and a forecast of the flows anticipated in the next year, as described in Standard Provision E.4 of the SPRRs.

13. A discussion of compliance with the WDRs and MRP and the corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the WDRs.

14. A copy of the certification for each certified wastewater treatment plant operator working at the Facility and a statement about whether the Discharger is in compliance with Title 23, Division 3, Chapter 26.

15. Monitoring equipment maintenance and calibration records, as described in Standard Provision C.4 of the SPRRs.

16. A statement of when the wastewater treatment system Operation and Maintenance Manual was last reviewed for adequacy and a description of any changes made during the year.

17. A discussion of any data gaps and potential deficiencies or redundancies in the monitoring system or reporting program.

C. Pretreatment Reporting

The Discharger shall submit quarterly and annual pretreatment reports as required by Standard Provision E.7 of the SPRRs.

A letter transmitting the self-monitoring reports shall accompany each report. The letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain a statement by the Discharger, or the Discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate and complete, as described in the Section B.3 of the SPRRs.

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

I, PATRICK PULUPA, Executive Officer, do hereby certify the forgoing is a full, true and correct copy of a Monitoring and Reporting Program issued by the California Regional Water Quality Control Board, Central Valley Region, on 7 December 2018.

ORIGINAL SIGNED BY

PATRICK PULUPA, Executive Officer

Table 1
Priority Pollutants

Inorganics [1]
Antimony
Arsenic
Beryllium
Cadmium
Chromium (III)
Chromium (VI)
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc
Cyanide
Asbestos

Dioxin Congeners
2,3,7,8-TCDD
1,2,3,7,8-PentaCDD
1,2,3,4,7,8-HexaCDD
1,2,3,6,7,8-HexaCDD
1,2,3,7,8,9-HexaCDD
1,2,3,4,6,7,8-HeptaCDD
OctaCDD
1,2,3,7,8-PentaCDF
2,3,4,7,8-PentaCDF
1,2,3,4,7,8-HexaCDF
1,2,3,6,7,8-HexaCDF
1,2,3,7,8,9-HexaCDF
2,3,4,6,7,8-HexaCDF
1,2,3,4,6,7,8-HeptaCDF
1,2,3,4,7,8,9-HeptaCDF
OctaCDF

Organics [2]
Acrolein
Acrylonitrile
Benzene
Bromoform
Carbon tetrachloride
Chlorobenzene
Chlorodibromomethane
Chloroethane
2-Chloroethylvinyl Ether
Chloroform
Dichlorobromomethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene
1,2-Dichloropropane
1,3-Dichloropropylene
Ethylbenzene
Methyl Bromide
Methyl Chloride
Methylene Chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (PCE)
Toluene
1,2-Trans-Dichloroethylene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene (TCE)
Vinyl chloride
2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2-Methyl-4,6-Dinitrophenol
2,4-Dinitrophenol
2-Nitrophenol
4-Nitrophenol
3-Methyl-4-Chlorophenol
Pentachlorophenol
Phenol
2,4,6-Trichlorophenol
Acenaphthene
Acenaphthylene
Anthracene
Benzidine
Benzo(a)Anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Bis(2-chloroethoxy) methane
Bis(2-chloroethyl) ether
Bis(2-chloroisopropyl) ether
Bis(2-Ethylhexyl)phthalate
4-Bromophenyl phenyl ether
Butylbenzyl Phthalate
2-Chloronaphthalene
4-Chlorophenyl Phenyl Ether
Chrysene
Dibenzo(a,h)Anthracene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3'-Dichlorobenzidine
Diethyl phthalate
Dimethyl phthalate
Di-n-Butyl Phthalate
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-Octyl Phthalate
1,2-Diphenylhydrazine
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno(1,2,3-c,d)pyrene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodi-n-Propylamine
N-Nitrosodiphenylamine
Phenanthrene
Pyrene
1,2,4-Trichlorobenzene

Pesticides
Aldrin
alpha-BHC
beta-BHC
gamma-BHC (Lindane)
delta-BHC
Chlordane
4,4'-DDT
4,4'-DDE
4,4'-DDD
Dieldrin
alpha-Endosulfan
beta-Endosulfan
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Heptachlor
Heptachlor epoxide
Polychlorinated biphenyls
Toxaphene

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1 With the exception of wastewater samples, samples for metals analysis must first be filtered. If filtering in the field is not feasible, samples shall be collected in unpreserved containers and submitted to the laboratory within 24 hours with a request (on the chain of custody form) to immediately filter then preserve the sample.

2 Samples to be analyzed for volatile compounds and phthalate esters shall be grab sample(s); the remainder shall be 24-hour composite sample(s).

GLOSSARY

BOD_5	Five-day biochemical oxygen demand
NTU	Nephelometric turbidity unit
Continuous	The specified parameter shall be measured by a meter continuously.
24-hr Composite	Samples shall be a flow-proportioned composite consisting of at least eight aliquots over a 24-hour period.
1/Day	Samples shall be collected every calendar day.
3/Week	Samples shall be collected at least three times per week on non-consecutive days.
1/Week	Samples shall be collected at least once per week on non-consecutive days
2/Month	Samples shall be collected at least twice per month during non-consecutive weeks.
1/Month	Samples shall be collected at least once per month.
1/Quarter	Samples shall be collected at least once per calendar quarter. Unless otherwise specified or approved, samples shall be collected in January, April, July, and October.
1/Year	Samples shall be collected at least once per year. Unless otherwise specified or approved, samples shall be collected in October.
1/Three Years	Samples shall be collected at least once per three calendar years.
mg/L	Milligrams per liter
µg/L	Micrograms per liter
µmhos/cm	Micromhos per centimeter
gpd	Gallons per day
mgd	Million gallons per day
MPN/100 mL	Most probable number [of organisms] per 100 milliliters

INFORMATION SHEET

ORDER R5-2018-0080
CITIES OF FRESNO AND CLOVIS
REGIONAL WASTEWATER RECLAMATION FACILITY
FRESNO COUNTY

Background

The cities of Fresno and Clovis (hereinafter collectively referred to as Discharger) own the Fresno-Clovis Regional Wastewater Treatment Facility (Facility). Specifically, the City of Clovis owns the rights and capacity to discharge 9.3 million gallons per day (mgd) to the Facility. The City of Fresno is responsible for the day-to-day operations of the Facility, and is therefore specifically referred to herein as "Operator."

The Facility is located at 5607 W. Jensen Avenue in Fresno, approximately 7 miles west of State Route 99. The Facility serves the cities of Fresno and Clovis; Pinedale Water District and Pinedale Utilities; and some areas within the Fresno County not within the city limits of Fresno or Clovis.

The Facility was permitted under Waste Discharge Requirements (WDRs) Order 5-01-254, which was adopted on 19 October 2001. At the time Order 5-01-254 was adopted, the Facility consisted of two separate wastewater treatment plants: (1) "Plaint 1," an activated treatment plant consisting of treatment trains (Train A and Train B), with a treatment capacity of 88 mgd; and (2) "Plant 2," a 6-mgd-capacity trickling filter treatment plant that included primary and secondary clarifiers. Plant 2 was demolished in 2008.

In October 2015, the City of Fresno (Operator) submitted a Report of Waste Discharge (RWD) requesting revised WDRs for the Facility reflecting the recent upgrades and new discharge points. Order 5-01-254 permitted the Facility to discharge undisinfected secondary-treated wastewater to the onsite disposal ponds or reuse the effluent for irrigation of crops at and around the Facility.

Wastewater Treatment

The Facility originated in 1891 as a 40-acre 'sewage farm' for raw sewage disposal. Since that time it has gone through various upgrades and expansions. The most recent upgrades to the Facility occurred in 2009 and 2017. In 2009, the Facility completed an 'organics upgrade,' which included a new secondary treatment train (Train C) and a new anaerobic digester. In 2017, the Facility completed the construction of Phase I of the tertiary treatment system at the Facility. The tertiary treatment system is planned in three phases. The design flow for Phase I of the Facility is 5.0 mgd, Phase II is 15 mgd, and Phase III is 30 mgd.

The Facility now includes preliminary, primary, secondary, and tertiary units with disinfection. The secondary treatment units consist of three treatment trains (Train A, B, and C) that operate as three separate activated sludge systems. The tertiary treatment system receives primary-treated effluent. The tertiary treatment system includes fine screens, four membrane bioreactor tanks, and four in-vessel ultraviolet light disinfection system trains. With these most recent upgrades, the Facility's current total treatment capacity is 92 mgd (87 mgd for the secondary treatment system and 5 mgd for the tertiary treatment system).

Wastewater Disposal

The Facility's primary means of disposing secondary-treated wastewater is having it percolate on 1,720 acres of disposal ponds on property owned by the City of Fresno (Discharge Point 001). The 1,720 acres of disposal ponds consist of 83 ponds that collectively provide a total storage capacity of 10,890 acre-feet. In addition to the onsite disposal ponds, the Operator conveys undisinfected secondary-treated wastewater to surrounding farms (onsite and offsite) for irrigation of nonfood crops (Discharge Point 002). The onsite use of recycled water for irrigation of crops by local farmers under lease agreements is authorized under this Order (Onsite Reclamation). The use of undisinfected secondary recycled water for surrounding offsite croplands is authorized under separate water reclamation requirements (Offsite Reclamation Areas).

The following water reclamation requirement orders currently have been issued to users authorizing the direct reuse of the Facility's secondary-treated wastewater for irrigation of crops

Water Reclamation Requirements (WRR) Order	User
94-367	Daniel Souza
94-369	Golden State Vintners
94-370	Al Coelho, Jr.
94-371	Quist Dairy (Alivin J. Quist)
94-372	Daniel Souza
R5-2002-0135	Big De Farms

The following table summarizes the direct onsite and offsite irrigation practices for 2016.

Farmer	Onsite/Offsite	Acreage	Volume (acre-ft)	Crops
Quist Dairy	Onsite	430	1736	Corn, Alfalfa, Wheat
Daniel Souza	Onsite	120	572	Alfalfa
Bakersfield Properties, Inc.	Onsite	158	815	Alfalfa
Quist Farms	Offsite (WRR 94-371)	152	349	Alfalfa
Big De Farms	Offsite (WRR R5-2002-0135)	340	1,485	Alfalfa, Winter Forage, Corn
Big De Farms	Offsite (WRR 94-372)	295	1,887	Alfalfa, Winter Forage, Corn
Coelho	Offsite (WRR 94-370)	194	899	Alfalfa, Winter Forage, Corn

In addition to the reclamation of undisinfected secondary recycled water, the Operator intends to reclaim tertiary-treated recycled water to various offsite use areas. Under Phase 1, the tertiary treatment facility will have a capacity of 5 mgd. The initial phase of the planned distribution system for the tertiary treatment facility is to the southwest quadrant of the city of Fresno. The major users in this quadrant are parks, cemeteries, schools, Highway 180, industrial, and residential and commercial development. On 20 March 2017, the Operator was enrolled under

the State Water Resources Control Board's *Water Reclamation Requirements for Recycled Water Use Order* WQ 2016-0068-DDW (General Reclamation Order) for the reclamation of disinfected tertiary-treated wastewater on various recycled water use areas (referred to in this Order as Discharge Point 003).

In 2016, 8,200 acre-feet of the Facility's secondary-treated effluent was recycled for direct irrigation of crops. The Operator's 2015 RWD estimated 3,489 acre-feet of disinfected tertiary-treated effluent would be reclaimed under Phase I per year. Based on this data, the Operator will directly reclaim approximately 20 percent of its combined effluent (secondary and tertiary) under current flow conditions (56 mgd) and 13 percent of its combined effluent under the maximum permitted flow conditions (91.5 mgd).

STILLAGE

The Discharger has historically been permitted to operate a stillage site at the Facility. In 2000, the Facility's stillage site received about 79 million gallons of stillage. Stillage has very high organic nitrogen concentrations which is primarily retained in the upper two to three feet of the soil profile. The organic nitrogen is transformed by soil bacteria into inorganic nitrogen (i.e., ammonia, nitrites, and nitrates). Nitrate and nitrite are highly soluble and leach through the vadose zone and into groundwater.

The Discharger ceased receiving stillage at the site in 2003. The disposal of stillage over the decades has resulted in groundwater degradation. Consequently, beginning in 2005, the Operator began farming the former stillage disposal area. This Order prohibits the discharge of untreated stillage to land at the Facility and continues to require the Operator to implement measures to provide nutrient uptake in the former stillage disposal area.

ADDITIONAL GROUNDWATER CONSIDERATIONS

Based on groundwater monitoring data reported by the Discharger, the depth to groundwater at the Facility varies between 50 to 90 feet below ground surface. The general groundwater flow in the area is a southwesterly direction. However, due to the extensive use of disposal ponds over the past decades, a substantial groundwater mound persists at the Facility. The mound is approximately 10 to 20 feet high and extends beyond the perimeter of the Facility's property. Beginning in 1924, the Operator began extracting groundwater from deep on-site irrigation wells to draw down the shallow groundwater table caused by the groundwater mounding under the Facility's disposal ponds. From 2001 to 2016, groundwater elevations decreased by approximately 40 feet, and the Operator was only able to collect 20 of the 49 during the 4th quarter of 2016.

Arsenic and manganese concentrations in select groundwater monitoring wells underlying and downgradient of the Facility exceed the applicable primary and secondary MCL for arsenic and manganese, respectively. This Order requires the Discharger to evaluate the extent of the elevated arsenic and manganese concentrations and the potential impact the concentrations are having on downgradient water supply wells.

MONITORING REQUIREMENTS

Water Code section 13267 authorizes the Central Valley Water Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the

State. Water Code section 13268 authorizes the assessment of administrative civil liability for failure to submit required monitoring and technical reports.

The Order includes influent, effluent, ultraviolet light, pond, lysimeter, groundwater, and reclamation well monitoring requirements, and requires loading calculations for wastewater, irrigation water, organics, nutrients, and salts to the land application area. This monitoring is necessary to characterize the discharge and evaluate compliance with the effluent limitations and discharge specifications prescribed in the Order.

LEGAL EFFECT OF RESCISSION OF PRIOR WDRS OR ORDERS ON EXISTING VIOLATIONS

The Central Valley Water Board's rescission of prior waste discharge requirements and/or monitoring and reporting orders does not extinguish any violations that may have occurred during the time those waste discharge requirements or orders were in effect. The Central Valley Water Board reserves the right to take enforcement actions to address violations of prior prohibitions, limitations, specifications, requirements, or provisions of rescinded waste discharge requirements or orders as allowed by law.

CV-SALTS REGULATORY CONSIDERATIONS

The Central Valley Water Board adopted Basin Plan amendments incorporating new programs for addressing ongoing salt and nitrate accumulation in the Central Valley at its 31 May 2018 Board Meeting. These programs once effective, could change how the Central Valley Water Board permits discharges of salt and nitrate. The Salinity Control Program currently being developed would subject dischargers that do not meet stringent salinity numeric values (700 µmhos/cm EC as a monthly average to protect the AGR beneficial use and 900 µmhos/cm as an annual average to protect the MUN beneficial use) to performance-based salinity requirements and would require these dischargers to participate in a Basin-wide Prioritization and Optimization Study to develop a long-term strategy for addressing salinity accumulation in the Central Valley.

The level of participation required of dischargers whose discharges do not meet stringent salinity requirements will vary based on factors such as the amount of salinity in the discharge, local conditions, and type of discharge. The Central Valley Water Board anticipates that the CV-SALTS initiative will result in regulatory changes that will be implemented through conditional prohibitions and modifications to many WDRs region-wide, including the WDRs that regulate discharges from the Facility. More information regarding this regulatory planning process can be found at the following link:

https://www.waterboards.ca.gov/centralvalley/water_issues/salinity/

REOPENER

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. It may be appropriate to reopen the Order if new technical information is provided or if applicable laws and regulations change.