



EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIGUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

4 November 2016

Mr. Mike Glavin
California Resources Production Corporation
9600 Ming Avenue, Suite 300
Bakersfield, California 93311

CERTIFIED MAIL
7016 0750 0000 7453 1958

Mr. Richard Diamond
North Kern Water Storage District
33380 Cawelo Avenue
Bakersfield, California 93308

CERTIFIED MAIL
7016 0750 0000 7453 1965

REVISED MONITORING AND REPORTING PROGRAM ORDER NO. R5-2015-0127, NORTH KERN WATER STORAGE DISTRICT AND CALIFORNIA RESOURCES PRODUCTION CORPORATION, PRODUCED WASTEWATER RECLAMATION PROJECT, KERN COUNTY

Enclosed is the Revised Monitoring and Reporting Program Order No. R5-2015-0127 (MRP) for Waste Discharge Requirements Order No. R5-2015-0127 regulating the discharge of produced wastewater to North Kern Water Storage District from California Resources Production Corporation's Section 23 Facility.

This MRP requires North Kern Water Storage District and California Resource Production Corporation to perform specific effluent and groundwater monitoring at specific frequencies. Failure to comply with the MRP will subject you to enforcement actions, including the potential assessment of civil liability.

If you have any questions regarding this matter, please contact Joshua Mahoney of this office at (559) 444 - 2449 or via email at Joshua.Mahoney@waterboards.ca.gov.

RONALD E. HOLCOMB
Senior Engineering Geologist
CEG No. 2390

cc: Julie Macedo, Office of Enforcement, State Water Resources Control Board
Patrick Pulupa, Office of Chief Counsel, State Water Resources Control Board
John Borkovich, Division of Water Quality, State Water Resources Control Board

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

REVISED MONITORING AND REPORTING PROGRAM
ORDER NO. R5-2015-0127
FOR
CALIFORNIA RESOURCES PRODUCTION CORPORATION
NORTH KERN WATER STORAGE DISTRICT
PRODUCED WASTEWATER RECLAMATION PROJECT
KERN FRONT OIL FIELD
KERN COUNTY

This revised Monitoring and Reporting Program (MRP) supersedes the Monitoring and Reporting Program signed on 11 December 2015 and is required pursuant to section 13267 of the California Water Code.

California Resources Production Corporation and North Kern Water Storage District (hereafter jointly referred to as Discharger) shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts, or the Executive Officer issues, a revised MRP. Changes to any sample location shall be established with concurrence of Central Valley Water Board staff, and a description of the revised station shall be submitted for approval by the Executive Officer.

This MRP includes monitoring, record-keeping, and reporting requirements. Monitoring requirements include groundwater samples, discharges of produced wastewater, chemicals associated with drilling, installation, operation, and maintenance of oil production, and application of recycled materials (wastewater); in order to determine if the Discharger is in compliance with applicable laws, regulations, and policies.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. All analyses shall be performed in accordance with ***Standard Provisions and Reporting Requirements for Waste Discharge Requirements***, dated 1 March 1991 (Standard Provisions).

Field test instruments (such as a pH meter) may be used provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer or in accordance with manufacturer instructions.

Analytical procedures shall comply with the methods and holding times specified in the following: *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA); *Test Methods for Evaluating Solid Waste* (EPA); *Methods for Chemical Analysis of Water and Wastes* (EPA); *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA); *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125). Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the State Water Board's Environmental Laboratory Accreditation Program. The Discharger may propose alternative methods for approval by the Executive Officer.

If monitoring consistently shows no significant variation in magnitude of a constituent concentration or parameter after a statistically significant number of sampling events, the Discharger may request this MRP be revised by the Executive Officer to reduce the monitoring frequency or to minimize the list of constituents. The proposal must include adequate technical justification for reduction in monitoring frequency.

EFFLUENT MONITORING

Effluent samples shall be representative of the volume and nature of the discharges. Detection limits shall be equal to or more precise than USEPA methodologies. Analysis with an MDL greater than the most stringent drinking water standard that results in non-detection needs to be reanalyzed with the MDL set lower than the drinking water standard or at the lowest level achievable by the laboratory.

If the discharge 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 constituents listed below, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge.

Discharge 001

The Discharger shall monitor the volume and quality of produced wastewater downstream of California Resources Production Corporation’s Station 23 Treatment Facility and prior to the discharge to any of North Kern Water Storage District’s conveyance facilities (i.e., canals, pipelines, and spreading basins). Effluent monitoring for Discharge 001 shall include at least the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>
Flow	mgd	Metered ¹	Daily
Table I – Water Quality Monitoring	Varies	Grab	Varies

¹ Flow may be measured with an appropriate engineered alternative if approved in writing by the Executive Officer.

Discharge 002

The Discharger shall monitor the volume and quality of blended produced wastewater (California Resources Production Corporation’s produced water, surface water, and/or groundwater) downstream of the mixing area in the Lerdo Canal and prior to the discharge to District farmlands. Effluent monitoring for Discharge 002 shall include at least the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>
Produced Wastewater ¹	ac-ft/d ²	Metered	Daily
Non-Produced Wastewater ¹	ac-ft/d	Metered ³	Daily
Total Discharge	ac-ft/d	Calculated	Daily
Blending Ratio ⁴	-	Calculated	Monthly
Table I – Water Quality Monitoring	Varies	Grab	Varies

¹ Volumes shall be monitored and all sources of water defined in each monitoring report (e.g., oil extraction wells, irrigation wells, or surface water sources).

² Acre-feet per day.

³ Metered or alternatively calculated by the Discharger based on pump efficiencies or weir observations.

⁴ The blending ratio shall be calculated using the sum of non-produced wastewater and produced wastewater that are blended and used for irrigation.

Discharge 003

The Discharger shall monitor the volume of the discharge to the Rosedale Spreading Basins. Effluent monitoring for Discharge 003 shall include at least the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>
Produced Wastewater ¹	ac-ft/d ²	Metered ³	Daily
Non-Produced Wastewater ¹	ac-ft/d	Metered ³	Daily
Total Discharge ⁴	ac-ft/d	Calculated	Daily
Blending Ratio ⁵	-	Calculated	Monthly

¹ Volumes shall be monitored and all sources of water defined in each monitoring report (e.g., oil extraction wells, irrigation wells, or surface water sources).

² Acre-feet per day.

³ Metered or alternatively calculated by the Discharger based on pump efficiencies or weir observations.

⁴ This includes the total volume of produced wastewater and non-produced wastewater discharged to the Rosedale Spreading Basins.

⁵ The Blending Ratio shall be calculated using the sum of non-produced wastewater and produced wastewater that are blended and used for irrigation.

CHEMICAL AND ADDITIVE MONITORING

The Discharger shall monitor all chemicals and additives used during petroleum exploration, production, and/or treatment that have the potential to be in produced wastewater discharged to the Lerdo Canal or Rosedale Spreading Basins. Chemical and additive monitoring shall include at least the following:

<u>Requirement</u>	<u>Frequency</u>
A list of all chemicals and additives used.	Quarterly
The volume and mass of each chemical and additive used in gallons and kilograms.	Quarterly
A list of the leases and facilities where the chemicals and additives are being used.	Quarterly
Safety Data Sheets for each chemical and/or additive.	Annually

GROUNDWATER MONITORING

The Discharger shall monitor eight groundwater wells (seven groundwater extraction wells and one first encountered groundwater monitoring well) completed in the Rosedale Spreading Basin. After measuring water levels and prior to collecting samples, each 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 is typically from 3 to 5 volumes of the standing water within the well casing and screen, or additionally the filter pack pore volume. Low-flow sampling techniques (purging only the volume of the dedicated tubing) can be used with prior approval from the Executive Officer.

The following wells shall be used in the required assessment.

<u>Well Number</u>	<u>Well Purpose</u>	<u>Location in Spreading Basin</u>
99-0-22	Extraction	North boundary of basin.
99-0-17	Extraction	Northwest corner of basin.
99-0-18	Extraction	East boundary of basin.
99-2-4	Extraction	North/central portion of basin.
99-2-6	Extraction	South/central portion of basin.
99-2-8	Extraction	South boundary of basin.
99-4-5	Extraction	West boundary of basin.
MW-4	Monitoring	Central Portion of basin.

Groundwater samples shall be representative of the volume and nature of the source. Detection limits shall be equal to or more precise than USEPA methodologies. Analysis with an MDL greater than the most stringent drinking water standard that results in non-detection needs to be reanalyzed with the MDL set lower than the drinking water standard or at the lowest level achievable by the laboratory.

The Discharger shall monitor the eight wells and any additional wells installed, for the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>
Depth to groundwater	Feet ¹	Measured	Quarterly
Groundwater elevation	Feet ²	Calculated	Quarterly
Volume of groundwater ³	ac-ft	Calculated	Monthly
Table II – Groundwater Quality Monitoring ⁴	Varies	Grab	Quarterly

¹ To the nearest hundredth of a foot.

² To the nearest hundredth of a foot above Mean Sea Level.

³ Individual volumes of groundwater pumped from each well shall be monitored.

⁴ All extraction wells that are active during a quarter shall be sampled, despite the numbers of days the extraction well is active. If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall collect a groundwater sample from the extraction wells. Extraction wells that are inactive for two consecutive quarters shall be sampled during the second quarter the well is inactive. Extraction wells that are inactive for more than two quarters shall be sampled every other quarter until active.

Within 30 days of notification that a well is no longer able to be sampled, the Discharger shall submit for review and approval by Central Valley Water Board staff a report that either: (1) demonstrates that a reduction in the number of monitoring wells will not impair the ability to clearly and accurately assess potential groundwater impacts, or (2) proposes the installation of a new monitoring well(s) to offset the well(s) that is no longer able to be sampled.

REPORTING REQUIREMENTS

All monitoring results shall be reported in Quarterly Monitoring Reports, which are due by the first day of the second month after the calendar quarter. Therefore, monitoring reports are due as follows:

First Quarter Monitoring Report:	1 May
Second Quarter Monitoring Report:	1 August
Third Quarter Monitoring Report:	1 November
Fourth Quarter Monitoring Report:	1 February

A transmittal letter shall accompany each monitoring report. The transmittal letter shall discuss any violations that occurred during the reporting period and all actions taken or planned for correcting violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions or a time schedule for implementing the corrective actions, reference to the previous correspondence is satisfactory. **Reports shall be submitted whether or not there is a discharge.**

The Discharger shall submit electronic copies of all work plans, reports, laboratory reports, chain of custody, Excel tables, and groundwater elevation data over the Internet to the State Water Board Geographic Environmental Information Management System database (GeoTracker) at http://www.waterboards.ca.gov/ust/electronic_submittal/index.shtml.

Frequently asked questions for GeoTracker can be found at http://www.waterboards.ca.gov/ust/electronic_submittal/docs/faq.pdf.

Electronic submittals shall comply with GeoTracker standards and procedures, as specified on the State Water Board's website. Uploads to GeoTracker shall be completed on or prior to the due date. In addition, a hardcopy of each document shall be submitted to:

California Regional Water Quality Control Board
Central Valley Region
1685 E Street, Suite 200
Fresno, CA 93706
Attn: Ronald E. Holcomb

The following information is to be included on all monitoring reports, as well as report transmittal letters:

California Resources Production Corporation and North Kern Water Storage District
Produced Water Reclamation Project
Monitoring and Reporting Program Order No. R5-2015-0127
GeoTracker Site Global ID: T10000009275

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible for all historical and current data. The data shall be summarized in such a manner that illustrates clearly, whether the Discharger complies with waste discharge requirements. Tables generated in Microsoft Excel shall be submitted online to GeoTracker.

A complete list of substances which are tested for and reported on by the testing laboratory shall be provided to the Central Valley Water Board. In addition, all sample result peaks, method detection limit (MDL), and the practical quantification limit (PQL) shall be reported in tabular form with historical and current data. All quality assurance/quality control (QA/QC) samples must be run on the same dates when samples were actually analyzed. Proper chain of custody procedures must be followed and a copy of the completed chain of custody form shall be submitted with the laboratory report. All analyses must be performed by an Environmental Laboratory Accreditation Program (ELAP) certified laboratory.

In addition to the details specified in Standard Provision C.3, monitoring information shall include the MDL and the Reporting limit (RL) or PQL. If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated. All analytical results included each monitoring report shall be accompanied by a signed laboratory report and chain of custody that is submitted in GeoTracker.

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 quarterly monitoring reports. Such increased frequency shall be indicated on the quarterly monitoring reports.

All monitoring reports shall comply with the signatory requirements in Standard Provision B.3. All monitoring reports that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1.

The Discharger shall maintain all sampling and analytical results: date, exact place, and time of sampling; dates analyses were performed; analyst's name; analytical techniques used; and results of all analyses. Such records 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 Central Valley Water Board.

A. All Quarterly Monitoring Reports shall include the following:

Effluent reporting:

1. Tabular summary of current and historical results as specified on pages 2 and 3.
2. For each month of the quarter, calculation of the maximum daily flow and the monthly average flow.
3. For each month of the quarter, calculation of the 12-month rolling average electrical conductivity (EC) of the discharge using the EC value for that month averaged with the EC values for the previous 11 months.
2. If there is no fluid discharged to the Rosedale Spreading Basins during the quarter, the monitoring report shall clearly indicate this.
3. Site map or description that clearly indicates the location of each water sample.

Chemical and additive reporting:

1. Tabular summary of results as specified on page 3.
2. New chemical and additives, or chemical and additives that are no longer used by the Discharger shall be clearly identified in the monitoring report.

Groundwater reporting:

1. Tabular summary of current and historical results as specified on pages 3 and 4.
2. A groundwater contour map based on groundwater elevations for that quarter. The map shall show the gradient and direction of groundwater flow under/around the facility and/or effluent disposal area(s). The map shall also include the locations of monitoring wells and water storage and discharge areas.

B. **Fourth Quarter Monitoring Reports**, in addition to the above, by 1 February of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

Facility information:

1. The names and general responsibilities of all persons employed to operate the produced water treatment systems.
2. The names and telephone numbers of persons to contact regarding the Facility for emergency and routine situations.
3. A statement certifying when the flow meters and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.4).
4. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the Facility as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.
5. A summary of any changes in processing that might affect waste characterization and/or discharge flow rates.
6. A flow chart (i.e. diagram that clearly illustrates all processes that produced water undergoes from extraction to discharge to the Lerdo Canal or Rosedale Spreading Basins) and site map of the following:
 - Section 23 Facility;
 - Lerdo Canal blending area;
 - Rosedale Spreading Basins;
 - Sample locations; and
 - Delivery network between the Discharger's facilities.

Effluent reporting:

1. Tabular summary of the current and historical total annual and quarterly flows for the Lerdo Canal and Rosedale Spreading Basins as specified on pages 2 and 3.
2. Tabular summary of the current and historical average annual blending ratio.

Chemical and additive reporting:

1. Safety data sheets for all chemicals and additives that were identified in quarterly monitoring reports for that respective calendar year.
2. Tabular summary of the current and historical total annual volumes or weight of chemicals and additives that have the potential to enter produced wastewater.

Requesting Administrative Review by the State Water Board. Any person aggrieved by an action of the Central Valley Water Board that is subject to review as set forth in Water Code section 13320(a), may petition the State Water Board to review the action. Any petition must be made in accordance with Water Code section 13320 and California Code of Regulations, title 23, section 2050 and following. The State Water Board must receive the petition within thirty (30) days of the date the action was taken, except that if the thirtieth day following the date the action was taken falls on a Saturday, Sunday, or state holiday, then the State Water Board must receive the petition by 5:00 p.m. on the next business day. Copies of the laws and regulations applicable to filing petitions may be found on the internet at http://www.waterboards.ca.gov/public_notices/petitions/water_quality/index.shtml or will be provided upon request.

Modifications. Any modification to this Monitoring and Reporting Program shall be in writing and approved by the Assistant Executive Officer, including any extensions. Any written extension request by the Discharger shall include justification for the delay.

This Monitoring and Reporting Program shall be effective on the signature date below.

Ordered by: Clay I. Rodgers
for PAMELA C. CREEDON, Executive Officer
11/4/2016
(Date)

Table I – Water Quality Monitoring

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u> ¹¹	<u>Reporting Frequency</u>
<u>Field Parameters</u>				
Temperature	°F ¹	Monthly	Meter	Quarterly
Electrical Conductivity	µmhos/cm ²	Monthly	Meter	Quarterly
pH	pH units	Monthly	Meter	Quarterly
<u>Monitoring Parameters</u>				
Total Dissolved Solids (TDS)	mg/L ³	Monthly	160.1	Quarterly
Total Suspended Solids (TSS)	mg/L	Monthly	160.2	Quarterly
Electrical Conductivity	µmhos/cm	Monthly	2510B	Quarterly
Total Organic Carbon (TOC)	mg/L	Monthly	415.3	Quarterly
Boron, dissolved	mg/L	Monthly	6010B	Quarterly
<u>Standard Minerals</u>				
Alkalinity as CaCO ₃	mg/L	Monthly	310.1	Quarterly
Bicarbonate Alkalinity as CaCO ₃	mg/L	Monthly	310.1	Quarterly
Carbonate Alkalinity as CaCO ₃	mg/L	Monthly	310.1	Quarterly
Hydroxide Alkalinity as CaCO ₃	mg/L	Monthly	310.1	Quarterly
Sulfate, dissolved	mg/L	Monthly	300.0	Quarterly
Nitrate N, dissolved	mg/L	Monthly	300.0	Quarterly
Calcium, dissolved	mg/L	Monthly	6010B	Quarterly
Magnesium, dissolved	mg/L	Monthly	6010B	Quarterly
Sodium, dissolved	mg/L	Monthly	6010B	Quarterly
Potassium	mg/L	Monthly	6010B	Quarterly
Chloride	mg/L	Monthly	300.0	Quarterly
<u>PAHs</u> ⁴	µg/L ⁵	Quarterly	8270	Quarterly
<u>Total Petroleum Hydrocarbons (TPH)</u>	µg/L	Quarterly	418.1	Quarterly
<u>Volatile Organic Compounds</u>				
Full Scan	µg/L	Bi-Monthly ⁶	8260B	Quarterly
<u>Stable Isotopes</u>				
Oxygen (¹⁸ O)	o/oo ⁷	Quarterly	900.0	Quarterly
Deuterium (Hydrogen 2, ² H, or D)	o/oo	Quarterly	900.0	Quarterly
<u>Radionuclides</u>				
Radium 226	pCi/L ⁸	Quarterly	SM ⁹ 7500 Ra	Quarterly
Radium 228	pCi/L	Quarterly	SM 7500 Ra	Quarterly
Gross Alpha particle (excluding radon and uranium)	pCi/L	Quarterly	SM 7110	Quarterly
Uranium	pCi/L	Quarterly	200.8	Quarterly

Table I – Water Quality Monitoring (continued)

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
<u>Oil and Grease</u>	mg/L	Monthly	1664A	Quarterly
<u>Constituents of Concern</u>				
Lithium	mg/L	Quarterly	200.7	Quarterly
Strontium	mg/L	Quarterly	200.7	Quarterly
Iron	mg/L	Quarterly	200.8	Quarterly
Manganese	mg/L	Quarterly	200.8	Quarterly
Antimony	mg/L	Quarterly	200.8	Quarterly
Arsenic	mg/L	Quarterly	200.8	Quarterly
Barium	mg/L	Quarterly	200.8	Quarterly
Beryllium	mg/L	Quarterly	200.8	Quarterly
Cadmium	mg/L	Quarterly	200.8	Quarterly
Chromium (total)	mg/L	Quarterly	200.8	Quarterly
Chromium (hexavalent)	mg/L	Quarterly	7196A	Quarterly
Cobalt	mg/L	Quarterly	200.8	Quarterly
Copper	mg/L	Quarterly	200.8	Quarterly
Lead	mg/L	Quarterly	200.8	Quarterly
Mercury	mg/L	Quarterly	7470A	Quarterly
Molybdenum	mg/L	Quarterly	200.8	Quarterly
Nickel	mg/L	Quarterly	200.8	Quarterly
Selenium	mg/L	Quarterly	200.8	Quarterly
Silver	mg/L	Quarterly	200.8	Quarterly
Thallium	mg/L	Quarterly	200.8	Quarterly
Vanadium	mg/L	Quarterly	200.8	Quarterly
Zinc	mg/L	Quarterly	200.8	Quarterly
<u>Oil Production and Process Chemicals and Additives</u> ¹⁰	µg/L	Quarterly	As Appropriate ⁹	Quarterly

¹ Degrees Fahrenheit

² Micromhos per centimeter

³ Milligrams per liter

⁴ Polycyclic aromatic hydrocarbons

⁵ Micrograms per liter

⁶ Samples shall be collected every other month

⁷ Parts per thousand

⁸ Picocuries per liter

⁹ Standard Methods

¹⁰ The Discharger shall provide analytical results for all chemicals and additives used (both in the current quarter and historically) in the production and or processing of all oil and wastewater discharged into surface impoundments or on to the ground surface as described under the Chemical and Additive Monitoring section of the MRP for which there are ELAP approved analyses. For those constituents for which there are not ELAP approved analytical methods, the Discharger shall submit a technical report describing how it intends to address this issue.

¹¹ Appropriate analytical methods may be proposed by the Discharger but are subject to the approval of the Assistant Executive Officer.

Table II – Groundwater Quality Monitoring

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u> ¹⁰	<u>Reporting Frequency</u>
<u>Field Parameters</u>				
Temperature	°F ¹	Quarterly	Meter	Quarterly
Electrical Conductivity	µmhos/cm ²	Quarterly	Meter	Quarterly
pH	pH units	Quarterly	Meter	Quarterly
<u>Monitoring Parameters</u>				
Total Dissolved Solids (TDS)	mg/L ³	Quarterly	160.1	Quarterly
Total Organic Carbon (TOC)	mg/L	Quarterly	415.3	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly	2510B	Quarterly
Boron, dissolved	mg/L	Quarterly	6010B	Quarterly
<u>Standard Minerals</u>				
Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Bicarbonate Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Carbonate Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Hydroxide Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Sulfate, dissolved	mg/L	Quarterly	300.0	Quarterly
Nitrate N, dissolved	mg/L	Quarterly	300.0	Quarterly
Calcium, dissolved	mg/L	Quarterly	6010B	Quarterly
Magnesium, dissolved	mg/L	Quarterly	6010B	Quarterly
Sodium, dissolved	mg/L	Quarterly	6010B	Quarterly
Potassium	mg/L	Quarterly	6010B	Quarterly
Chloride	mg/L	Quarterly	300.0	Quarterly
<u>PAHs</u> ⁴	µg/L ⁵	Quarterly	8270	Quarterly
<u>Total Petroleum Hydrocarbons (TPH)</u>	µg/L	Quarterly	418.1	Quarterly
<u>Volatile Organic Compounds</u>				
Full Scan	µg/L	Quarterly	8260B	Quarterly
<u>Stable Isotopes</u>				
Oxygen (¹⁸ O)	o/oo ⁶	Quarterly	900.0	Quarterly
Deuterium (Hydrogen 2, ² H, or D)	o/oo	Quarterly	900.0	Quarterly
<u>Radionuclides</u>				
Radium 226	pCi/L ⁷	Quarterly	SM ⁸ 7500 Ra	Quarterly
Radium 228	pCi/L	Quarterly	SM 7500 Ra	Quarterly
Gross Alpha particle (excluding radon and uranium)	pCi/L	Quarterly	SM 7110	Quarterly
Uranium	pCi/L	Quarterly	200.8	Quarterly

Table II – Groundwater Quality Monitoring (continued)

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
<u>Oil and Grease</u>	mg/L	Quarterly	1664A	Quarterly
<u>Constituents of Concern</u>				
Lithium	mg/L	Quarterly	200.7	Quarterly
Strontium	mg/L	Quarterly	200.7	Quarterly
Iron	mg/L	Quarterly	200.8	Quarterly
Manganese	mg/L	Quarterly	200.8	Quarterly
Antimony	mg/L	Quarterly	200.8	Quarterly
Arsenic	mg/L	Quarterly	200.8	Quarterly
Barium	mg/L	Quarterly	200.8	Quarterly
Beryllium	mg/L	Quarterly	200.8	Quarterly
Cadmium	mg/L	Quarterly	200.8	Quarterly
Chromium (total)	mg/L	Quarterly	200.8	Quarterly
Chromium (hexavalent)	mg/L	Quarterly	7196A	Quarterly
Cobalt	mg/L	Quarterly	200.8	Quarterly
Copper	mg/L	Quarterly	200.8	Quarterly
Lead	mg/L	Quarterly	200.8	Quarterly
Mercury	mg/L	Quarterly	7470A	Quarterly
Molybdenum	mg/L	Quarterly	200.8	Quarterly
Nickel	mg/L	Quarterly	200.8	Quarterly
Selenium	mg/L	Quarterly	200.8	Quarterly
Silver	mg/L	Quarterly	200.8	Quarterly
Thallium	mg/L	Quarterly	200.8	Quarterly
Vanadium	mg/L	Quarterly	200.8	Quarterly
Zinc	mg/L	Quarterly	200.8	Quarterly
<u>Oil Production and Process Chemicals and Additives</u> ⁹	µg/L	Quarterly	As Appropriate ¹⁰	Quarterly

¹ Degrees Fahrenheit

² Micromhos per centimeter

³ Milligrams per liter

⁴ Polycyclic aromatic hydrocarbons

⁵ Micrograms per liter

⁶ Parts per thousand

⁷ Picocuries per liter

⁸ Standard Methods

⁹ The Discharger shall provide analytical results for all chemicals and additives used (both in the current quarter and historically) in the production and or processing of all oil and wastewater discharged into surface impoundments or on to the ground surface as described under the Chemical and Additive Monitoring section of the MRP for which there are ELAP approved analyses. For those constituents for which there are not ELAP approved analytical methods, the Discharger shall submit a technical report describing how it intends to address this issue.

¹⁰ Appropriate analytical methods may be proposed by the Discharger but are subject to the approval of the Assistant Executive Officer