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Central Valley Regional Water Quality Control Board

16 October 2018

Mr. William Miller
Operator
Central Pacific Resources
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NOTICE OF APPLICABILITY (NOA), CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD, ORDER R5-2017-0036, WASTE DISCHARGE REQUIREMENTS FOR OIL FIELD DISCHARGES TO LAND, GENERAL ORDER NUMBER THREE, CENTRAL PACIFIC RESOURCES, LEHI RICHARDSON LEASE, CYMRIC OIL FIELD, KERN COUNTY

On 6 November 2017, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) received a document titled, *Second Addendum to the Notice of Intent for Coverage Under Central Valley Water Board General Order R5-2017-0036, Discharges of Oil Field Waste to Land: Central Pacific Resources, Lehi-Richardson Lease and USL Lease, Cymric Field, Kern County, California*. Previous versions of the document were submitted to the Central Valley Water Board on 23 May 2017 and 25 July 2017 (herein collectively referred to as the Notice of Intent or NOI).

The NOI describes Central Pacific Resources' intention to obtain regulatory coverage under Order R5-2017-0036, Waste Discharge Requirements General Order for Oil Field Discharges to Land, General Order Three (General Order Three). The Notice of Intent was prepared by Central Pacific Resources' consultant Mark Magahee.

Central Pacific Resources (CPR or discharger) operates the Lehi-Richardson Lease in the Cymric Oil Field in section 7, T29S, R21E, MDB&M in Kern county (Lease or facility). The Lease has three unlined surface impoundments (ponds) that receive discharges of oil field produced wastewater (produced water or discharge).

This letter serves as formal notice that General Order Three is applicable to CPR's discharges at the Lease. General Order Number **R5-2017-0036-006** is hereby assigned to all produced wastewater discharges into the pond. CPR should become familiar with all the requirements, time schedules, prohibitions, and provisions of General Order Three, and the associated Monitoring and Reporting Program R5-2017-0036 (MRP).

Cleanup and Abatement Order No. R5-2015-0749 (CAO) was issued to CPR on 1 December 2015 for ponds at the Lehi-Richardson Lease and the USL Lease in the Cymric Oil Field. This letter serves as formal notice that the portions of the CAO that apply to the Lehi-Richardson Lease are hereby rescinded.

General Order Three regulates the discharge of produced water into ponds. As stated in Water Code section 13263, all discharges of waste into waters of the state are privileges, not rights. General Order Three does not create a vested right for CPR to continue the discharges to the

ponds. Failure to prevent conditions that create or threaten to create pollution or nuisance or cause degradation of groundwater, will be sufficient reason to modify, revoke, or enforce the provisions of General Order Three, as well as prohibit further discharge.

In 2006, the Central Valley Water Board, the State Water Resources Control Board (State Water Board), and regional stakeholders began a joint effort to address salinity and nitrate problems in the region and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity and nitrate management program. The CV-SALTS effort might effect changes to the Basin Plan that would necessitate the re-opening of General Order Three.

FACILITY SPECIFIC REQUIREMENTS

1. CPR shall maintain exclusive control of the discharge and shall comply with all of the requirements and timelines of General Order Three and the MRP.
2. The required annual fee specified in the annual billing from the State Water Board shall be paid until coverage for the Lease under General Order Three is officially terminated. CPR must notify the Central Valley Water Board in writing to request termination.
3. Under Discharge Specifications, Item B.2., General Order Three states: *“The discharge flow shall not exceed actual maximum monthly average produced wastewater flow to the pond between 26 November 2004 and 26 November 2014. The discharge flow also shall not exceed the maximum design flow of the Facility’s limiting unit as described by the technical data in the NOI.”* The “design capacity” of the ponds is identified in the NOI as being approximately 17,350 cubic feet with the two feet of freeboard. CPR has provided an estimation of the maximum monthly average flow into the pond as being approximately 2,700 barrels and shall not be exceeded. Any increase in discharge volume that would exceed the maximum monthly average flow constitutes a facility expansion requiring an evaluation under the California Environmental Quality Act (CEQA).
4. CPR shall not discharge produced water outside of the pond except for permitted dust control use. If CPR intends to apply for use of produced wastewater for dust control, a proposed management plan as described in Provision E.6 of General Order Three must be submitted at least **90 days prior** to the anticipated discharges.
5. An engineered alternative may be proposed to satisfy Provision E.3 of General Order Three, which states that CPR must submit written certification that acceptable flow meters have been installed at a location or locations to ensure the accurate measurement of all discharge flows.

To use an engineered alternative, the discharger must have an approval in writing from the Central Valley Water Board’s Executive Officer. The NOI states that volumes of produced water are measured intermittently by a tank gauging method. The tank

gauging method uses a strapping chart, which compares the height of the fluid in the tank to the fluid volume. When measuring produced water, the Lease operator uses a plumb bob tape measure before and after produced water is discharged into ponds. The volume is calculated by subtracting the closing volume from the original volume. This method is hereby approved.

6. **By 17 December 2018**, CPR shall, pursuant to Provision E.4. of General Order Three, submit either:
 - a. The results of a hydrogeological investigation demonstrating that there is no groundwater beneath the ponds and that produced wastewater and constituents associated with other approved wastes discharged at the Lease will not migrate into areas where there is groundwater with designated beneficial uses. Upon the written concurrence of the investigation results by the Executive Officer, this provision shall be considered satisfied; or,
 - b. If there is first encountered groundwater underlying the Lease or the Executive Officer does not concur with the results of the investigation in Provision E.4.a., above, the Discharger shall demonstrate that the natural background groundwater quality for the Lease meets the Sources of Drinking Water Policy exception criteria and/or parallel exception criteria outlined in General Order Three (Findings 22 through 24) and thus the current Basin Plan groundwater beneficial uses are eligible for de-designation in accordance with the compliance schedule provided in Tasks 1 through 10 of Provision 4.b.

The NOI states that the first encountered fluids underlying the ponds is crude oil. The NOI states that geophysical logs show that wells on the Lease exhibit a condition referred to as "No Top Water," which describes a condition where hydrocarbons are the first encountered fluids in a well. This is interpreted as demonstrating that there are no designated beneficial uses for the groundwater beneath the ponds.

However, geophysical log data from wells and monitoring well data indicates that the first encountered fluid in some portions of the Cymric Oil Field is groundwater. For example, a well referenced in the NOI, the Miller and Lux Well (API # 02936424), encountered water in sediments between 685 to 700 feet bgs, whereas oil was not encountered until 1,225 feet bgs. A separate well near the Lease (API # 02939371) appeared to encounter water at approximately 200 feet bgs. In the same well, oil was not encountered until 928 feet bgs. In addition, Central Valley Water Board staff have observed the drilling of monitoring wells in the Cymric Oil Field at a facility operated by Incremental Oil and Gas Holdings, Inc (Incremental Facility). Groundwater was determined to be the first encountered fluids at the Incremental Facility, which is located approximately 9,000 feet southeast of CPR's ponds. CPR must clearly demonstrate whether crude oil is the first encountered fluid beneath the CPR ponds.

CPR must also demonstrate, per Provision E.4., that constituents from the discharge will not migrate to into areas where there is groundwater with designated beneficial uses.

The NOI states that the Bacon Hills Fault (BHF) acts as a hydraulic barrier and provides a subsurface boundary, further isolating the discharge from the greater San Joaquin Valley. Central Valley Water Board's staff review of information regarding the BHF found that the BHF may be located west of the ponds and may not act as a hydraulic barrier. This attribute of the BHF, and its location relative to the Lease, needs to be assessed.

7. CPR shall operate and maintain the pond sufficiently to protect the integrity of containment and berms and prevent overtopping and/or structural failure. Discharges not authorized by the General Order and not described in the NOI should be reported to Central Valley Water Board. The discharge of wastes other than those described in the NOI is prohibited. If the method of waste disposal changes, CPR must submit a Report of Waste Discharge (Form 200).
8. Dischargers proposing to reuse solids for road mix shall submit a solids management plan. CPR shall, pursuant to Provision E.7 of General Order Three, submit a solids management plan for approval by the Executive Officer at least **180 days prior** to solids reuse. This plan shall include the information required by Provision E.7.
9. Order Number 2014-0057-DWQ (NPDES General Permit CAS000001) specifies requirements for discharges of storm water associated with industrial activities. According to information provided with the NOI, the discharge is contained within the ponds. The NOI reports that, *"All of the tanks and produced water disposal ponds are surrounded by two to three-foot-high berms and are fenced and netted. These features result in there being no potential for the commingling of produced water with storm water. Furthermore, none of the local drainages are considered to be connected to navigable waters of the United States. ... Therefore, the Lease is exempt from the requirement to obtain coverage under the Industrial Storm Water Permit."*

Based on the information submitted in the NOI, coverage under NPDES General Permit CAS000001 is not needed at this time. If the conditions or regulatory policies change, the Lease may need coverage under NPDES General Permit CAS000001.

The MRP associated with General Order Three requires extensive monitoring requirements. Failure to comply with the requirements in General Order Three and the MRP could result in an enforcement action as authorized by provisions of the California Water Code. A copy of General Order Three and the MRP is included with the enclosures to this notice. A copy can also be found online at:
https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2017-0036.pdf.

The MRP includes monitoring and reporting of chemicals and additives. CPR should become familiar with those requirements. The Central Valley Water Board will review the MRP periodically and revise requirements when necessary. The MRP can be modified if CPR provides sufficient data to support the proposed changes. If monitoring consistently shows no significant variation in magnitude of a constituent concentration or parameter after a statistically significant number of sampling events, CPR may request the MRP be revised by the Executive

Officer to reduce monitoring frequency or minimize the list of constituents. The proposal must include adequate technical justification for a reduction in monitoring frequency.

CPR must comply with the Central Valley Water Board's Standard Provisions and Reporting Requirements for Waste Discharge Requirements, dated 1 March 1991 (Standard Provisions). A copy of the Standard Provisions is included with the enclosures to this notice.

A copy can be found online at:

https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/std_provisions/wdr-mar1991.pdf.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review this action in accordance with Water Code section 13320 and CCR, title 23, division 3, chapter 6, section 2050 and those that follow. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Notice of Applicability, except that if the thirtieth day following the date falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day.

SUBMISSIONS

Documents associated with the Lease, that are less than 50 MB must be sent via electronic mail to: centralvalleyfresno@waterboards.ca.gov. Documents that are 50 MB or larger can be mailed to the Central Valley Water Board office at 1685 E Street, Fresno, CA 93706.

CPR shall submit electronic PDF copies of all work plans, reports, analytical results, 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. CPR shall note that GeoTracker only accepts PDF files.

A frequently asked question document 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 web site. Uploads to GeoTracker shall be completed on or prior to the due date. The GeoTracker site Global I.D. number that is associated with this NOA is:

T10000007036.

Please review the attached memorandum. If you have any questions regarding this matter, please contact Rebecca T. Asami of this office at (559) 445-5548 or at rebecca.asami@waterboards.ca.gov.



for Patrick Pulupa
Executive Officer

Enclosures: 16 October 2018 Memorandum
General Order Three
1 March 1991 Standard Provisions

cc: Cameron Campbell, Chief Deputy of the Division of Oil Gas and Geothermal Resources,
Bakersfield (NOA and Memorandum only, via email)
Mark Magargee, Consultant, Bakersfield
Keith Nakatani, Oil and Gas Program Manager, Clean Water Action
(NOA and Memorandum only, via email)
Andrew Grinberg, National Campaigns Special Projects Manager, Clean Water Action
(NOA and Memorandum only, via email)
Bill Allayaud, California Director of Government Affairs, Environmental Working Group
(NOA and Memorandum only, via email)

Central Valley Regional Water Quality Control Board

TO: Clay Rodgers
Assistant Executive Officer

W. Dale Harvey
Supervising Engineer
RCE No. 55628

FROM: Michael L. Pfister *MLP*
Senior Engineering Geologist
PG No. 5946

Rebecca T. Asami *RT*
Engineering Geologist

DATE: 16 October 2018

SUBJECT: NOTICE OF INTENT REVIEW, CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD, ORDER R5-2017-0036, WASTE DISCHARGE REQUIREMENTS GENERAL ORDER FOR DISCHARGES TO LAND, GENERAL ORDER THREE, CENTRAL PACIFIC RESOURCES, LEHI-RICHARDSON LEASE, CYMRIC OIL FIELD, KERN COUNTY

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The NOI presents Central Pacific Resources' rationale for regulatory coverage under Order R5-2017-0036, Waste Discharge Requirements General Order for Oil Field Discharges to Land, General Order Three (General Order Three). The NOI was prepared by Central Pacific Resources' consultant Mark Magargee. This memorandum provides a summary of the NOI.

Location

Central Pacific Resources (CPR or discharger) operates the Lehi-Richardson Lease in the Cymric Oil Field in section 7, T29S, R21E, MDB&M in Kern county (Lease).

SUBMITTED INFORMATION

Lease Description

The Lease utilizes three unlined surface impoundments (ponds) for disposal of oil field produced water (produced water or discharge) by evaporation and percolation. Oil is produced by primary recovery; no stimulation activities occur in the wells on the Lease. According to the NOI, additives (emulsion breakers) are used when oil is heated in preparation for shipping. Oil is stored in tanks, which are used to separate oil from water via gravity. Produced water is discharged to the ponds intermittently. All of the produced water generated at the Lease is disposed of in the ponds. According to the NOI, none of the produced water is used for dust control, the construction of berms, or fire protection. CPR has committed to submitting a management plan prior to reusing produced water on the Lease.

CPR has implemented a Spill Prevention Control and Countermeasure Plan (SPCCP) on the Lease. The Lease tanks and ponds are surrounded by berms, which provide secondary containment and prevent produced water from comingling with storm water. The ponds are fenced and netted to preclude wildlife. The ponds' dimensions are as follows:

Pond Number	Length (feet)	Width (feet)	Depth (feet)	Volume (cubic feet)	Volume (gallons)
Pond One	80	40	6	19,200	143,626
Pond Two	30	15	5	2,250	16,831
Pond Three	40	40	7	11,200	83,781

Discharge Characteristics

As per Discharge Specifications, Item B.2., of General Order Three, the discharge volume shall not exceed maximum monthly average produced wastewater flow to the ponds between 26 November 2004 and 26 November 2014. According to information submitted in the NOI, with two feet of freeboard, the ponds have a capacity of approximately 3,945 barrels. The NOI states that since November 2004, the maximum monthly average flow to the ponds was approximately 2,700 barrels. This flow volume shall not be exceeded.

CPR must account for pond capacity, precipitation, regional evaporation rates, and required freeboard when calculating discharge volumes. The discharge volume also shall not exceed the maximum flow as per the ponds' design, as described in the Notice of Intent. The ponds must maintain two feet of freeboard.

The discharge was sampled on 17 December 2014, and yielded the following selected analytical results:

Constituent	Concentration	Units
Total Dissolved Solids (TDS)	22,000	Milligrams per Liter (mg/l)
Conductivity (EC)	36,000	Micromohs per centimeter (μ mohs/cm)
Chloride	10,000	mg/l
Boron	89	mg/l

According to the NOI, CPR does not generate hazardous waste on the Lease. Tank bottoms are periodically removed and are hauled off-site for disposal. CPR has committed to submitting a management plan before using oil field produced solids on the Lease. Any solids produced on the Lease and/ or removed from the ponds must be disposed of in an appropriately permitted facility or reused in a manner protective of water quality after a solids-reuse work plan has been approved by the Executive Officer.

Regional Characteristics

The Lease is located along the western margin of the San Joaquin Valley, near the Temblor Range. Average annual rainfall in the region is approximately six inches. Evaporation in the region occurs at a rate of approximately 80 inches per year. Isohyetal maps submitted with the NOI indicate that the 100-year, 24 hour, maximum precipitation is two inches. According to the NOI, several seasonal drainages cross the Lease, but the Lease is not located within a designated FEMA 100 or 500-year flood zone.

Sediments underlying the Lease consist of alluvium and are underlain by the Tulare Formation which outcrops near the Lease. The Tulare Formation consists of delta fan deposits, lacustrine deposits, and braided stream deposits. Tulare Formation sediments are highly permeable and have allowed hydrocarbons to accumulate in sediments underlying the Lease. The NOI states that in the Cymric Oil Field, crude oil is the first encountered fluid. This condition is referred to as "No Top Water".

According to the NOI, oil production at the Lease is controlled by the Bacon Hills Fault (BHF), a northwest southeast trending thrust fault. Hydrocarbons are trapped on the west side of the BHF. The NOI states that the BHF isolates the discharge and prevents it from migrating east in the sediments underlying the ponds.

POTENTIAL THREAT TO WATER QUALITY

General Order Three regulates oil field discharges where first encountered groundwater does not support beneficial uses as identified in the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, Revised January 2015* (Basin Plan). General Order Three applies to discharges that began prior to November 2014, are primarily from oil operations to land, and exceed the maximum oil field salinity limits for electrical conductivity, chloride, and boron contained in the Basin Plan.

Provision 4 of General Order Three

Provision 4 of General Order Three requires that CPR either:

- 1) demonstrate that “...*there is no groundwater beneath the Facility discharge areas and that produced wastewater and constituents associated with other approved wastes discharged at the Facility will not migrate into areas that there is groundwater with designated beneficial uses,*” or
- 2) obtain a Basin Plan amendment under the timeline outlined in General Order Three Provision 4.b.

The NOI states that the Lease’s “*hydrogeologic conditions demonstrate that there are no designated beneficial uses for the groundwater beneath the site and that a Basin Plan amendment is not required for the Lease.*”

The NOI includes geophysical logs which describe a condition of “No Top Water” in the sediments underlying the ponds. The NOI indicates that based on these logs, in the sediments underlying the ponds, first encountered fluids are crude oil.

Central Valley Water Board staff have reviewed geophysical logs from wells near the Lease. Information collected from geophysical logs and laboratory reports, indicates that first encountered fluid is groundwater in some portions of the Cymric Oil Field. For example, information collected from the Baker-Hall Well indicates that a small amount of groundwater was encountered before oil at a depth of about 65 feet bgs. Additional geophysical logs for wells nearby the Lease including the Miller and Lux Well (API # 02936424) and a separate well (API # 02939371), indicate that groundwater is encountered above the occurrence of oil near the ponds. In addition, Central Valley Water Board staff observed the drilling of monitoring wells at a facility operated by Incremental Oil and Gas Holdings, Inc. (Incremental Facility), located approximately 9,000 feet southeast of the CPR ponds. At the Incremental Facility, groundwater was determined to be first encountered fluid. First encountered fluids in the sediments underlying the Lease needs to be further assessed.

According to the NOI, the primary geologic structure containing the discharge to the east is the BHF. According to the NOI, the ability of the BHF to inhibit fluid movement is proven by an injection test performed by the Mobil Oil Company in 1987 (injection test). The injection test was performed at the Topeka Lease which lies 0.86 miles east of the ponds in section 6, T29S, R21E, MDB&M, in Kern County. The injection test occurred for 90 days and pumped saline water into wells rates that ranged between 900 and 10,000 barrels per day.

Regarding the injection test, the NOI states, “*Topeka Fee Well 1-6 received 73,400 barrels of saline produced water that were injected into Tulare Formation “air sands” in the interval from 160-400 fbg. Topeka Fee Well 2-6 received 4,500 barrels of saline produced water that were injected into Etchegoin Formation in the interval from 707 to 1696 fbg. The injection test further documents that produced water has been discharged into the unsaturated zone on the northeast side of the Bacon Hills Fault, and that the depth to first encountered fluids is substantially deeper on the northeastern side of the Bacon Hills Fault than the shallow*

occurrence of oil on the southwest side of the Bacon Hills Fault, further documenting that the Bacon Hills Fault, which extends to the surface, serves as a hydrologic boundary for fluid migration, isolating the fluids percolating beneath the subject ponds on the southwestern side of the Bacon Hills Fault.”

According to the NOI, produced water injected into Topeka Lease wells did not impact produced water generated on the Lease because the BHF acts as a hydraulic barrier. However, the NOI does not include any data collected from the Lease wells during the injection test, which makes it difficult to measure the effects of the BHF at the Lease. Furthermore, the Topeka Lease is more than one-half mile east of the ponds. Distance alone could impede the injectate from reaching sediments underlying the Lease.

Finally, the NOI states that the BHF traps fluids to the west. Figures included in the NOI depict the BHF at varying locations. If the BHF lies west of the ponds, the discharge could potentially migrate east even if the BHF acts as a hydraulic barrier. The potential for fluids to migrate needs to be further evaluated.

SUMMARY

Information submitted in the NOI indicates that the ponds meet the requirements for coverage under General Order Three. However, Provision 4 of General Order Three still must be satisfied. CPR must demonstrate that 1) the first encountered fluids are crude oil or groundwater without beneficial uses as designated by the Basin Plan and 2) the discharge will not migrate to waters of beneficial use or pursue a Basin Plan amendment following the time schedule outlined in General Order Three.

If CPR chooses to pursue a Basin Plan Amendment, then CPR must adhere to the time schedule described in General Order Three. CPR should note that the time schedule requires certain tasks to be completed by certain dates. If CPR cannot obtain a Basin Plan Amendment within the time frame described in General Order Three, then the discharge must cease.

If CPR does not choose to pursue a Basin Plan Amendment, and instead chooses to demonstrate that first encountered fluids are hydrocarbons and the discharge will not migrate to waters of beneficial uses, then that demonstration must be provided by **17 December 2018**. Hydrogeological information that supports the demonstration must be provided.