

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2006-XXXX

NPDES NO. CA0083348

MONITORING AND REPORTING PROGRAM
FOR
UNIVERSITY OF CALIFORNIA
CENTER FOR AQUATIC BIOLOGY AND AQUACULTURE
YOLO AND SOLANO COUNTIES

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code (CWC) Sections 13383 and 13267. The University of California (Discharger) shall not implement any changes to the Program unless and until the Regional Water Quality Control Board (Regional Water Board) or Executive Officer issues a revised MRP. Specific sample station locations shall be established under direction of the Regional Water Board's staff, and a description of the stations shall be attached to this Order.

The Code of Federal Regulations (CFR) at 40 CFR Section 122.48 requires that all National Pollutant Discharge Elimination System (NPDES) permits specify monitoring and reporting requirements. CWC sections 13267 and 13383 also authorize the Regional Water Board to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements that implement the federal and State regulations.

The Discharger must use US Environmental Protection Agency (USEPA) test methods and detection limits to achieve detection levels below applicable water quality criteria. At a minimum, the Discharger shall comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (also referred to as the State Implementation Plan or SIP), adopted 2 March 2000 and amended on 24 February 2005 by the State Water Resources Control Board (State Water Board). All peak monitoring values identified by the USEPA test methods shall be reported.

**EFFLUENT MONITORING AQUATIC CENTER (D-001) and
PUTAH CREEK RESEARCH FACILITY (D-002)**

Effluent samples shall be collected at **D-001** at a point downstream from the last connection through which wastes can be admitted to the outfall and prior to discharge from the Aquatic Center to the South Fork of Putah Creek. During periods when wastewater from the Aquatic Center facility is re-used for campus agriculture irrigation purposes, effluent samples shall also be collected at **D-001A** at the central drainage sump located adjacent to the main well. Effluent samples shall be collected at **D-002** at a point downstream from the last connection through which wastes can be admitted to the outfall and prior to discharge from the Putah Creek Research Facility to either the South Fork of Putah Creek or the Experimental Ecosystem. For both discharges, effluent samples shall be representative of the volume and quality of the discharge. Time of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

Effluent Location D-001, D-001A and D-002

Constituents	Units	Type of Sample	Sampling Frequency
Flow (from each facility)	mgd	Metered	Continuous
5 Day Biochemical Oxygen Demand (BOD ₅)	mg/L, lbs/day	24-hour composite ¹	Quarterly
Total Suspended Solids (TSS)	mg/L, lbs/day	24-hour composite ¹	Quarterly
Settleable Solids	ml/L	24-hour composite ¹	Quarterly
Electrical Conductivity (EC) @ 25°C ²	µmhos/cm	Grab	Quarterly
Chloride	mg/L, lbs/day	Grab	Monthly during use
Total Dissolved Solids	mg/L, lbs/day	24-hour composite ¹	Monthly during use
Formaldehyde ³	mg/L, lbs/day	Grab	Weekly during use
Cadmium ⁴	µg/L, lbs/day	Grab	Weekly during use
Total residual chlorine ^{5,6}	mg/L, lbs/day	Grab	Daily ⁷
Oxytetracycline ⁸	mg/L, lbs/day	Grab	Weekly during use
Mercury	mg/L	Grab	Weekly during use
Selenium, Total ⁹	µg/L, lbs/day	Grab	Weekly during use
Pyrethroids ¹¹	µg/L, lbs/day	Grab	Weekly during use
Microcystin ¹²	µg/L, lbs/day	Grab	Weekly during use
Beta Naphthoflavone ¹³	µg/L, lbs/day	Grab	Weekly during use
Estradiol ¹⁴	µg/L, lbs/day	Grab	Weekly during use
Chlorpyrophos ¹⁵	µg/L, lbs/day	Grab	Weekly during use
Florfenicol ¹⁶	µg/L, lbs/day	Grab	Weekly during use
Chloramine T ¹⁷	µg/L, lbs/day	Grab	Weekly during use
Hardness as CaCO ₃	mg/L	Grab	Monthly

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Constituents	Units	Type of Sample	Sampling Frequency
pH	standard units	Metered or Grab	Weekly
Chromium (hexavalent) ¹⁸	µg/L, lbs/day	Grab	Quarterly
		Grab	Weekly during use
Chromium (total) ¹⁸	µg/L, lbs/day	Grab	Quarterly
		Grab	Weekly during use
Priority Pollutant Metals	See below	Grab	See below
Temperature	°F	Grab	Weekly
Acute Toxicity	---	Composite	Annually
Chronic Toxicity	---	Composite	Annually

- 1 Composite samples shall be flow proportional composite samples.
- 2 In months when sodium chloride is added to waters of the Facility, EC and chloride shall be measured during sodium chloride use.
- 3 In months when formalin is added to the waters of the Facility, formaldehyde concentration shall be measured during formalin use.
- 4 In months when cadmium is added to the waters of the Facility, cadmium concentration shall be measured during use.
- 5 Use of continuous monitoring instrumentation for chlorine and dechlorination agent residual in the effluent is an appropriate method of process control. However, the accuracy of the chlorine analyzers is not low enough to meet minimum detection levels. Residual dechlorination agent in the effluent indicates that chlorine is not present in the effluent, which can validate a zero residual reading on the chlorine analyzer. Reporting of these two constituents, when dechlorination agent is present and chlorine is zero, sufficiently insures compliance with the chlorine residual limit, as long as the instruments are maintained and calibrated in accordance with the manufactures recommendations. In addition to the continuous recorder, a daily grab sample of the effluent shall be analyzed by a certified laboratory for chlorine and the dechlorination agent. Readings from the residual analyzers shall be taken at the time of sampling, and reported with the laboratory results to validate the accuracy of the process control instrumentation.
- 6 Report magnitude and duration of all non-zero residual events. Non-zero events are defined as a reading of zero for chlorine residual and the dechlorination agent is below the minimum detection limit of the continuous residual monitoring device. If the continuous monitoring device is out of service, then one grab chlorine residual sample shall be collected per day.
- 7 Monitor daily whenever chlorine or chlorine containing substances are used for cleaning and sanitizing.
- 8 In months when oxytetracycline is added to the waters of the Facility, concentrations shall be measured during oxytetracycline use.
- 9 In months when selenium is added to the waters of the Facility, concentrations shall be measured during use.
- 11 In months when pyrethroids are added to the waters of the Facility, concentrations shall be measured during use.
- 12 In months when microcystin is added to the waters of the Facility, concentrations shall be measured during use.

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- 13 In months when beta naphthoflavone is added to the waters of the Facility, concentrations shall be measured during use.
- 14 In months when estradiol is added to the waters of the Facility, concentrations shall be measured during use.
- 15 In months when chlorpyrophos is added to the waters of the Facility, concentrations shall be measured during use.
- 16 In months when florfenicol is added to the waters of the Facility, concentrations shall be measured during use.
- 17 In months when chloramine T is added to the waters of the Facility, concentrations shall be measured during use.
- 18 In months when chromium is added to the waters of the Facility, concentrations shall be measured during use.

If the discharge of a constituent, chemical and/or drug is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the applicable constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

DRUG AND CHEMICAL USE REPORT

The following information shall be submitted for all chemicals, therapeutic agents (antibiotics) or anesthetics administered via immersion baths and discharged at the Facility:

- a. The name(s) and active ingredient(s).
- b. The date(s) of application.
- c. The purpose(s) for the application.
- d. The treatment concentration(s), duration of treatment, whether the treatment was static or flush, amount in gallons or pounds used, and the flow in cubic feet per second (cfs) in the treatment units.
- e. The total flow through the facility to the South Fork of Putah Creek after mixing with the treated water.
- f. The estimated concentration in the effluent at the point of discharge.

Calculation of Concentration:

For drugs or chemicals used in an immersion bath, “drip” treatment, or in other direct application to waters at the facility, use the following formula to calculate concentration (C) at the point of discharge.

C = concentration of chemical or drug at the point of discharge

$C = (\text{treatment concentration}) \times (\text{flow in treatment area}) \div (\text{flow at point of discharge})$

Example: Oxytetracycline concentration

$C = 0.2 \text{ mg/L (Oxytetracycline)} \times \frac{0.45 \text{ mgd (flow through treatment area)}}{0.74 \text{ mgd (flow at point of discharge)}}$

$C = 0.2 \text{ mg/L} \times 0.61$

C = 0.12 mg/L Oxytetracycline at the point of discharge

This information shall be submitted in the monthly discharge monitoring report, if applicable. If the analysis of this chemical use data compared with any toxicity testing results or other available information for the therapeutic agent, chemical or anesthetic indicates that the discharge may cause, have the reasonable potential to cause, or contribute to an excursion of a numeric or narrative water quality criterion or objective, the Executive Officer may require site specific whole effluent toxicity (WET) tests using *C. dubia* or reopen this Order to include an effluent limitation based on that objective.

WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

- A. Acute Toxicity Testing: The Discharger shall conduct acute toxicity testing to determine whether the effluent is contributing acute toxicity to the receiving water. The Discharger shall meet the following acute toxicity testing requirements:
1. Monitoring Frequency: The Discharger shall perform annual acute toxicity testing.
 2. Sample Types: For static non-renewal and static renewal testing, the samples shall be 24-hour flow proportional composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring locations for D-001 and D-002.
 3. Test Species: Test species shall be fathead minnows (*Pimephales promelas*).

4. **Methods:** The acute toxicity testing samples shall be analyzed using EPA-821-R-02-012, Fifth Edition. Temperature, total residual chlorine, and pH shall be recorded at the time of sample collection. No pH adjustment may be made unless approved by the Executive Officer.
 5. **Test Failure:** If an acute toxicity test does not meet all test acceptability criteria, as specified in the test method, the Discharger must re-sample and re-test as soon as possible, not to exceed 7 days following notification of test failure.
- B. **Chronic Toxicity Testing:** The Discharger shall conduct three species chronic toxicity testing to determine whether the effluent is contributing chronic toxicity to the receiving water. The Discharger shall meet the following chronic toxicity testing requirements:
1. **Monitoring Frequency:** The Discharger shall perform annually, three species chronic toxicity testing.
 2. **Sample Types:** Effluent samples shall be flow proportional 24-hour composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location specified in the Monitoring and Reporting Program. The receiving water control shall be a 24-hour composite sample obtained from the R-1 and R-3 sampling location, as identified in the Monitoring and Reporting Program.
 3. **Sample Volumes:** Adequate sample volumes shall be collected to provide renewal water to complete the test in the event that the discharge is intermittent.
 4. **Test Species:** Chronic toxicity testing measures sublethal (e.g. reduced growth, reproduction) and/or lethal effects to test organisms exposed to an effluent compared to that of the control organisms. The Discharger shall conduct chronic toxicity tests with:
 - The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
 - The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
 - The green alga, *Selenastrum capricornutum* (growth test).
 5. **Methods:** The presence of chronic toxicity shall be estimated as specified in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002.*

6. Reference Toxicant: As required by the SIP, all chronic toxicity tests shall be conducted with concurrent testing with a reference toxicant and shall be reported with the chronic toxicity test results.
7. Dilutions: The chronic toxicity testing shall be performed using the dilution series identified in the Table below. The receiving water control shall be used as the diluent.
8. Test Failure: The Discharger must re-sample and re-test as soon as possible, but no later than fourteen (14) days after receiving notification of a test failure. A test failure is defined as follows:
 - a. The reference toxicant test or the effluent test does not meet all test acceptability criteria as specified in the *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002 (Method Manual), and its subsequent amendments or revisions;* or
 - b. The percent minimum significant difference (PMSD) measured for the test exceeds the upper PMSD bound variability criterion in Table 6 on page 52 of the Method Manual. (A retest is only required in this case if the test results do not exceed the monitoring trigger.)

Chronic Toxicity Testing Dilution Series

Sample	Dilutions (%)					Controls	
	100	75	50	25	12.5	Receiving Water	Laboratory Water
% Effluent	100	75	50	25	12.5	0	0
% Receiving Water	0	25	50	75	87.5	100	0
% Laboratory Water	0	0	0	0	0	0	100

- C. WET Testing Notification Requirements: The Discharger shall notify the Regional Water Board within 24-hrs after the receipt of test results exceeding the monitoring trigger during regular or accelerated monitoring, or an exceedance of the acute toxicity effluent limitation.
- D. WET Testing Reporting Requirements: All toxicity test reports shall include the contracting laboratory's complete report provided to the Discharger and shall be in accordance with the appropriate "Report Preparation and Test Review" sections of the

method manuals. At a minimum, whole effluent toxicity monitoring shall be reported as follows:

1. Chronic WET Reporting: Regular chronic toxicity monitoring results shall be reported to the Regional Water Board within 30 days following completion of the test, and shall contain, at minimum:
 - a. The results expressed in Chronic Toxicity Units (Tuc), measured as 100/NOEC, and also measured as 100/LC₅₀, 100/EC₂₅, 100/IC₂₅, and 100/IC₅₀, as appropriate.
 - b. The statistical methods used to calculate endpoints;
 - c. The statistical output page, which includes the calculation of the percent minimum significant difference (PMSD);
 - d. The dates of sample collection and initiation of each toxicity test; and
 - e. The results compared to the numeric toxicity monitoring trigger.

Additionally, the monthly discharger self-monitoring reports shall contain an updated chronology of chronic toxicity test results expressed in TUc, and organized by test species, type of test (survival, growth or reproduction), and monitoring frequency, i.e., either quarterly, monthly, accelerated, or TRE.

2. Acute WET Reporting: Acute toxicity test results shall be submitted with the monthly discharger self-monitoring reports and reported as percent survival.
3. TRE Reporting: Reports for Toxicity Reduction Evaluations shall be submitted in accordance with the schedule contained in the Discharger's approved TRE Work Plan.
4. Quality Assurance (QA): The Discharger must provide the following information for QA purposes:
 - a. Results of the applicable reference toxicant data with the statistical output page giving the species, NOEC, LOEC, type of toxicant, dilution water used, concentrations used, PMSD, and dates tested.
 - b. The reference toxicant control charts for each endpoint, which include summaries of reference toxicant tests performed by the contracting laboratory.
 - c. Any information on deviations or problems encountered and how they were dealt with.
 - d. Information on all instances in which the Discharger determined the facility effluent to be unsuitable for discharge and the wastewater was containerized and hauled offsite.

RECEIVING WATER MONITORING

The receiving water shall be monitored at the following monitoring locations:

Station	Description
R-1	South Fork Putah Creek, 50 feet upstream of the Aquatic Center facility discharge point.
R-2	South Fork Putah Creek, 150 feet downstream from the Aquatic Center facility discharge point.
R-3	South Fork Putah Creek, 50 feet upstream of the Putah Creek Research Facility discharge point.
R-4	South Fork Putah Creek, 150 feet downstream from the Putah Creek Research Facility discharge point.

All receiving water samples shall be grab samples. At minimum, receiving water monitoring shall be conducted for the following constituents at the corresponding frequencies:

Constituents	Units	Station	Sampling Frequency
Dissolved Oxygen	mg/L	R-1, R-2, R-3, R-4	Quarterly
pH	standard units	R-1, R-2, R-3, R-4	Quarterly
Hardness	mg/L	R-1, R-2, R-3, R-4	Quarterly
Temperature	°F	R-1, R-2, R-3, R-4	Quarterly
Turbidity	NTU	R-1, R-2, R-3, R-4	Quarterly
Electrical Conductivity (EC at 25°C)	µmhos/cm	R-1, R-2, R-3, R-4	Quarterly

In conducting the receiving water monitoring, a written log shall be kept of the receiving water conditions, the experimental ecosystem wetlands and all sampling locations. Attention shall be given to the presence or absence of:

- a. Floating or suspended matter
- b. Discoloration
- c. Bottom deposits
- d. Aquatic life
- e. Visible films, sheens or coatings
- f. Fungi, slimes, or objectionable growths
- g. Potential nuisance conditions

The Discharger's written log on receiving water conditions shall be summarized in the monitoring report.

PONDS AND WETLANDS MONITORING

There shall be **no discharge** to surface waters from the evaporation/percolation pond that receives wastewater from the Aquatic Disease Wet Lab. In order to comply with permit requirements for the evaporation/percolation pond, settling ponds, and wetlands/ponds, monitoring of the ponds shall include at least the following:

WETLANDS INFLUENT/EFFLUENT MONITORING:

A monitoring station shall be established at each major inlet and outlet point for the measurement and collection of representative samples of the influent and effluent. The influent/effluent monitoring shall consist of the following:

Constituents	Units	Type of Sample	Sampling Frequency
pH	standard units	Grab	Monthly
DO ¹	mg/L	Grab	Monthly
Freeboard	feet	Visual	Monthly
Color	---	Observation	Monthly
Odors	---	Observation	Monthly
Electrical Conductivity (EC) @ 25°C	µmhos/cm	Grab	Monthly
Chronic Toxicity ²		Grab	Quarterly
Temperature ²	°F or °C	Grab	Quarterly
Hardness ²	mg/l	Grab	Quarterly

¹ Measured within the upper one-foot of water in the pond

² Monitoring required in the Experimental Ecosystem/Wetlands only. Monitoring shall only be required during times when the wastewater is routed to or stored in the wetlands.

PRIORITY POLLUTANT METALS MONITORING

The SIP states that the Regional Water Boards will require periodic monitoring (at least once prior to issuance and re-issuance of a permit) for pollutants with applicable criteria or objectives and no effluent limitations have been established in an existing permit.

The Regional Water Board has determined that, based on priority pollutant data collected from this facility and similar aquaculture facilities, discharge of priority pollutants other than metals are unlikely. Accordingly, the Regional Water Board is requiring, as part of this MRP, that the Discharger monitor effluent and supply water (as a surrogate for receiving water upstream of the discharge) and analyze the sample for priority pollutant metals **one time, prior to 18 months after the adoption date of this Order, and submit the corresponding monitoring results prior to 21 months after the adoption date of this Order.**

The Discharger must analyze pH and hardness of the effluent and supply water at the same time as priority pollutant metals monitoring. The priority pollutant metals, for which this one-time analysis is required, are as follows:

- Antimony
- Arsenic
- Beryllium
- Cadmium
- Chromium (III)
- Chromium (IV)
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Thallium
- Zinc

Metals shall be analyzed by the USEPA methods listed below. The Discharger may use alternative analytical procedures with approval by the Regional Water Board, if the alternative method has the same or better detection level than the method listed.

Method Description	EPA Method	Constituents
Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)	1638	Antimony, Beryllium, Cadmium, Copper, Lead, Nickel, Selenium, Silver, Thallium, Total Chromium, Zinc
Cold Vapor Atomic Absorption (CVAA)	1631	Mercury
Gaseous Hydride Atomic Absorption (HYDRIDE)	206.3	Arsenic
Flame Atomic Absorption (FAA)	218.4	Chromium VI

All priority pollutant metal analyses shall be performed at a laboratory certified by the California Department of Health Services. The laboratory is required to submit the Minimum Level (ML) and the Method Detection Limit (MDL) with the reported results for each constituent. The MDL should be as close as practicable to the USEPA MDL determined by the procedure found in 40 CFR Part 136. The results of analytical determinations for the presence of chemical constituents in a sample shall use the following reporting protocols:

- a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory.
- b. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, shall be reported as "Detected but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.
- c. For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration." Numerical estimates of data quality may be by percent accuracy (+ or – a percentage of the

- reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.
- d. Sample results that are less than the laboratory's MDL shall be reported as "Not Detected" or ND.

GROUNDWATER MONITORING

Prior to construction of any additional groundwater monitoring wells, the Discharger shall submit plans and specifications to the Regional Water Board for review and approval. Once installed, all new wells shall be added to the MRP as new monitoring locations, and shall be sampled and analyzed according to the schedule below.

The Discharger is required to submit a *Monitoring Well Installation Work Plan* consistent with, and include the items listed in *Requirements for Monitoring Well Installation Work Plans and Monitoring Well Installation Reports*. The work plan should describe a proposed groundwater monitoring well network containing one or more background monitoring wells and sufficient number of designated monitoring wells to evaluate performance and compliance with this Order's groundwater limitations. These include monitoring wells immediately down gradient of aquatic disease wet lab evaporation/percolation pond, the Putah Creek Research Facility sedimentation pond, and the wetlands area that do or may release waste constituents to groundwater.

The Discharger must conduct the necessary investigation surrounding the Aquatic Center ponds to address the surrounding hydrogeology and the need for monitoring wells between the Aquatic Center ponds and Putah Creek. The findings of the investigation must be incorporated in the Monitoring Well Installation Work Plan required in WDR Order No. R5-2006-____. The Discharger must provide technical justification and hydrological information supporting that their proposed groundwater monitoring plan will provide the necessary information to determine compliance with groundwater quality requirements and prohibitions in the proposed Orders.

The network's monitoring wells will be constructed to yield representative samples from the first saturated zone, and deeper zones as necessary, to evaluate the discharge's impact on groundwater. All wells will comply with appropriate standards as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981), and any more stringent standards adopted by the Discharger or Yolo County pursuant to CWC Section 13801. The proposed network should include existing monitoring wells where they will serve to measure compliance or provide other relevant information (e.g., depth to groundwater).

The Discharger will install approved monitoring wells, utilize existing wells, properly remove ineffective wells (as necessary), and monitor groundwater in accordance with this Order. Following well installation, the Discharger shall submit a *Monitoring Well Installation Report* consistent with, and include the items listed in, Section 2 of *Requirements for Monitoring Well Installation Work Plans and Monitoring Well Installation Reports*. The Discharger will

continue to monitor groundwater in existing monitoring wells in accordance with the MRP unless and until individual existing wells are removed from the approved network.

Prior to collecting samples and after measuring the water level, each monitoring well shall be adequately purged to remove water that has been standing within the well screen and casing that may not be chemically representative of formation water. Depending on the hydraulic conductivity of the geologic setting, the volume removed during purging typically does not exceed three to five times the volumes of the standing water within the well casing and screen, or additionally the filter pack pore volume. At least quarterly, and concurrently with groundwater quality sampling, the Discharger shall measure the water level in each well as groundwater depth (in feet and hundredths) and as groundwater surface elevation (in feet and hundredths above mean sea level). Samples shall be collected from approved monitoring wells and analyzed for the following constituents:

Constituent/Parameter	Units	Type of Sample	Frequency
Depth to groundwater	To 0.01 foot (hundredths)	Measured	Quarterly ¹
Groundwater elevation	Above mean sea level, to 0.01 foot	Calculated	Quarterly ¹
Gradient Direction	Degrees	Calculated	Quarterly ¹
pH	pH Units	Grab	Quarterly ¹
Chemical Oxygen Demand	mg/L	Grab	Quarterly ¹
Total Organic Carbon	mg/L	Grab	Quarterly ¹
Total Nitrogen	mg/L	Calculated	Quarterly ¹
Nitrates (as N)	mg/L	Grab	Quarterly ¹
Total Kjeldahl Nitrogen (as N)	mg/L	Grab	Quarterly ¹
Electrical Conductivity (@ 25°C)	µmhos/cm	Grab	Quarterly ¹
Oxytetracycline	mg/L	Grab	Annually
Formaldehyde	mg/L	Grab	Annually
Title 22 Metals ³	Mg/L	Grab	Annually
Standard Minerals ³	mg/L	Grab	Annually

¹ January, April, July and October

² Standard minerals shall include all major cations and anions and include verification that the analysis is complete (*i.e.*, cation/anion balance). Standard Minerals shall include boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, phosphorus, total alkalinity (including alkalinity series), and hardness. Title 22 metals shall include the analyses of arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc.

Additionally, the Discharger shall include a technical description of proposed Data Analysis Methods for evaluating groundwater monitoring data (e.g., equivalent or similar to that described in Title 27 Section 20415(e)(7-10)), at a minimum consisting of methods to: (a) characterize natural background groundwater concentrations of monitored constituents; (b) for detected constituents, determine statistically significant differences between background concentration monitors and compliance wells for constituents that do not have water quality objectives or have background concentrations that exceed water quality objectives; and (c) select the minimum sample size required for the proposed data analysis approach and, if greater than the 4 quarters required by this monitoring program, identify of when and how the additional samples will be collected during the one-year groundwater characterization period.

After one full year of groundwater monitoring, the Discharger shall analyze monitoring data from background well(s) to (a) compute values characterizing natural background water quality for each monitored chemical constituent/parameter and (b) perform an initial assessment of whether there is evidence of an impact from the discharge. Reports thereafter shall be submitted quarterly by the **1st day of the second month** after the prescribed sample collection and shall include the same analysis. The Discharger shall characterize groundwater quality using the proposed Data Analysis Method for the following constituents:

Groundwater Constituents to Evaluate Using Data Analysis Method	
Chloride	TOC
Hardness (as CaCO ₃)	Electrical Conductivity
Nitrate (as N)	

A. Quarterly Groundwater Monitoring Report

Quarterly groundwater monitoring reports shall be submitted under separate cover to the Regional Board by the **1st day of the second month following each calendar quarter** (i.e., the first quarter report is due by May 1st). The Quarterly Report shall include the following:

1. Tabular summary of all groundwater monitoring results collected to date.
2. Scaled maps showing relevant structures and features of the facilities, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum.
3. An assessment of groundwater flow direction and gradient on the date of measurement, comparison of previous flow direction and gradient data, and discussion of seasonal trends, if any.
4. A narrative discussion of the analytical results for all groundwater locations monitored, including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable).

5. A comparison, of the monitoring data collected during the reporting period to numerical groundwater limitations in the WDRs, and an explanation of any exceedances of limitations.
6. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring (reference to previously submitted report(s) describing standard sampling procedures is acceptable).
7. Field logs for each well, documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged.
8. Summary data tables of historical and current water table elevations and analytical results.
9. Copies of laboratory analytical report(s) for groundwater monitoring.

REPORTING

Monitoring results shall be submitted to the Regional Water Board by the **first day** of the second month following sample collection. Quarterly, semi-annual, and annual monitoring results and reports shall be submitted by the **first day of the second month following each calendar quarter, semi-annual period, and year**, respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, should be determined and recorded.

If the Discharger monitors any pollutant at the locations designated herein, more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

The Discharger may also be requested to submit an annual discharger report to the Regional Water Board with both tabular and graphical summaries of the monitoring data obtained during the previous years. Any such request shall be made in writing. The report shall discuss the facility's compliance record for the most recent year. If violations have occurred, the report shall also discuss the corrective actions, taken and planned, to bring the discharge into full compliance with the waste discharge requirements.

All reports submitted in response to this MRP shall comply with the signatory requirements of the Standard Provision in the WDR Order.

The following compliance schedule in implementing groundwater wells and monitoring is required:

Task	Compliance Date
A. Submit Monitoring Well Installation Work Plan	Within 120 days following Order adoption
B. Implement monitoring well installation work plan	30 days following completion of task A
C. Complete monitoring well installation and well destruction and commence groundwater monitoring from newly installed wells	60 days following completion of task B
D. Submit Monitoring Well Installation Report	30 days following completion of task C
E. Submit technical report on sampling procedures and proposed Data Analysis Methods as described in the MRP	1 st day of the second month following the first sampling event
F. Submit technical report: natural background quality	365/730 days following completion of task E

The Discharger shall implement the above monitoring and reporting program on the first day of the month following the effective date of this Order.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

(Date)