

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2016-00XX
INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS
FOR
OIL FIELD DISCHARGES TO LAND
GENERAL ORDER NUMBER THREE

APPLICABILITY

This Information Sheet provides information to support the findings and requirements contained in Waste Discharge Requirements General Order No. R5-2016-00XX, General Order No. 3 (hereafter, General Order). This General Order regulates discharges of produced wastewater and other discharges from oil production facilities to land within the Tulare Lake Basin of the Central Valley Region where the discharges meet the following requirements:

1. Discharges exceed the maximum salinity limits of the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, Revised January 2015* (with Approved Amendments) (Basin Plan). These salinity limits are discussed in more detail below.
2. The first encountered groundwater is of poor quality or there is no first encountered groundwater.
3. The first encountered groundwater does not support beneficial uses as identified in Basin Plan as Municipal and Domestic Supply (MUN), or Agricultural Supply (AGR), or Industrial Service Supply (IND) or Industrial Process Supply (PRO).

BACKGROUND

California ranks third in the U.S. in oil production. Based on 2014 data, approximately 74 percent of California's production occurs within the Central Valley. In most oil fields in California, the oil is comingled with formation water. This means that large quantities of water are extracted with the oil. Within the Central Valley, approximately 16 barrels of water are produced with each barrel of oil. Oil and gas production facilities separate the water from the oil. This separated water is called produced wastewater.

Many oil and gas production facilities within the Central Valley share many similarities. Facility components can include production wells, enhanced oil recovery wells, networks of pipelines, gas separators and dehydrators, oil and water separation units of various configurations and types (e.g. ponds, tank batteries, induced gas or air flotation

tanks commonly referred to as WEMCOs), storage units, produced wastewater treatment systems, and disposal systems that can include evaporation and percolation ponds or “ponds.” In some operations, produced wastewater is disposed of through underground injection wells permitted and regulated by California Department of Conservation’s Division of Oil, Gas, and Geothermal Resources (DOGGR). In some operations produced wastewater is further treated and reused in steam and power generation or injected as steam or water into the hydrocarbon reservoir to enhance oil recovery. This type of reuse is also regulated by DOGGR. High quality produced wastewater may also be reused to supplement agricultural water supplies. Other uses of produced wastewater of appropriate quality include oil field dust control and to aid in compaction on oil field construction projects. Sludge and solids removed from tanks are commonly mixed with soil and used to asphalt roads within the oil fields. This General Order includes specific requirements to regulate these discharges, with the exception of reuse for agricultural supplies, and ensure they do not cause pollution or nuisance conditions.

Beginning in May 2014, the Central Valley Water Board began an effort to re-evaluate its Oil Field Program with respect to discharges to ponds. Central Valley Water Board staff identified and inspected oil field production facilities with ponds. Staff found that there are approximately 326 facilities with 1100 ponds that receive produced wastewater. Approximately 241 facilities are discharging to ponds without waste discharge requirements. Approximately 85 facilities are discharging to ponds under WDRs that are twenty years old or older.

In response to the re-evaluation, Central Valley Water Board staff has issued various information and enforcement orders requiring those discharging without WDRs and those discharging under old WDRs to characterize their discharge practices and to provide information to support ongoing discharges, if feasible.

RATIONALE FOR ISSUING A GENERAL ORDER AND OTHER CONSIDERATIONS

Water Code section 13263(i) describes the criteria that the Central Valley Water Board must use to determine whether a group of facilities should be regulated under a general order (as opposed to individual orders). These criteria include:

1. The discharges are produced by the same or similar types of operations,
2. The discharges involve the same or similar types of wastes,
3. The discharges require the same or similar treatment standards, and
4. The discharges are more appropriately regulated under general WDRs rather than individual WDRs.

The discharges that can be covered under this General Order meet the above listed requirements of 13263(i).

Pursuant to Water Code section 13263(a), this General Order must implement the Basin Plan including consideration of the beneficial uses of water, the water quality objectives reasonably required for protection of those beneficial uses, other waste discharges, and the need to prevent nuisance conditions. Water quality objectives are the limits or levels of water quality constituents or characteristics that are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area (Water Code, section 13050(h)). Water quality objectives apply to all waters within a surface water or groundwater resource for which beneficial uses have been designated.

Pursuant to Water Code sections 13241 and 13263, the Central Valley Water Board, in establishing the requirements contained in this General Order, considered factors including, but not limited to, the following:

- a. Past, present, and probable future beneficial uses of water;
- b. Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;
- c. Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
- d. Economic considerations;
- e. The need for developing housing within the region(s); and
- f. The need to develop and use recycled water.

APPLICATION PROCESS

Dischargers seeking coverage under the General Order are required to file a Notice of Intent (NOI) (Equivalent to Report of Waste Discharge (RWD)), which includes the following:

1. A completed State Form 200, which is available at: http://www.waterboards.ca.gov/publications_forms/forms/docs/form200.pdf.
2. An application fee. Discharger's not operating under waste discharge requirements (WDRs) must submit an application fee that serves as the first annual fee. The fee is based on a threat to water quality (TTWQ) and Complexity (CPLX) rating of 3C and applicable surcharges as described in Title 23, California Code of Regulations (CCR), section 2200. The Dischargers with existing WDRs do not need to submit an application fee unless annual fees are due during the application process.
3. A technical report. The technical report must describe the wastewater generation, treatment, storage, reuse and disposal activities. The technical report must be prepared by a California registered civil engineer or engineering geologist. Attachment B to the General Order, *Information Needs Sheet* describes the information to be included in the technical report. Applicants are advised to inquire

with the Central Valley Water Board staff before performing investigations and/or preparing the technical report to ensure that the report will be complete.

After Central Valley Water Board staff review of the NOI, they will determine the appropriate TTWQ and CPLX rating of the discharge, and additional fees may be required. If the information in the NOI demonstrates that the coverage under the General Order is appropriate, the Central Valley Water Board's Executive Officer (Executive Officer) will authorize coverage under the General Order by issuing Notice of Applicability (NOA). The NOA will describe appropriate monitoring and reporting requirements.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

Water Quality Control Plans

The Basin Plan for the Tulare Lake Basin designates the beneficial uses of groundwater and surface waters within the Basin and specifies water quality objectives to protect those uses, and includes implementation plans for achieving water quality objectives. The Basin Plan also incorporates, by reference, plans and policies of the State Water Board. The requirements of the General Order are designed to ensure that discharges authorized therein comply with the Basin Plan.

Beneficial Uses of Surface Water and Groundwater

The Basin Plan identifies the beneficial uses of surface water as: municipal and domestic supply (MUN); agricultural supply (AGR); industrial process supply (IND); industrial service supply (PRO); hydro-power generation (POW); water contact recreation (REC-1); non-contact water recreation (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); migration of aquatic organisms (MIGR); spawning reproduction and/or early development (SPWN); wildlife habitat (WILD); navigation (NAV); rare, threatened, or endangered species (RARE); groundwater recharge (GRW); freshwater replenishment (FRSH); aquaculture (AQUA); and preservation of biological habitats of special significance (BIOL). The Basin Plan Table II-1 (Page II-4) lists the surface water bodies of the Tulare Lake Basin and the designated beneficial uses of those specific surface water bodies. Where surface water bodies are not listed, the Basin Plan designates beneficial uses based on the waters to which they are tributary.

Chapter II of the Basin Plan designates the beneficial uses of groundwater to include MUN, AGR, IND, PRO, REC-1, and WILD. Table II-2 of the Basin Plan lists specific designated beneficial uses of groundwater within each Detailed Analysis Unit of the Basin. Chapter II of the Basin Plan in Existing and Potential Beneficial Uses states:

Due to the "Sources of Drinking Water Policy," all ground waters are designated

MUN (the use may be existing or potential) unless specifically exempted by the Regional Water Board and approved for exemption by the State Water Board. Ground water areas exempted from MUN are footnoted in Table II-2. In addition, unless otherwise designated by the Regional Water Board, all ground waters in the Region are considered suitable or potentially suitable, at a minimum, for agricultural supply (AGR), industrial supply (IND), and industrial process supply (PRO).

Therefore, in accordance to the Basin Plan Sources of Drinking Water Policy (which is described in detail below), unless groundwater beneficial uses are de-designated, all ground waters of the Basin have the designated beneficial uses of MUN unless specifically are designated by the Central Valley Water Board. All ground waters are also designated as suitable or potentially suitable for AGR, IND, and PRO use. The current Basin Plan exempts a few limited areas from MUN as described in the Basin Plan Table II-2 footnote. Though Basin Plan Table II-2 also lists the designated beneficial uses within the listed Detailed Analysis Units (DAUs), due to their sizes, the listed uses may not exist throughout the DAUs. Also, some discharges do not fall within the DAUs.

Consideration of Sources of Drinking Water Policy

The Basin Plan under the Existing and Potential Beneficial Uses, on Page II-2 states that pursuant to Sources of Drinking Water Policy (Resolution No. 88-63), all groundwaters of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply and are so designated by the Regional Board. When considering exceptions to the beneficial use designation; the Basin Plan will employ the following criteria:

- a. The total dissolved solids (TDS) exceed 3,000 milligrams per liter (mg/L) (5,000 micromhos per centimeter ($\mu\text{mhos/cm}$) electrical conductivity) and it is not reasonably be expected by the Regional Boards to supply a public water system; or
- b. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices; or
- c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day; or
- d. The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, section 261.3.

Exceptions to the Sources of Drinking Water Policy are not self-implementing, but must be established in an amendment to the Basin Plan.

The Basin plan at Page II-3 states that to be consistent with the Sources of Drinking Water Policy in making exceptions to beneficial use designations other than MUN, the Central Valley Water Board will consider criteria for exceptions, parallel to Resolution No. 88-63 exception criteria, which would indicate limitations on those other beneficial uses as follows:

In making any exceptions to the beneficial use designation of agricultural supply (AGR), the Central Valley Water Board will consider the following criteria:

- a. There is pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for agricultural use using either Best Management Practices or best economically achievable treatment practices, or
- b. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day, or
- c. The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon, or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, section 261.3.

In making any exceptions to the beneficial use designation of industrial supply (IND or PRO), the Central Valley Water Board will consider the following criteria:

- a. There is pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for industrial use using either Best Management Practices or best economically achievable treatment practices, or
- b. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

Dischargers authorized under this General Order are those where the natural background groundwater quality meets the Sources of Drinking Water Policy exception criteria and/or parallel to exception criteria outlined above.

The Basin Plan at page I states:

Basin plans are adopted and amended by regional water boards under a structured process involving full public participation and state environmental review. Basin plans and amendments do not become effective until approved by the State Water Board. Regulatory provisions must be approved by the Office of Administrative Law.

Under this General Order, the current Basin Plan groundwater beneficial uses can be de-designated through a structured process, once the Discharger has demonstrated that there are sufficient scientific data available or will be available to support the de-designation of the current Basin Plan designated beneficial uses of MUN, AGR, IND, or PRO. The General Order includes a five year compliance time schedule to de-designate beneficial uses through a structured process, which is further described in this Information Sheet Provisions section.

Water Quality Objectives

Pursuant to Water Code section 13263(a), the General Order must implement the Basin Plan including consideration of the beneficial uses of water, the water quality objectives for protection of those beneficial uses, other waste discharges, and the need to prevent nuisance conditions. Water quality objectives are the limits or levels of water quality constituents or characteristics that are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area (Water Code, section 13050(h)). Water quality objectives apply to all waters within a surface water or groundwater resource for which beneficial uses have been designated. Water quality objectives are listed separately for surface water and groundwater in Chapter III of the Basin Plan and are either numeric or narrative. The water quality objectives are implemented in the General Order consistent with the Basin Plan's *Policy for Application of Water Quality Objectives*, which specifies that the Central Valley Water Board "will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives." To derive numeric limits from narrative water quality objectives, the Board considers relevant numerical criteria and guidelines developed and/or published by other agencies and organizations.

Chapter III of the Basin Plan under Water Quality Objectives for groundwater for salinity, states:

All ground waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use and management of water resources. No proven means exist at present that will allow ongoing human activity in the Basin and maintain ground water salinity at current levels throughout the Basin. Accordingly, the water quality objectives for ground water salinity control the rate of increase.

The maximum average annual increase in salinity measured as electrical conductivity shall not exceed the values specified in Table III-4 for each hydrographic unit shown on [Basin Plan] Figure III-1.

The Basin Plan requires waters designated as MUN to meet the State drinking water maximum contaminant levels (MCLs) specified in Title 22 for primary and secondary standards.

The Basin Plan establishes narrative water quality objectives for Chemical Constituents, Taste and Odors, and Toxicity. The Basin Plan states that when compliance with a narrative objective is required to protect specific beneficial uses, the Central Valley Water Board will, on a case-by-case basis, adopt numerical limitations in order to implement the narrative objective. In the absence of specific numerical water quality limits, the Basin Plan methodology is to consider any relevant published criteria.

Under this General Order, the background groundwater quality is poor and constituents of concern exceed the Basin Plan water quality objectives.

Basin Plan Effluent Limits

The Basin Plan is unique in that it sets specific effluent limits for oil field discharges to land for EC, chloride and boron and even more specific effluent limits for discharges associated with oil field activities. On page IV-15, the Basin Plan specifically states that the maximum salinity limits for wastewaters in unlined sumps overlying groundwater with existing and future probable beneficial uses are as follows:

Constituent	Maximum Limit
EC ($\mu\text{mhos/cm}$)	1000
Chloride (mg/L)	200
Boron (mg/L)	1

The Basin Plan also includes separate salinity limits for the White Wolf Subarea based on the class of irrigation water underlying the discharge.

The Basin Plan specifically states that discharges of oil field wastewater that exceed the above maximum salinity limits may be permitted to unlined sumps, stream channels, or surface waters if the Discharger successfully demonstrates to the Central Valley Water Board in a public hearing that the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives.

The Basin Plan maximum salinity limits do not apply to the discharge of the wastewater to land under this General Order because the groundwater is poor quality, the groundwater exceeds the Basin Plan water quality objectives, and the groundwater does not support existing and future probable beneficial uses.

Oil Field Discharges and Proposed Discharge Limits

The primary waste constituent of concerns (COCs) associated with discharges of waste from oil field facilities include, but are not limited to, electrical conductivity (EC), total dissolved solids, chloride, and boron, some metals (i.e., arsenic), some trace elements (i.e., strontium, thallium, lithium, etc.), petroleum hydrocarbons, PAHs, VOCs, and radionuclides.

With respect to EC, total dissolved solids, chloride, and boron, this General Order authorizes discharges to land that exceed the Basin Plan salinity limits described above since the General Order applies to areas where first encountered groundwater does not exist or if it does exist, it is such poor quality that it does not, and could not be reasonably expected to support designated beneficial uses. In this General Order the discharge of produced wastewater is not allowed to cause groundwater to contain COCs in concentrations that adversely affect the beneficial uses. Therefore, this General Order require “best efforts” approach in implementing reasonable control measures to treat produced wastewater prior to discharge to land. As result, this General Order does not have discharge or effluent limits.

Oil field produced wastewater can also contain metals exceeding MCLs, and particularly arsenic at levels exceeding the MCL of 10 µg/L. Whether those metals pose a threat to groundwater quality and designated beneficial uses depends on many factors including, but not limited to, discharge concentrations, discharge volumes, depth to groundwater, soil types and hydrogeology underlying the discharge location, and natural groundwater quality. Generally, most metals associated with oil field produced water discharges are relatively immobile in the alkaline soils associated with most areas of the Central Valley and are expected to attenuate as they percolate with produced water through the soil profile.

Specifically with respect to arsenic, studies conducted within the Central Valley indicate that arsenic migration to groundwater that would cause exceedances of water quality objectives is unlikely. Kennedy Jenks Consultants completed an arsenic soil-adsorption removal study using soil samples collected from the Famoso Basins in Famoso area in 2011. The results were included in a technical report titled, *Cawelo Water District Famoso Basins Antidegradation Analysis*. The results indicate that the arsenic associated with the discharges up to 120 ug/L will attenuate in the underlying soils and not adversely impact underlying groundwater. Similarly, other studies show that soil can remove significant amounts of arsenic.

Given the above information, this General Order does not include effluent limits for metals associated with discharges to land at this time.

Oil naturally contains numerous organic compounds including BTEX and PAHs. It is the goal of the industry to separate for sale these compounds from the produced wastewater in which they are entrained. Some organic chemicals may be added to oil

wells, to separation processes, or to treatment systems to enhance recovery efficiencies and final produced wastewater quality.

Generally, heavier organic compounds associated with oil production do not move readily through the soil and do not pose a significant threat to groundwater. It has also been well-documented in the literature, including a study published by the Lawrence Livermore National Laboratory in 1995 and several reports generated by the State Water Resources Control Board, that petroleum fuels naturally attenuate in the environment through adsorption, dispersion, dilution, volatilization, and biological degradation. This natural attenuation slows and limits the migration of dissolved petroleum plumes in groundwater. The biodegradation of petroleum, in particular, distinguishes petroleum products from other hazardous substances commonly found at commercial and industrial sites.

The limited existing data for produced water discharges that can be directly compared with groundwater monitoring results for support the notion that organics associated with petroleum production will not migrate to underlying groundwater in concentrations that exceed water quality objectives.

For these reasons, Central Valley Water Board staff does not recommend specific produced wastewater discharge limits to ponds for organic chemicals at this time.

Some geologic formations contain naturally occurring radionuclides. Radium-226 and radium-228, gross alpha- particle activity, uranium have been detected in produced water in concentrations exceeding the primary MCLs. These detections have been limited to specific oil fields. Much like metals discussed above, these constituents don't generally move readily through soils and their threat to groundwater quality will vary based on site specific hydrogeology. For these reasons, Central Valley Water Board staff does not recommend specific produced wastewater discharge limits to ponds for radionuclides at this time.

As water quality data for produced wastewater and groundwater become available, the Central Valley Water Board staff will be evaluating the data for COCs and will update this General Order to include additional discharge limits if necessary to be protective of the future beneficial uses of the groundwater.

Title 27 of the California Code of Regulations

California Code of Regulations, Title 27 (hereafter Title 27) contains regulatory requirements for the treatment, storage, processing, and disposal of solid waste, which includes designated waste, as defined by Water Code section 13173. Title 27 exempts certain activities from its provisions. Discharges regulated by this General Order are exempt from Title 27 pursuant to provisions that exempt wastewater under specific conditions. This exemption, found at Title 27, section 20090 is described below:

* * *

(b) Wastewater - Discharges of wastewater to land, including but not limited to evaporation ponds, percolation ponds, or subsurface leachfields if the following conditions are met:

- (1) the applicable RWQCB has issued WDRs, reclamation requirements, or waived such issuance;
- (2) the discharge is in compliance with the applicable water quality control plan; and
- (3) the wastewater does not need to be managed according to Chapter 11, Division 4.5, Title 22 of this code as a hazardous waste.

* * *

Therefore, the discharge authorized in this General Order is exempt from the requirements of Title 27 in accordance with Title 27, sections 20090(b) because: 1) The Central Valley Water Board is issuing general WDRs; 2) The discharge is in compliance with the Basin Plan, and; 3) The treated waste discharged to the pond(s) does not need to be managed as hazardous waste.

Resolution 68-16 (State Antidegradation Policy) and Basin Plan Amendments

State Water Board Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (hereafter, the State Antidegradation Policy), requires that disposal of waste into high quality waters of the State be regulated to achieve the highest water quality consistent with the maximum benefit to the people of the State. Resolution 68-16 does not apply to waters that are not high quality. The “best efforts” approach is considered where a water body is “poor quality.”

This General Order applies to areas where first encountered groundwater does not exist (e.g., it is petroleum or hydrocarbon producing) or if it does exist, it is such poor quality that it does not, and could not be reasonably expected to, support beneficial uses. Accordingly, the State Antidegradation Policy does not apply to this General Order, and the “best efforts” approach is considered to minimize the natural background groundwater quality degradation and to implement reasonable waste discharge treatments to land. The “best efforts” approach involves implementation of reasonable control measures to treat produced wastewater prior to discharge to land. The factors analyzed under the “best efforts” approach include the water quality achieved by other similarly-situated Dischargers, the good faith efforts of the Discharger to limit the discharge of COCs, and the measures necessary to achieve compliance.

The primary waste constituents of concerns due to discharges of waste from oil field facilities with respect to surface waters and groundwater are in general elevated concentrations of general minerals (especially total dissolved solids and chloride), metals (e.g., arsenic), trace elements (e.g., boron, strontium, thallium, lithium, etc.), petroleum hydrocarbons, polynuclear aromatic hydrocarbons (PAHs), volatile organic

compounds (VOCs, e.g., benzene, toluene, ethylbenzene, and xylenes [BTEX]), and radionuclides.

As described in the Beneficial Uses of Surface Water and Groundwater section above, the Basin Plan applies MUN to all groundwater where it is not specifically de-designated. The Basin Plan also states that unless otherwise designated by the Regional Water Board, all groundwater in the Region are considered suitable or potentially suitable for AGR, IND, and PRO. Hydrogeological conditions, particularly in the oil fields on the west side of the Central Valley, have resulted in areas where first encountered groundwater is petroleum or hydrocarbon producing and/or is of such poor quality that it cannot reasonably be expected to be used, now or in the future, for the Basin Plan assigned beneficial uses, even with the implementation of best management practices or best economically achievable treatment practices. Under these circumstances, Dischargers are expected to apply "best efforts" to minimize water quality degradation and prevent conditions of nuisance. Also, under these circumstances, Dischargers may be able to obtain amendments to the Basin Plan that de-designate the beneficial uses that cannot reasonably be achieved.

This General Order puts the Discharger on a five year compliance schedule (Provision E.4.b of the General Order) to obtain an amendment or amendments to the Basin plan to de-designate the beneficial uses of MUN, AGR, IND, or PRO as appropriate. The compliance time schedule requires the Discharger to demonstrate, in the case of MUN, that its discharges will meet the Sources of Drinking Water Policy exception criteria, or in the case of AGR, IND, and PRO, parallel criteria. The compliance schedule also requires the Discharger to demonstrate, where it can meet the above criteria that its discharges will not migrate from the areas where the beneficial uses will be de-designated to areas of higher quality groundwater; it must demonstrate containment. The compliance schedule may be extended by up to two years by the Executive Officer if, through no fault of the Discharger, the process is delayed.

The General Order compliance time schedule requires the Discharger to cease discharge if it is unable to obtain the amendments to the Basin Plan by the end of the compliance schedule.

The General Order has another option (Provision E. 4.a) for Dischargers where their production facility discharges to land have no underlying first encountered groundwater. Where Dischargers can demonstrate through an appropriate hydrogeological investigation that groundwater does not exist and discharges of produced water and other wastes to land will not migrate into areas where groundwater does exist, Basin Plan amendments are not required. The General Order will regulate these discharges to confirm the results of the hydrogeological investigation, protect surface waters and surface water drainages, and to prevent the creation of nuisance conditions. The details of this provision are described below in Provisions section of this Information Sheet.

Verifying that the “best efforts” is implemented

The primary method used to determine if the appropriateness of this General Order and whether Dischargers are implementing best efforts is effluent and groundwater quality monitoring. This General Order requires monitoring of natural background groundwater quality and the water quality downgradient of production facility area including ponds and secondary containment areas. The General Order also, as an alternative, includes Dischargers participation in a regional monitoring program.

Monitoring and Reporting Program R5-2016-xxxx (MRP) requires oil field operators to sample municipal or domestic water supply wells within one-mile radius of the property, and monitor first-encountered groundwater at their production facility. The purpose of requiring monitoring of water supply wells includes identifying the quality and trends of water being used near or within the oil field. The purpose of requiring monitoring of first-encountered groundwater is to evaluate current discharge practices in order to determine whether such practices are protective of groundwater quality at the most vulnerable point. Groundwater monitoring at existing oil field facilities is necessary to: determine background groundwater quality; determine existing groundwater conditions near ponds and production facility areas; determine whether improved management practices need to be implemented; and confirm that any improved discharge practices will have the desired result on groundwater quality.

This General Order requires the Discharger to report any noncompliance or any noncompliance with the Prohibitions of the General Order as soon as becoming aware of its occurrence and confirm this in writing within two weeks of when it became aware of the noncompliance. This General Order and its application process requires the Discharger to submit annual monitoring reports in a tabular form for all the effluent and groundwater monitoring data and domestic water supply well data, if applicable. Additionally, an annual assessment of groundwater monitoring is required to delineate the lateral and vertical extent of impacts to the groundwater. The assessment must include an evaluation of the groundwater monitoring program’s adequacy to assess compliance with the General Order, including whether the data provided are representative of conditions upgradient and downgradient of the production facility.

The Central Valley Water Board recognizes that monitoring the effectiveness of the oil field facilities’ “best efforts” and their effect on groundwater is needed to verify that water quality degradation is minimized and to prevent conditions of nuisance.

The individual or regional groundwater monitoring provisions and requirements are designed to measure water quality data over time in first-encountered groundwater. It is recognized that in many cases, a single set of groundwater monitoring data, or even monitoring data over a period of months or years, may not be sufficient to determine the effectiveness of existing wastewater discharge practices. Evaluating groundwater

results over an extended period of time, in conjunction with gathering data regarding existing surface practices, is necessary to determine whether water quality is being protected or is being unreasonably impacted.

California Environmental Quality Act

The adoption of this General Order, which prescribes regulatory requirements for existing facilities in order to ensure the protection of groundwater resources, is exempt from the requirements of the California Environmental Quality Act (CEQA)(Pub. Resources Code, § 21000 et seq.) based on the following three categorical exemptions:

1. California Code of Regulations, title 14, section 15301 exempts the “operation, repair, maintenance, [and] permitting ... of existing public or private structures, facilities, mechanical equipment, or topographical features” from environmental review. Eligibility under this General Order is limited to oil field facilities that were existing facilities prior to 1 January 2015, and the General Order does not authorize the expansion of these facilities or operation of new facility unless the Discharger demonstrates compliance with the provisions of CEQA in the form of a certified Environmental Impact Report, Mitigated Negative Declaration, or Negative Declaration, or other appropriate environmental documents if the facility was either:
 - not in existence prior to **1 January 2015** (“new”) or
 - has expanded or made a material change.
2. California Code of Regulations, title 14, section 15302 exempts the “replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced.”
3. California Code of Regulations, title 14, section 15304 exempts “minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry and agricultural purposes.”

The General Order and its NOI application process impose requirements for facilities with poor wastewater effluent quality overlying first encountered groundwater with poor qualities with no current and future beneficial uses or there is no first encountered groundwater. The Central Valley Water Board staff also is drafting additional general orders to cover area where groundwater quality conditions support current and future beneficial uses.

Central Valley Salinity Alternatives for Long-Term Sustainability

The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has the goal of developing sustainable solutions to the increasing salt and nitrate concentrations that threaten achievement of water quality objectives in Central Valley surface waters and groundwaters. The General Order requires actions that will implement “best efforts” and improve management practices to minimize degradation of groundwater for COCs. The General Order requires Basin Plan amendment through a compliance schedule to de-designate beneficial uses of groundwater for MUN, AGR, IND, or PRO where there is no existing or future beneficial use. The Central Valley Water Board intends to coordinate all such actions through the CV-SALTS initiative and will require Dischargers participation. CV-SALTS may identify additional actions that need to be taken by existing wastewater production facility and others to address Basin Plan amendment. The General Order may also be amended in the future to implement any policies or requirements established by the Central Valley Water Board as a result of the CV-SALTS process.

REQUIREMENTS OF THE GENERAL ORDER

The following describes Prohibitions, Discharge Specifications, Groundwater Limitations, Solids Disposal Specifications, and Provisions are intended to protect the quality of surface water and groundwater.

Prohibitions

Dischargers wishing to obtain coverage under this General Order must submit NOI to comply with the requirements of the General Order. The NOI must contain a detailed description of all discharges that will be regulated under the General Order. The General Order prohibits discharges, other than those described in the NOI and approved in a NOA.

The discharge of waste other than produced wastewater from production wells to pond(s) is prohibited unless the Executive Officer approves the discharge in accordance with an appropriate management plan outlined in the Provisions section of the General Order and this Information Sheet.

Storm water that comes into contact with residual oil, produced wastewater, or oil field wastes may contain pollutants. This General Order prohibits the discharge of any wastes to surface waters or surface water drainages.

The discharge of any fluids from wells that have undergone a “well stimulation treatment”, as defined by CCR, title 14, section 1761 (including hydraulic fracturing, acid fracturing, and acid matrix stimulation) to land is prohibited. The discharge of produced wastewater from wells that have been stimulated as defined by CCR, title 14, section 1761 is prohibited.

The General Order prohibits acceptance, treatment, or discharge of “hazardous waste,” as defined in the CCR, title 22, section 66261.1 et seq.

To ensure that all wastes are properly treated and contained, the General Order prohibits the bypass of treatment and the discharges related to overflow of ponds except as allowed by section E.2 of Standard Provisions and Reporting Requirements for Waste Discharge Requirements, dated 1 March 1991 and part of the General Order. Operation or discharge of produced wastewater to ponds that could impact nearby water supply wells is prohibited in the General Order unless the Discharger can demonstrate that there will be no impact to the municipal or domestic water supply well. The General Order prohibits the collection, treatment, discharge or disposal of wastes that could result in the creation of nuisance or pollution conditions.

Discharge Specifications

The General Order requires the Discharger to achieve compliance in accordance with the time schedules in Provision E.4 of the General Order for Basin Plan amendment. The compliance time schedule requirements are described in Provisions section of this Information Sheet as Tasks one through eleven.

The Dischargers as part of the General Order application process will provide in the NOI appropriate technical data to support the maximum design flow of the produced wastewater production facility and its treatment and disposal system. The discharge flow limit authorized in the NOA will be based on this design flow.

The General Order requires the discharge remain within the permitted waste treatment/containment/disposal structures at all times, or in case of emergency within secondary containment structures.

Ponds are required to operate and to maintain in a manner that will prevent wastes from concentrating to hazardous levels.

Ponds are required to be free of oil or be netted to preclude the entry of wildlife (CCR, title 14, section 1778 (d)).

The General Order restricts the public contact with wastes to such means as fences or other acceptable alternatives (CCR, title 14, section 1770 (b) through (b)(4)).

The General Order requires all the conveyance, treatment, storage, and disposal systems including ponds, tank batteries, and other components of oil and gas production wastewater discharge facility, to be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency. By 1 October of each year the available capacity in ponds is required to be

sufficient to capture seasonal precipitation and production facility wastewater design flows.

The Discharger is required to operate and maintain all ponds with two feet of freeboard using a staff gauge unless a California registered civil engineer certifies that the operation of ponds less than two feet is adequate and will not impact the integrity of the ponds.

The General Order requires the ponds and containment structures be managed and operated to prevent breeding of vectors. Specifically ponds must be managed to minimize the accumulation of dead algae, vegetation, and debris on the pond surface; minimize growth of weeds and vegetation; and control pond erosion to limit vector breeding sites.

The General Order requires newly reconstructed or rehabilitated berms or levees (excluding internal berms that separate ponds or control the flow of water within a pond) be designed and constructed under the supervision of a California registered civil engineer. A post construction report by the registered civil engineer that oversaw construction is required to be submitted within 60 days of completion of construction and certification that the berms and/or levees were constructed in accordance with design specifications and are suitable for the retention of wastewater.

The General Order also allows the Discharger to use the produced wastewater generated from the production facility wells for dust control and construction activities as long as it is consistent with an approved management plan. The application rates are limited to those that are reasonable rates to preclude creation of a nuisance conditions and unreasonable degradation of groundwater. Applied wastewater shall not be allowed to pond onsite or runoff from the site.

The General Order requires the Dischargers to implement water quality management practices based on "best efforts," as necessary, to protect water quality and to minimize groundwater degradation.

Groundwater Water Limitations

The General Order proscribes the discharges of produced wastewater from causing the underlying groundwater to contain any constituents in concentrations that adversely affect beneficial uses of the groundwater.

Solids Disposal Specifications

The General Order defines oil field solids as the solid, semisolid, and liquid residues removed from treatment processes or accumulated in tanks, ponds, or other facility components. The General Order requires any handling and storage of solids to be

controlled in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soil in a mass or concentration that will violate the groundwater limitations of the General Order.

The General Order requires solids removed from the facility to be managed and disposed of in a manner consistent with solids management plan approved by the Executive Officer. The removal of solids for reuse plans as road mix is restricted to within the lease area.

The General Order also requires for solids to be tested prior to use as a road mix and show to be non-hazardous. Any proposed changes in solids use or disposal practices are required to be reported in writing to the Executive Officer at least 90 days in advance of the change and be pre-approved by the Executive Officer.

Provisions

The General Order requires compliance with the applicable sections of “Standard Provisions and Reporting Requirements for Waste Discharge Requirements,” dated 1 March 1991 (Standard Provisions) and compliance with “**Monitoring and Reporting Program R5-2016-XXXX**.” During application process, the NOAs issued will delineate the Standard Provisions that are applicable.

The General Order also requires the Discharger to certify that it has installed an acceptable flowmetering. An engineering alternative to flowmetering may be used if approved in writing by the Executive Officer.

The General Order in Provision E.4 provides two options for the Discharger depending if there is first encountered groundwater underlying the Facility. For the first option, If there is no underlying groundwater (Provision E.4.a.) beneath the Facility, the Discharger is required by 60 days of issuance of the NOA, as directed in the NOA issued for coverage under the General Order, the results of a hydrogeological investigation demonstrating that there is no groundwater beneath 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. Upon the written concurrence of the investigation results by the Executive Officer, this provision shall be considered satisfied.

However, for the second option, if there is underlying groundwater (Provision E.4.b.) beneath the Facility, the Discharger is required to demonstrate that the natural background groundwater quality will meet the Sources of Drinking Water Policy exception criteria and/or parallel exception criteria outlined in the Sources of Drinking Water Policy and is required to obtain appropriate Basin Plan amendments to de-designate the beneficial uses of groundwater as MUN, AGR, IND, and PRO. Listed below are ten Tasks to amend the Basin Plan with associated compliance schedules:

1. Participate in the CV-SALTS Group to facilitate the Basin Plan Amendment (BPA) process under the Salt and Nutrient Management Plan **[Task 1 is ongoing]**.
2. Develop an outline of a BPA Work Plan for CV-SALTS Technical Advisory Committee review and comment prior to submittal to the Central Valley Water Board staff for evaluation of the de-designation of Basin Plan beneficial uses of the groundwater. The Work Plan shall include **[Task 2 due 4 months from the date of NOA]**:
 - a. Consideration of Sources of Drinking Water Policy and applicable exemption criteria for MUN and applicable parallel criteria for exemption of AGR, IND, and PRO;
 - b. Consideration of available data or how the data will be collected to evaluate and support the exemption criteria; and
 - c. An outline of a draft proposal to de-designate the Basin Plan beneficial uses that are not applicable under the area of consideration.
3. Central Valley Water Board staff shall review and consider for approval the outline of BPA Work Plan **[Task 3 due 6 months from the date of NOA]**.
4. Work with Central Valley Water Board staff to develop a Work Plan describing BPA tasks that will be completed and deliverables that will be produced to support the de-designation of the Basin Plan beneficial uses of the groundwater under consideration. The BPA tasks and resulting deliverables shall include but are not limited to **[Task 4 due 10 months from the date of NOA]**:
 - a. Delineation of the horizontal and vertical extent of the sub-basin or subject area under consideration,
 - b. A summary of available data and analyses for each beneficial use proposed for de-designation,
 - c. Maps, geologic cross sections, well and water quality data and any other information that are supportive of de-designation,
 - d. A description of additional data or studies required to fill in any data gaps and support de-designation,
 - e. A final proposed BPA Work Plan to accomplish above tasks a-d, and
 - f. The development of a final technical report that compiles all the information developed in tasks a-e.
5. Central Valley Water Board staff shall review and consider for approval the final BPA Work Plan and proposed deliverables **[Task 5 due 12 months from the date of NOA]**.

6. Implement final Work Plan and submit the final technical report to the Central Valley Water Board. The Discharger shall provide quarterly progress reports **[Task 6 due 36 months from the date of NOA]**.
7. Central Valley Water Board staff will evaluate the final technical report and provide written directions to the Discharger for completing the **[Task 7 due 45 months from the date of NOA]**:
 - a. CEQA scoping process for the BPA,
 - b. Developing a draft staff report for the Central Valley Water Board, and
 - c. Preparing a final staff report for the Central Valley Water Board.
8. The Central Water Board and Discharger shall implement BPA Process including **[Task 8 due 54 months from the date of NOA]**:
 - a. Stakeholder Participation-Public review of final draft of staff report,
 - b. Peer Review Process-Request peer reviewers to provide comments for final staff report,
 - c. Administrative Records-Preparing record keeping tasks and staff review and comments on deliverables,
 - d. Progress Reports-Providing periodic presentation/reports to the Board and the public on the progress of BPA and deliverables.
 - e. Final Central Valley Water Board approval-Provide a presentation of final report to the Board for consideration, and
 - f. Finalize Administrative Records and submit to State Water Board for consideration.
9. State Water Board to consider Central Valley Water Board adopted Basin Plan Amendment(s) **[Task 9 due 57 months from the date of NOA]**.
10. Office of Administrative Law review and approval of adopted Basin Plan Amendment(s) **[Task 10 due 60 months from the date of NOA]**.
11. If Basin Plan Amendments are not secured by the compliance date in Task 10 above, the discharges at the Facility shall cease and the Discharger shall submit a Report of Waste Discharge for closure/post closure waste discharge requirements **[Task 11 due 60 months from the date of NOA]**.

The time schedule compliance due dates (described above for the eleven tasks) are based on the issuance date of the NOA by the Executive Officer. The Executive Officer can extend the due dates of Tasks 1 through 10 if the Discharger is making acceptable

progress and misses a due date through no fault of its own. When proposing Basin Plan amendment, it is not a guarantee that it will be approved. The science has to support the amendment. The Central Valley Water Board in special circumstances, when significant progress has been made, can extend the 5 year compliance period up to an additional 2 years with the written concurrence of the Executive Officer.

The General Order authorizes discharge of waste from oil field activities other than produced wastewater from production wells if the Discharger can demonstrate through appropriate water quality data and analysis that the discharge does not pose a threat to beneficial uses of the groundwater. The General Order also requires prior approval of these oil field related discharges to ponds by the Executive Officer.

The General Order allows the application of produced wastewater at the production facility for dust control or construction activities if it is consistent with an Executive Officer approved management plan. The management plan must contain: a) data characterizing the quality of the produced wastewater that will be applied; b) proposed application/use methods, application rates, and proposed frequencies of application; c) a scaled aerial photograph showing the leases proposed application areas with identified roads, ponds, production treatment facility, surface waters, and surface water drainages; d) proposed constituent loading rates; e) a list of all management practices to be implemented to ensure produced wastewater does not migrate from proposed application areas; and f) a demonstration that the discharges will be protective of water quality and will not adversely affect the beneficial uses of surface water or underlying groundwater.

The management plan must be submitted to the Executive Officer at least 90 days prior to the anticipated discharges. Discharges shall not occur without Executive Officer written approval of the management plan.

The General Order requires Dischargers to submit a solids management plan for approval of the Executive Officer at least 180 days prior to any solids reuse. For Dischargers already reusing solids for road mix the General Order requires submittal of a solids management plan for approval by the Executive Officer within 60 days of receipt of the NOA for the Facility. The solids management plan shall include a complete characterization of the quality and quantity of the solids. For reuse of solids as road mix within the lease area, the solids management plan must contain: 1) a demonstration that the solids are not hazardous as defined by CCR, title 22, section 66261.1 et seq.; 2) a scaled aerial photograph showing the leases proposed application areas with identified roads, ponds, production treatment facility, surface waters, and surface water drainages; 3) proposed constituent loading rates; 4) a list of all management practices that will be implemented to ensure wastes will remain where processed and applied and will not migrate from the site; and 5) a demonstration that the discharges will be protective of water quality and will not adversely affect the beneficial uses of surface water or underlying groundwater. Reuse of solids must not

commence prior to obtaining the written approval of the solids management plan from the Executive Officer.

The General Order requires Dischargers proposing to reuse solids for road mix must submit a solids management plan for approval by the Executive Officer at least 180 days prior to any solids reuse. The General Order also requires Dischargers with existing road mix facility for reusing solids, as described in General Order Solids Disposal Specifications, must submit a solids management plan for approval by the Executive Officer within 60 days of receipt of the NOA for the Facility.

Solid wastes disposed off-site must be transported to an appropriately permitted Facility. Solid waste volumes, disposal methods, disposal facilities, and analytical results from waste characterization must be reported in accordance with the MRP.

How Will the Board Evaluate the Effectiveness of Discharge Practices?

The General Order requires monitoring of all activities that result in discharges to land specifically **the Monitoring and Reporting Program R5-2016-xxxx** requires:

- Extensive produced wastewater discharge monitoring
- Pond and facility monitoring
- Groundwater monitoring
- Solids monitoring
- Hydrogeological evaluation of the discharge facility, if applicable
- Annual reporting
- Noncompliance reporting
- Spill and release reporting

Specifically, the General Order requires Dischargers to monitor individually or regionally, first encountered groundwater upgradient and downgradient of the production facility ponds. The purpose of the groundwater monitoring program is to determine whether discharge practices being employed at the oil field facilities are “best efforts” and confirm compliance with the requirements of this General Order.

The individual groundwater monitoring program requires the Discharger to submit monitoring data for natural background (unaffected by the Discharger or others) groundwater quality upgradient of the facility; and groundwater quality downgradient of the production facility area including ponds.