CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2007-
FOR
UNIVAR USA, INC. (FORMER VAN WATERS AND ROGERS, INC.) AND
RIVER CITY BASEBALL GROUP
FORMER VAN WATERS AND ROGERS FACILITY/RALEY FIELD
WEST SACRAMENTO
YOLO COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring a groundwater extraction and treatment system. 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. Regional Board staff shall approve specific sample station locations prior to implementation of sampling activities.

All samples should 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.

GROUNDWATER MONITORING

As shown on Attachment B, there are 22 monitor wells, five extraction/gradient control wells (GC-5, GC-6, GC-7, GC-8, & GC-9), two combination gradient control/vapor extraction wells (GCVE-1, GCVE-2), and three injection trenches (Trenches 1, 2, and 3) associated with this site. The groundwater monitoring program for these wells and any wells installed subsequent to the issuance of this MRP, shall follow the schedule below. Monitor wells with free phase petroleum product or visible sheen shall be monitored, at a minimum, for product thickness and depth to water. The volume of extracted groundwater also shall be provided in quarterly monitoring reports. Sample collection and analysis shall follow standard EPA protocol.

Performance of the recirculation system will be assessed by the decline of VOC concentrations in the groundwater monitoring wells inside and along the boundary of the treatment zone. The Discharger will demonstrate that continued containment and cleanup is being achieved within the transition area surrounding the treatment zone by measuring groundwater levels and constituent concentrations in compliance monitoring wells, MR-9, MW-16, MW-18, MW-20, MW-22, as specified below.

The monitor wells, extraction wells and/or injection wells shall be sampled according to the schedule in Table 1 and the samples analyzed by the methods in Table 2, as follows:

Table 1: SAMPLING REQUENCY AND CONSTITUENT SUITE[1]

Well Number	Quarterly[2]	Semi-Annually[3]	Annually[4]	Monitoring Objective
MR-1	--------	--------	Suites A, B, C, D	Transition Area[5]
MR-2	--------	--------	Suites A, B and C	Treatment Zone[6]

Well Number	Quarterly[2]	Semi-Annually[3]	Annually[4]	Monitoring Objective
MR-3	Suite A	Suites B and C	--------	Treatment Zone[6]
MR-4	--------	--------	Suites A, B, C, D	Treatment Zone[6]
MR-5	Suite A	Suites B and C	--------	Treatment Zone[6]
MR-5D	--------	Suite A	--------	Treatment Zone[6]
MR-6	--------	--------	Suites A, B, C, D	Transition Area[5]
MR-6D	--------	--------	Suites A, B, C, D	Transition Area[5]
MR-7	--------	Suite A	Suites B and C	Treatment Zone[6]
MR-8A	--------	--------	Suites A, B, C, D	Transition Area[5]
MR-9	--------	--------	Suites A, B, C, D	Migration[7]
GCVE-1	Suite A	Suites B and C	--------	Treatment Zone[6]
GCVE-2	Suite A	Suites B and C	--------	Treatment Zone[6]
GC-5	--------	Suite A	Suites B, C, D	Transition Area[5]
GC-6	--------	Suite A	Suites B, C, D	Transition Area[5]
GC-7	Suite A	Suites B and C	--------	Treatment Zone[6]
GC-8	--------	Suite A	--------	Treatment Zone[6]
GC-9	--------	Suite A	--------	Treatment Zone[6]
MW-7	Suite A	Suites B and C	--------	Treatment Zone[6]
MW-13	--------	--------	Suites A, B, C, D	Treatment Zone[6]
MW-14	--------	--------	Suites A, B, C, D	Transition Area[5]
MW-15	--------	--------	Suites A, B, C, D	Transition Area[5]
MW-16	--------	--------	Suite A	Migration[7]
MW-17A	--------	Suite A	--------	Transition Area[5]
MW-18	--------	--------	Suite A	Migration[7]
MW-20	--------	--------	Suite A	Migration[7]
MW-21	--------	Suite A	--------	Treatment Zone[6]
MW-22	--------	--------	Suite A	Migration[7]
New Wells[8]	Suite A	--------	--------	--------

[1] Wells shall be sampled for the constituents in Suites A, B, C and D as specified in Table 2. Analysis of the samples shall be conducted using the methods specified in Table 2.

[2] All wells and on-site trenches shall be monitored at least quarterly and immediately following any abrupt significant change (greater than 2 feet) in the Sacramento River stage for water levels to determine and report groundwater flow direction.

[3] Wells shall be sampled semi-annually during the second and fourth quarters.

[4] Wells shall be sampled annually during the fourth quarter.

[5] Wells sampled to evaluate changes in water quality along the treatment zone boundary and in the transition area.

[6] Wells sampled to evaluate in-situ bioremediation progress inside the treatment zone.

[7] Wells sampled to evaluate potential migration of pollutants outside of treatment zone and transition area.

[8] Prior to construction of any new wells or destruction of any wells, the Discharger shall submit plans and specifications to the Regional Water Board staff for approval. All new wells shall be added to the monitoring program and sampled as specified above using the methods specified in Table 2.

Table 2: ANALYTICAL METHODS

Constituent	Method[1]	Maximum Practical Quantitation Limit (µg/L)[2]
Suite A		
Volatile Organic Compounds	EPA 8020 or 8260B	0.5
Sodium	EPA 200.7	1,000
Potassium	EPA 200.7	1,000
Suite B		
Volatile Organic Acids	EPA 6500	1,000
Orthophosphate	Hach Method 8131	30
Suite C		
Ethane	Modified EPA 602	0.1
Ethene	Modified EPA 602	0.1
Methane	Modified EPA 602	0.1
Total Dissolved Solids	EPA 160.1	10,000
Chloride	EPA 6500	300
Nitrate	EPA 6500	300
Sulfate	EPA 6500	200
Sulfide	Hach Method 8131	30
Metals, Dissolved[3]	EPA 200.7, 200.8	Various
Suite D[4]		
Ethylene Glycol	EPA 1666, 1671	200,000
Boron	EPA 200.7 or 6010B	50

[1] Or an equivalent EPA Method that achieves the maximum Practical Quantitation Limit.

[2] All concentrations between the Method Detection Limit and the Practical Quantitation Limit shall be reported as an estimated value All wells and on-site trenches shall be monitored at least quarterly and immediately following any abrupt significant change (greater than 2 feet) in the Sacramento River stage for water levels to determine and report groundwater flow direction.

[3] Metals include barium cadmium, calcium, total chromium, copper, lead, magnesium, manganese, mercury, molybdenum, nickel, silica, and iron (dissolved).

[4] Wells shall be sampled for the constituents in Suite D, as specified in Table 1 after approval and during implementation of the third mode of system operation.

In addition, baseline samples must be collected from all monitor wells, and analyzed for the consitutents in Suites A, B, C and D, a minimum of two weeks prior to any injection into the treatment area using any new mode of operation that has been approved.

Field Sampling

In addition to the above sampling and analysis, field sampling and analysis shall be conducted each time a monitor well or extraction well is sampled. The sampling and analysis of field parameters shall be as specified in Table 3.

Table 3: FIELD SAMPLNG REQUIREMENTS

Parameters	Units	Type of Sample
Groundwater Elevation	Feet, Mean Sea Level	Grab
Oxidation-Reduction Potential	Millvolts	Grab
Electrical Conductivity	uhmos	Grab
Dissolved Oxygen	mg/L	Grab
pH	pH Units (to 0.1 units)	Grab

Field test instruments (such as those used to test 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. 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 this MRP.

TREATMENT SYSTEM MONITORING

During normal operations the treatment system shall be monitored as described below. The initial sample must be collected within 24-hours after commencing operation of the treatment system and subsequent sampling will follow the requirements specified in Tables 4 and 5. If a new mode of operation is approved, then initial sampling shall once again take place within 24 hours following startup under the new operation mode.

Influent Monitoring

During regular operation samples for influent monitoring shall be collected at a point prior to the lead GAC vessel at each of the groundwater treatment facilities. Influent monitoring shall be as specified in Table 4:

Table 4: Treatment System Influent Monitoring

Constituent	Units	Type of Sample	Sampling Frequency
Influent Flow	gpm	Meter	Continuously
Monthly Average Daily Flow	gpd	Calculated	Monthly
VOCs[1]	ug/l	Grab	Monthly
pH[2]	pH units	Grab	Monthly

[1] Volatile organic contaminants by EPA Method 8260 or 601/602, or an equivalent method with a reporting limit of no greater than 0.5 µg/l. Values between the detection level and the reporting level should be reported as trace.
[2] Field Measurement. See requirements above for field sampling.

Effluent Monitoring

During regular operation effluent samples shall be collected after the final treatment unit, before discharge and shall be representative of the volume and nature of the discharge. Effluent monitoring shall be as specified in Table 5.

Table 5: Treatment System Effluent Monitoring

Constituent	Units	Type of Sample	Sampling Frequency
Effluent Flow	gpm	Meter	Continuously
Monthly Average Daily Flow	gpd	Calculated	Monthly
VOCs[1]	ug/l	Grab	Monthly
VOCs[1] between GAC Vessels (after secondary mid-vessel)	ug/L	Grab	Every Two Months
pH[2]	pH units	Grab	Monthly
Sodium	mg/L	Grab	Quarterly
Total and Dissolved Iron	ug/L	Grab	Quarterly
Electrical Conductivity[2]	uhmos	Grab	Monthly
Dissolved Oxygen[2]	mg/L	Grab	Monthly
Oxidation-Reduction Potential[2]	uhmos	Grab	Monthly

[1] Volatile organic contaminants by EPA Method 8260 or 601/602, or an equivalent method with a reporting limit of no greater than 0.5 µg/l. Values between the detection level and the reporting level should be reported as trace.

[2] Field Measurement. See requirements above for field sampling.

REPORTING

When reporting the data, the Discharger shall arrange the information in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner as to illustrate clearly the compliance with this Order. In addition, the Discharger shall notify the Regional Board within 48 hours of any unscheduled shutdown of any soil vapor and/or groundwater extraction system. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall also be reported to the Regional Board.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all reports shall be prepared by a registered professional or their subordinate and signed by the registered professional.

The Discharger shall submit quarterly electronic data reports, which conform to the requirements of the California Code of Regulations, Title 23, Division 3, Chapter 30. The quarterly reports shall be submitted electronically over the internet to the Geotracker database system by the 1st day of the second month following the end of each calendar quarter by **1 February, 1 May, 1 August, and 1 November** until such time as the Executive Officer determines that the reports are no longer necessary.

Quarterly reports shall be submitted to the Regional Board by the **1st day of the second month following the end of each calendar quarter (i.e., by 1 February, 1 May, 1 August, and 1 November**) until such time as the Executive Officer determines that the reports are no longer necessary. Each quarterly report shall include the following minimum information:

(a) a description and discussion of the groundwater sampling event and results, including trends in the concentrations of pollutants and groundwater elevations in the wells, how and when samples were collected, and whether the pollutant plume(s) is delineated;

(b) field logs that contain, at a minimum, water quality parameters measured before, during, and after purging, method of purging, depth of water, volume of water purged, etc.;

(c) groundwater contour maps for all groundwater zones, if applicable;

(d) isocontour pollutant concentration maps for all groundwater zones, if applicable;

(e) a table showing well construction details such as well number, groundwater zone being monitored, coordinates (longitude and latitude), ground surface elevation, reference elevation, elevation of screen, elevation of bentonite, elevation of filter pack, and elevation of well bottom;

(f) a table showing historical lateral and vertical (if applicable) flow directions and gradients;

(g) cumulative data tables containing the water quality analytical results and depth to groundwater;

(h) a copy of the laboratory analytical data report;

(i) if applicable, the status of any ongoing remediation, including cumulative information on the mass of pollutant removed from the subsurface, system operating time, the effectiveness of the remediation system, and any field notes pertaining to the operation and maintenance of the system; and

(j) if applicable, the reasons for and duration of all interruptions in the operation of any remediation system, and actions planned or taken to correct and prevent interruptions; and

(k) A log of GAC replacement, along with transportation date(s) and destination of disposal.

An Annual Report shall be submitted to the Regional Board by **1 February (1 November for semi-annual monitoring)** of each year. This report shall contain an evaluation of the effectiveness and progress of the investigation and remediation, and may be substituted for the fourth quarter **(or second semi-annual)** monitoring report. The Annual Report shall contain the following minimum information:

(a) both tabular and graphical summaries of all data obtained during the year;

(b) groundwater contour maps and pollutant concentration maps containing all data obtained during the previous year;

(c) a discussion of the long-term trends in the concentrations of the pollutants in the groundwater monitoring wells;

(d) an analysis of whether the pollutant plume is being captured by an extraction system or is continuing to spread;

(e) a description of all remedial activities conducted during the year, an analysis of their effectiveness in removing the pollutants, and plans to improve remediation system effectiveness;

(f) an identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and

(g) if desired, a proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.

A letter transmitting the self-monitoring reports shall accompany each report. Such a 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 the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

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

Ordered by: _____
PAMELA C. CREEDON Executive Officer

_____ xx xxxxxxx xxxx
(Date)

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