

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

TENTATIVE ORDER AMENDMENT

AMENDMENT OF WASTE DISCHARGE REQUIREMENTS ORDER NO. R2-2008-0013
FOR:

PHILLIPS 66 COMPANY
RODEO CARBON PLANT
RODEO, CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Water Board) finds that:

FACILITY OWNERSHIP AND LOCATION

1. Phillips 66 Company (hereinafter called the Discharger) presently owns and operates the Rodeo Carbon Plant, a petroleum coke calcining and power generating facility (hereinafter called the Facility). In May 2012, the prior owner and operator ConocoPhillips Company, separated its refining and marketing business from its exploration and production business to create two separate stand-alone companies, making Phillips 66 the owner and operator of the Carbon Plant. At that time, the name of the plant was changed from the Contra Costa Carbon Plant to the Rodeo Carbon Plant.
2. The Facility is located at 2101 Franklin Canyon Road, approximately two miles southeast of Rodeo (Figure 1).
3. Tosco Refining Company owned and operated the Facility from April 1997 until January 2003.
4. Unocal Corporation owned and operated the Facility from 1960 to April 1997.

PURPOSE OF AMENDMENT

5. The primary objectives of this amendment are to: 1) update the Self-Monitoring Program (SMP), and 2) reflect the recent change in Facility ownership.

FACILITY AND WASTE MANAGEMENT UNIT DESCRIPTION

6. Waste Discharge Requirements (WDRs, Order R2-2008-0013) for this Facility have been established for the operation, maintenance, and monitoring of the Facility's surface impoundment, settling basins, and groundwater monitoring wells. The Facility uses rain and make-up water for plant operations and dust control. This water is collected in the Discharger's Basin System for the recovery and recycling of coke fines, and water for plant operations.

7. The Facility constructed the Basin System, consisting of two settling basins and a large surface impoundment, in 1983. The Basin System was designed to recover water used at the Facility, including 1) boiler and cooling tower blowdown water, 2) dust control water, and 3) storm water runoff; and to recover coke fines (a carbonaceous solid produced as a byproduct in the refining of crude, useful as fuel and in manufacturing). Recovered water is recycled from the surface impoundment and used in Facility processes in a closed loop system.
8. The following activities conducted at the Facility could adversely affect water quality and are therefore subject to WDRs and this amendment:
 - a. Approximately 25,000 gallons per day (GPD) of wastewater from various industrial processes are discharged to the Basin System. Sources of wastewater include the boiler and cooling tower blowdown, filter backwashing, excess spray runoff from the uncalcined coke (green coke) storage area, and make-up water from a water supply agency.
 - b. Green coke is stored in large piles on the asphalt pavement (Figure A1). The piles are sprayed with water from the Basin System for dust control. Storm water runoff and excess sprayed water drains from the asphalted areas back into the Basin System.
9. The surface impoundment is classified as a Class II waste containment structure, because it isolates non-hazardous waste from Waters of the State. Activities conducted at the Facility contribute or potentially contribute to elevated concentrations of vanadium, zinc, nickel, chloride, sodium, total phosphorus, diesel and gasoline in the process wastewater. The surface impoundment is clay-lined and irregularly shaped, measuring approximately 460 by 325 feet at its widest and approximately 460 by 135 feet at its smallest, and has a storage capacity of approximately 15.89 acre-feet to the height where freeboard is equal to two feet. There is no regulated discharge from the surface impoundment.
10. Eight monitoring wells (MW 88-1 through MW 88-5 and UZM 88-1 through UZM 88-3) are installed around the surface impoundment to monitor shallow groundwater to detect potential impacts of the surface impoundment on shallow groundwater. Well locations are shown on Figure A1.

CHANGES TO THE SELF-MONITORING PROGRAM

11. Provision 8 of WDRs Order No. R2-2008-0013 required the Discharger to increase the storage capacity of the surface impoundment, in response to repeated overflows. Provision 9 required the Discharger revise the SMP as necessary, to account for any alterations to the structure, such as lateral extensions or additions that might affect the SMP. The Discharger enhanced the capacity of the surface impoundment by increasing the height of the levees surrounding the basin, thereby complying with Provision 8 in a manner that required no revisions to the SMP.

12. Though changes to the SMP are not required to address enhancements to the surface impoundment, Water Board staff determined the existing SMP must be updated to improve groundwater monitoring of the Facility's surface impoundment. Currently, during each sampling event, concentrations of metals and other inorganic parameters in groundwater are compared directly to those in surface impoundment water to evaluate whether a release has occurred. This process is not statistically robust and does not meet the monitoring requirements established in California Code of Regulations, Title 27, section 20415. Staff therefore requested the Discharger propose revisions to streamline and improve detection monitoring at the Facility.
13. The Discharger proposed the following primary changes to the SMP:
 - c. The number of monitoring wells necessary to detect a release has been reduced from eight to three, which is sufficient to detect a leak from the Basin System.
 - d. Total Petroleum Hydrocarbons in the gasoline, diesel, and motor-oil ranges have been added to the SMP as Constituents of Concern (COCs), because they have been identified in waters of the Basin System.
 - e. Groundwater data will no longer be compared to data collected from the surface impoundment to identify a release. Instead, historic data from the same well (intrawell analysis) will be used to construct prediction intervals to identify whether concentrations of COCs are increasing in each well, an indicator of a potential release (see the SMP Section F, Water Quality Protection Standards for additional information).

Water Board Staff concur that the above changes will improve the effectiveness of the SMP.

14. The SMP due dates have been modified at the request of the Discharger, to facilitate reporting. The time of year the sampling events occurs will not change.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

15. This action is an amendment of an Order to enforce the laws and regulations administered by the Regional Water Board. The amendment does not require additional activities, investigations, or construction and therefore is not a project, as defined in CEQA, and does not have a significant impact on the environment. (Cal. Code Regs., tit. 14 §§ 15378 and 15061, subd. (b) (3).)

NOTIFICATIONS AND MEETING

16. The Water Board has notified the Discharger and interested agencies and persons of its intent to update these WDRs, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

17. The Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that Order No. R2-2008-0013 is amended as follows:

- A. The Carbon Plant shall be referred to as the Rodeo Carbon Plant.
- B. The owner and operator will be referred to as Phillips 66 Company.
- C. The Discharger shall be defined as Phillips 66 Company.
- D. The attached SMP shall replace the SMP attached to Order No. R2-2008-0013.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on _____.

Bruce H. Wolfe
Executive Officer

Attachments: A. Self-Monitoring Program

ATTACHMENT A
SELF-MONITORING PROGRAM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION SELF-MONITORING PROGRAM

FOR

**PHILLIPS 66 COMPANY
RODEO CARBON PLANT**

**2101 FRANKLIN CANYON ROAD
RODEO, CONTRA COSTA COUNTY**

ORDER NO. R2-2013-XXXX

CONSISTS OF

PART A

AND

PART B

PART A

A. AUTHORITY AND PURPOSE

Reporting responsibilities of waste discharges are specified in sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and the Water Board's Resolution No. 73-16. This Self-Monitoring Program is issued in accordance with Title 27 of the California Code of Regulations (Title 27).

The principal purposes of a Self-Monitoring Program are to:

1. Document compliance with waste discharge requirements and prohibitions established by the Water Board;
2. Facilitate self-policing by the waste dischargers in the prevention and abatement of pollution arising from waste discharge;
3. Develop or assist in the development of standards of performance and toxicity standards;
4. Assist the dischargers in complying with requirements of Title 27.

B. SAMPLING AND ANALYTICAL METHODS

Sample collection, storage, and analyses shall be performed according to the most recent version of U.S. EPA Standard Methods and in accordance with an approved sampling and analysis plan.

Water and waste analysis shall be performed by a laboratory approved for these analyses by the State of California. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and all reports of such work submitted to the Water Board shall be signed by a duly authorized representative of the laboratory.

All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

C. DEFINITION OF TERMS

1. A grab sample is a discrete sample collected at any time.

2. Receiving waters refers to any surface that actually or potentially receives surface or groundwater that pass over, through, or under waste materials or contaminated soils. In this case the groundwater beneath and adjacent to the Basin System and the surface runoff from the Facility are considered receiving waters.
3. Standard observations refer to:
 - a. Receiving Waters
 - 1) Floating and suspended materials of waste origin: presence or absence, source, and size of affected area;
 - 2) Discoloration and turbidity: description of color, source, and size of affected area;
 - 3) Evidence of odors, presence or absence, characterization, source, and distance of travel from source;
 - 4) Evidence of beneficial use: presence of water associated wildlife;
 - 5) Flow rate; and
 - 6) Weather conditions: wind direction and estimated velocity, total precipitation during the previous five days and on the day of observation.
 - b. Perimeter of the Basin System.
 - 1) Evidence of uncontrolled liquid leaving the Basin System, estimated size of affected area and flow rate. (Show affected area on map);
 - 2) Evidence of odors, presence or absence, characterization, source, and distance of travel from source; and
 - 3) Evidence of erosion.
 - c. The Basin System.
 - 1) Evidence of odors, presence or absence, characterization, source, and distance of travel from source;
 - 2) Evidence of algal or other unusual growth, precipitation of sludge minerals, quantity, nature and chemical composition;
 - 3) Evidence of erosion, slope or ground movement;
 - 4) Adequacy of access road; and

- 5) Monitoring points and measurements (monitoring parameters) are listed on Table A-2 (attached).

D. SAMPLING, ANALYSIS, AND OBSERVATIONS

The Discharger is required to perform sampling, analyses, and observations in the following media:

1. Storm water discharges per the Industrial Activities Storm Water General Permit
2. Groundwater per Title 27, section 20415(b)
3. Surfacewater per Title 27, section 20415(c)

and in accordance with the general requirements specified in section 20415(e) of Title 27.

E. RECORDS TO BE MAINTAINED

Written reports shall be maintained by the Discharger or laboratory, and shall be retained for a minimum of five years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Water Board. Such records shall show the following for each sample:

1. Identity of sample and sample station number;
2. Date and time of sampling;
3. Date and time that analyses are started and completed, and name of the personnel performing the analyses;
4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
5. Calculation of results; and
6. Results of analyses, and detection limits for each analysis.

F. REPORTS TO BE FILED WITH THE BOARD

1. **Self-Monitoring Reports**

Written monitoring reports shall be filed by **June 15 and December 15** of each year. As part of the December report, an annual report shall be filed each year. The reports shall be comprised of the following:

a. Letter of Transmittal

A letter transmitting the essential points in each report should accompany each report. Such a letter shall include a discussion of **any requirement violations** found during the last report period, and actions taken or planned for correcting the violations. If the Discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred in the last reporting period, this shall be stated in the letter of transmittal.

Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer at the level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the Facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.

b. Each monitoring report shall include a compliance evaluation summary. The summary shall contain:

- 1) A graphic description of the direction of groundwater flow under/around Basin System, based upon the past and present water level elevations and pertinent visual observations;
- 2) The method and time of water level measurement, the type of pump used for purging, pump placement in the well; method of purging, pumping rate, equipment and methods used to monitor field pH, temperature, and conductivity during purging, calibration of the field equipment, results of the pH, temperature, conductivity and turbidity testing, well recovery time, and method of disposing of the purge water;
- 3) Type of pump used, pump placement for sampling, a detailed description of the sampling procedure; number and description of equipment, field and travel blanks; number and description of duplicate samples; type of sample containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations; and
- 4) A written discussion of the groundwater analyses indicating any change in the quality or characteristics of the groundwater.

c. A comprehensive discussion of the compliance record and corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the Waste Discharge Requirements and Title 27.

d. A map or aerial photograph shall accompany each report showing observation and monitoring station locations.

- e. Laboratory statements with the results of analyses specified in Part B must be included in each report. The director of the laboratory whose name appears on the laboratory certification shall supervise all analytical work in his/her laboratory and all reports of such work submitted to the Water Board shall be signed by a duly authorized representative of the laboratory.
 - 1) The methods of analyses and detection limits must be appropriate for the expected concentrations. Specific methods of analyses must be identified. If methods other than U.S. EPA Standard Methods are used, the exact methodology must be submitted for review and approved by the Executive Officer prior to use.
 - 2) In addition to the results of the analyses, laboratory quality assurance/quality control (QA/QC) information must be included in the monitoring report. The laboratory QA/QC information should include the method, equipment and analytical detection limits; the recovery rates; an explanation for any recovery rate that are outside laboratory control limits; the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.
- f. A summary and certification of completion of all standard observations for the Basin System, the perimeter of the Basin System, and the receiving waters.
- g. The Annual Monitoring Report shall be submitted to the Water Board covering the previous year, and shall be filed by December 15 of each year. The Report shall include, but is not limited to, the following:
 - 1) A graphical presentation for each monitoring point, submit in graphical format the laboratory analytical data for all samples taken. Each such graph shall plot the concentration of one or more constituents over time for a given monitoring point, at a scale appropriate to show trends or variations in water quality. On the basis of any aberrations noted in the plotted data, the Executive Officer may direct the Discharger to carry out a preliminary investigation, the results of which will determine whether or not a release is indicated;
 - 2) A tabular summary of all the monitoring data obtained during the previous year;
 - 3) A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements and Title 27;
 - 4) A written summary of the groundwater analyses indicating any change in the quality of the groundwater.

- h. Tabular and graphical summaries of the monitoring data obtained during the previous year; the annual report should be accompanied by a compact disc, MS-EXCEL format, tabulating the year's data.

2. **Contingency Reporting**

- a. A report shall be made by telephone of any seepage from the Basin System immediately after it is discovered. A written report shall be filed with the Water Board within **five days** thereafter. This report shall contain the following information:
 - 1) A map showing the location(s) of discharge if any;
 - 2) Approximate flow rate;
 - 3) The number of samples of the discharge collected for chemical analysis, or defensible reason samples could not be collected;
 - 4) The nature of effects, i.e. all pertinent observations and analyses; and
 - 5) The corrective measures underway, proposed, or as specified in the WDRs.
- b. A report shall be made in writing to the Water Board within **seven days** of determining that a statistically significant difference occurred between a downgradient sample and a Water Quality Protection Standard (WQPS) (see Part A, Section G). Notification shall indicate which WQPS(s) has/have been exceeded. The Discharger shall immediately resample at the compliance point where the difference has been found and re-analyze.
- c. A report shall be made by telephone of any requirement violation(s) immediately after it is discovered. A written report shall also be filed within seven days that includes a discussion of the requirement violation(s), and actions taken or planned for correcting the violation(s).
- d. If resampling and analysis confirms the earlier finding of a significant difference between monitoring results and WQPS(s) the discharger must submit to the Water Board, an amended Report of Waste Discharge as specified in Title 27, Section 20420(k)(5) for establishment of an Evaluation Monitoring Program, meeting the requirements of Title 27, Section 20425.
- e. The Discharger is required to notify the Water Board report a release from the Basin System in accordance with Section 20420(k)(1-6) of Title 27 within 90 days following the discovery of the release. An Evaluation Monitoring Program must be initiated within 90 days following discovery of a release from the Basin System in accordance with Section 20420 (k)(5) of Title 27. Within **180 days** of determining a statistically significant evidence of a release, submit to the Water

Board an engineering feasibility study for a Corrective Action Program necessary to meet the requirements of Title 27, Section 20430. At a minimum, the feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern.

3. **Well Logs**

A boring log and a monitoring well construction log shall be submitted for each new sampling well established for this monitoring program, as well as a report of inspection or certification that each well has been constructed in accordance with the construction standards of the Department of Water Resources. These shall be submitted within 45 days after well installation.

G. WATER QUALITY PROTECTION STANDARDS

1. **Constituents of Concern:** The Constituents of Concern (COC) for groundwater and surfacewater are those listed in Table A-1 of this Self-Monitoring Program. The COC list contains waste constituents, reaction products and hazardous constituents that are reasonably expected to be in or derived from waste contained in the surface impoundment. Groundwater and surfacewater shall be analyzed for COCs at least one time **every five years**. The initial five-year COC sampling event shall occur in conjunction with the second semi-annual sampling event for 2013.

COC monitoring shall undergo the same statistical comparison as the semi-annual testing of Monitoring Parameters described below, provided that a sufficient number of samples exist to perform the comparison. If the number of historical samples is insufficient to perform a robust statistical analysis, a non-statistical evaluation of the data will be performed (an evaluation of whether a constituent is newly or historically detected). If a previously undetected metal, inorganic constituent, or hydrocarbon COC is detected, that constituent will be considered for addition to the Monitoring Parameter list. For those monitoring locations where a statistical exceedance is indicated, monitoring shall be conducted to demonstrate that levels of COCs have either stabilized or are decreasing (the constituent will be added to the Monitoring Parameter list).

2. **Monitoring Parameters:** The Monitoring Parameters for groundwater and surfacewater are listed in Table A-2 of this Self-Monitoring Program. Monitoring Parameters are a subset of COCs that shall be analyzed and reported in every Self-Monitoring Report, serving to indicate if a release has occurred. Groundwater and surfacewater samples (i.e., collected from the adjacent ephemeral creek) shall be analyzed for Monitoring Parameters semi-annually and reported in every Self-Monitoring Report.
3. **Concentration Limits or Statistical Method:** The Concentration Limits (CLs) for each COC will be set semi-annually utilizing prediction intervals, in an intrawell

statistical analysis regime, as shown in Table A-3. It has been determined that intrawell statistical analysis, identifying trends within a single monitoring well to detect a release, is the preferred methodology for detection monitoring at this Facility because a background groundwater location could not be identified. Therefore, static CLs will not be established.

Prediction (or tolerance) intervals are listed among the accepted statistical procedures pursuant to Title 27, sections 20415(e)(8)(C) and 20415(e)(9)(D). They are constructed to predict, within a specified probability, the next one or more sample value(s) from a statistical population, including a resample in the case of an exceedance. A confirmed exceedance indicates that an anomalously high concentration of the COC was identified, and further investigation in to a potential release must be performed. Procedures exist for constructing prediction intervals (also called prediction limits) for data that are normally or non-normally distributed. Non-detects shall be assigned a value of one-half the detection limit when calculating prediction intervals and plotting concentration over time.

The procedure for the two-tiered statistical approach using prediction intervals shall be as follows:

- a. The analysis shall be performed using the appropriate computer based software applications (e.g., SAS or SANITAS software).
 - b. The Monitoring Parameter/well pair shall be evaluated against intrawell prediction intervals established at a 95% confidence level using historical data. All available data, subsequent to and including 1995 sampling events, excluding data from known release events, or data statistically and empirically shown to be an outlier, shall be used to establish the prediction intervals. If no statistical exceedance of the intrawell prediction limit is observed, no release is indicated, and resampling is not necessary.
 - c. If an intrawell prediction interval exceedance occurs, and a data collection error such as a lab artifact cannot be identified, a resample shall be collected and tested to confirm the exceedance and presence of a release, according to Title 27 section 20415(e)(8)(E).
4. Monitoring Points: Monitoring Points for the Basin System will be identified in Figure A-1 of this Self-Monitoring Program. If appropriate background water quality monitoring locations do not exist, intra-well comparisons can be used for evaluating monitoring data. For those areas where COC concentrations greater than the CLs existed prior to corrective measures, monitoring will be conducted to demonstrate that levels of COCs have either stabilized or are decreasing.
5. Point of Compliance: The Point of Compliance for the Facility is the vertical surface that extends from the outside edge of the lateral containment structures through the uppermost aquifer underlying the surface impoundment.

Part B**1. DESCRIPTION OF OBSERVATION STATIONS AND SCHEDULE OF OBSERVATIONS****A. GROUNDWATER AND SURFACEWATER MONITORING:**

Semi-Annual Report: Due June 15 of each year
Annual Report: Due December 15 of each year

Groundwater shall be sampled and analyzed as detailed in Tables A-1 and A-2, and in accordance with the US EPA test methods and CLs described in Table A-3. Monitoring well locations are illustrated in Figure A-1. Groundwater analyses shall include the following field measurements and observations: pH, temperature, specific conductance, water level, volume purged, number of casings volumes purged, and whether the well went dry during sampling (including measures taken to ensure accuracy of analyses given this condition). Groundwater monitoring wells installed in the future will be sampled and analyzed as detailed in Tables A-1 and A-2 and on a quarterly basis until a statistically significant dataset is established. Storm water shall be monitored as detailed in the Facility's SWPPP.

B. SURFACEWATER MONITORING: Surfacewater samples from the unnamed ephemeral creek adjacent to the Basin System semi-annually (summer/fall and winter/spring) when flowing, and sampled in accordance with Table A-2.**C. FACILITIES MONITORING - **Observe quarterly, report semi-annually****

Semi-Annual Report: Due June 15 of each year
Annual Report: Due December 15 of each year

The Discharger shall inspect all facilities to ensure proper and safe operation and report semi-annually. The facilities to be monitored shall include, but not be limited to:

1. Waste Containment systems;
2. Surfacewater retention basins;
3. Leak detection systems (where applicable); and
4. Leachate/groundwater management facilities and secondary containment where applicable.

Attachments:

Figure A-1 – Monitoring Well Location Map

Table A-1 – Constituents of Concern for Groundwater and Surfacewater

Table A-2 – Monitoring Parameters for Groundwater and Surfacewater

Table A-3 – Concentration Limits for Groundwater

Figure A-1. Monitoring Well Location Map

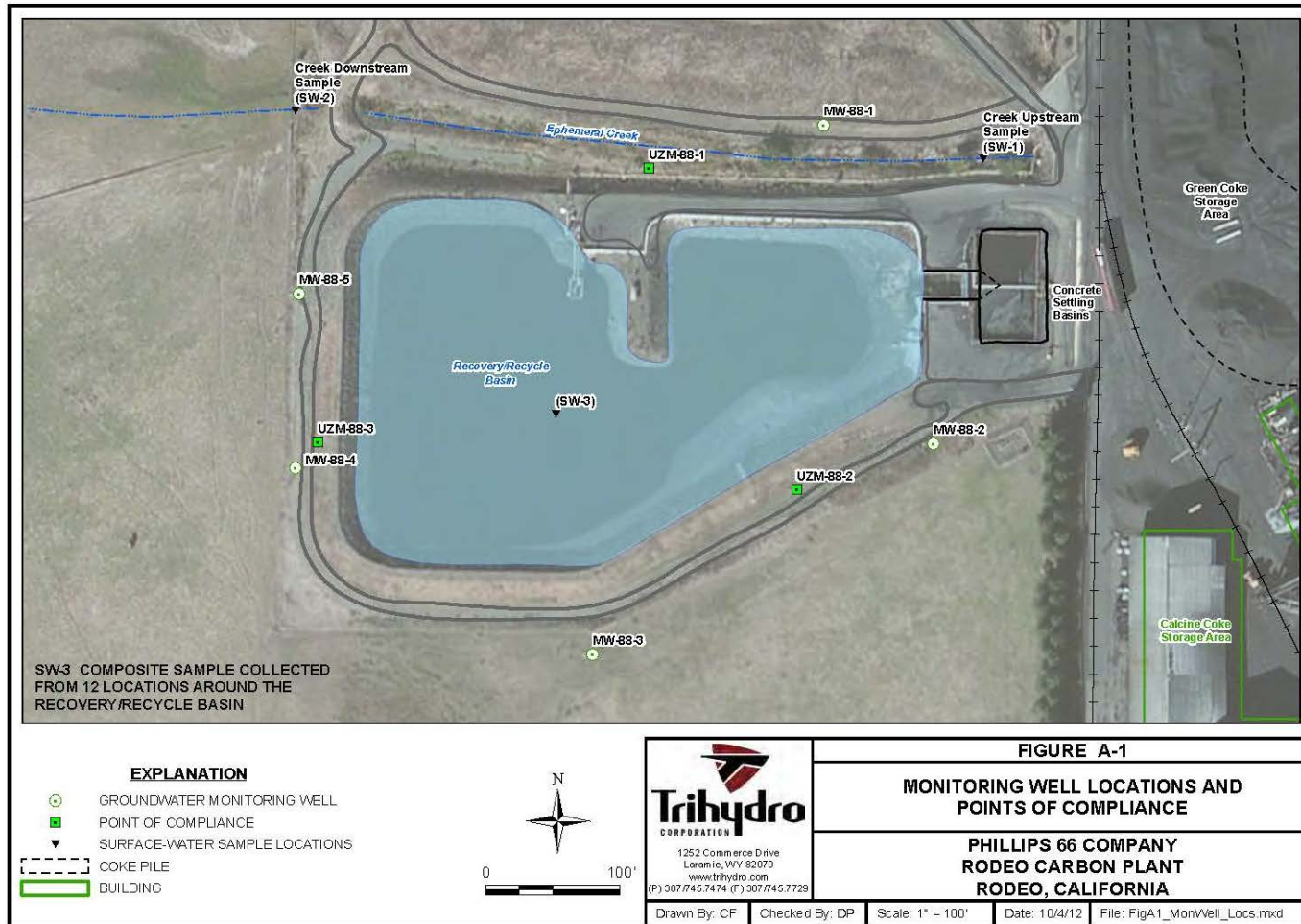


Table A-1 – Constituents of Concern for Groundwater and Surfacewater (analyzed every five years)

Monitoring Points	Constituents of Concern
<p>Groundwater Monitoring Wells UZM-88-1 UZM-88-2 UZM-88-3</p> <p>Surfacewater SW-1 (Creek, Upstream) SW-2 (Creek, Downstream) SW-3 (Basin Composite Sample)</p>	<p>General Water Quality Parameters pH, specific conductance, bicarbonate alkalinity, and total dissolved solids</p> <p>Dissolved Metals and Other Inorganics Nickel, vanadium, zinc, chloride, sodium, total phosphorus, potassium, and sulfate</p> <p>Petroleum Hydrocarbons Total Petroleum Hydrocarbons (TPH) as gasoline, diesel, and motor oil</p>

Table A-2 – Monitoring Parameters for Groundwater and Surfacewater

Monitoring Points	Monitoring Parameters
<p>All Groundwater Monitoring Wells UZM-88-1 UZM-88-2 UZM-88-3</p> <p>Surfacewater SW-1 (Ephemeral Creek upstream of Basin System)</p> <p>SW-2 (Ephemeral Creek downstream of Basin System)</p>	<p>Groundwater Monitoring Dissolved nickel, dissolved vanadium, dissolved zinc chloride, sodium, and total phosphorus</p> <p>Surfacewater Monitoring Dissolved nickel, dissolved vanadium, dissolved zinc , and total petroleum hydrocarbons as gasoline, diesel, and motor oil</p>

Table A-3 - Concentration Limits for Groundwater

Constituent of Concern	Practical Quantitation Limit	US EPA Test Method	Concentration Limits
pH	0.05 pH units	9040	Prediction Interval
Specific conductance	1.0 umhos/cm	120.1	Prediction Interval
chloride	0.5 mg/L	300	Prediction Interval
sodium	0.5 mg/L	6010B	Prediction Interval
potassium	1.0 mg/L	6010B	Prediction Interval
sulfate	1.0 mg/L	300	Prediction Interval
total phosphorus	0.5 mg/L	365.4	Prediction Interval
bicarbonate alkalinity	2.9 mg/L	310.1	Prediction Interval
total dissolved solids	10 mg/L	160.1	Prediction Interval
nickel (dissolved)	0.01 mg/L	6010B	Prediction Interval
vanadium (dissolved)	0.01 mg/L	6010B	Prediction Interval
zinc, (dissolved)	0.01 mg/L	6010B	Prediction Interval
TPH - gasoline	50 µg/L	8015B	Prediction Interval
TPH - diesel	50 µg/L	8015B	Prediction Interval
TPH – motor oil	50 µg/L	8015B	Prediction Interval