

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

REVISED MONITORING AND REPORTING PROGRAM
R5-2013-0010 REVISION NO. 1

FOR

IRONHOUSE SANITARY DISTRICT
IRONHOUSE WATER RECYCLING FACILITY
CONTRA COSTA COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring influent wastewater, treated effluent, disposal ponds, groundwater, sludge, and water supply. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. Central Valley Water Board staff shall approve specific sample station locations prior to implementation of sampling activities.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form. Field test instruments (such as those used to measure pH and dissolved oxygen) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are calibrated prior to each monitoring event;
3. The instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of the MRP.

INFLUENT MONITORING

Influent flow monitoring shall be performed at the headworks. Grab samples shall be collected prior to the headworks as shown on Attachment D. Influent monitoring shall include the following:

| Constituent | Units | Type of Sample | Sampling Frequency | Reporting Frequency |
|-------------------------------|-------|------------------------------|--------------------|---------------------|
| Flow | MGD | Meter Reading | Daily | Monthly |
| BOD ₅ ¹ | mg/L | 24-hr Composite ² | Weekly | Monthly |
| Total Dissolved Solids | mg/L | Grab | Monthly | Monthly |

¹ 5-day Biochemical Oxygen Demand.

² 24-hour flow proportional composite.

EFFLUENT MONITORING

Effluent samples shall be collected after the UV disinfection system and prior to discharge to the effluent storage pond (North Pond) or to the LAA, as shown in Attachment D. Grab samples will be considered representative. Effluent monitoring shall include the following:

| Constituent | Units | Type of Sample | Sampling Frequency | Reporting Frequency |
|-----------------------------|------------|------------------------------|---|---------------------|
| BOD ₅ | mg/L | 24-hr Composite ² | Weekly | Monthly |
| Total Nitrogen ¹ | mg/L | Grab | Weekly | Monthly |
| Total Dissolved Solids | mg/L | Grab | Weekly | Monthly |
| Total Coliform Organisms | MPN/100 mL | Grab | Daily during manned operation ³ | Monthly |

¹ Total nitrogen is the sum of Total Kjeldahl Nitrogen, nitrate-nitrogen, and nitrite-nitrogen.

² 24-hour flow proportional composite.

³ Typically Monday through Friday, or on days that a facility operator is present and discharge is occurring.

ULTRAVIOLET LIGHT (UV) DISINFECTION SYSTEM MONITORING

Effective 1 September 2013, The UV disinfection system shall be monitored as specified below:

| Parameter | Units | Sample Type | Monitoring Frequency | Reporting Frequency |
|------------------------|--------------------|-------------|-------------------------|---------------------|
| Flow | MGD | Meter | Continuous ¹ | Monthly |
| Turbidity ² | NTU | Meter | Continuous ¹ | Monthly |
| UV banks in operation | Number | Observation | Continuous ¹ | Monthly |
| UV Transmittance | Percent (%) | Meter | Continuous ¹ | Monthly |
| UV Power Setting | Percent (%) | Meter | Continuous ¹ | Monthly |
| UV Dose ³ | MJ/cm ² | Calculated | Continuous ¹ | Monthly |

¹ For continuous analyzers, the Discharger shall report documented routine meter maintenance activities including date, time of day, and duration, in which the analyzer(s) is not in operation.

² Turbidity shall be monitored upstream of the UV system.

³ Report daily minimum UV dose, daily average UV dose, and weekly average UV dose. For the daily minimum UV dose, also report associated number of banks, gallons per minute per lamp, and UV transmittance used in the calculation. If effluent discharge has received less than the minimum UV dose, report the duration and dose calculation variables associated with each incident.

STORAGE POND MONITORING

The effluent storage ponds and the Bethel Island emergency storage pond shall be monitored as specified below. Dissolved oxygen monitoring applies to any pond containing more than two feet of standing water:

| Constituent | Units | Type of Sample | Sampling Frequency | Reporting Frequency |
|-------------------------------|----------|----------------|--------------------|---------------------|
| Dissolved Oxygen ¹ | mg/L | Grab | Weekly | Monthly |
| Freeboard | 0.1 feet | Measurement | Weekly | Monthly |
| pH ¹ | Standard | Grab | Weekly | Monthly |
| Odors | -- | Observation | Weekly | Monthly |
| Berm condition | -- | Observation | Monthly | Monthly |

¹ Samples shall be collected opposite the pond inlet.

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.

LAND APPLICATION AREA MONITORING

A. Daily Pre-Application Inspections

The Discharger shall inspect the LAA fields at least **once daily** prior to and during irrigation events, and observations from those inspections shall be documented for inclusion in the monthly monitoring reports. The following items shall be documented for each check or field to be irrigated on that day:

- a. Evidence of erosion;
- b. Containment berm condition;
- c. Condition of each standpipe and flow control valve (if applicable);
- d. Proper use of valves;
- e. Soil saturation;
- f. Ponding;
- g. Tailwater ditches and potential runoff to off-site areas;
- h. Potential and actual discharge to surface water;
- i. Odors that have the potential to be objectionable at or beyond the property boundary; and
- j. Insects.

Temperature; wind direction and relative strength; and other relevant field conditions shall also be observed and recorded. The notations shall also document any corrective actions taken based on observations made. A copy of entries made in the log during each month shall be submitted as part of the Monthly Monitoring Report. If no irrigation with wastewater takes place during a given month, then the monthly monitoring report shall so state.

B. Routine Monitoring

The Discharger shall perform the following routine monitoring and loading calculations during all months when water recycling occurs, and shall present the data in the Monthly and Annual Monitoring Reports.

| Constituent | Units | Type of Sample | Sampling Frequency | Reporting Frequency |
|--|---------|-------------------------|--------------------|---------------------|
| Precipitation | 0.1 in. | Rain Gauge ¹ | Daily | Monthly, Annually |
| Individual LAA fields receiving recycled water | -- | Observation | Daily | Monthly, Annually |

| Constituent | Units | Type of Sample | Sampling Frequency | Reporting Frequency |
|---|-----------|----------------------------|--------------------|---------------------|
| Hydraulic loading rate | in. | Calculated ² | Daily | Monthly, Annually |
| Biosolids Loading Rate | | | | |
| Wet weight | lb/ac | Calculated ² | Daily | Monthly, Annually |
| Dry weight | | | | |
| Nitrogen loading rate | | | | |
| Recycled water | lb/ac/day | Calculated ^{2, 3} | Daily | Monthly, Annually |
| Other sources (fertilizer, biosolids, etc.) | lb/ac/mo. | Calculated ^{2, 4} | Daily | Monthly, Annually |

¹ Data obtained from the nearest National Weather Service rain gauge is acceptable.

² Rate shall be calculated for each LAA field.

³ Total nitrogen loading rates shall be calculated using the applied volume of recycled water, supplemental irrigation water, and actual application area using the specified method in Section D (Mass Loading Limitations) of the WDRs.

⁴ Loading rates for supplemental nitrogen shall be calculated using the actual load and the application area.

MAINLAND GROUNDWATER MONITORING

The current groundwater monitoring well network consists of MNLND-1, MNLND-2, MNLND-3, MNLND-5, MNLND-7, and MNLND-14, which are all compliance wells. Prior to construction of any new groundwater monitoring wells, the Discharger shall submit plans and specifications to the Central Valley Water Board for review and approval.

Prior to sampling, the groundwater elevations shall be measured. Depth to groundwater shall be measured to the nearest 0.01 feet. Samples shall be collected using standard EPA methods. Groundwater monitoring shall include, at a minimum, the following constituents:

| Constituent | Units | Type of Sample | Sampling and Reporting Frequency |
|------------------------------------|-----------|----------------|----------------------------------|
| Depth to Groundwater ¹ | 0.01 feet | Measurement | Quarterly |
| Groundwater Elevation ¹ | 0.01 feet | Calculated | Quarterly |
| Gradient ¹ | feet/feet | Calculated | Quarterly |
| Gradient Direction ¹ | Degrees | Calculated | Quarterly |
| pH | Standard | Grab | Quarterly |
| Nitrate (as nitrogen) | mg/L | Grab | Quarterly |

¹ Groundwater elevations shall be determined based on depth-to-water measurements using a surveyed elevation reference point on the well casing.

BIOSOLIDS MONITORING

Biosolids applied to the LAA fields shall be sampled and analyzed as follows. Results for all chemical constituents shall be reported in mg/Kg on a dry weight basis. Composite samples may be used in lieu of grab samples if all required sample holding times are met.

| Constituent(s) | Sample Type | Sampling and Reporting Frequency |
|--|-------------|----------------------------------|
| Metals (total) ¹ | Grab | Monthly ⁴ |
| Percent moisture | Grab | Monthly ⁴ |
| Total nitrogen | Grab | Monthly ⁴ |
| Ammonia nitrogen | Grab | Monthly ⁴ |
| Nitrate nitrogen | Grab | Monthly ⁴ |
| Total phosphorus | Grab | Monthly ⁴ |
| Total potassium | Grab | Monthly ⁴ |
| PCB arochlors, aldrin, dieldrin ² | Grab | Semi-annually ⁴ |
| Semi-volatile organics ³ | Grab | Semi-annually ⁴ |

¹ Include at least the following metals: arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc.

² Using SW 846 Method 8080.

³ Using EPA Method 8270.

⁴ Include analytical data in the monthly monitoring report for the month in which monitoring occurred. For months in which no monitoring takes place, the Monthly Monitoring Report shall so state.

ROUTINE FIELD MONITORING FOR BIOSOLIDS APPLICATION

The Discharger shall establish and implement an inspection and application oversight program to monitor and control biosolids application rates and ensure compliance with the WDRs. Each discrete application field shall be managed and monitored as follows:

1. Pre-application Oversight:
 - a. Define crop to be planted.
 - b. Calculate allowable loading rate based on soil nitrogen residual data from the previous fall and most recent plant available nitrogen (PAN) and moisture content data for the biosolids.
 - c. Sample soil pH and verify it is greater than 6.5
 - d. Sample soil cation exchange capacity and verify that it is greater than 15 meg/100g.
 - e. Document communication of allowable loading rates to spreader operator.
2. Pre-application Inspection:
 - a. Verify that setbacks are clearly delineated.
 - b. Verify that runoff controls are in place and functional.
 - c. Verify that culverts are blocked (where applicable).
3. Application Oversight:
 - a. Verify compliance with setbacks and allowable loading rate.

- b. Verify compliance with soil incorporation requirements.
- 4. Post-application Oversight:
 - a. Confirm with irrigation manager requirements to control runoff for the specified period after application.
 - b. Calculate actual biosolids and PAN loading rates.
 - c. Note anticipated dates of planting, irrigation, and harvest.

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring shall include at least the following for each water source used during the previous year. As an alternative, the Discharger may submit results of the most current Department of Public Health Consumer Confidence Report in the Annual Monitoring Report.

| Constituents | Units | Sampling and Reporting Frequency |
|--------------------------------|----------|----------------------------------|
| pH | Standard | Annually |
| Total Dissolved Solids | mg/L | Annually |
| Standard minerals ¹ | mg/L | Annually |

¹ Standard Minerals shall include, at a minimum, the following elements/compounds: boron, calcium, chloride, iron, magnesium, manganese, nitrogen, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness

REPORTING

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 waste discharge requirements 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.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a Registered Engineer or Geologist and signed by the registered professional.

A. Monthly Monitoring Reports

Daily, weekly, and monthly monitoring data shall be reported in monthly monitoring reports. Monthly reports shall be submitted to the Central Valley Water Board on the **1st day of the second month following sampling** (i.e. the January Report is due by 1 March). At a minimum, the reports shall include:

1. Results of influent, effluent, UV disinfection, effluent storage pond, land application area, and biosolids monitoring. Data shall be presented in a tabular format.
2. Average daily flow for the month and total annual flow to date.
3. Calculated monthly median and maximum results for effluent total coliform organisms (TCO).
4. A comparison of monitoring data to the effluent limitations and discharge specifications and an explanation of any violation of those requirements.
5. A scaled site map depicting each discrete field that received biosolids, property boundaries, roads, on-site structures, surface water bodies, drainage features, and runoff controls (as applicable);
6. The results of biosolids monitoring that was applied to land during the month. Specifically, tabulated data shall be provided using the attached Biosolids Monitoring Results form (or approved revision thereof). Laboratory analytical reports need not be included, but must be provided upon request.
7. Verification of classification of biosolids as nonhazardous per 22 CCR, Article 11, Criteria for Identification of Hazardous and Extremely Hazardous Waste (California Assessment Manual procedures).
8. Verification that the application of biosolids will not exceed the maximum soluble metal concentrations or maximum cumulative loading rates of the WDRs, including supporting calculations.
9. The results of routine field monitoring for biosolids application. Specifically, tabulated information for each discrete application field used during the month shall be provided using the attached Field Monitoring Results form (or approved revision thereof). Verification that the soil pH and cation exchange capacity (CEC) limits of the WDRs are met. Describe any measures used to amend the soil to bring the pH or CEC within limits prior to biosolids application. If biosolids were not land applied, the report shall so state.
10. For each discrete application field, a comparison of monitoring data to the loading rate limitations and discharge specifications and an explanation of any violation of those requirements.
11. Copies of inspection logs.
12. Copies of laboratory analytical report(s), if requested.
13. A calibration log verifying calibration of all hand-held monitoring instruments.

B. Quarterly Monitoring Reports

The Discharger shall establish a quarterly sampling schedule for mainland groundwater monitoring such that samples are obtained approximately every three months. Quarterly monitoring reports shall be submitted to the Board by the **1st day of the second month after the quarter** (i.e. the January-March quarterly report is due by May 1st). The Quarterly Report shall include the following:

1. Results of groundwater monitoring.
2. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by 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.
3. Calculation of groundwater elevations, 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 monitoring locations, including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable).
5. Summary data tables of historical and current water table elevations and analytical results.
6. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells, surface water monitoring locations, and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum.
7. Copies of laboratory analytical report(s) for monitoring.

C. Annual Monitoring Report

An Annual Monitoring Report shall be submitted to the Central Valley Water Board by **1 February** each year. The Annual Monitoring Report shall include the following:

1. Total annual influent flow, average monthly flows for each month of the year, and the average dry weather flow compared to the flow limitations of the WDRs.
2. Tabular and graphical summaries of all data collected during the year.
3. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.
4. For each compliance groundwater monitoring well, a statistical evaluation of the groundwater quality beneath the wastewater treatment facility, in accordance with the approved report submitted pursuant to Provision M.1.b and a comparison of the results to the groundwater limitations.

5. A summary of all analytical data and verification of compliance with the biosolids monitoring requirements.
6. For each discrete application field, a chronological log of dates of biosolids application, irrigation, precipitation, and runoff control operations. Specifically, tabulated information for each discrete application field shall be provided using the attached Field Activities Summary form (or approved revision thereof).
7. For each discrete biosolids application field:
 - a. Total cumulative metals loading rates as of the end of the previous calendar year;
 - b. Calculation of the total metals and nitrogen loading rates for the year;
 - c. The cumulative metals loading rates since biosolids land application began; and
 - d. The cumulative metals loading rates to date as a percentage of the cumulative metals loading limits.
8. A digital database (Microsoft Excel) containing historic influent, effluent, water supply, biosolids and groundwater data.
9. An evaluation of the performance of the WWTF, 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
10. A discussion of compliance and the corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.
11. Summary of information on the disposal of sludge and/or solid waste. The results from any sludge monitoring required by the disposal facility.
12. 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, CCR, Division 3, Chapter 26.
13. Equipment maintenance and calibration records, as described in Standard Provision C.4.
14. A statement of when the O&M Manual was last reviewed for adequacy and a description of any changes made during the year.

A transmittal letter shall accompany each self-monitoring report. The letter shall include a discussion of all violations of the WDRs or 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 Standard Provisions and General Reporting Requirements, the transmittal letter shall contain a statement by the Discharger or the Discharger's authorized agent certifying under penalty of perjury that the report is true, accurate and complete to the best of the signer's knowledge.

The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered by: *Pamela C. Creedon* For
PAMELA C. CREEDON, Executive Officer

2/1/16

(Date)