CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2019-0024

WASTE DISCHARGE REQUIREMENTS
FOR
SHERWOOD HILLS, LLC; JAY LLC; STEIR BERTON TRUST;
HOMEWOOD MOUNTAIN PARTNERS, LLC; FAMOSO HILLS RANCH, LLC;
YUROSEK FARMS, LLC; AND E & B NATURAL RESOURCES MANAGEMENT CORPORATION

PRODUCED WASTEWATER RECLAMATION PROJECT
MCVAN AREA TREATMENT FACILITY
POSO CREEK OIL FIELD
KERN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board) finds that:

1. On 26 January 2018, a Report of Waste Discharge was submitted to the Central Valley Regional Water Quality Control Board (Central Valley Water Board) that proposed the reuse of oil field produced wastewater (produced wastewater) from an oil treatment facility to an irrigation management company as a new water supply for irrigation. A revised RWD and supplemental technical reports (hereafter collectively referred to as RWD) were submitted on 23 May 2018 and 14 June 2018. The RWD was prepared by EnviroTech Consultants, Inc., on behalf of E & B Natural Resources Management Corporation (E&B) and Sherwood Hills, LLC (Sherwood).

2. E&B owns and operates the McVan Area Treatment Facility (McVan Facility). Famoso Hills Ranch, LLC (Famoso) owns the land on which Sherwood's four unlined reservoirs (Sherwood's Reservoirs) are located. Sherwood will operate Sherwood's Reservoirs and distribute produced wastewater to cropland for irrigation.

3. Sherwood; Jay LLC; Steir Berton Trust; Homewood Mountain Partners, LLC; Famoso; and Yurosek Farms, LLC own the cropland that will be irrigated with produced wastewater.

4. This Order regulates the discharge of produced wastewater to Sherwood's Reservoirs and to land for irrigation of crops, including those for human consumption. The development of cropland for this project will consist of two phases. The initial phase of development will consist of approximately 1,000 acres of trees (e.g., citrus and/or nuts), silage, oilseed, and grain crops. The final phase of development is anticipated to consist of approximately 3,400 acres of cropland with crops similar to those planted in Phase 1. The rate of development and acreage for each crop type are subject to change throughout the development process. Factors that may impact the rate of development include: sufficient water supply, capital for new development, and market prices.

5. Sherwood; Jay LLC; Steir Berton Trust; Homewood Mountain Partners, LLC; Famoso; Yurosek Farms, LLC; and E&B (hereafter jointly referred to as Discharger) are jointly responsible for compliance with these Waste Discharge Requirements (WDRs).

Background and Current Practices

6. E&B is an oil and natural gas exploration and production company that owns and operates the McVan Facility in the Poso Creek Oil Field (Sections 14 and 15, Township 27 South, Range 27 East, Mount Diablo Base and Meridian (MDB&M); Assessor's Parcel Number (APN) 074-030-03, 074-030-08, 074-030-09, and 074-030-31), as shown on Attachment A, which is attached hereto and made part of this Order by reference. The McVan Facility receives produced wastewater from the Claflin, New Hope, Enas, and Gov't Leases.

7. Famoso Hills Ranch, LLC is a farming company that primarily operates in the Central Valley of California. Famoso Hills Ranch, LLC owns several parcels of land in the area, including the land where Sherwood's Reservoirs are located and cropland that will be irrigated with produced wastewater under this Order. Sherwood is a water management company that will operate Sherwood's Reservoirs and distribute produced wastewater to cropland for irrigation. Produced wastewater from the McVan Facility will be piped to Sherwood's Reservoirs, approximately one mile east-southeast of Highway 65 and Famoso Road (Section 9, Township 27 South, Range 27 East, MDB&M; APN 074-290-09), as shown on Attachment A.

8. E&B recovers crude oil from approximately 220 oil production wells in the Poso Creek Oil Field. The process produces significant amounts of produced wastewater that is treated at the McVan Facility. Attachment B, which is attached hereto and made part of this Order by reference, provides a flow schematic of the treatment processes at the McVan Facility. Treatment starts with gravity separation of oil and water using a wash tank, after which separated water is sent to a Wemco unit. The Wemco unit uses mechanical agitation to induce the formation of small bubbles to capture oil that is then skimmed off and returned to the wash tank. Water from the Wemco Unit is distributed to two holding tanks from which water flows to a filter system that removes suspended solids. The treatment capacity of the McVan Facility is 200,000 barrels per day.

9. E&B will continue to inject approximately 1,000 barrels of produced wastewater per day into its 15 active water disposal wells. In the event E&B's produced wastewater volume exceeds Sherwood's capacity or Sherwood's Reservoirs are temporarily out of service, E&B will retain the ability to transfer excess produced wastewater to the existing water disposal wells at the McVan Facility for disposal.

10. Jay LLC; Steir Berton Trust; Homewood Mountain Partners, LLC; Famoso; and Yurosek Farms, LLC individually own the cropland identified in Table 1 below.

Table 1. Cropland Owners

Owner	APN	Acres
Jay LLC / Steir Berton Trust	060-322-14-00-6	411
Jay LLC	060-322-23-00-2	406
Famoso Hills Ranch, LLC	060-360-01-00-6	633
Steir Berton Trust / Yurosek Farms, LLC	060-360-16-00-0	157
Famoso Hills Ranch, LLC	060-360-18-00-6	319
Famoso Hills Ranch, LLC	060-360-19-00-9	317
Famoso Hills Ranch, LLC	060-370-62-00-6	634
Steir Berton Trust / Yurosek Farms, LLC	074-010-27-00-1	161

Owner	APN	Acres
Steir Berton Trust / Yurosek Farms, LLC	074-290-05-00-9	101
Famoso Hills Ranch, LLC	074-290-09-00-1	595
Famoso Hills Ranch, LLC	074-290-08-00-8	72
Homewood Mountain Partners, LLC	074-043-01-00-5	570
Homewood Mountain Partners, LLC	074-020-37-00-3	43

11. The primary sources of irrigation water in the region are groundwater, surface water from the Kern River, and imported water from the Friant-Kern Canal. The region has challenging water supply conditions that are dependent on available surface water supplies and deep groundwater. The proposed cropland identified in Finding 10 of this Order is not within an irrigation district and does not have access to surface water from the Kern River or the Friant-Kern Canal. Implementation of the Sustainable Groundwater Management Act may restrict future availability of groundwater in the area. New sources of water such as recycling of produced wastewater, where the quality of the water is suitable, may be needed to supplement water resources to support agricultural activities in this part of Kern County.

Proposed Discharge

12. E&B will discharge up to 200,000 barrels per day (approximately 9,400 acre-feet per year) of produced wastewater to Sherwood's Reservoirs for irrigation.

13. The RWD includes analytical results of produced wastewater samples from E&B. Produced wastewater from E&B was sampled on 20 June 2017 and analyzed for the following: volatile organic compounds, polycyclic aromatic hydrocarbons, oil and grease, total petroleum hydrocarbons, general minerals, stable isotopes, and metals. Due to a laboratory error, a second produced wastewater sample was collected on 12 June 2018 and re-analyzed for radionuclides. Select analytical results are summarized in Table 2 below.

Table 2. E&B Produced Wastewater Quality

Constituents	Units	Results
Total Dissolved Solids	mg/L [1]	370
Electrical Conductivity	umhos/cm [2]	505
Chloride	mg/L	59
Boron	mg/L	0.76
Sodium	mg/L	110
Arsenic	ug/L [3]	4.9
Oil and Grease	mg/L	4.9
Total Petroleum Hydrocarbons	mg/L	1.4
Radium 226, plus Radium 228	pCi/L[4]	0.025 +/- 0.664
Toluene	ug/L	1.3
Xylenes, Total	ug/L	8.4

1. mg/L = milligrams per liter.
2. umhos/cm = micromhos per centimeter.
3. ug/L = micrograms per liter.
4. pCi/L = picocuries per liter.

The complete list of analytical results for produced wastewater is in the Information Sheet, which is attached hereto and made part of this Order by reference.

14. The Discharger collected produced wastewater samples on 30 August 2018 and submitted the samples to three Environmental Laboratory Accreditation Program (ELAP) certified laboratories for chemical analysis. The samples were analyzed for the presence and concentration of the constituents identified in Table II of Monitoring and Reporting Program Order No. R5-2019-0024 (MRP). Table II of the MRP identifies known compounds and elements that make-up the chemicals and additives that are used during petroleum exploration, production, and treatment. This list has been posted on the Central Valley Water Board's website and is referred to as the Oil Field Additive List. Analytical results of the analyses were submitted to the Central Valley Water Board on 1 October 2018 and are available in Attachment II of the Information Sheet. Detectable analytical results are summarized in Table 3 below.

Table 3. Detectable Analytical Results

Constituent	CASRN [1]	August 2018 Results			Maximum Contaminant Levels[3]
		Result	MDL [2]	Units	
1,2,4-Trimethylbenzene	95-63-6	69	0.12	ug/L	-
1,3,5-Trimethylbenzene	108-67-8	19	0.12	ug/L	-
2-Butoxyethanol	111-76-2	1.7	1.7	mg/L	-
2-Ethylhexanol	104-76-7	9.1	9.1	ug/L	-
Acetic Acid	64-19-7	7.9	0.31	mg/L	-
Acetone	67-64-1	500	4.6	ug/L	6,300 [4]
Amorphous silica	7631-86-9	76,000	53	ug/L	-
Barium	7440-39-3	7	3.5	ug/L	1,000 [4]
Benzene	71-43-2	0.66	0.083	ug/L	1
Carbon Dioxide	124-38-9	16	2	mg/L	-
Copper	7440-50-8	1.9	1.1	ug/L	-
Cumene	98-82-8	2.8	0.14	ug/L	-
Ethylbenzene	100-41-4	1.5	0.098	ug/L	300 [4]
Formaldehyde	50-00-0	22	0.31	ug/L	-
Glutaral	111-30-8	16	16	ug/L	-
Glyoxal	107-22-2	25	0.76	ug/l	-
Isopropanol	67-63-0	110	9.3	ug/L	-
Mercury	7439-97-6	0.065	0.029	ug/L	2 [4]
Methanol	67-56-1	500	10	ug/L	-
Naphthalene	91-20-3	3.9	0.36	ug/L	-
Nickel	7440-02-0	29	2	ug/L	100 [4]
Toluene	108-88-3	1.2	0.093	ug/L	150 [4]
Total Xylenes	1330-20-7	12	0.36	ug/L	1,750 [4]
Zinc	7440-66-6	8	2.3	ug/L	5,000 [5]
2,4,5-TFAP	129322-83-4	17.7	0	ug/l	-

Constituent	CASRN [1]	August 2018 Results			Maximum Contaminant Levels [3]
		Result	MDL [2]	Units	
Methyl Glyoxal	78-98-8	11	1.1	ug/l	-
Butyraldehyde	123-72-8	170	0	ug/L	-
4-Bromofluorobenzene	460-00-4	15	0	ug/L	-
Dibromofluoromethane	1868-53-7	9.2	0	ug/L	-
p- & m-Xylenes	179601-23-1	6.3	0.28	ug/L	-
o-Xylene	95-47-6	5.7	0.082	ug/L	-
Total Calcium	7440-70-2	4.7	0.015	mg/L	-
Total Sodium	7440-23-5	110	0.051	mg/L	-
Total Potassium	7440-09-7	2.8	0.13	mg/L	-
Bicarbonate Alkalinity as CaCO3	71-52-3	150	4.1	mg/L	-
Alkalinity as CaCO3	-	550	1	mg/L	-
Chloride	16887-00-6	66	0.077	mg/L	250 [5]
Fluoride	16984-48-8	0.84	0.012	mg/L	-
Sulfate	14808-79-8	13	0.13	mg/L	250 [5]
Electrical Conductivity @ 25 C	-	543	1	umhos/cm	900 [5]
Total Suspended Solids (Glass Fiber)	-	8.7	0.56	mg/L	-
MBAS	-	0.057	0.1	mg/L	0.5 [5]
Iodide	20461-54-5	0.14	0.01	mg/L	-
Ammonium as NH4	14798-03-9	5.5	0.12	mg/L	-
Lactic Acid	50-21-5	1.4	0.5	mg/L	-
Propionic Acid	79-09-4	0.97	0.42	mg/L	-
Total Aluminum	7429-90-5	270	26	ug/L	1,000 [4]
Total Lithium	7439-93-2	54	6.2	ug/L	-

[1] Chemical abstracts service registry number.

[2] Minimum detection limit.

[3] Maximum contaminant levels (MCLs) are published by the State Water Resources Control Board, Division of Drinking Water.

[4] Primary Maximum Contaminant Level.

[5] Secondary Maximum Contaminant Level – Derived from human welfare considerations (e.g., taste, order, or laundry staining).

The analyses show detections for several constituents, including some organic compounds; however, the detections are below the maximum contaminant levels (MCLs) where they exist. As discussed in more detail in Finding 67, the Central Valley Water Board has enlisted the services of a panel of experts (Food Safety Expert Panel) to investigate whether the use of produced wastewater for irrigation poses a threat to food safety. To date, the Food Safety Expert Panel has not identified a significant threat to food safety from the reuse of produced wastewater for irrigation.

15. Produced wastewater from the McVan Facility will be discharged to Reservoir #1. After Reservoir #1, produced wastewater will be transferred to Reservoirs #2, #3, or #4 via a gravity fed pipeline. Between Reservoirs #2, #3, and #4 are additional gravity fed pipelines that permit the controlled flow (via manual control valves) of produced wastewater from Reservoir #2 to Reservoir #3 and Reservoir #3 to Reservoir #4, as shown on Attachment C. At Reservoir #4, a pump station north of the reservoir will transfer produced wastewater to cropland for irrigation.

16. Sherwood's Reservoirs consist of four unlined surface impoundments that will store produced wastewater that will be reused for irrigation. Reservoirs #1 and #4 are primarily in-ground surface impoundments with an embankment height of approximately six and eight feet, respectively. Reservoirs #2 and #3 will contain water through the construction of a total of two dams that store water within the gulley of the hilly terrain. The storage capacities of Sherwood's Reservoirs are as follows: Reservoir #1 is 1.76 acre-feet, Reservoir #2 is 29 acre-feet, Reservoir #3 is 27 acre-feet, and Reservoir #4 is 25 acre-feet.

17. The reuse and application of produced wastewater for irrigation will consist of sprinklers and/or drip irrigation. Flood irrigation will not be implemented due to the hilly topography and implementation of water conservation methods.

18. The blending of produced wastewater with other water supplies (e.g., surface water and/or groundwater) is not proposed for this project. However, produced wastewater may be blended with other water supplies, if available.

19. E&B stated, via electronic mail dated 9 March 2018, that oil wells in the McVan Area have not undergone well stimulation, as defined by California Code of Regulations (CCR), title 14, section 1761, while owned and operated by E&B. E&B obtained ownership of the McVan Area property in January 2011.

Water Reclamation Policies

20. The *Water Quality Control Plan for the Tulare Lake Basin, Third Edition – revised May 2018,* (hereinafter Basin Plan) specifically states that "blending of wastewater with surface or groundwater to promote beneficial reuse of wastewater in water short areas may be allowed where the Regional Water Board determines such reuse is consistent with other regulatory policies set forth or referenced herein."

21. The Basin Plan states further, "The irrigation season in the Tulare Lake Basin area typically extends 9 to 10 months, but monthly water usage varies widely. To maximize reuse, users should provide water storage and regulating reservoirs, or percolation ponds that could be used for groundwater recharge of surplus waters when there is no irrigation demand."

Site-Specific Conditions

22. This project is anticipated to develop approximately 4,400 acres of land that has been designated by the United States Department of Agriculture (USDA) as "non-prime farmland" into farmland. In general, prime farmland, as defined by the USDA, has an adequate and dependable water supply from precipitation or irrigation, favorable temperatures and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks.

23. Farmers are anticipated to grow tree crops (including but not limited to citrus and nuts), grains, oilseed, and silage crops on the proposed cropland, but the crop types are subject to change. The project will not provide produced wastewater directly to livestock or to fields where livestock are present, but may use this water for irrigation of grazing land. A change to the scope of the

project will require the Discharger to submit a revised Report of Waste Discharge to the Central Valley Water Board for the new or modified discharge.

24. Due to the nature of the topography, approximately 10-20% of the land is too steep to be used for cropland. This approximate loss of land has been factored into the project size, resulting in an anticipated project size of 4,400 acres.

25. The land surface for the project slopes gently to the west. The topography of the project area consists of rolling hills with elevations ranging from 700 to 900 feet above mean sea level. The elevation at Sherwood's Reservoirs is about 868 feet above mean sea level.

26. According to Federal Emergency Management Agency (FEMA) map number 06029C1325E, Sherwood's Reservoirs are not within the 100-year return frequency flood zones. According to FEMA map numbers 06029C1325E and 06029C0775E, limited areas of the proposed cropland in the north and south, along Little Creek and Dyer Creek, are within the 100-year return frequency flood zones.

27. According to the Web Soil Survey published by the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), soils in the project area consist of Chanac-Pleito complex and Chanac clay loam. Soils at Sherwood's Reservoirs consist of Chanac clay loam.

28. According to the report *Soil Survey of Kern County, Northeastern Part, and Southeastern Part of Tulare County, California*, published by the USDA NRCS, Chanac-Pleito complex and Chanac clay loam soil types both have a drainage class of "Well Drained." According to the *Soil Survey Manual (Agriculture Handbook No. 18)*, published by the USDA, the drainage class refers to the frequency and duration of wet period under which the soil was developed. The drainage class consists of seven categories in which "well drained" is ranked third as the maximum draining soil type.

29. The Chanac-Pleito complex soil has a Land Capability Classification of 4e for irrigated land, designated by the USDA NRCS. The "4" class indicates the soil has severe limitations that will reduce the choice of plants or that require very careful management, or both. The "e" subclass indicates that the main hazard is the risk of erosion unless a close-growing plant cover is maintained.

30. The Chanac clay loam soil has a Land Capability Classification of 3e for irrigated land, designated by the USDA NRCS. The "3" class indicates the soil has severe limitations that reduce the choice of plants or that require special conservation practices, or both. The "e" subclass indicates that the main hazard is the risk of erosion unless a close-growing plant cover is maintained.

31. The project area is characterized by hot dry summers and cooler, humid winters. The rainy season generally extends from November through March. Average annual precipitation is about 6.5 inches and annual evapotranspiration is 54.6 inches with monthly average evapotranspiration rates ranging from 1.3 inches in January and December to 8.1 inches in July (California Irrigation Management Information System (CIMIS) Shafter Station # 5). The 100-year, 24-hour maximum precipitation is about 2.9 inches, based on maps obtained from the

Kern County Resource Management Agency, Engineering, Survey and Permit Services, Floodplain Management Section.

32. Little Creek flows parallel to Sherwood's Reservoirs along the north side of the facility, maintaining a minimum distance of approximately 0.25 miles. Sherwood's Reservoirs are approximately 868 feet above mean sea level and the surface elevation of Little Creek, nearest Sherwood's Reservoirs, ranges from 750 to 780 feet above mean sea level. The structural failure of Sherwood's Reservoirs would likely result in produced wastewater flowing into Little Creek and potentially flooding rural residential housing located approximately 1.25 miles southwest of Sherwood's Reservoirs.

33. Little Creek flows to a drainage area located 0.5 miles north of Poso Creek. The failure of Sherwood's Reservoirs and the release of produced wastewater to Little Creek is likely to flood the drainage area and result in the inundation of cropland and the discharge of produced wastewater into Poso Creek. The Basin Plan has designated beneficial uses for Poso Creek that have been not been assessed in the RWD. The proper design, construction, and maintenance of Sherwood's Reservoirs is necessary to ensure the protection of water quality in Poso Creek.

34. On 31 August 2018, Central Valley Water Board staff conducted a joint inspection with Division of Safety of Dams (DSOD) staff to assess whether Sherwood's Reservoirs are within the jurisdictional requirements of DSOD. During the inspection, DSOD staff measured the height of all structures and determined that Sherwood's Reservoirs, particularly the two dams retaining water within the gully of the hilly terrain, are not under the jurisdiction of DSOD since all structures are under 25 feet in height and the individual storage capacity of each reservoir does not exceed 50 acre-feet. Due to the design and construction of the facility, DSOD does not have the authority to require the Discharger to submit a construction quality assurance and control plan to verify the structural integrity of the facility.

Basin Plan, Beneficial Uses, and Water Quality Objectives

35. The Basin Plan designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Board. The intended use of the water discharged to Sherwood's Reservoirs is agricultural supply. Surface water flows in the area are to the South Valley Floor hydrologic unit, Valley Floor Waters. The surface water beneficial uses of Valley Floor Waters, as stated in the Basin Plan for Hydrologic Area No. 558, are agricultural supply (AGR); industrial service supply (IND); industrial process supply (PRO); water contact recreation (REC-1); non-contact water recreation (REC-2); warm freshwater habitat (WARM); wildlife habitat (WILD); rare, threatened, or endangered species (RARE); and groundwater recharge (GWR).

36. The project is in the Kern County Basin hydrologic unit, Poso groundwater hydrographic unit with regards to groundwater. The Basin Plan designates the beneficial uses of groundwater in the Kern County Basin Detailed Analysis Unit (DAU) 257 as municipal and domestic supply (MUN), agricultural supply (AGR), industrial supply (IND), and water contact recreation (REC-1).

37. Water in the Tulare Lake Basin is in short supply, requiring importation of surface water from

other parts of the State. The Basin Plan encourages use of recycled water on irrigated crops wherever feasible and indicates that evaporation of recyclable wastewater is not an acceptable permanent disposal method where the opportunity exists to replace existing uses or proposed use of fresh water with recycled water.

38. The Basin Plan includes a water quality objective for chemical constituents that, at a minimum, require waters designated as MUN to meet the State drinking water MCLs specified in Title 22. The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

39. 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 to implement the narrative objective.

40. In the absence of specific numerical water quality limits, the Basin Plan methodology is to consider any relevant published criteria. General salt tolerance guidelines, such as *Water Quality for Agriculture* by Ayers and Westcot and similar references, indicate that yield reductions in nearly all crops are not evident when irrigating with water having an electrical conductivity (EC) less than 700 umhos/cm. There is, however, an eight- to ten-fold range in salt tolerance for agricultural crops. It is possible to achieve full yield potential for some crops with waters having EC up to 3,000 umhos/cm if the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop.

41. According to *Water Quality for Agriculture* by Ayers and Westcot, boron is an essential element for plant growth that has the potential to become toxic at elevated concentrations. The yield for specific crops is not impacted until the toxicity threshold is reached resulting in a variety of symptoms displayed on the trunk, limbs, leaves, and/or crops. *Water Quality for Agriculture* has a relative boron tolerance threshold category for a variety of crops that ranges from “Very Sensitive” (<0.5 mg/l) to “Very Tolerant” (6-15 mg/l). Crops related to this project that are discussed in *Water Quality for Agriculture* are displayed in Table 4 below.

Table 4. Crop Sensitivity for Boron

Crop(s)	Boron Tolerance Category	Boron Range (mg/l)
Lemon	Very Sensitive	< 0.5
Orange, Grape, Walnut	Sensitive	0.5 – 0.75
Wheat, Barley	Moderately Sensitive	0.75 – 1.0
Alfalfa	Tolerant	4.0 – 6.0

42. The Basin Plan contains the following requirements for oil field discharges:

    a. The Basin Plan policy for disposal of produced wastewater includes effluent limits for EC, chloride, and boron of 1,000 umhos/cm, 200 mg/L, and 1.0 mg/L, respectively.

    b. In 1982, the Central Valley Water Board amended the Basin Plan to allow discharges of produced wastewater to exceed the above limits to facilitate use for irrigation and other beneficial uses where the exception would not cause an exceedance of a water quality objective. The Basin Plan, therefore, provides some flexibility to allow

produced wastewater exceeding Basin Plan salinity limits to be used for agricultural use in water short areas, provided the discharger first successfully demonstrates to the Central Valley Water Board that the increases will not cause exceedances of water quality objectives.

43. The rationale for specific effluent limits within this Order follow:

    a. **Oil and Grease**: An effluent limit of 35 mg/L for Oil and Grease is established in 40 CFR Part 435.50, Oil and Grease Extraction Point Source Category, Agricultural and Wildlife Water Use Subcategory. While the discharges to land described here are not subject to federal requirements, the Basin Plan requires the Discharger to comply with, or justify a departure from, effluent limitations set forth in 40 CFR 400 et seq., if the discharge is to land. The Discharger has not provided such a justification, but rather has shown that the McVan Facility is capable of meeting the oil and grease limit of 35 mg/L. Thus, the limit is applied for this Order.

    b. **Electrical Conductivity**: This Order applies the Basin Plan effluent limit for produced wastewater of 1,000 µmhos/cm as an annual average for the discharge to Sherwood's Reservoirs.

    c. **Boron**: This Order applies the Basin Plan effluent limit of 1.0 mg/L for produced wastewater as an annual average for the discharge to Sherwood's Reservoirs.

    d. **Chloride:** This Order applies the Basin Plan effluent limit of 200 mg/L for produced wastewater as an annual average for the discharge to Sherwood's Reservoirs.

44. The project will provide a new source of irrigation water for cropland east of Highway 65. The cropland proposed for the project is not within a water district and, therefore, farmers are reliant on groundwater for irrigation. Benefits for the reuse of produced wastewater for irrigation include the following:

    a. Reduces the demand of groundwater in the area from agricultural uses;

    b. Recycles produced wastewater that historically has been injected via water disposal wells; and

    c. Provides a drought tolerant source of water for irrigation.

Groundwater Considerations

45. Basin Plan water quality objectives to protect the beneficial uses of groundwater include numeric and narrative objectives, including objectives for chemical constituents, toxicity of groundwater, and taste and odor. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, or animals. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the MCLs in Title 22 of the CCR. The Basin Plan requires the application of the most stringent objective necessary to ensure that groundwater does not

contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

46. According to 2017 groundwater data from the Department of Water Resources website, depth to groundwater near Sherwood's Reservoirs is approximately 590 feet below ground surface (bgs). Groundwater elevation is approximately 140 feet above mean sea level (asl). Groundwater flow is generally from east to west.

47. According to 2017 groundwater data from the Department of Water Resources website, depth to groundwater across the proposed cropland varies from approximately 590 to 650 feet bgs. Groundwater elevation in this area ranges from approximately 140 to 170 feet asl. Groundwater flow for the proposed cropland is generally east to west.

48. Famoso Hills Ranch, LLC owns two agricultural wells near Sherwood's Reservoirs. Well #6 is approximately 0.05 miles west of Sherwood's Reservoirs and is perforated from 800 to 1,975 feet bgs. Well #7 is 0.7 miles west of Sherwood's Reservoirs and is perforated from 842 to 1,920 feet bgs. Wells #6 and #7 have the potential to be used as supplemental water sources in instances of water shortages or to mix with produced wastewater.

49. Wells #6 and #7 are the only wells within two miles of Sherwood's Reservoirs that will provide groundwater quality data beneath Sherwood's Reservoirs. Water samples from Wells #6 and #7 were collected on 20 June 2017 and analyzed for volatile organic compounds, polycyclic aromatic hydrocarbons, oil and grease, total petroleum hydrocarbons, general minerals, metals, stable isotopes, and radionuclides. Select water quality results for Wells #6 and #7 are available in Table 5 below.

Table 5. Groundwater Quality

Constituents	Units	Well #6 Results	Well #7 Results
Total Dissolved Solids	mg/L	220	190
Electrical Conductivity	umhos/cm	248	262
Chloride	mg/L	17	17
Boron	mg/L	0.084	0.083
Sodium	mg/L	56	58
Arsenic	ug/L	< 0.70 [1]	1.8
Oil and Grease	mg/L	< 0.86	< 0.86
Total Petroleum Hydrocarbons	mg/L	< 0.79	< 0.79
Radium 226, plus 228	pCi/L	1.6 +/- 0.95	0.289 +/- 0.44
Toluene	ug/L	0.60	<0.093
Xylenes, Total	ug/L	<0.36	<0.36

[1.] Analytical results that have a "<" represent non-detect results and are displayed in the table to show the method detection limit (MDL) for each constituent (e.g., < MDL).

The complete list of analytical results for groundwater is in the Information Sheet, which is attached hereto and made part of this Order by reference.

50. The Discharger did not propose groundwater monitoring in the RWD. The MRP, attached and a part of this Order, requires groundwater monitoring for Sherwood's Reservoirs. Included in the MRP is a time schedule for the Discharger to submit a Monitoring Well Installation and Sampling Plan (MWISP) and install an appropriate groundwater monitoring well network. The MWISP is subject to review and approval by the Executive Officer.

51. State Water Board Resolution No. 68-16 (hereafter Resolution 68-16) requires the Central Valley Water Board, in regulating the discharge of waste, to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with the maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality lower than that described in the Central Valley Water Board's policies (e.g., quality that exceeds water quality objectives).

Antidegradation Analysis

52. To determine the potential degradation of groundwater downstream of Sherwood's Reservoirs, the RWD includes an antidegradation analysis that compares the quality of produced wastewater to groundwater from Wells #6 and #7. The RWD concludes that electrical conductivity, chloride, and sulfate may increase in groundwater, although the anticipated increase will not impact the beneficial uses designated in the Basin Plan or yield concerns regarding crop toxicity issues. For arsenic, the RWD states that modeling data from a Kennedy/Jenks report dated 30 June 2011 for Cawelo Water District's Reservoir B (approximately seven miles southwest of Sherwood's Reservoirs) shows that soil adsorption will bind and remove arsenic from percolating water. Concentrations for boron and sodium will increase in groundwater, but will not impact the designated beneficial uses established in the Basin Plan. Due to the elevated concentrations of boron and sodium and potential concerns regarding plant toxicity, the RWD includes calculations and results of the anticipated increase of boron and sodium in groundwater. Using a leaching fraction and an estimated groundwater flowrate, the RWD states that groundwater concentrations for boron and sodium will likely increase to 0.14 mg/l and 40 mg/l, respectively. These constituents are known to be present in produced wastewater and will be required in groundwater monitoring reports to identify any potential degradation in first encountered groundwater.

53. Table 6 compares the water quality of produced wastewater and groundwater, effluent limitations specified in the Basin Plan, and drinking water maximum contaminant levels (MCLs) published by the State Water Resources Control Board, Division of Drinking Water.

Table 6. Summary of Water Quality Results and Criteria

	EC umhos/cm	Arsenic ug/L	Boron mg/L	Chloride mg/L	Sodium mg/L	Toluene ug/L	Xylenes, Total ug/l
Groundwater	205	1.3	0.083	17	57	0.32	<0.36
E&B Produced Wastewater	505	4.9	0.76	59	110	1.3	8.4
Basin Plan Effluent Limits	1,000	-	1.0	200	-	-	-
Maximum Contaminant Levels	900 **	10 *	-	250 **	-	150 *	1,750 *

* Primary Maximum Contaminant Level.

** Secondary Maximum Contaminant Level – Derived from human welfare considerations (e.g., taste, order, or laundry staining).

The quality of produced wastewater does not exceed effluent limits in the Basin Plan or MCLs. The RWD states that the groundwater quality at the project site will not be significantly degraded and will not impact the designated beneficial uses established in the Basin Plan. This Order requires the installation of a groundwater monitoring well network to identify any potential impacts to groundwater beneath the project area and to ensure that the findings in the RWD are accurate.

54. Sample analyses of the Oil Field Additives List (Table II of the MRP) are presented in Finding 14. The results indicate:

    a. Inorganic compound results from June 2017 and August 2018 appear to be similar;

    b. Detectable analytical results for the analyses are below the drinking water primary and secondary MCLs, where applicable; and

    c. Groundwater at Sherwood's Reservoirs is not likely to be impacted by organics given the low concentrations and depth to groundwater of approximately 590 feet.

55. This Order establishes effluent limitations for discharges that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan.

56. The RWD states that the Discharger will implement the following best practicable treatment or control (BPTC) measures to minimize the potential degradation of water quality:

    a. Produced wastewater will be treated to remove solids and oil and grease prior to reuse for irrigation;

    b. Water disposal wells will be maintained at the McVan Facility to accept poor quality produced wastewater or to divert excess flow to maintain a sustainable flowrate to Sherwood's Reservoirs;

    c. Monitoring of the discharge of produced wastewater to Sherwood's Reservoirs to ensure that reservoirs do not overflow;

    d. Implementation of water management practices to prevent over-irrigation of crops; and

    e. Installation of drip lines or sprinklers to reduce poor and wasteful irrigation practices.

    Central Valley Water Board staff finds that these treatment and control practices represent BPTC for the wastes that may threaten to degrade waters of the state.

57. The discharge, as regulated by this Order, will provide the following benefits:

    a. Provide up to 9,400 ac-ft/yr (approximately 8.4 million gallons per day) of recycled water (i.e., produced wastewater) for irrigation;

b. Result in the protection and maintenance of surface water and groundwater resources. Groundwater recharge can reduce the rate of groundwater decline in the project area and decrease pumping costs for any groundwater extraction needed;

c. Provide a new source of water for irrigation to reduce the demand of groundwater in the project area;

d. Make available an additional water supply to support the agricultural economy of the area and the Central Valley region;

e. Provide a 'drought proof' water supply. This has additional benefits for crop production planning; and

f. Convert flows that otherwise would be disposed of by well injection to a beneficial use as irrigation water supply.

Central Valley Water Board staff finds that these benefits represent a significant benefit to the people of the state.

58. This Order complies with Resolution 68-16 because it ensures that any degradation that may occur as a result of the discharges regulated by this Order will not result in water quality lower than that prescribed in state and regional policies, that the degradation will not unreasonably affect present and anticipated future beneficial uses, that the Discharger will employ BPTC to minimize degradation, and that the degradation is consistent with the maximum benefit to the people of the state due to the significant benefits provided by the activities regulated by this Order as described in Finding No. 57.

Other Regulatory Considerations

59. Title 27 of the CCR (hereafter Title 27) contains regulatory requirements for the treatment, storage, processing, and disposal of solid waste. However, Title 27 exempts certain activities from its provisions. Title 27, section 20090 states, in relevant part:

> (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.

Discharges of produced wastewater to Sherwood's Reservoirs and reuse of produced wastewater for irrigation are exempt from the requirements of Title 27 because the Board is issuing these waste discharge requirements, because the discharge as regulated by this Order

will comply with the Basin Plan, and because the wastes subject to regulation under this Order do not need to be managed as hazardous wastes.

60. Water Code section 13267(b) states, in relevant part, that:

> In conducting an investigation … the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

The technical reports required by this Order and the attached MRP are necessary to assure compliance with this Order. The Discharger owns and operates the facility that discharges the waste subject to this Order.

61. Kern County (County) is the lead agency for purposes of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et seq.) and the CEQA Guidelines (Title14, Division 6, California Code of Regulations, as amended). On November 9, 2015, the County certified the Environmental Impact Report (EIR) for the Kern County Amended Zoning Ordinance for Oil and Gas Activities (Kern County EIR). The State Water Resources Control Board commented on the draft EIR. As part of the Kern County EIR, the County analyzed the use of produced wastewater for irrigation purposes.

62. The Regional Board as the responsible agency pursuant to CEQA (Public Resources Code, section 21069) and in making its determinations and findings, must presume that the Kern County EIR comports with the requirements of CEQA and is valid. (Public Resources Code, section 21167.3.) The Regional Board has reviewed and considered the Kern County EIR. The Kern County EIR found that there was a potentially significant impact to water supplies and that the use of produced wastewater for agricultural irrigation will reduce the potentially significant impact. The Kern County EIR concluded that any produced wastewater treated and used for agricultural irrigation shall be tested and monitored to ensure compliance with applicable standards for such agricultural irrigation. (Kern County EIR, MM 4.17-2.) This Order requires compliance with certain conditions and monitoring intended to ensure compliance with water quality standards. The Regional Board has determined that the Project, when implemented in accordance with the MMRP and the conditions in this Order, will not result in any significant adverse water resource impacts.

63. The California Department of Water Resources (DWR) sets standards for the construction and destruction of groundwater wells, as described in the *California Well Standards Bulletin 74-90 (June 1991)* and *Water Well Standards: State of California Bulletin 74-81 (December 1981)*. These standards and any more stringent standards adopted by the State or County of Kern pursuant to Water Code section 13801, apply to all monitoring wells.

64. Pursuant to Water Code section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

CV-SALTS Reopener

65. The Central Valley Water Board adopted Basin Plan amendments incorporating new programs for addressing ongoing salt and nitrate accumulation in the Central Valley at its 31 May 2018 Board Meeting. These programs, once effective, could change how the Central Valley Water Board permits discharges of salt and nitrate. For nitrate, dischargers that are unable to comply with stringent nitrate requirements will be required to take on alternate compliance approaches that involve providing replacement drinking water to persons whose drinking water is affected by nitrates. Dischargers could comply with the new nitrate program either individually or collectively with other dischargers. For salinity, dischargers that are unable to comply with stringent salinity requirements would instead need to meet performance-based requirements and participate in a basin-wide effort to develop a long-term salinity strategy for the Central Valley. This Order may be amended or modified to incorporate any newly-applicable requirements.

66. The stakeholder-led Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has been coordinating efforts to implement new salt and nitrate management strategies. The Board expects dischargers that may be affected by new salt and nitrate management policies to coordinate with the CV-SALTS initiative.

Food Safety Expert Panel

67. The Central Valley Water Board established a panel of experts (Food Safety Expert Panel) in the field of toxicology, biology, and agriculture to review data regarding the reuse of produced wastewater for irrigation. The Food Safety Expert Panel is to provide the Board with recommendations regarding potential impacts that may be associated with the reuse of produced wastewater for irrigation. The Board expects dischargers that reuse produced wastewater for irrigation to participate in the Food Safety Expert Panel effort and join the memorandum of understanding with other oil producers and irrigation management entities. If this project does not implement similar practices or grow similar crop types to those being discussed currently by the Food Safety Expert Panel, the Discharger may be required to conduct a separate investigation regarding this practice that will require expenses to be covered solely by the Discharger. If the work being conducted by the Food Safety Expert Panel effort determines there is a significant threat to crop safety and public health associated with the irrigation of crops with produced wastewater, this Order may be reopened and modified to address the threat.

Public Notice

68. All the above, which is incorporated herein, were considered in establishing the following conditions of the discharge.

69. Sherwood; Jay LLC; Steir Berton Trust; Homewood Mountain Partners, LLC; Famoso Hills Ranch, LLC; Yurosek Farms, LLC; E&B; and interested agencies and persons have been notified of the intent to prescribe WDRs for this discharge, and they have been provided an

opportunity for a public hearing and an opportunity to submit their written views and recommendations.

70. All comments pertaining to the discharge were heard and considered in a public hearing.

IT IS HEREBY ORDERED that pursuant to sections 13263 and 13267 of the Water Code, Sherwood Hills, LLC; Jay LLC; Steir Berton Trust; Homewood Mountain Partners, LLC; Famoso Hills Ranch, LLC; Yurosek Farms, LLC; and E & B Natural Resources Management Corporation, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted there under, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of wastes, including produced wastewater, to surface waters or surface water drainage courses is prohibited.

2. Discharge of wastes other than treated produced wastewater to Sherwood's Reservoirs and cropland identified in Attachment D in the manner described in the Findings and authorized herein is prohibited.

3. Neither the discharge nor its treatment shall create a nuisance or pollution as defined in Water Code section 13050.

4. Discharge of waste classified as 'hazardous', as defined in the CCR, title 23, section 66261.1 et seq., is prohibited.

5. The discharge of fluids used in "well stimulation treatment," as defined by CCR, title 14, section 1761 (including hydraulic fracturing, acid fracturing, and acid matrix stimulation), to land is prohibited.

6. The discharge of produced wastewater from wells containing well stimulation treatment fluids, as defined by CCR, title 14, section 1761, is prohibited.

7. Treatment system bypass of untreated or partially treated waste is prohibited, except as allowed by section A.13 of Standard Provisions and Reporting Requirements for Waste Discharge Requirements, dated 1 March 1991.

8. Produced wastewater overflow from Sherwood's Reservoirs or subsequent surface impoundments that contain produced wastewater is prohibited.

B. Effluent Limitations

1. The discharge of treated produced wastewater from the McVan Facility to Sherwood's Reservoirs (**Discharge 001**) shall not exceed the following for the constituents listed:

Constituent	Units	Daily Maximum [1]	Annual Average [2]
Flow	mgd [3]	8.4	-
Electrical Conductivity	umhos/cm	-	1,000
Boron	mg/L	-	1.0
Chloride	mg/L	-	200
Oil & Grease	mg/L	35	-

[1] The **Daily Maximum** is the greatest discharge rate or concentration permitted for one day.
[2] The **Annual Average** is the arithmetic mean of measurements made during a calendar year.
[3] mgd = million gallons per day.

C. Discharge Specifications

1. The Discharger shall operate all systems and equipment to optimize treatment of wastewater and the quality of the discharge.

2. The discharge of produced wastewater shall not create objectionable odors perceivable beyond the limits of Sherwood's Reservoirs at an intensity that creates or threatens to create nuisance conditions.

3. Sherwood's Reservoirs and subsequent reservoirs shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the winter. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

4. Sherwood's Reservoirs shall be managed to prevent breeding of mosquitos. In particular,

    a. Weeds shall be minimized through control of water depth, harvesting and herbicides.

    b. Dead algae, vegetation and other debris shall not be allowed to accumulate on the water surface.

    c. Vegetation management operations in areas in which nesting birds have been observed shall be carried out either before or after, but not during, the 1 April to 30 June bird nesting season.

5. Newly constructed or rehabilitated berms or levees (excluding internal berms that separate ponds or control the flow of water within a surface impoundment) shall be designed and constructed under the supervision of a California Registered Civil Engineer.

6. Newly constructed or rehabilitated berms or levees (excluding internal berms that separate ponds or control the flow of water within a surface impoundment) shall be designed and constructed under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1.

7. Sherwood's Reservoirs and downstream irrigation ponds shall be free of visible oil or oil accumulation, or effectively netted to preclude the entry of wildlife.

D. Groundwater Limitations

Release of waste constituents from any portion of the Facility, including but not limited to any treatment, reclamation, or storage component associated with the discharge of produced wastewater, shall not cause or contribute to groundwater:

1. Containing constituent concentrations in excess of the concentrations specified below or in excess of natural background water quality, whichever is greater:

    i. Boron of 0.75 mg/L.

    ii. For constituents identified in Title 22, the MCLs quantified herein.

2. Containing taste or odor producing constituents, toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.

E. Provisions

1. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991 (Standard Provisions), which are attached and made part of this Order.

2. The Discharger shall comply with Monitoring and Reporting Program Order No. R5-2019-0024, which is part of this Order, and any revisions thereto as adopted by the Central Valley Water Board or approved by the Executive Officer.

3. The Discharger shall comply with the following:

    a. The Discharger shall be fully engaged in the Food Safety Project as envisioned in the MOU as signed in June 2017 and shall provide to the Manager and Administrator in a timely manner information that they may request to ensure the timely completion of the crop sampling under Task 3, including but not limited to, the following:

        i. The Discharger shall, on an annual basis by 1 January, submit a list of all crops that are irrigated with produced wastewater within its service area. The list shall include a description of the anticipated time of harvest for each crop.

        ii. The Discharger shall provide notification to the Manager and Administrator at least two weeks prior to harvest of any and all crops that are or have been irrigated with water that could contain produced wastewater. The notification shall include the type of crop and anticipated harvest date. The Discharger shall work with the Administrator and the crop owners to obtain access and ensure that representative samples of the crops can be obtained by the third-party sampler under Central Valley Water Board oversight.

b. As directed by the Manager, the Discharger shall participate as directed in Tasks 1, 2, and 3, as agreed upon in the MOU including timely responses to inquiries by the Administrator and Manager.

c. If one of the Dischargers listed in Finding No. 5 does not comply with any part of the above provision, then the Manager at his discretion, may bring to the Central Valley Water Board for consideration an Order prohibiting the use of produced wastewater for irrigation for that Discharger.

If the results of the Food Safety Project and recommendations of the Food Safety Expert Panel indicate that the practices and crop types used by the Discharger need additional scrutiny, the Discharger may be required by the Executive Officer to conduct a separate investigation.

4. Due to water quality concerns downstream of the structure, the discharge of produced wastewater to Reservoirs #2, #3, and #4 shall not occur prior to the submittal of a demonstration to the Central Valley Water Board that these structures have been properly designed and constructed. This demonstration is subject to review and approval by the Executive Officer and shall include, at a minimum, a construction quality assurance and control report that is signed and stamped by an appropriate registered professional. The discharge of produced wastewater to Sherwood's Reservoirs #2, #3, and #4 is prohibited until the Discharger has received written approval from the Central Valley Water Board.

5. **At least 60 days prior to planting new crops**, the Discharger shall notify, in writing, the Central Valley Water Board. The Discharger shall include at least the following: crop type, acreage, parcel(s), anticipated harvest year for human consumption, and an approximate timeframe for harvesting during the year.

6. The Discharger shall comply with Standard Provisions, General Reporting Requirements A.4, which requires the submittal of a new Report of Waste Discharge to the Central Valley Water Board **at least 140 days** before making any material change to the discharge. Material changes include, but not limited to increasing the volume of produced wastewater, irrigation of lands not identified in Findings 7 and 10 of this Order, and incorporating new sources of produced wastewater not identified in Findings 6 and 8 of this Order.

7. **Within 120 days following the signature date of this Order**, all parties regulated by this Order shall sign the "Memorandum of Understanding Between the Central Valley Regional Water Quality Control Board and the Permit Holders Governing the Solicitation, Management and Review of Academic, Technical and/or Scientific Studies Related to the Irrigation of Food Crops with Oil Field Produced Water", or submit a work plan to the Central Valley Water Board, subject to review and approval by the Executive Officer and the Food Safety Expert Panel, that outlines a study by the Discharger for demonstrating that crops grown under this Order are safe for human consumption.

8. The Discharger shall have copies of this Order, including its MRP, Information Sheet, Attachments, and Standard Provisions, available for reference by operating personnel. Key operating personnel shall be familiar with the contents of the documents.

9. The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used to achieve compliance with the conditions of this Order. Proper operation and maintenance also include adequate laboratory controls and appropriate quality assurance procedures. This Provision requires the operation of back-up or auxiliary facilities or similar systems that are installed only when the operation is necessary to achieve compliance with the conditions of the Order.

10. All technical reports and work plans required herein that involve planning, investigation, evaluation, design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of a person registered to practice engineering or geology in California pursuant to California Business and Professions Code Sections 6735, 7835, and 7835.1. As required by these laws, completed technical reports and work plans must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work. All reports required herein are required pursuant to California Water Code Section 13267.

11. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports. On or before each report due date, the Discharger shall submit the specified document to the Central Valley Water Board or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, then the Discharger shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board in writing when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

12. In the event of any change in control or ownership of land or waste treatment and storage facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.

13. To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B. 3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. If approved by the Executive Officer, the transfer request will be submitted to the Central Valley Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.

14. The Discharger shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with this Order.

15. As described in the Standard Provisions, the Discharger shall report promptly to the Central Valley Water Board any material change or proposed change in the character, location, or volume of the discharge.

16. The Central Valley Water Board will review this Order periodically and will revise requirements when necessary.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to $10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and CCR, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order 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. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

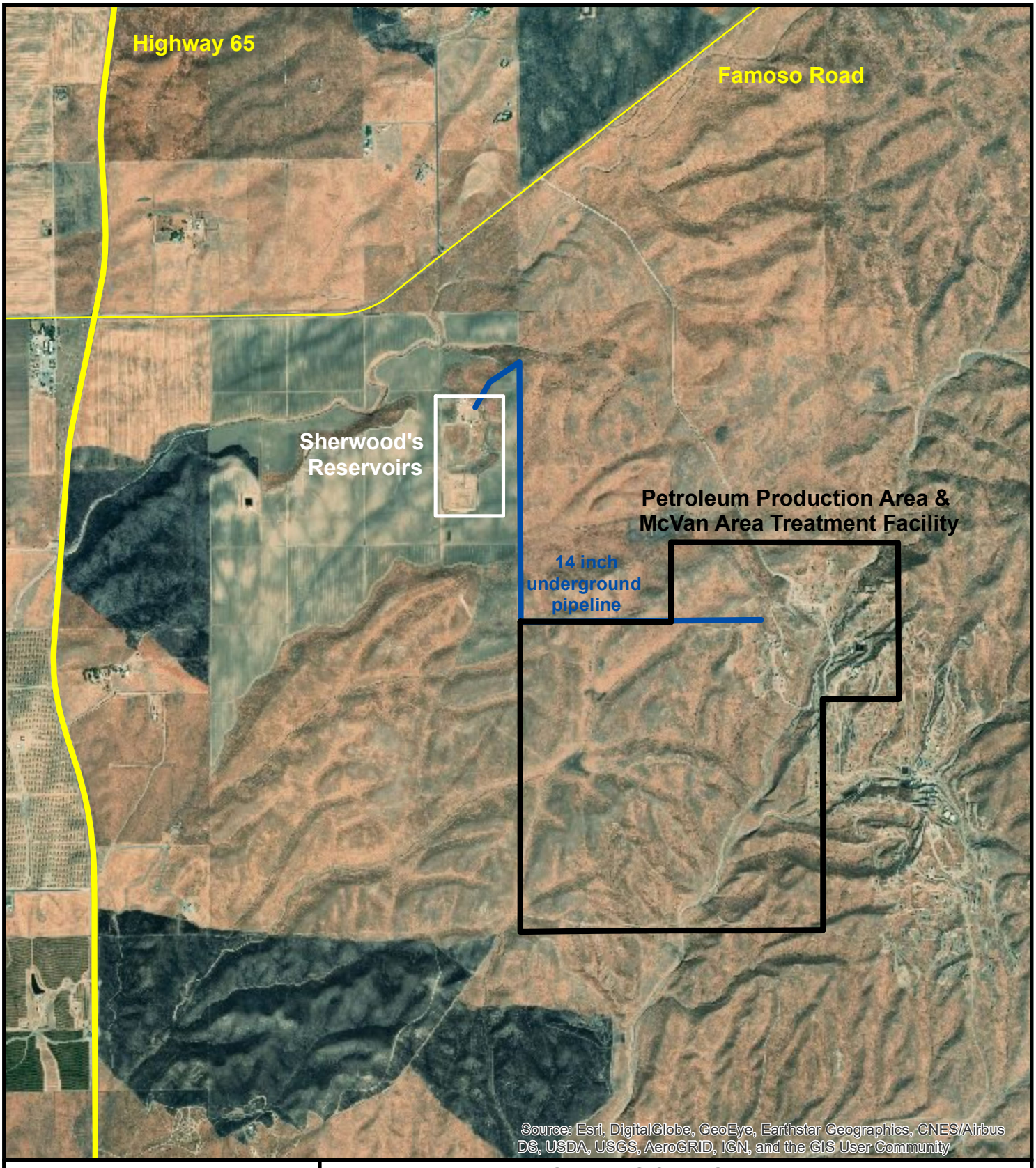
I, PATRICK PULUPA, Executive Officer, do hereby certify that the foregoing is a full true, and correct copy of an Order adopted by the California Regional Water Quality Control Board on, 5 April 2019

Original Signed By:

PATRICK PULUPA, Executive Officer

Order Attachments
- Attachment A – Site Location Map
- Attachment B – Treatment Process Flow Diagram
- Attachment C – Schematic of Sherwood's Reservoirs
- Attachment D – Vicinity Map

Monitoring and Reporting Program R5-2019-0024
Information Sheet Order R5-2019-0024
Standard Provisions (1 March 1991) (separate attachment to Discharger only)



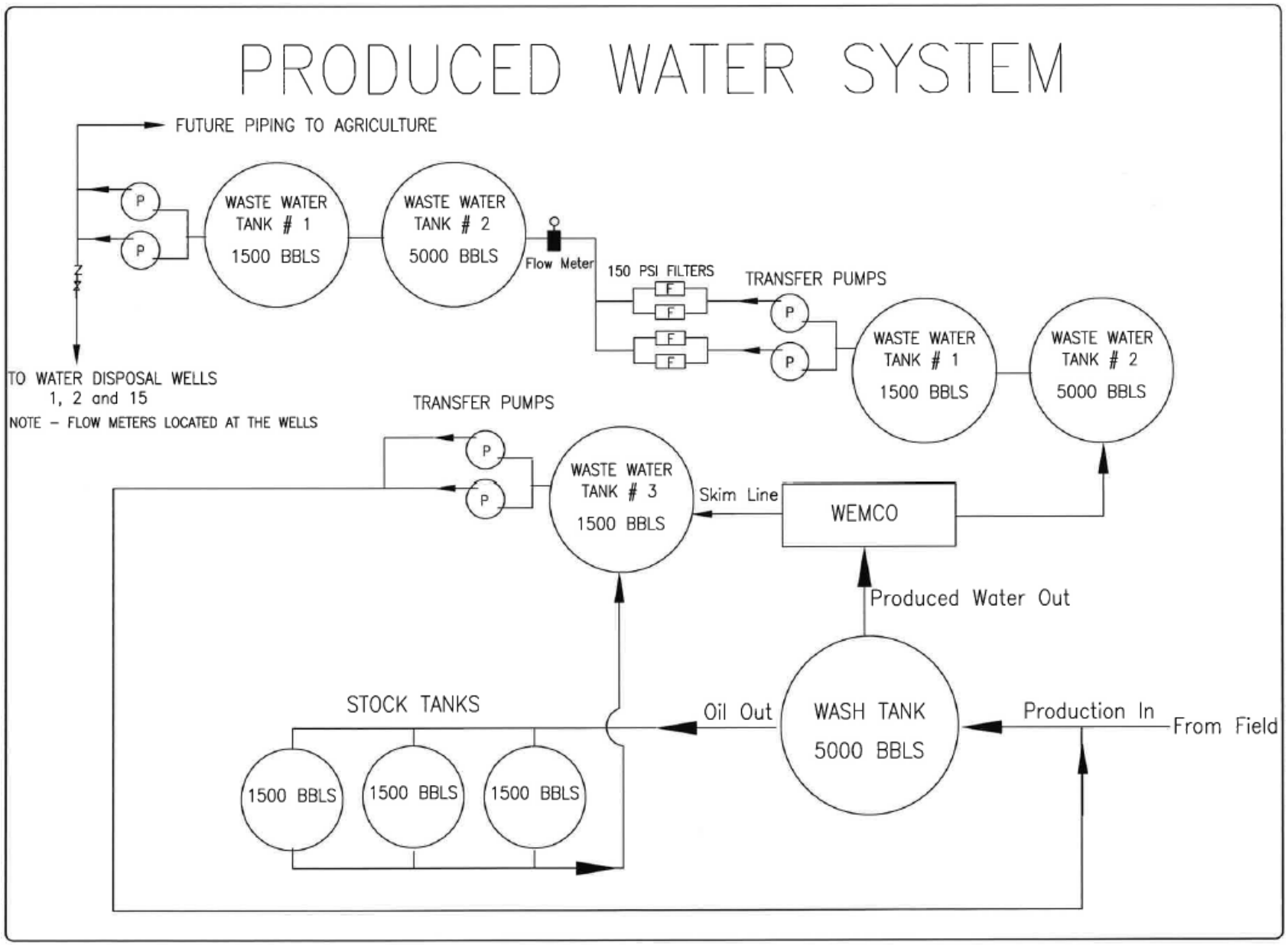
N

0 0.2 0.4 0.8 Miles

SITE LOCATION MAP

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2019-0024
FOR
SHERWOOD HILLS, LLC; JAY LLC; STEIR BERTON TRUST;
HOMEWOOD MOUNTAIN PARTNERS, LLC;
FAMOSO HILLS RANCH, LLC; YUROSEK FARMS, LLC;
AND E & B NATURAL RESOURCES MANAGEMENT CORPORATION
MCVAN AREA TREATMENT FACILITY
KERN COUNTY

ATTACHMENT A



TREATMENT PROCESS FLOW DIAGRAM

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2019-0024

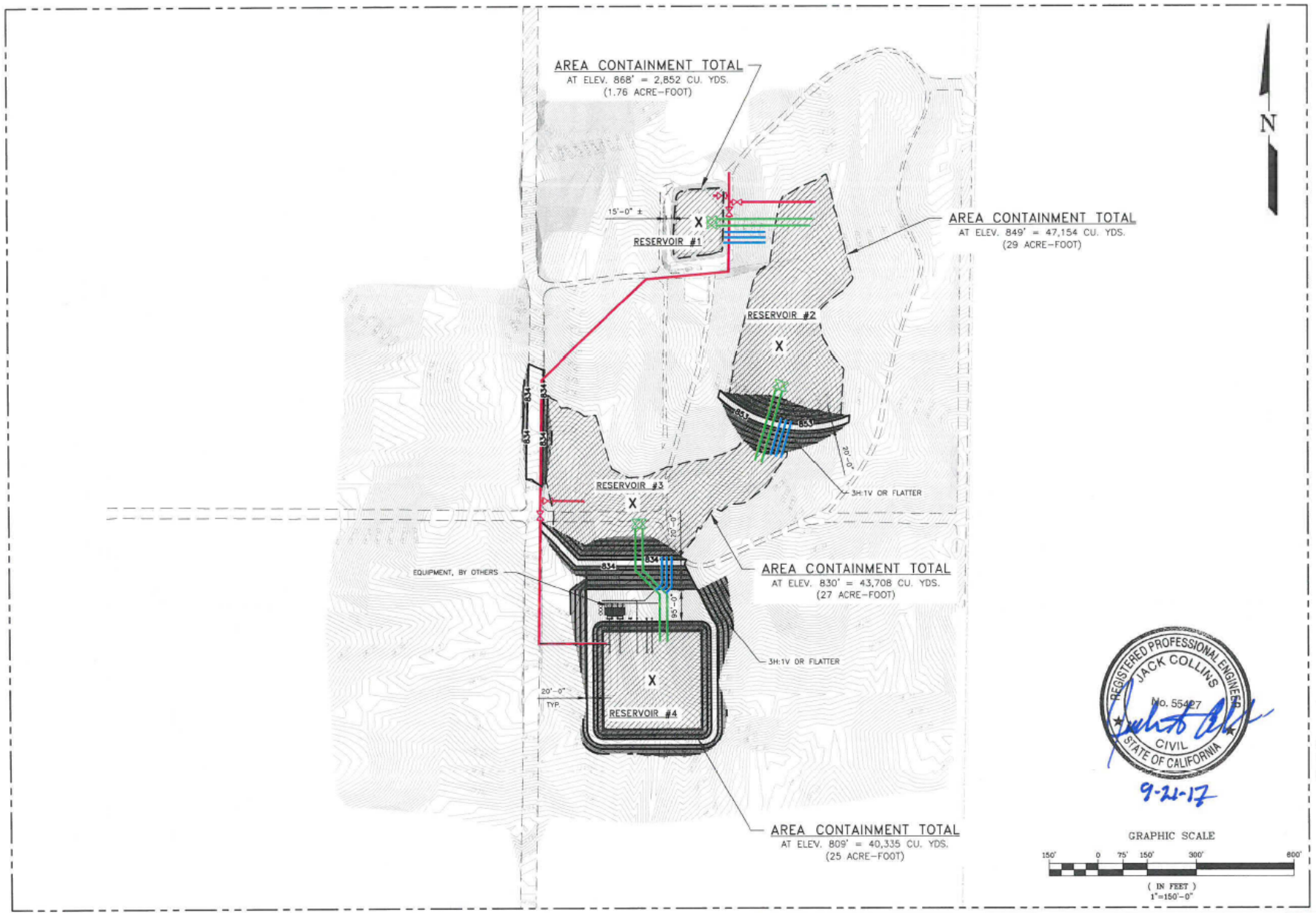
FOR

SHERWOOD HILLS, LLC; JAY LLC; STEIR BERTON TRUST;
HOMEWOOD MOUNTAIN PATNERS, LLC; FAMOSO HILLS RANCH, LLC;
YUROSEK FARMS, LLC; AND E & B NATURAL RESOURCES MANAGEMENT CORPORATION

MCVAN AREA TREATMENT FACILITY

KERN COUNTY

ATTACHMENT B

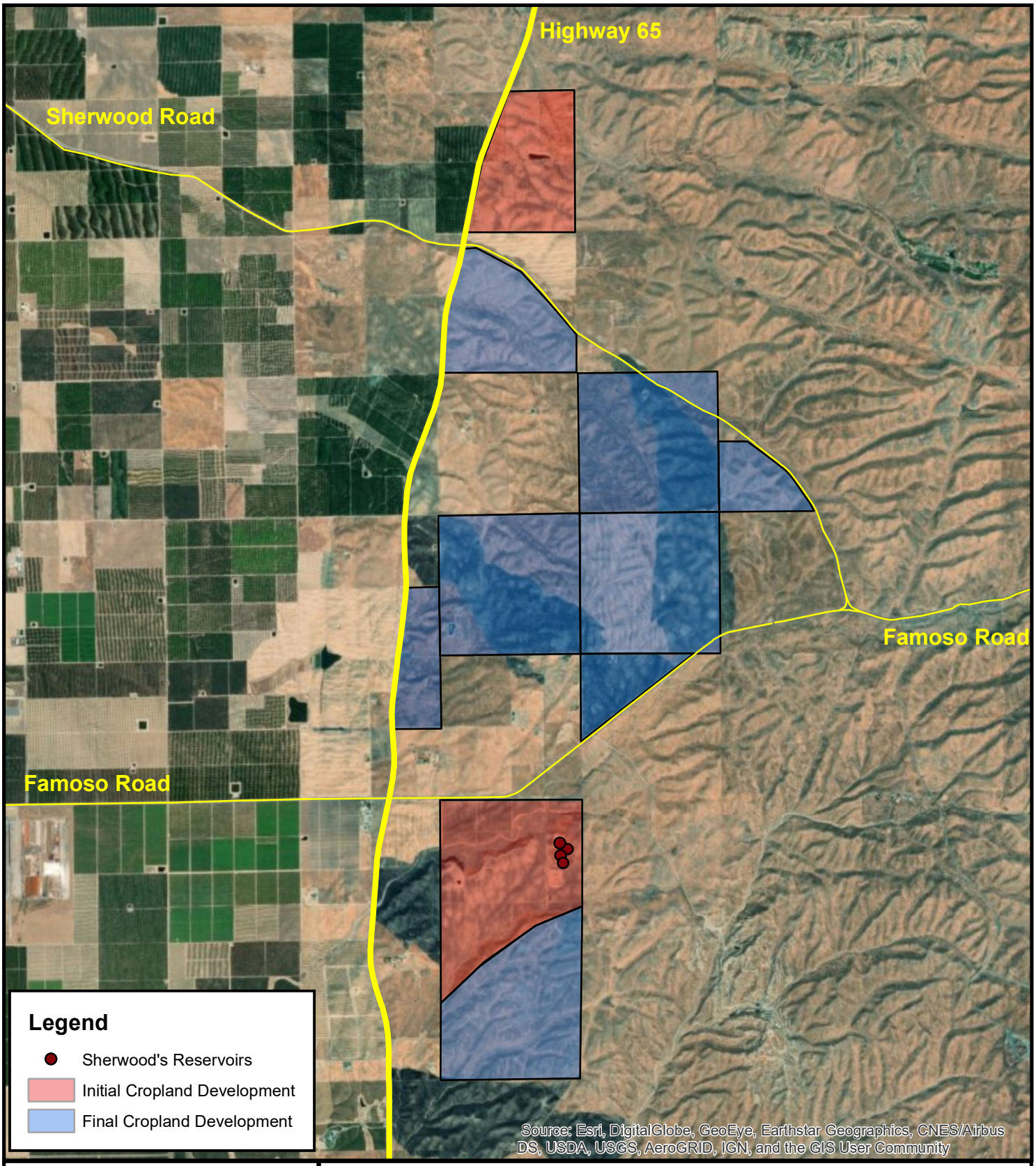


LEGEND:

- CONTAINMENT EXTENT
- HDPE — SPILL WAY (3 EA. RESERVOIR) – 24" DIA. (540'±)
- C.S. — TRANSFER LINE (2 EA. RESERVOIR) – 24" DIA. (1080'±)
- C.S. — INLET PIPING – 30" DIA. (2,095'±)
- X – LOCATION OF LAT. / LONG.

SCHEMATIC OF SHERWOOD'S RESERVOIRS
WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2019-0024
FOR
SHERWOOD HILLS, LLC; JAY LLC; STEIR BERTON TRUST;
HOMEWOOD MOUNTAIN PATNERS, LLC; FAMOSO HILLS RANCH, LLC;
YUROSEK FARMS, LLC; AND E & B NATURAL RESOURCES MANAGEMENT CORPORATION
MCVAN AREA TREATMENT FACILITY
KERN COUNTY

ATTACHMENT C



N

0 0.45 0.9 1.8 Miles

VICINITY MAP

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2019-0024
FOR
SHERWOOD HILLS, LLC; JAY LLC; STEIR BERTON TRUST;
HOMEWOOD MOUNTAIN PARTNERS, LLC;
FAMOSO HILLS RANCH, LLC; YUROSEK FARMS, LLC;
AND E & B NATURAL RESOURCES MANAGEMENT CORPORATION
MCVAN AREA TREATMENT FACILITY
KERN COUNTY

ATTACHMENT D

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM
ORDER NO. R5-2019-0024

FOR
SHERWOOD HILLS, LLC; JAY LLC; STEIR BERTON TRUST;
HOMEWOOD MOUNTAIN PARTNERS, LLC; FAMOSO HILLS RANCH, LLC;
YUROSEK FARMS, LLC; AND E & B NATURAL RESOURCES MANAGEMENT CORPORATION

PRODUCED WASTEWATER RECLAMATION PROJECT
MCVAN AREA TREATMENT FACILITY
POSO CREEK OIL FIELD
KERN COUNTY

This Monitoring and Reporting Program (MRP) is required pursuant to Water Code section 13267.

Sherwood Hills, LLC; Jay LLC, Steir Berton Trust, Homewood Mountain Partners, LLC; Famoso Hills Ranch, LLC; Yurosek Farms, LLC; and E & B Natural Resources Management Corporation (hereafter jointly referred to as Discharger) shall not implement any changes to this MRP unless and until the Central Valley Regional Water Quality Control Board (Central Valley Water Board) adopts, or the Executive Officer issues, a revised MRP. Changes to a sample location(s) shall be established with concurrence of Central Valley Water Board staff, and a description of the revised station(s) shall be submitted for approval by the Executive Officer.

This MRP includes monitoring, record-keeping, reporting, and further hydrogeological investigation requirements. Monitoring requirements include monitoring of groundwater, discharges of produced wastewater, solid wastes, chemicals associated with petroleum exploration and production, and the application of recycled materials (wastewater and solids); to determine if the Discharger is complying with Waste Discharge Requirements Order No. R5-2019-0024.

MONITORING

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 the applicable provisions of the ***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 (ELAP). The Discharger may propose alternative methods for approval by the Executive Officer.

A complete list of substances that are tested for and reported on by the testing laboratory shall be provided to the Central Valley Water Board. All peaks must be reported. In addition, both the method detection limit (MDL) and the practical quantification limit (PQL) shall be reported. 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-detect needs to be reanalyzed with the MDL set lower than the drinking water standard, if possible, or at the lowest level achievable by the laboratory. If the regulatory limit for a given constituent is less than the reporting limit (RL) or practical quantification limit (PQL), then any analytical results for that constituent below the RL (or PQL), but above the method detection limit (MDL), shall be reported and flagged as estimated. All quality assurance/quality control (QA/QC) samples must be run on the same dates as when samples are 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 report. All analyses must be performed by an ELAP certified laboratory.

The MRP can be modified if the Discharger 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, the Discharger may request this MRP be revised by the Executive Officer to reduce the monitoring frequency or minimize the list of constituents. The proposal must include adequate technical justification for reduction in monitoring frequency.

Monitoring requirements include the periodic visual inspection of the facility to ensure continued compliance with the Order. The MRP also requires submittal of information regarding the use of all chemicals used during well drilling, installation, operation, and maintenance activities associated with each well generating waste materials (liquids) that are discharged to land and regulated under this Order.

This MRP requires the Discharger to keep and maintain records for five years from the date the monitoring activities occurred and to prepare and submit reports containing the results of monitoring specified below. 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.

PRODUCED WASTEWATER MONITORING

Produced wastewater samples shall be representative of the volume and nature of the discharges. 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.

The Discharger shall label all pipelines discharging produced wastewater, or other sources of water (e.g., surface water and/or groundwater), to Reservoirs #1, #2, #3, and #4 (Sherwood's Reservoirs). Identifying labels shall be located within five feet of the pipeline and shall include at least the following: type of water (e.g., produced wastewater, surface water, or groundwater), source of the water (e.g., Well ID, canal, or lease/facility), and the company that supplies the water (e.g., E&B or Sherwood).

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge within the specified monitoring frequency of this Order, the Discharger

shall monitor and record data for all the constituents listed below, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge for the subsequent monitoring periods.

Discharge 001 – Produced Wastewater
(McVan Area Treatment Facility)

The Discharger shall monitor the volume and quality of produced wastewater discharged from the McVan Area Treatment Facility (McVan Facility) to Sherwood's Reservoirs. Produced wastewater samples shall be collected downstream from the treatment system and prior to the discharge to Sherwood's Reservoirs. Produced wastewater monitoring for Discharge 001 shall include at least the following:

Constituent/Parameter	Units	Sample Type	Frequency
Flow	MGD [1]	Metered [2]	Continuous
Electrical Conductivity	µmhos/cm	Meter	Continuous
Table I – Water Quality Monitoring	Varies	Grab	Quarterly
Table II – Oil Production and Process Chemicals and Additives [3]	Varies	Grab	Quarterly

[1] mgd = million gallons per day.
[2] Flow may be measured with an appropriate engineered alternative if approved in writing by the Executive Officer.
[3] The Discharger is responsible for identifying approved analytical methods for all constituents identified in Table II, as appropriate. For constituents that do not have an approved analytical method, the Discharger shall cite the source (e.g., name of the consultant or laboratory) and qualifications of the entity that made the determination that an analytical method is not available for specific constituents in Table II. Entities that are reviewing Table II to identify analytical methods shall have adequate knowledge related to laboratory analyses and be qualified to complete this review.

Discharge 002 – Irrigation Water
(Sherwood's Reservoirs)

The Discharger shall monitor the volume and quality of the discharge from Sherwood's Reservoirs to cropland for irrigation. The monitoring location for Discharge 002 shall consist of the pumping station adjacent to Reservoir #4 that transfers produced wastewater to cropland for irrigation. Monitoring at Discharge 002 shall include at least the following:

Constituent/Parameter	Units	Sample Type	Frequency
Influent Flow to Sherwood's Reservoirs[1]	MGD	Metered[2]	Continuous
Effluent Flow from Sherwood's Reservoirs[3]	MGD	Metered	Continuous
Table I – Water Quality Monitoring	Varies	Grab	Quarterly
Table II – Oil Production and Process Chemicals and Additives [4]	Varies	Grab	Quarterly

[1] If there are multiple discharges of water to Sherwood's Reservoirs (e.g., groundwater and/or surface water), the flowrate for each shall be recorded individually.
[2] Flow may be measured with an appropriate engineered alternative if approved in writing by the Executive Officer.
[3] If there are multiple outlets from Sherwood's Reservoirs, the flowrate for each shall be recorded individually.
[4] The Discharger is responsible for identifying approved analytical methods for all constituents identified in Table II, as appropriate. For constituents that do not have an approved analytical method, the Discharger shall cite the source (e.g., name of the consultant or laboratory) and qualifications of the entity that made the

determination that an analytical method is not available for specific constituents in Table II. Entities that are reviewing Table II to identify analytical methods shall have adequate knowledge related to laboratory analyses and be qualified to complete this review.

IRRIGATION WATER MONITORING

The Discharger shall monitor the volume of water used for irrigation and the acreage of cropland receiving produced wastewater. Irrigation water monitoring shall include at least the following:

Constituent/Parameter	Units	Sample Type	Frequency
Volume [1] of Produced Wastewater	ac-ft/d [2]	Metered	Monthly
Volume [1] of Blending Water	ac-ft/d [2]	Metered	Monthly
Blending Ratio [3]	-	Calculated	Monthly
Area of Cropland Receiving Produced Wastewater [4]	Acres	Calculated	Quarterly
Crop Types [5]	-	-	Annually

1 Individual volumes shall be monitored and all sources of water defined in each monitoring report (e.g., petroleum leases, irrigation well names, and surface water sources).

2 Acre-feet per day.

3 Blending ratios shall be calculated using the sum of blending water (e.g., surface and/or groundwater) and produced wastewater that are mixed and used for irrigation.

4 The acreage of cropland shall include all land that was irrigated with produced wastewater within each water district and water company.

5 This shall include at least the crop type and acreage for all cropland irrigated with produced wastewater within each water district and water company.

CHEMICAL AND ADDITIVE MONITORING

In addition to the Table II monitoring in the Produced Wastewater Monitoring section above, the Discharger shall provide the following for all chemicals and additives[1] used at all leases and facilities that discharge produced wastewater to Sherwood's Reservoirs:

Requirement	Frequency
A list of all chemicals and additives used.	Quarterly
The volume of each liquid chemical and additive used in gallons.	Quarterly
The mass of each solid chemical and additive used in grams or kilograms. (if dissolved into a solution, provide resulting solution concentration or ratio).	Quarterly
A list of the leases and facilities where the chemicals and additives are being used.	Quarterly
Safety Data Sheets (SDSs) or Material Safety Data Sheets (MSDSs) for each chemical and/or additive used during the year	Annually

[1] Chemicals that are a part of trade secrets shall be kept confidential at the Central Valley Water Board. Documents containing trade secrets shall be properly marked on the cover, by the Discharger, prior to submitting the document to the Central Valley Water Board. Individuals that present proper credentials, or that have received permission by the Discharger, shall be granted access to view the files at the office.

Monitoring and reporting of chemical additives may be reduced at the discretion of the Assistant Executive Officer.

SOLID WASTE MONITORING

Prior to the disposal of solid wastes on-site, the Solid Waste Management Plan must be approved, in writing, by the Executive Officer. Modifications to the Solid Waste Management Plan need to be submitted in an addendum report that requires written approval by the Executive Officer prior to implementation. On-site solid waste monitoring shall consist of the reporting requirements specified in the approved Solid Waste Management Plan.

Solid wastes disposed off-site shall be transported to a permitted facility. The Discharger shall provide at least the following for all solid waste disposed off-site:

1. Volume of solid waste,
2. Procedures for hauling waste,
3. Disposal location,
4. Waste manifest documentation, and
5. Documentation that the disposal facility is permitted to accept the solid waste.

FACILITY MONITORING

Permanent markers in Reservoir #4 shall be in place with calibrations indicating the pond water level at design capacity and available operational freeboard (two feet minimum required). Permanent markers in Reservoirs #1, #2, and #3 are not required due to the installation of overflow pipes that do not allow the freeboard to exceed three feet. The freeboard for Reservoir #4 shall be monitored to the nearest tenth of a foot **monthly** and results included in the **quarterly report**.

Annually, prior to the anticipated rainy season, but **no later than 30 September**, the Discharger shall conduct an inspection of Sherwood's Reservoirs. The inspection shall assess repair and maintenance needed for oil booms, drainage control systems, slope failure, groundwater monitoring wells, changes in site conditions that could impair the integrity of the reservoirs, overflow pipes, and a preparedness assessment for winter conditions including, but not limited to, erosion and sedimentation control. The Discharger shall take photos of any problem areas before and after repairs. Any necessary construction, maintenance, or repairs shall be **completed by 31 October**. Annual facility inspection reporting shall be **submitted with the fourth quarter monitoring report.**

The Discharger shall inspect all precipitation diversion and drainage facilities for damage **within 7 days** following major storm events (e.g., a storm that causes continual runoff for at least one hour) capable of causing flooding, damage, or significant erosion. The Discharger shall take photos of any problem areas before and after repairs. Necessary repairs shall be commenced **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in the Reporting Requirements section of this MRP and shall be reported in the quarterly monitoring report following the major storm event.

The Discharger shall monitor and record on-site rainfall data using an automated rainfall gauge or an acceptable alternative. Data shall be used in establishing the severity of storm events and wet seasons for comparison with design parameters used for waste management unit design and conveyance and drainage design. Daily data and on-site observation shall be used for establishing the need for inspection and repairs after major storm events. Rainfall data shall be reported in the semi-annual monitoring reports, as required by this MRP.

GROUNDWATER MONITORING

The Discharger shall monitor groundwater wells at Sherwood's Reservoirs. After measuring water levels and prior to collecting samples, each monitoring 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. The Discharger shall monitor groundwater wells for the following:

Constituent/Parameter	Units	Sample Type	Frequency
Depth to groundwater	Feet[1]	Measured	Quarterly
Groundwater elevation	Feet[1]	Calculated	Quarterly
Table I – Water Quality Monitoring	Varies	Grab	Varies
Table II – Oil Production and Process Chemicals and Additives [2]	Varies	Grab	Quarterly

1 Recorded to one hundredth of a foot.

2 The Discharger is responsible for identifying approved analytical methods for all constituents identified in Table II, as appropriate. For constituents that do not have an approved analytical method, the Discharger shall cite the source (e.g., name of the consultant or laboratory) and qualifications of the entity that made the determination that an analytical method is not available for specific constituents in Table II. Entities that are reviewing Table II to identify analytical methods shall have adequate knowledge related to laboratory analyses and be qualified to complete this review.

Within 30 days of notification that permission to sample a well(s) is not granted or is revoked or a well is dry, 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 well(s) 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.

GROUNDWATER WELL SURVEY

Within 60 days of the signature date of this MRP, the Discharger shall conduct a well survey to identify all water supply wells within two (2.0) miles of Sherwood's Reservoirs. **Within 90 days** of the signature date of this MRP, the Discharger shall sample the identified domestic water supply wells within one (1.0) mile of Sherwood's Reservoirs and analyze the samples for the waste constituents listed in Tables I and II of this MRP. Groundwater well survey results, analytical results, and its interpretation shall be reported in an individual report, separate from quarterly monitoring reports. If access to private property is requested and denied, evidence of that denial

is required.

GROUNDWATER MONITORING WELL NETWORK INSTALLATION

A Monitoring Well Installation and Sampling Plan (MWISP) shall be submitted **within 180 days** of the signature date of this MRP. The MWISP shall propose the installation of an appropriate number of upgradient/up-structure groundwater monitoring wells to identify background water quality and an appropriate number of downgradient/down-structure groundwater monitoring wells to identify potential impacts to first-encountered groundwater from Sherwood's Reservoirs. The Discharger shall operate and maintain this groundwater monitoring system, subject to approval by the Executive Officer, that may include groundwater wells available around, downgradient, or within a reasonable distance of Sherwood's Reservoirs. At a minimum, the monitoring system needs to include three groundwater wells, with at least two wells located downgradient of Sherwood's Reservoirs that are designed to monitor first-encountered groundwater.

If the Discharger demonstrates, in the MWISP, that the wastes discharged to the ponds cannot affect the quality of groundwater, the Executive Officer may rescind by signed letter all or part of the requirements to complete the groundwater investigation and groundwater monitoring portions of this Order.

At a minimum, the MWISP must contain all the information listed below.

1. General Information:
   a. Topographic map showing any existing nearby (about 2.0 mile) domestic, irrigation, and municipal supply wells and monitoring wells known to the Discharger, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features, as appropriate.
   b. Site plan showing proposed well locations, other existing wells, unused and/or abandoned wells, major physical site structures, any waste handling facilities, irrigated cropland and pasture, and on-site surface water features.
   c. Rationale for the number of proposed monitoring wells, their locations and depths, and identification of anticipated depth to groundwater.
   d. If, proposing to use existing groundwater wells as part of the MWISP, include well screen intervals in relation to groundwater levels, current well use, and rationale for well selection.
   e. Local permitting information (as required for drilling, well seals, boring/well abandonment).
   f. Drilling details, including methods and types of equipment for drilling and logging activities. Equipment decontamination procedures (as appropriate) should be described.
   g. Health and Safety Plan.

2. Proposed Drilling Details:
   a. Drilling techniques.
   b. Well logging method.
   c. Proposed Monitoring Well Design - all proposed well construction information must be displayed on a construction diagram or schematic to accurately identify the following:
   d. Well depth.

e. Borehole depth and diameter.
f. Well construction materials.
g. Casing material and diameter - include conductor casing, if appropriate.
h. Location and length of perforation interval, size of perforations, and rationale.
i. Location and thickness of filter pack, type and size of filter pack material, and rationale.
j. Location and thickness of bentonite seal.
k. Location, thickness, and type of annular seal.
l. Surface seal depth and material.
m. Type of well cap(s).
n. Type of well surface completion.
o. Well protection devices (such as below-grade water tight-vaults, locking steel monument, bollards, etc.).

3. Proposed Monitoring Well Development:
   a. Schedule for development (not less than 48 hours or more than 10 days after well completion).
   b. Method of development.
   c. Method of determining when development is complete.
   d. Parameters to be monitored during development.
   e. Method for storage and disposal of development water.

4. Proposed Surveying:
   a. How horizontal and vertical position of each monitoring well will be determined.
   b. The accuracy of horizontal and vertical measurements to be obtained.
   c. The California licensed professional (licensed land surveyor or civil engineer) to perform the survey.

5. Proposed Groundwater Monitoring:
   a. Schedule (at least 48 hours after well development).
   b. Depth to groundwater measuring equipment (e.g., electric sounder or chalked tape capable of ±0.01-foot measurements).
   c. Well purging method, equipment, amount of purge water, and field measurements stabilization.
   d. Sample collection (e.g., bottles and preservation methods), handling procedures, and holding times.
   e. Quality assurance/quality control (QA/QC) procedures (as appropriate).
   f. Analytical procedures.
   g. Equipment decontamination procedures (as appropriate).

6. Proposed Schedule:
   a. Fieldwork.
   b. Laboratory analyses.
   c. Report submittal.

MONITORING WELL INSTALLATION COMPLETION REPORT

Within **90 days** of the installation of a groundwater monitoring well(s), a Monitoring Well Installation Completion Report (MWICR) shall be submitted. At a minimum, the MWICR shall summarize the field activities as described below.

1. General Information:
   a. Brief overview of field activities including well installation summary (such as number, depths), and description and resolution of difficulties encountered during field program.
   b. Topographic map showing any existing nearby domestic, irrigation, and municipal supply wells and monitoring wells, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features.
   c. Site plan showing monitoring well locations, other existing wells, unused and/or abandoned wells, major physical site structures, any waste handling facilities, and on-site surface water features.
   d. Period of field activities and milestone events (e.g., distinguish between dates of well installation, development, and sampling).

2. Monitoring Well Construction:
   a. Number and depths of monitoring wells installed.
   b. Monitoring well identification (i.e., numbers).
   c. Date(s) of drilling and well installation.
   d. Description of monitoring well locations including field-implemented changes (from proposed locations) due to physical obstacles or safety hazards.
   e. Description of drilling and construction, including equipment, methods, and difficulties encountered (such as hole collapse, lost circulation, need for fishing).
   f. Name of drilling company, driller, and logger (site geologist to be identified).
   g. As-builts for each monitoring well with the following details:
      i. Well identification.
      ii. Total borehole and well depth.
      iii. Date of installation.
      iv. Boring diameter.
      v. Casing material and diameter (include conductor casing, if appropriate).
      vi. Location and thickness of slotted casing, perforation size.
      vii. Location, thickness, type, and size of filter pack.
      viii. Location and thickness of bentonite seal.
      ix. Location, thickness, and type of annular seal.
      x. Depth of surface seal.
      xi. Type of well cap.
      xii. Type of surface completion.
      xiii. Depth to water (note any rises in water level from initial measurement) and date of measurement.
      xiv. Well protection device (such as below-grade water tight vaults, stovepipe, bollards, etc.).
   h. All depth to groundwater measurements during field program.
   i. Field notes from drilling and installation activities (e.g., all subcontractor dailies, as

appropriate).

j. Construction summary table of pertinent information such as date of installation, well depth, casing diameter, screen interval, bentonite seal interval, and well elevation.
k. Detailed geologic log of subsurface materials encountered.
l. Complete geophysical logs and corresponding interpretations.

3. Monitoring Well Development:
   a. Date(s) and time of development.
   b. Name of developer.
   c. Method of development.
   d. Methods used to identify completion of development.
   e. Development log: volume of water purged and measurements of temperature, pH and electrical conductivity during and after development.
   f. Disposition of development water.
   g. Field notes (such a bailing to dryness, recovery time, number of development cycles).

4. Monitoring Well Survey:
   a. Identify coordinate system or reference points used.
   b. Description of measuring points (i.e. ground surface, top of casing, etc.).
   c. Horizontal and vertical coordinates of well casing with cap removed.
   d. Name, license number, and signature of California licensed professional who conducted survey.
   e. Surveyor's field notes.
   f. Tabulated survey data.

REPORTING REQUIREMENTS

All monitoring reports shall be submitted to the Central Valley Water Board, which are due as follows:

Monitoring Report	**Due Date**
First Quarter Monitoring Report: January – March	**1 May**
Second Quarter Monitoring Report: April – June	**1 August**
Third Quarter Monitoring Report July - September	**1 November**
Fourth Quarter Monitoring Report October – December	**1 February**
Annual Monitoring Report:	**1 February**

A transmittal letter shall accompany each monitoring report. The transmittal letter shall discuss any exceedances of applicable effluent or groundwater limitations or other instances of non-compliance that occurred during the reporting period and all corrective actions taken or planned, 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.**

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 the waste discharge requirements.

If the Discharger monitors any constituent 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 monitoring reports. Such increased frequency shall be indicated in the monitoring reports.

All reports that include analytical results shall be accompanied by the corresponding laboratory report. Laboratory reports shall include at least the following: signature, chain of custody, and quality assurance and quality control results.

All monitoring reports shall comply with the signatory requirements in Standard Provision B.3. All monitoring reports that involve planning, investigation, evaluation, 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.

A. Reports submitted to the Central Valley Water Board

The Discharger shall submit copies of all monitoring reports, work plans, and technical reports to the following:

1. Electronic mail to CentralValleyFresno@waterboards.ca.gov.

2. 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.

   A frequently asked question document for GeoTracker can be found at: http://www.waterboards.ca.gov/ust/electronic_submittal/docs/faq.pdf.

   Electronic submittals to GeoTracker shall comply with GeoTracker standards and procedures, as specified on the State Water Board's web site.

The following information is to be included on all monitoring reports and report transmittal letters:

Sherwood Hills, LLC and E & B Natural Resources Management Corporation
Produced Wastewater Reclamation Project
McVan Area Treatment Facility
Waste Discharge Requirements Order No. R5-2019-0024
GeoTracker Site Global ID: WDR100039691
CIWQS Place ID: 834917

B. Quarterly Monitoring Reports shall include the following:

Produced Wastewater Reporting:

1. Tabular summary of current and historical water quality results for Discharge 001 and Discharge 002 as specified on MRP pages 2 and 3.
2. The tabular summary of water quality results shall include the Chemicals Abstracts Service Registry Number (CASRN) for all constituents, as appropriate, required in Tables I and II of this Order.
3. For each month, a tabular summary of the monthly flow, the total annual flow (for the calendar year), and the historical annual flowrates for Discharge 001 and Discharge 002.

Irrigation Water Reporting:

1. Irrigation water reporting shall be clearly marked in all monitoring reports.
2. Tabular summary of current and historical results as specified on MRP page 4.

Chemical and Additive Reporting:

1. List of all chemicals and additives that were used during the quarter.
2. Tabular summary of current and historical monthly volume and mass for all chemicals and additives as specified on MRP pages 4 and 5.
3. Summary that identifies if any chemicals and additives were detected in produced wastewater discharged to the Sherwood's Reservoirs or in groundwater.
4. List of all leases and facilities where chemicals and additives are being used.

Solid Waste Reporting:

1. The results of solid waste monitoring as specified in the approved Solid Waste Management Plan.
2. Tabular summary of current and historical analytical results characterizing the solid waste, and particularly, whether the waste is hazardous as defined in California Code of Regulations, title 22, section 66261.
3. For wastes transported off-site, information for the transfer of the solid waste as specified on MRP page 5.

Facility Reporting:

1. Monthly freeboard results as specified on MRP pages 5 and 6.
2. Daily rainfall data as specified on MRP pages 5 and 6.

Groundwater Reporting:

1. For each monitoring well, a tabular summary of current and historical water quality results as specified on MRP page 6.
2. A groundwater contour map based on groundwater elevations for each quarter. The map shall show the gradient and direction of groundwater flow under/around Sherwood's Reservoirs. The map shall also include the locations of monitoring wells and wastewater storage and discharge areas.
3. Provide a current isoconcentration map of groundwater data for EC, chloride, and boron concentrations.

Laboratory Reports:

1. Laboratory reports submitted in compliance with this MRP shall be accompanied by an **Excel file** that includes the analytical data found in the laboratory report. Excel files need to be generated by the laboratory or compiled by the Discharger. At a minimum, the Excel file shall include the constituent name, sample location, sample name, sample date, analysis date, analytical method, result, unit, MDL, RL, CASRN, and dilution factor. Excel files shall either be mailed to the Central Valley Water Board Office on an electronic storage device, or sent via electronic mail to CentralValleyFresno@waterboards.ca.gov. Either method of delivery needs to include, at a minimum, a copy of the transmittal letter.

C. Annual Monitoring Reports, in addition to the above, by **1 February** of each year, the Discharger shall submit a written report to the Central Valley Water Board containing the following:

Facility Information:

1. The names and general responsibilities of all persons employed to operate the produced wastewater 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 summary of all spills/releases, if any, that occurred during the year at the production facility, tasks undertaken in response to the spills, and the results of the tasks undertaken.
5. The results of the facility inspection as specified on MRP pages 5 and 6.
6. A summary of the chemical and additive data collected under the Chemical and Additive Monitoring section, the required Material Safety Data Sheets (MDSs) / Safety Data Sheets (SDSs), and a discussion of whether any of the chemicals or additives were found in the discharge to Sherwood's Reservoirs.
7. A flow chart (i.e. diagram that clearly illustrates all processes that produced wastewater undergoes within the Facility, including the irrigation of cropland with produced wastewater) and map of the following:
    - Facility (highlight treatment components) within the oil field,
    - Facility/Lease boundaries.
    - Produced wastewater distribution network with all discharge points to Sherwood's Reservoirs and cropland.
    - All cropland that is receiving produced wastewater.

Produced Wastewater Reporting:

1. Tabular summary of current and historical total annual flow for Produced Wastewater Monitoring as specified on MRP pages 2 and 3.

Irrigation Water Reporting

1. Irrigation water reporting shall be clearly marked in all monitoring reports.
2. Tabular summary of the current and historical annual results as specified on MRP page 4.

3. Tabular summary of current and historical crops that were irrigated with blended produced wastewater and the crops respective acreage within the service territory of each water provider.

Chemical and Additive Reporting:

1. Safety Data Sheets for all chemicals and additives that are identified in quarterly monitoring reports for that respective calendar year.
2. Tabular summary of current and historical annual volume and mass for all chemicals and additives.
3. Summary that identifies if any chemicals and additives were detected in the produced wastewater used for irrigation or groundwater.
4. Identify new chemicals/additives that were used during the current calendar year and not in the previous calendar year.
5. Identify chemicals/additives that were used during the current or previous calendar year that will no longer be used by the Discharger.

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 Executive Officer, including any extensions. Any written extension request by the Discharger shall include justification for the delay.

I, PATRICK PULUPA, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of the Monitoring and Reporting Program issued by the California Regional Water Quality Control Board, Central Valley Region on 5 April 2019.

Original Signed By:

PATRICK PULUPA, Executive Officer

Table I – Water Quality Monitoring

Parameters	Units	Monitoring Frequency	US EPA or other Method	Reporting Frequency
Field Parameters				
Temperature	°F[1]	Quarterly	Meter	Quarterly
Electrical Conductivity	µmhos/cm[2]	Quarterly	Meter	Quarterly
pH	pH units	Quarterly	Meter	Quarterly
Monitoring Parameters				
Total Dissolved Solids (TDS)	mg/L[3]	Quarterly	160.1	Quarterly
Total Suspended Solids (TSS)[4]	mg/L	Quarterly	160.2	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
Standard Minerals				
Alkalinity as CaCO3	mg/L	Quarterly	310.1	Quarterly
Bicarbonate Alkalinity as CaCO3	mg/L	Quarterly	310.1	Quarterly
Carbonate Alkalinity as CaCO3	mg/L	Quarterly	310.1	Quarterly
Hydroxide Alkalinity as CaCO3	mg/L	Quarterly	310.1	Quarterly
Sulfate, dissolved	mg/L	Quarterly	300.0	Quarterly
Nitrogen, Total	mg/L	Quarterly	440.0	Quarterly
Total Kjeldahl Nitrogen	mg/L	Quarterly	351.3	Quarterly
Nitrate as N	mg/L	Quarterly	300.0	Quarterly
Nitrite as N	mg/L	Quarterly	353.2	Quarterly
Ammonia N	mg/L	Quarterly	350.1	Quarterly
Ammonium N	mg/L	Quarterly	350.2	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
PAHs[5]	µg/L[6]	Quarterly	8270C-SIM	Quarterly
Total Petroleum Hydrocarbons (TPH)	µg/L	Quarterly	418.1	Quarterly
Volatile Organic Compounds				
Full Scan	µg/L	Quarterly	8260B	Quarterly
Oil and Grease	mg/L	Quarterly	1664A	Quarterly
Stable Isotopes				
Oxygen (^{18}O)	o/oo[7]	Quarterly	900.0	Quarterly
Deuterium (Hydrogen $_2$, ^2H, or D)	o/oo	Quarterly	900.0	Quarterly

Table I – Water Quality Monitoring (continued)

Parameters	Units	Monitoring Frequency	US EPA or other Method	Reporting Frequency
Radionuclides				
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
Other Constituents				
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
MBAS (Methylene Blue Active Substances)	mg/L	Quarterly	SM 425.1	Quarterly
QAC (Quaternary Ammonium Compounds)	mg/L	Quarterly	As Appropriate	Quarterly

[1] Degrees Fahrenheit.
[2] Micromhos per centimeter.
[3] Milligrams per liter.
[4] TSS is not required for groundwater monitoring.
[5] Polycyclic aromatic hydrocarbons.
[6] Micrograms per liter.
[7] Parts per thousand.
[8] Picocuries per liter.
[9] Standard Methods.

Table II - Oil Production and Process Chemicals and Additives

No.	Constituent	CASRN	No.	Constituent	CASRN
1	1,2,3 Trimethylbenzene	526-73-8	160	Lead	7439-92-1
2	1,2 Benzisothiazol-3(2H)-one	2634-33-5	161	Light Aliphatic Naphtha	64742-89-8
3	1,2,4-Trimethylbenzene	95-63-6	162	Light aromatic naphtha	64742-95-6
4	1,3,5 Trimethylbenzene	108-67-8	163	Lignite	129521-66-0
5	1,4 Dioxane	123-91-1	164	Limestone	1317-65-3
6	1H, 3H-Pyrano (4,3-b)(1)benzopyran-9-carboxylic acid, 4,10-dihydro-3,7,8 trihydroxy-3-methyl-10-oxo	479-66-3	165	Lithium carbonate	554-13-2
7	1-Hexadecene	629-73-2	166	Lithium chlorate	13453-71-9
8	2-Butoxyethanol	111-76-2	167	Lithium chloride	7447-41-8
9	2-Ethylhexanol	104-76-7	168	Lithium hydroxide	1310-65-2
10	2-Methylamino-2-methyl-1-propanol	27646-80-6	169	Lithium hypochlorite	13840-33-0
11	2-Propen-1-aminium, N,N-dimethyl-N-2-propenyl-, chloride, polymer with 2-hydroxypropyl 2-	67990-40-3	170	Magma Fiber	6806-10-0000
12	2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate, octadecyl 2-methyl 2 propenoate and 2propenoic acid, sodium salt	145417-45-4	171	Mercury	7439-97-6
13	2-Propenoic acid, polymer with 2-propenamide, sodium salt	25987-30-8	172	Methanol	67-56-1
14	2-Propenoic acid, telomer with 2-methyl-2-(1-oxo-2-propenyl)-1-propanesulfonic acid, sodium salt	130800-24-7	173	Methyl Chloride	74-87-3
15	3-Butyn-2-ol, 2-methyl	115-19-5	174	Methyl ester of sulfonated tannin	N/A
16	Acetaldehyde	75-07-0	175	Methyl oxirane polymer	PE-M2464
17	Acetic Acid	64-19-7	176	Methylchloroisothiazolinone	26172-55-4
18	Acetone	67-64-1	177	Mineral Oil	8012-95-1
19	Acrolein	107-02-8	178	Monoethanolamine	141-43-5
20	Acrolein dimer	100-73-2	179	Mullite	1302-93-8
21	Acrylamide	79-06-1	180	Naphthalene	91-20-3
22	Acrylic Acid	79-10-7	181	Nickel	7440-02-0
23	Alchohols, C14-15, ethoxylated	68951-67-7	182	Nickel sulfate	7786-81-4
24	Alcohol ethoxylate	68439-45-2	183	Non-Phenol Ethoxylates	9016-45-9
25	Alcohol ethoxylated, C-10-14	66455-15-0	184	Nonylphenol polyethylene glycol ether	127087-87-0
26	Alcohols, C9-11, ethoxylated	68439-46-3	185	Nutshell	N/A
27	Alkanes, C11-15-iso	90622-58-5	186	Oleic acid	112-80-1
28	Alkanes, C14-16	90622-46-1	187	Orange terpenes	68647-72-3
29	Alkanolamine aldehyde condensate	4719-04-4	188	Organic Acids Ethoxylated Alcohols	104-55-2
30	Alkanolamine phosphate	29868-05-1	189	Organic surfactant	577-11-7
31	Alkoxylated alcohol	69011-36-5	190	Oxyalkylated alkylphenol	68412-54-4
32	Alkyl amine	68439-70-3	191	Oxyalkylated alkylphenolic resin	30704-64-4
33	Alkyl benzenesulfonate	68081-81-2	192	Oxyalkylated alkylphenolic resin	30846-35-6
34	Alkyl benzenesulfonic acid	68584-22-5	193	Oxyalkylated alkylphenolic resin	63428-92-2
35	Alkyl dimethyl benzyl ammonium chloride	8001-54-5	194	Oxyalkylated alkylphenolic resin	68171-44-8
36	Alkylaryl sulfonate	68584-27-0	195	Oxyalkylated polyamine	67939-72-4
37	Alkylaryl sulfonates	68910-32-7	196	Oxyalkylated polyamine	68910-19-0
38	Alkylarylsulfonate amine salt	90218-35-2	197	Paraffinic petroleum distillate	64742-55-8
39	Alkylbenzene mixture	68648-87-3	198	Pentadecane, 3-methylene	56919-55-2
40	Almond Shell	90320-37-9	199	Pentadecane, 5-methylene	115146-98-0
41	Aluminum oxide	1344-28-1	200	Pentadecane, 7-methylene	13043-55-5
42	Aluminum chloride	7446-70-0	201	Pentasodium diethylenetriamine pentaacetate	140-01-2
43	Aluminum chloride hydroxide	12042-91-0	202	Peroxyacetic acid	79-21-0
44	Aluminum stearate	300-92-5	203	Petroleum distillates	64742-53-6
45	Amide surfactant acid salt	N/A	204	Phosphate ester salt	68425-75-2

Table II - Oil Production and Process Chemicals and Additives

No.	Constituent	CASRN	No.	Constituent	CASRN
46	Amides, Non-Ionics	68140-01-2	205	Phosphonate salt	P-84-470
47	Amine derivative	61791-24-0	206	Phosphonic Acid	13598-36-2
48	Amine salt	67924-33-8	207	Phosphonium, tetrakis (hydroxymethyl)-, sulfate (2:1), salt	55566-30-8
49	Amine salt	NP-U2856	208	Phosphoric acid	7664-38-2
50	Amine sulfate	64346-44-7	209	Phosphoric acid ester salt	N/A
51	Amine sulfate	926-39-6	210	Piperazine	110-85-0
52	Aminotri (methylenephosphonic acid)	6419-19-8	211	POE (20) Sorbitan Trioleate	9005-70-3
53	Ammonium alkylaryl sulfonates	68910-31-6	212	Polyacrylamide	9003 05 8
54	Ammonium Benzoate	1863-63-4	213	Polyacrylate	9003-79-8
55	Ammonium bisulfate	10192-30-0	214	Polyacrylic acid	9003 01 4
56	Ammonium chloride	12125-02-9	215	Polyamine	64114-46-1
57	Ammonium Fluoride	1341-49-7	216	Polyamine salts	68955-69-1
58	Ammonium sulfate	7783-20-2	217	Polycarboxlate salt	19019-43-3
59	Amorphous silica	7631-86-9	218	PolyDADMAC	26062-79-3
60	Antimony trioxide	1309-64-4	219	Polydimethylsiloxane emulsion	N/A
61	Aromatic amines	N/A	220	Polyethylene	25038-59-9
62	Barite	13462-86-7	221	Polyethylene glycol	25322-68-3
63	Barium	7440-39-3	222	Polyglycol diepoxide	68036-92-0
64	Barium sulfate	7727-43-7	223	Polyglycol diepoxide	68036-95-3
65	Bentonite	1302-78-9	224	Polyglycol ester	PE-M2481
66	Benzene	71-43-2	225	Polyglycol ether	9038-95-3
67	Benzoic Acid	65-85-0	226	Polylactide resin	9051-89-2
68	Benzyl chloride	100-44-7	227	Polymer sodium acrylate	9033-79-8
69	Beryllium	7440-41-7	228	Polyoxyalklene glycol	68123-18-2
70	Branched DDBSA	68411-32-5	229	Polyoxyalkylene	68551-12-2
71	C12-C14 Isoalkanes	68551-19-9	230	Polyoxyalkylene glycol	36484-54-5
72	C12-C14 Isoalkanes	68551-20-2	231	Polyoxyalkylenes	78330-21-9
73	C14-30 Alkyl Derivatives	68855-24-3	232	Polyoxyalkylenes	61790-86-1
74	Cadmium	7440-43-9	233	Polyoxyethylene nonylphenyl ether phosphate	68412-53-3
75	Calcium carbonate	471-34-1	234	Polypropylene glycol	25322-69-4
76	Calcium oxide	1305-78-8	235	Polyquaternary amine	42751-79-1
77	Calcium sulfate	7778-18-9	236	Polyvinyl Alcohol	9002-89-5
78	Carbon	7440-44-0	237	Potassium acetate	127-08-2
79	Carbon Dioxide	124-38-9	238	Potassium bisulfate	7646-93-7
80	Carboxymethyl cellulose	9004-32-4	239	Potassium chloride	7447-40-7
81	Cationic acrylamide copolymer	69418-26-4	240	Potassium hydroxide	1310-58-3
82	Cationic acrylamide monomer	44992-01-0	241	Potassium Oxide	12136-45-7
83	Cationic polymer	54076-97-0	242	Propargl alcohol	107-19-7
84	Cedar Fiber	11132-73-3	243	Propionaldehyde	123-38-6
85	cellophane	9005-81-6	244	Propylene glycol	57-55-6
86	Cellulose	9004-34-6	245	Quartz Crystalline Silica	14808-60-7
87	Chromium	7440-47-3	246	Quaternary ammonium compound	61790-41-8
88	Citric acid	77-92-9	247	Quaternary ammonium compound	68424-85-1
89	Citrus Terpenes	94266-47-4	248	Quaternized condensed alkanolamines	68609-18-7
90	Cocamide DEA	68603-42-9	249	Quinaldine	91-63-4
91	Cocamide DEA	68155-07-7	250	Salt of an organic sulfur compound	P-88-1256
92	Coke, petroleum, calcined	64743-05-1	251	Salt of fatty acid polyamine	68153-60-6
93	Copper	7440-50-8	252	Saponite	1319-41-1
94	Copper sulfate pentahydrate	7758-99-8	253	Severely Hydrotreated Paraffinic	64742-62-7
95	Cotton seed hulls	68308-87-2	254	Silica crystalline tridymite	15468-32-3
96	Crosslinked polyol ester	129828-31-5	255	Silica, crystalline, cristobalite	14464-46-1
97	Cumene	98-82-8	256	Siloxanes and Silicones	63148-62-9
98	Cyclohexanol	108-93-0	257	Smectite	1318-93-0
99	Cyclohexylamine	108-91-8	258	Sodium acetate	127-09-3
100	Cymenes	25155-15-1	259	Sodium Acid Pyrophosphate	7758-16-9
101	DDBSA Salt	N/A	260	Sodium Benzoate	532-32-1

Table II - Oil Production and Process Chemicals and Additives

No.	Constituent	CASRN	No.	Constituent	CASRN
102	Diester of sulfosuccinic acid sodium salt	2673-22-5	261	Sodium bicarbonate	144-55-8
103	Diethanolamine	111-42-2	262	Sodium bisulfite	7631-90-5
104	Dimethyl siloxane	N/A	263	Sodium carbonate	497-19-8
105	Dinonylphenyl polyoxyethylene	9014-93-1	264	Sodium carboxymethylstarch	9063-38-1
106	Diphosphoric acid, sodium salt (1:4)	7722-88-5	265	Sodium Chlorate	7775 09 9
107	Dipropylene glycol methyl ether	34590-94-8	266	Sodium chloride	7647-14-5
108	Disodium ethylenediaminediacetate	38011-25-5	267	Sodium chloride	4647-14-5
109	Diutan gum	125005-87-0	268	Sodium dichloroisocyanurate	2893-78-9
110	d-Limonene	5989-27-5	269	Sodium edetate	64-02-8
111	Dodecane	112-40-3	270	Sodium Erythorbate	6381-77-7
112	Drilling Paper	N/A	271	Sodium glycolate	2836-32-0
113	Ethanol	64-17-5	272	Sodium hydroxide	1310-73-2
114	Ethanolamine thioglycolate	126-97-6	273	Sodium hypochlorite	7681-52-9
115	Ethoxylated amine	61791-26-2	274	Sodium Iodide	7681-82-5
116	Ethoxylated C11 Alcohol	34398-01-1	275	Sodium olefin sulfonate	68439-57-6
117	Ethoxylated octylphenol	N/A	276	Sodium Oxide	1313-59-3
118	Ethyl Acetate	141-78-6	277	Sodium polyacrylate	9003-79-3
119	Ethyl acrylate	140-88-5	278	Sodium polyacrylate	9003 04 7
120	Ethyl Octynol	5877-42-9	279	Sodium sulfate	7757-82-6
121	Ethylbenzene	100-41-4	280	Sodium tetraborate pentahydrate	12179-04-3
122	Ethylene Glycol	107-21-1	281	Sodium Thiosulfate Pentahydrate	10102-17-7
123	Fatty Acid	143-07-7	282	Sodium Thiosulfate Pentahydrate	7772-98-7
124	Fatty acid ester	67762-38-3	283	Sodium Trimetaphosphate	7785-84-4
125	Fatty acid oxyalkylate	70142-34-6	284	Solvent Dewaxed Heavy Paraffinic	64742-65-0
126	Fatty acids, tall-oil, sodium salts	61790-45-2	285	Sorbitan ester	NP-SMO3_U1240
127	Fatty alkylamines	61788-91-8	286	Sorbitan Mono-9-Octadecenoate	9005-65-6
128	Ferrous sulfate	17375-41-6	287	Sorbitan monooleate	1338-43-8
129	Formaldehyde	50-00-0	288	Soybean oil, Me ester	67784-80-9
130	Formamide	75-12-7	289	Stearic acid	57-11-4
131	Formic Acid	64-18-6	290	Steel mill slag	65996-69-2
132	Furfuryl alcohol	98-00-0	291	Stoddard Solvents	8052-41-3
133	Glutaral	111-30-8	292	Sulfur dioxide	7446 09 5
134	Glycerides, tall oil mono-, di, and tri	97722-02-6	293	Sulfuric acid	7664-93-9
135	Glycerine	56-81-5	294	Tall oil fatty acids	61790-12-3
136	Glycine, N,N, 1,2- ethanediylbis (N-(carboxymethyl)-disodium salt	139-33-3	295	Tallow alkylamines	61790-33-8
137	Glycolic acid	79-14-1	296	Tar bases, Quinoline derivatives, benzyl chloride- Quaternized	72480-70-7
138	Glyoxal	107-22-2	297	Terpene hydrocarbon	8002 09 3
139	Graphite	7782-42-5	298	Tetradecane	629-59-4
140	Gypsum	13397-24-5	299	Tetrapropylenebenzene	25265-78-5
141	Heavy aromatic naphtha	64742-94-5	300	Thiourea, polymer with formaldehyde and 1-phenylethanone	68527-49-1
142	Heavy Catalytic Naphtha	64741-68-0	301	Titanium dioxide	13463-67-7
143	Humic acids	1415-93-6	302	Toluene	108-88-3
144	Hydrochloric Acid	7647-01-0	303	Tridecane	629-50-5
145	Hydrofluoric Acid	7664-39-3	304	Triethylene Glycol	112-27-6
146	Hydrogen Peroxide	7722-84-1	305	Trimethyl Benzene	25551-13-7
147	Hydroquinone	123-31-9	306	Triphosphoric acid, sodium salt (1:5)	7758-29-4
148	Hydrotreated light distillate	64742-47-8	307	Trisodium nitrilotriacetic acid	5064-31-3
149	Hydroxyethyl cellulose	9004-62-0	308	Undecane	1120-21-4
150	Hydroxyethylidenediphosphonic Acid	2809-21-4	309	Urea	57-13-6
151	Inorganic sulfur compound	7783-18-8	310	Walnut Shell	84012-43-1
152	Iodine	7553-56-2	311	Water	7732-18-5
153	Ionic surfactants	N/A	312	Wood dust	N/A
154	Isobutanolamine	124-68-5	313	Xanthan Gum	11138-66-2

Table II - Oil Production and Process Chemicals and Additives

No.	Constituent	CASRN	No.	Constituent	CASRN
155	Isopropanol	67-63-0	314	Xenon	7440-63-3
156	Isoquinoline	119-65-3	315	Xenon radionuclide	14932-42-4
157	Kerosene	8008-20-6	316	Xylene	1330-20-7
158	Krypton	7439-90-9	317	Zinc	7440-66-6
159	Krypton 85	13983-27-2	318	Zinc chloride	7646-85-7

INFORMATION SHEET

ORDER NO. R5-2019-0024
SHERWOOD HILLS, LLC; JAY LLC; STEIR BERTON TRUST; HOMEWOOD MOUNTAIN PARTNERS, LLC; FAMOSO HILLS RANCH, LLC; YUROSEK FARMS, LLC; AND
E & B NATURAL RESOURCES MANAGEMENT CORPORATION
PRODUCED WASTEWATEWATER RECLAMATION PROJECT
MCVAN AREA TREATMENT FACILITY
POSO CREEK OIL FIELD
KERN COUNTY

Background

On 26 January 2018, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) received a Report of Waste Discharge that proposed the reuse of oil field produced wastewater (produced wastewater) for the irrigation of crops for human consumption. On 23 May 2018 and 14 June 2018, the Central Valley Water Board received a revised Report of Waste Discharge and supplemental technical reports (hereafter collectively referred to as RWD) for the proposed project. The RWD was prepared by EnviroTech Consultants, Inc., on behalf of E & B Natural Resources Management Corporation (E&B) and Sherwood Hills, LLC (Sherwood).

The RWD proposes the discharge of produced wastewater from the McVan Area Treatment Facility (McVan Facility), owned and operated by E&B, to four unlined reservoirs (Sherwood's Reservoirs), Famoso Hills Ranch, LLC (Famoso) owns the land on which Sherwood's Reservoirs are located. Produced wastewater from Sherwood's Reservoirs will be discharged to approximately 4,400 acres of cropland developed in two phases. Each parcel of cropland is owned and operated, individually, by Jay LLC; Steir Berton Trust; Homewood Mountain Partners, LLC; Famoso; and Yurosek Farms, LLC, for irrigation. The development of this cropland may vary depending on water supply, available capital, and market prices and proposed crops include trees (e.g., citrus or nuts), vines, (e.g., grapes), silage, and/or grain crops. Sherwood; Jay LLC; Steir Berton Trust; Homewood Mountain Partners, LLC; Famoso; Yurosek Farms, LLC; and E&B (hereafter jointly referred to as Discharger) are jointly responsible for compliance with Waste Discharge Requirements Order No. R5-2019-0024 (WDRs).

Proposed Discharge

The RWD proposes the discharge of approximately 200,000 barrels of produced wastewater a day (approximately 8.4 million gallons per day) to Sherwood's Reservoirs for irrigation. Prior to transferring produced wastewater to Sherwood's Reservoirs, E&B will treat the produced wastewater at the McVan Facility. Treatment will consist of the following: oil/water separation tanks, WEMCO, and filters (as shown in Attachment B of the WDRs). E&B will continue to use its existing injection wells in the event that produced wastewater exceeds the Sherwood Reservoir's capacity or the system is temporarily non-operational.

Sherwood's Reservoirs consist of four unlined surface impoundments that are approximately one mile east-southeast of Highway 65 and Famoso Road (Section 9, Township 27 South, Range 27 East, MDB&M; APN 074-290-09), as shown on Attachment A. Reservoirs #1 and #4 are primarily in-ground surface impoundments. Reservoirs #2 and #3 will store water in the gulley of the hilly terrain via the construction of two dams. Produced wastewater will enter Sherwood's Reservoirs via Reservoir #1, which will be subsequently transferred to Reservoirs #2, #3, or #4 via gravity fed pipelines with manual control valves. Adjacent to Reservoir #4 is a pumping station that will transfer produced wastewater from Sherwood's Reservoirs to cropland for irrigation.

The project proposes the development of approximately 4,400 acres of cropland. The

development of the cropland will occur in two phases. The initial phase of development will consist of approximately 1,000 acres of citrus, grapes, gran, and/or silage crops. The second phase of development will consist of 3,500 acres of similar crop types to the initial phase of development, but may change depending on capital, market prices, and production during the initial phase of development. The anticipated cropland that will be developed is shown on Attachment C of the WDRs. The owners of the proposed cropland are identified in Table 1 below.

Table 1. Cropland Owners

Owner	APN	Acres
Jay LLC / Steir Burton Trust	060-322-14-00-6	411
Jay LLC	060-322-23-00-2	406
Famoso Hills Ranch, LLC	060-360-01-00-6	633
Steir Berton Trust / Yurosek Farms, LLC	060-360-16-00-0	157
Famoso Hills Ranch, LLC	060-360-18-00-6	319
Famoso Hills Ranch, LLC	060-360-19-00-9	317
Famoso Hills Ranch, LLC	060-370-62-00-6	634
Steir Berton Trust / Yurosek Farms, LLC	074-010-27-00-1	161
Steir Berton Trust / Yurosek Farms, LLC	074-290-05-00-9	101
Famoso Hills Ranch, LLC	074-290-09-00-1	595
Famoso Hills Ranch, LLC	074-290-08-00-8	72
Homewood Mountain Partners, LLC	074-043-01-00-5	570
Homewood Mountain Partners, LLC	074-020-37-00-3	43

The RWD includes analytical results of produced wastewater samples from the E&B McVan Facility. Produced wastewater from E&B was sampled on 20 June 2017 and analyzed for the following: volatile organic compounds, polycyclic aromatic hydrocarbons, oil and grease, total petroleum hydrocarbons, general minerals, stable isotopes, and metals. Due to a laboratory error, a second produced wastewater sample was collected on 12 June 2018 and re-analyzed for radionuclides.

Analytical results for produced wastewater yielded concentrations of total dissolved solids, chloride, and boron of 370 mg/l, 59 mg/l, and 0.76 mg/l, respectively. Analytical results, where applicable, for metals, polynuclear aromatic hydrocarbons, and volatile organic compounds are below the drinking water maximum contaminant levels (MCLs) published by the State Water Resources Control Board, Division of Drinking Water and effluent limits established in the *Water Quality Control Plan for the Tulare Lake Basin, Third Edition – revised May 2018,* (hereinafter Basin Plan). Table 2 below is a summary of select water quality results for the produced wastewater.

Table 2. Water Quality Results of Produced Wastewater

Constituents	Units	E&B Produced Wastewater
Total Dissolved Solids	mg/L [1]	370
Electrical Conductivity	umhos/cm [2]	505
Chloride	mg/L	59
Boron	mg/L	0.76
Sodium	mg/L	110
Arsenic	ug/L [3]	4.9
Oil and Grease	mg/L	4.9
Total Petroleum Hydrocarbons	mg/L	1.4
Radium 226, plus Radium 228	pCi/L [4]	-0.0158 +/- 0.728
Toluene	ug/L	1.3
Benzene	ug/L	0.47
Xylenes, Total	ug/L	8.4

1. mg/L = milligrams per liter.
2. umhos/cm = micromhos per centimeter.
3. ug/L = micrograms per liter.
4. pCi/L = picocuries per liter.

Analytical results for all constituents in the RWD have been tabulated by Central Valley Water Board staff and are available in Attachment 1 of this Information Sheet. Most constituents are non-detect, with detection limits below the most stringent drinking water standards or at the lowest level achievable by the laboratory. All analytical results are below the most stringent drinking water standard, where appropriate, excluding Benzo(a)pyrene. The primary maximum contaminant level for benzo(a)pyrene is 0.2 ug/l and the analytical result for produced wastewater was non-detect with a minimum detection limit of 0.43 ug/l. According to the Discharger, this is the lowest level achievable by the laboratory.

The water quality results summarized in Attachment 1 indicate that the produced wastewater does not have detectable concentrations of constituents of concern above primary or secondary MCLs. Analytical results summarized in Attachment 1 appear to indicate that produced wastewater from the McVan Facility is of good quality and is not likely to pose a significant threat to water quality. This Order requires groundwater monitoring to ensure that degradation beyond that described in the RWD and that described in the findings of Waste Discharge Requirement Order No. R5-2019-0024 does not occur at Sherwood's Reservoirs. Groundwater monitoring requirements specify the installation of wells downgradient of Sherwood's Reservoirs that are able to detect potential impacts to first encountered groundwater.

The Discharger collected produced wastewater samples on 30 August 2018 and submitted the samples to three Environmental Laboratory Accreditation Program (ELAP) certified laboratories for chemical analysis. The samples were analyzed for the presence and concentration of the constituents identified in Table II of Monitoring and Reporting Program Order No. R5-2019-0024 (MRP). Table II of the MRP identifies known compounds and elements that make-up the

chemicals and additives that are used during petroleum exploration, production, and treatment. This list has been posted on the Central Valley Water Board's website and is referred to as the Oil Field Additive List. Analytical results of the analyses were submitted to the Central Valley Water Board on 1 October 2018 and are available in Attachment II of the Information Sheet. Detectable analytical results are summarized in Table 3 below.

Table 3. Detectable Analytical Results of the Oil Field Additive List

Constituent	CASRN [1]	August 2018 Results			Maximum Contaminant Levels[3]
		Result	MDL[2]	Units	
1,2,4-Trimethylbenzene	95-63-6	69	0.12	ug/L	-
1,3,5-Trimethylbenzene	108-67-8	19	0.12	ug/L	-
2-Butoxyethanol	111-76-2	1.7	1.7	mg/L	-
2-Ethylhexanol	104-76-7	9.1	9.1	ug/L	-
Acetic Acid	64-19-7	7.9	0.31	mg/L	-
Acetone	67-64-1	500	4.6	ug/L	6,300 [4]
Amorphous silica	7631-86-9	76,000	53	ug/L	-
Barium	7440-39-3	7	3.5	ug/L	1,000 [4]
Benzene	71-43-2	0.66	0.083	ug/L	1
Carbon Dioxide	124-38-9	16	2	mg/L	-
Copper	7440-50-8	1.9	1.1	ug/L	-
Cumene	98-82-8	2.8	0.14	ug/L	-
Ethylbenzene	100-41-4	1.5	0.098	ug/L	300 [4]
Formaldehyde	50-00-0	22	0.31	ug/L	-
Glutaral	111-30-8	16	16	ug/L	-
Glyoxal	107-22-2	25	0.76	ug/l	-
Isopropanol	67-63-0	110	9.3	ug/L	-
Mercury	7439-97-6	0.065	0.029	ug/L	2 [4]
Methanol	67-56-1	500	10	ug/L	-
Naphthalene	91-20-3	3.9	0.36	ug/L	-
Nickel	7440-02-0	29	2	ug/L	100 [4]
Toluene	108-88-3	1.2	0.093	ug/L	150 [4]
Total Xylenes	1330-20-7	12	0.36	ug/L	1,750 [4]
Zinc	7440-66-6	8	2.3	ug/L	5,000 [5]
2,4,5-TFAP	129322-83-4	17.7	0	ug/l	-
Methyl Glyoxal	78-98-8	11	1.1	ug/l	-
Butyraldehyde	123-72-8	170	0	ug/L	-
4-Bromofluorobenzene	460-00-4	15	0	ug/L	-
Dibromofluoromethane	1868-53-7	9.2	0	ug/L	-
p- & m-Xylenes	179601-23-1	6.3	0.28	ug/L	-
o-Xylene	95-47-6	5.7	0.082	ug/L	-
Total Calcium	7440-70-2	4.7	0.015	mg/L	-
Total Sodium	7440-23-5	110	0.051	mg/L	-
Total Potassium	7440-09-7	2.8	0.13	mg/L	-
Bicarbonate Alkalinity as CaCO3	71-52-3	150	4.1	mg/L	-
Alkalinity as CaCO3	-	550	1	mg/L	-

Constituent	CASRN [1]	August 2018 Results			Maximum Contaminant Levels[3]
		Result	MDL[2]	Units	
Chloride	16887-00-6	66	0.077	mg/L	250 [5]
Fluoride	16984-48-8	0.84	0.012	mg/L	-
Sulfate	14808-79-8	13	0.13	mg/L	250 [5]
Electrical Conductivity @ 25 C	-	543	1	umhos/cm	900 [5]
Total Suspended Solids (Glass Fiber)	-	8.7	0.56	mg/L	-
MBAS	-	0.057	0.1	mg/L	0.5 [5]
Iodide	20461-54-5	0.14	0.01	mg/L	-
Ammonium as NH4	14798-03-9	5.5	0.12	mg/L	-
Lactic Acid	50-21-5	1.4	0.5	mg/L	-
Propionic Acid	79-09-4	0.97	0.42	mg/L	-
Total Aluminum	7429-90-5	270	26	ug/L	1,000 [4]
Total Lithium	7439-93-2	54	6.2	ug/L	-

[1] Chemical abstracts service registry number.

[2] Minimum detection limit.

[3] Maximum contaminant levels (MCLs) are published by the State Water Resources Control Board, Division of Drinking Water.

[4] Primary Maximum Contaminant Level.

[5] Secondary Maximum Contaminant Level – Derived from human welfare considerations (e.g., taste, order, or laundry staining).

The analyses do show detections for several constituents, including some organic compounds; however, the detections are below the maximum contaminant levels (MCLs) where they exist. As discussed in more detail in the Food Safety Expert Panel section of the Information Sheet, the Central Valley Water Board has enlisted the services of a panel of experts (Food Safety Expert Panel) to investigate whether the use of produced wastewater for irrigation poses a threat to food safety. To date, the Food Safety Expert Panel has not identified a significant threat to food safety from the reuse of produced wastewater for irrigation.

REGULATORY CONSIDERATIONS

Basin Plan, Beneficial Uses, and Water Quality Objectives

The Basin Plan designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Board. The intended use of the water discharged to Sherwood's Reservoirs is agricultural supply. Surface water flows at the proposed cropland are to the South Valley Floor hydrologic unit, Valley Floor Waters. The beneficial uses of Valley Floor Waters, as stated in the Basin Plan for Hydrologic Area No. 558, are agricultural supply (AGR); industrial service supply (IND); industrial process supply (PRO); water contact recreation (REC-1); non-contact water recreation (REC-2); warm freshwater habitat (WARM); wildlife habitat (WILD); rare, threatened, or endangered species (RARE); and groundwater recharge (GWR).

The Basin Plan also specifies salinity limits for oil field discharges of 1,000 umhos/cm for EC, 200 mg/L for chloride, and 1.0 mg/L for boron, which are generally applied as annual averages. In 1982, the Central Valley Water Board adopted Resolution No. 82-136, amending the Basin Plan to

allow discharges of produced wastewater to exceed Basin Plan effluent limits to facilitate use for irrigation and other beneficial uses where the exception would not cause an exceedance of a water quality objective. The Basin Plan, therefore, provides some flexibility to allow produced wastewater exceeding Basin Plan salinity limits to be used for agricultural use in water-short areas, provided the Discharger first successfully demonstrates to the Regional Water Board that the proposed discharge will not substantially affect water quality nor cause a violation of a water quality objective.

Basin Plan water quality objectives to protect the beneficial uses of groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity of groundwater, and taste and odor. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, or animals. The chemical constituent objective states that groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the MCLs in Title 22, California Code of Regulations. The Basin Plan requires the application of the most stringent objective necessary to ensure that groundwater does not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

The Basin Plan allows blending of wastewater with surface and groundwater to promote reuse of wastewater in water-short areas provided it is otherwise consistent with water quality policies. The Basin Plan incorporates the State's Antidegradation Policy. The State's Antidegradation Policy requires the Regional Water Board, in regulating discharges of waste, to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with the maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Water Board's policies (e.g., quality that exceeds water quality objectives). The State's Antidegradation Policy requires that the constituents contributing to degradation be regulated to meet BPTC to assure that pollution or nuisance will not occur and that the highest water quality consistent with the maximum benefit to the people of the State will be maintained.

Groundwater Considerations

The depth to groundwater is highly variable due to nearby groundwater recharge areas and groundwater extraction areas. Based on 2017 groundwater well data available on the Department of Water Resources website, depth to groundwater across the proposed project varies from approximately 590 to 650 feet below the ground surface (bgs). Groundwater elevation in this area ranges from approximately 140 to 170 feet above mean sea level. The gradient flow direction of the area is generally east to west.

Famoso Hills Ranch, LLC owns two agricultural wells near Sherwood's Reservoirs. Well #6 is approximately 0.05 miles west of Sherwood's Reservoirs and is perforated from 800 to 1,975 feet bgs. Well #7 is 0.7 miles west of Sherwood's Reservoirs and is perforated from 842 to 1,920 feet bgs. Wells #6 and #7 have the potential to be used as supplemental water sources in instances of water shortages or to mix with produced wastewater.

Water samples from each well were collected on 20 June 2017 and analyzed for volatile organic compounds, polycyclic aromatic hydrocarbons, oil and grease, total petroleum hydrocarbons, general minerals, metals, stable isotopes, and radionuclides. Water quality results for Wells #6 and #7 are shown Table 4 below:

Table 4. Groundwater Quality

Constituents	Units	Well #6 Results	Well #7 Results
Total Dissolved Solids	mg/L	220	190
Electrical Conductivity	umhos/cm	248	262
Chloride	mg/L	17	17
Boron	mg/L	0.084	0.083
Sodium	mg/L	56	58
Arsenic	ug/L	< 0.70	1.8
Oil and Grease	mg/L	< 0.86	< 0.86
Total Petroleum Hydrocarbons	mg/L	< 0.79	< 0.79
Radium 226, plus 228	pCi/L	1.6 +/- 0.95	0.289 +/- 0.44
Toluene	ug/L	0.60	<0.093
Xylenes, Total	ug/L	<0.36	<0.36

Water quality results for groundwater and produced wastewater appear to indicate that both sources of water meet water quality objectives appropriate for the area. This Order requires the installation of a groundwater monitoring well network and specific monitoring of produced wastewater to ensure that the beneficial uses of groundwater will not be impacted.

DISCHARGE PROHIBITIONS, EFFLUENT LIMITATIONS, DISCHARGE SPECIFICATIONS, AND PROVISIONS

This Order will regulate the discharge of produced wastewater to Sherwood's Reservoirs and the reuse of the produced wastewater for irrigation.

Discharge Prohibitions

This Order includes Discharge Prohibitions A.1 through A.7 that identify specific prohibitions for the facility regarding the reuse of produced wastewater for irrigation. This includes prohibiting the discharge of well stimulation fluids and produced wastewater from wells that have undergone well stimulation, as defined by California Code of Regulations, title 14, section 1761.

Effluent Limits

Rationale for the Effluent Limitations in this Order follow:

a. **Oil and Grease:** An effluent limit of 35 mg/L for Oil and Grease is established in 40 CFR Part 435.50, *Oil and Grease Extraction Point Source Category, Agricultural and Wildlife Water Use Subcategory*. While the discharges to land described here are not subject to federal requirements, the Basin Plan requires the Discharger to comply with, or justify a departure from, effluent limitations set forth in 40 CFR 400 et seq. if discharge is to land. The Discharger has not provided such a justification, but rather has shown that the Treatment Facility is capable of consistently meeting the oil and grease limit of 35 mg/L. Thus, the limit for the discharge (Discharge 001) is applied for this Order.

b. **Conductivity (EC):** This Order applies the Basin Plan effluent limit for produced wastewater of 1,000 µmhos/cm as an annual average for Discharge 001.

c. **Boron:** This Order applies the Basin Plan effluent limit of 1.0 mg/L for oilfield wastewater as an annual average for Discharge 001.

d. **Chloride:** This Order applies the Basin Plan effluent limit of 200 mg/L for oilfield wastewater as an annual average for Discharge 001.

Monitoring Requirements

Water Code section 13267 authorizes the Central Valley Water Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the State. In recent years there has been an increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Water Code section 13268 authorizes assessment of civil administrative liability where appropriate.

This Order includes produced wastewater and groundwater monitoring. Produced wastewater monitoring includes the analysis of produced wastewater for specific constituents at specific frequencies. Analysis of produced wastewater will include the analysis of chemicals and additives used during petroleum exploration and production that may be in produced wastewater. Groundwater monitoring requires the installation of a groundwater monitoring well network for the project area capable of determining any potential impacts to first encountered groundwater from the project. Groundwater monitoring will also include the submittal of groundwater contour maps and analysis of groundwater for specific constituents at specific frequencies.

Reopener

The conditions of discharge in this Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. This Order will set limitations based on the information provided thus far. If applicable laws and regulations change, or once new information is obtained that will change the overall discharge and its potential to impact groundwater, it may be appropriate to reopen the Order.

ANTIDEGRADATION

To determine the potential degradation of groundwater downstream of Sherwood's Reservoirs, the RWD included an antidegradation analysis that compared the quality of produced wastewater to groundwater from Wells #6 and #7. The RWD concluded that electrical conductivity, chloride, sulfate, and arsenic would not result in a significant increase in groundwater beneath the project. Concentrations for boron and sodium may increase in groundwater, but will not impair the designated beneficial uses established in the Basin Plan. These constituents are known to be present in produced wastewater and will be monitored in groundwater to ensure that any degradation that may occur does not impact designated beneficial uses.

State Water Board Resolution No. 68-16 (*Policy with Respect to Maintaining High Quality Waters of the State*) (Anti-Degradation Policy) generally prohibits the Central Valley Water Board from authorizing activities that will result in the degradation of high-quality waters unless it has been shown that:

a. The degradation will not result in water quality lower than that prescribed in state and regional policies, including violation of one or more water quality objectives;

b. The degradation will not unreasonably affect present and anticipated future beneficial uses;

c. The discharger will employ BPTC to minimize degradation; and

d. The degradation is consistent with the maximum benefit to the people of the state.

This Order establishes effluent limitations for the discharges that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan.

Table 5 compares select water quality results of produced wastewater and groundwater, effluent limitations specified in the Basin Plan, and drinking water maximum contaminant levels published by the State Water Resources Control Board, Division of Drinking Water.

Table 5. Summary of Water Quality Results and Criteria

	EC	Arsenic	Boron	Chloride	Sodium	Toluene	Xylenes, Total
	umhos/cm	ug/L	mg/L	mg/L	mg/L	ug/L	ug/l
Groundwater	205	1.3	0.083	17	57	0.32	<0.36
E&B Produced Wastewater	505	4.9	0.76	59	110	1.3	8.4
Basin Plan Effluent Limits	1,000	-	1.0	200	-	-	-
Maximum Contaminant Levels	900 **	10 *	-	250 **	-	150 *	1,750 *

* Primary Maximum Contaminant Level.

** Secondary Maximum Contaminant Level – Derived from human welfare considerations (e.g., taste, order, or laundry staining).

Constituents in Table 5 represent known analytes that are common in produced wastewater. Water

quality results that are not available in Table 5 are identified in Attachment 1 of this Information Sheet.

The quality of produced wastewater does not exceed effluent limits in the Basin Plan or maximum contaminant levels. The RWD states that water quality at the project will not be significantly degraded and will not impact designated beneficial uses identified in the Basin Plan. This Order requires the installation of a groundwater monitoring well network to identify any potential impacts to groundwater and to ensure that the findings in the RWD are accurate.

Sample analyses of the Oil Field Additives List (Table II of the MRP) are presented in the Proposed Discharge section of the Information Sheet. The results of the analyses indicate:

a. Inorganic compound results from June 2017 and August 2018 appear to be similar;
b. Detectable analytical results for the analyses are below the drinking water primary and secondary MCLs, where applicable; and
c. Groundwater at Sherwood's Reservoirs is not likely to be impacted by organics given the low concentrations and depth to groundwater of approximately 590 feet.

The RWD states that the Discharger shall implement the following best practicable treatment or control (BPTC) measures to minimize the potential degradation of water quality:

a. Produced wastewater will be treated to remove solids and oil and grease prior to reuse for irrigation;
b. Water disposal wells will be maintained at the McVan Facility to accept poor quality produced wastewater or to divert excess flow to maintain a sustainable flowrate to Sherwood's Reservoirs;
c. Monitoring of the discharge of produced wastewater to Sherwood's Reservoirs to ensure that reservoirs do not overflow;
d. Implementation of water management practices to prevent over-irrigation of crops; and
e. Installation of drip lines or sprinklers to reduce poor and wasteful irrigation practices.

These treatment and control practices represent BPTC for the wastes that may threaten to degrade waters of the State.

This Order complies with the Anti-Degradation Policy because it ensures that any degradation that may occur as a result of the discharges regulated by this Order will not result in water quality lower than that prescribed in state and regional policies, that the degradation will not unreasonably affect present and anticipated future beneficial uses, that the Discharger will employ BPTC to minimize degradation, and that the degradation is consistent with the maximum benefit to the people of the state due to the significant benefits provided by the activities regulated by this Order.

CV-SALTS Reopener

The Central Valley Water Board adopted Basin Plan amendments incorporating new programs for addressing ongoing salt and nitrate accumulation in the Central Valley at its 31 May 2018 Board Meeting. These programs, once effective, could change how the Central Valley Water Board permits discharges of salt and nitrate. For nitrate, dischargers that are unable to comply with stringent nitrate requirements will be required to take on alternate compliance approaches that involve providing replacement drinking water to persons whose drinking water is affected by nitrates. Dischargers could comply with the new nitrate program either individually or collectively with other dischargers. For salinity, dischargers that are unable to comply with stringent salinity requirements would instead need to meet performance-based requirements and participate in a basin-wide effort to develop a long-term salinity strategy for the Central Valley. This Order may be amended or modified to incorporate any newly-applicable requirements.

The stakeholder-led Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has been coordinating efforts to implement new salt and nitrate management strategies. The Board expects dischargers that may be affected by new salt and nitrate management policies to coordinate with the CV-SALTS initiative.

FOOD SAFETY EXPERT PANEL

The Central Valley Water Board established a panel of experts (Food Safety Expert Panel) in the field of toxicology, biology, and agriculture to review data regarding the reuse of produced wastewater for irrigation. The Food Safety Expert Panel is to provide the Board with recommendations regarding potential impacts that may be associated with the reuse of produced wastewater for irrigation. The Board expects dischargers that reuse produced wastewater for irrigation to participate in the Food Safety Expert Panel effort and join the memorandum of understanding with other oil producers and irrigation management entities. If this project does not implement similar practices or grow similar crop types to those being discussed currently by the Food Safety Expert Panel, the Discharger may be required to conduct a separate investigation regarding this practice that will require expenses to be covered solely by the Discharger. If the work being conducted by the Food Safety Expert Panel effort determines there is a significant threat to crop safety and public health associated with the irrigation of crops with produced wastewater, this Order may be reopened and modified to address the threat.

TITLE 27

Title 27 of the California Code of Regulations, section 20005 et seq (Title 27) contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for full containment of classified waste, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent in a classified waste is acceptable under Title 27 regulations.

Unless exempt, the treatment, storage, processing, and disposal of solid waste is subject to full containment pursuant to Title 27 requirements. However, Title 27 exempts certain activities from its provisions. Title 27, section 20090 states, in relevant part:

> (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.

The discharge of produced wastewater from E&B's McVan Facility meets the above requirements and is, therefore, exempt from Title 27.

CEQA

Kern County (County) is the lead agency for purposes of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et seq.) and the CEQA Guidelines (Title14, Division 6, California Code of Regulations, as amended). On November 9, 2015, the County certified the Environmental Impact Report (EIR) for the Kern County Amended Zoning Ordinance for Oil and Gas Activities (Kern County EIR). The State Water Resources Control Board, in conjunction with the Central Valley Water Board, commented on the draft EIR. As part of the Kern County EIR, the County analyzed the use of produced wastewater for irrigation purposes.

The Regional Board as the responsible agency pursuant to CEQA (Public Resources Code, section 21069) and in making its determinations and findings, must presume that the Kern County EIR comports with the requirements of CEQA and is valid. (Public Resources Code, section 21167.3.) The Regional Board has reviewed and considered the Kern County EIR. The Kern County EIR found that there was a potentially significant impact to water supplies and that the use of produced wastewater for agricultural irrigation will reduce the potentially significant impact. The Kern County EIR concluded that any produced wastewater treated and used for agricultural irrigation shall be tested and monitored to ensure compliance with applicable standards for such agricultural irrigation. (Kern County EIR, MM 4.17-2.) This Order requires compliance with certain conditions and monitoring intended to ensure compliance with water quality standards. The Regional Board has determined that the Project, when implemented in accordance with the MRP and the conditions in this Order, will not result in any significant adverse water resource impacts.

Attachment 1 – Analytical Results for Produced Wastewater and Groundwater

			Produced Wastewater McVan Facility	Groundwater Well #6	Groundwater Well #7	Water Quality Criteria Primary MCL [1]
Constituent	**Method**	**Units**	**Result**	**Result**	**Result**	**Result**
Benzene	EPA-8260B [2]	ug/L [3]	0.47	ND (<0.083) [4]	ND (<0.083)	1
Bromobenzene	EPA-8260B	ug/L	ND (<0.13)	ND (<0.13)	ND (<0.13)	-
Bromochloromethane	EPA-8260B	ug/L	ND (<0.24)	ND (<0.24)	ND (<0.24)	-
Bromodichloromethane	EPA-8260B	ug/L	ND (<0.14)	ND (<0.14)	ND (<0.14)	80
Bromoform	EPA-8260B	ug/L	ND (<0.27)	ND (<0.27)	ND (<0.27)	80
Bromomethane	EPA-8260B	ug/L	ND (<0.25)	ND (<0.25)	ND (<0.25)	-
n-Butylbenzene	EPA-8260B	ug/L	0.81	ND (<0.11)	ND (<0.11)	-
sec-Butylbenzene	EPA-8260B	ug/L	ND (<0.15)	ND (<0.15)	ND (<0.15)	-
tert-Butylbenzene	EPA-8260B	ug/L	ND (<0.13)	ND (<0.13)	ND (<0.13)	-
Carbon tetrachloride	EPA-8260B	ug/L	ND (<0.18)	ND (<0.18)	ND (<0.18)	0.5
Chlorobenzene	EPA-8260B	ug/L	ND (<0.093)	ND (<0.093)	ND (<0.093)	70
Chloroethane	EPA-8260B	ug/L	ND (<0.14)	ND (<0.14)	ND (<0.14)	-
Chloroform	EPA-8260B	ug/L	ND (<0.12)	ND (<0.12)	ND (<0.12)	80
Chloromethane	EPA-8260B	ug/L	ND (<0.14)	ND (<0.14)	ND (<0.14)	-
2-Chlorotoluene	EPA-8260B	ug/L	ND (<0.2)	ND (<0.2)	ND (<0.2)	-
4-Chlorotoluene	EPA-8260B	ug/L	ND (<0.15)	ND (<0.15)	ND (<0.15)	-
Dibromochloromethane	EPA-8260B	ug/L	ND (<0.13)	ND (<0.13)	ND (<0.13)	80
1,2-Dibromo-3-chloropropane	EPA-8260B	ug/L	ND (<0.44)	ND (<0.44)	ND (<0.44)	0.2
1,2-Dibromoethane	EPA-8260B	ug/L	ND (<0.16)	ND (<0.16)	ND (<0.16)	0.05
Dibromomethane	EPA-8260B	ug/L	ND (<0.24)	ND (<0.24)	ND (<0.24)	-
1,2-Dichlorobenzene	EPA-8260B	ug/L	ND (<0.072)	ND (<0.072)	ND (<0.072)	600
1,3-Dichlorobenzene	EPA-8260B	ug/L	ND (<0.15)	ND (<0.15)	ND (<0.15)	-
1,4-Dichlorobenzene	EPA-8260B	ug/L	ND (<0.062)	ND (<0.062)	ND (<0.062)	5
Dichlorodifluoromethane	EPA-8260B	ug/L	ND (<0.099)	ND (<0.099)	ND (<0.099)	-
1,1-Dichloroethane	EPA-8260B	ug/L	ND (<0.11)	ND (<0.11)	ND (<0.11)	5
1,2-Dichloroethane	EPA-8260B	ug/L	ND (<0.17)	ND (<0.17)	ND (<0.17)	-
1,1-Dichloroethene	EPA-8260B	ug/L	ND (<0.18)	ND (<0.18)	ND (<0.18)	-
cis-1,2-Dichloroethene	EPA-8260B	ug/L	ND (<0.085)	ND (<0.085)	ND (<0.085)	6
trans-1,2-Dichloroethene	EPA-8260B	ug/L	ND (<0.15)	ND (<0.15)	ND (<0.15)	10
1,2-Dichloropropane	EPA-8260B	ug/L	ND (<0.13)	ND (<0.13)	ND (<0.13)	5
1,3-Dichloropropane	EPA-8260B	ug/L	ND (<0.086)	ND (<0.086)	ND (<0.086)	-
2,2-Dichloropropane	EPA-8260B	ug/L	ND (<0.13)	ND (<0.13)	ND (<0.13)	-
1,1-Dichloropropene	EPA-8260B	ug/L	ND (<0.085)	ND (<0.085)	ND (<0.085)	-
cis-1,3-Dichloropropene	EPA-8260B	ug/L	ND (<0.14)	ND (<0.14)	ND (<0.14)	0.5

Attachment 1 – Analytical Results for Produced Wastewater and Groundwater

			Produced Wastewater McVan Facility	Groundwater Well #6	Groundwater Well #7	Water Quality Criteria Primary MCL [1]
Constituent	**Method**	**Units**	**Result**	**Result**	**Result**	**Result**
trans-1,3-Dichloropropene	EPA-8260B	ug/L	ND (<0.079)	ND (<0.079)	ND (<0.079)	-
Ethylbenzene	EPA-8260B	ug/L	0.63	ND (<0.098)	ND (<0.098)	300
Hexachlorobutadiene	EPA-8260B	ug/L	ND (<0.17)	ND (<0.17)	ND (<0.17)	-
Isopropylbenzene	EPA-8260B	ug/L	2.2	ND (<0.14)	ND (<0.14)	-
p-Isopropyltoluene	EPA-8260B	ug/L	0.35	ND (<0.12)	ND (<0.12)	-
Methylene chloride	EPA-8260B	ug/L	ND (<0.48)	ND (<0.48)	ND (<0.48)	5
Methyl t-butyl ether	EPA-8260B	ug/L	ND (<0.11)	ND (<0.11)	ND (<0.11)	-
Naphthalene	EPA-8260B	ug/L	3.2	ND (<0.36)	ND (<0.36)	-
n-Propylbenzene	EPA-8260B	ug/L	10	ND (<0.11)	ND (<0.11)	-
Styrene	EPA-8260B	ug/L	ND (<0.068)	ND (<0.068)	ND (<0.068)	100
1,1,1,2-Tetrachloroethane	EPA-8260B	ug/L	ND (<0.18)	ND (<0.18)	ND (<0.18)	-
1,1,2,2-Tetrachloroethane	EPA-8260B	ug/L	ND (<0.17)	ND (<0.17)	ND (<0.17)	1
Tetrachloroethene	EPA-8260B	ug/L	ND (<0.13)	ND (<0.13)	ND (<0.13)	5
Toluene	EPA-8260B	ug/L	1.3	0.6	ND (<0.093)	150
1,2,3-Trichlorobenzene	EPA-8260B	ug/L	ND (<0.16)	ND (<0.16)	ND (<0.16)	-
1,2,4-Trichlorobenzene	EPA-8260B	ug/L	ND (<0.19)	ND (<0.19)	ND (<0.19)	5
1,1,1-Trichloroethane	EPA-8260B	ug/L	ND (<0.11)	ND (<0.11)	ND (<0.11)	200
1,1,2-Trichloroethane	EPA-8260B	ug/L	ND (<0.16)	ND (<0.16)	ND (<0.16)	5
Trichloroethene	EPA-8260B	ug/L	ND (<0.085)	ND (<0.085)	ND (<0.085)	5
Trichlorofluoromethane	EPA-8260B	ug/L	ND (<0.13)	ND (<0.13)	ND (<0.13)	150
1,2,3-Trichloropropane	EPA-8260B	ug/L	ND (<0.24)	ND (<0.24)	ND (<0.24)	-
1,1,2-Trichloro-1,2,2-trifluoroethane	EPA-8260B	ug/L	ND (<0.15)	ND (<0.15)	ND (<0.15)	1200
1,2,4-Trimethylbenzene	EPA-8260B	ug/L	48	ND (<0.12)	ND (<0.12)	-
1,3,5-Trimethylbenzene	EPA-8260B	ug/L	14	ND (<0.12)	ND (<0.12)	-
Vinyl chloride	EPA-8260B	ug/L	ND (<0.12)	ND (<0.12)	ND (<0.12)	0.5
Total Xylenes	EPA-8260B	ug/L	8.4	ND (<0.36)	ND (<0.36)	1750
p- & m-Xylenes	EPA-8260B	ug/L	2.9	ND (<0.28)	ND (<0.28)	-
o-Xylene	EPA-8260B	ug/L	5.4	ND (<0.082)	ND (<0.082)	-
Acenaphthene	EPA-8270C-SIM	ug/L	ND (<0.3)	ND (<0.03)	ND (<0.03)	-
Acenaphthylene	EPA-8270C-SIM	ug/L	ND (<0.3)	ND (<0.03)	ND (<0.03)	-
Anthracene	EPA-8270C-SIM	ug/L	ND (<0.3)	ND (<0.03)	ND (<0.03)	-
Benzo[a]anthracene	EPA-8270C-SIM	ug/L	ND (<0.3)	ND (<0.03)	ND (<0.03)	-
Benzo[b]fluoranthene	EPA-8270C-SIM	ug/L	ND (<0.29)	ND (<0.029)	ND (<0.029)	-

Attachment 1 – Analytical Results for Produced Wastewater and Groundwater

			Produced Wastewater McVan Facility	Groundwater Well #6	Groundwater Well #7	Water Quality Criteria Primary MCL [1]
Constituent	**Method**	**Units**	**Result**	**Result**	**Result**	**Result**
Benzo[k]fluoranthene	EPA-8270C-SIM	ug/L	ND (<0.32)	ND (<0.032)	ND (<0.032)	-
Benzo[a]pyrene	EPA-8270C-SIM	ug/L	ND (<0.43)	ND (<0.043)	ND (<0.043)	0.2
Benzo[g,h,i]perylene	EPA-8270C-SIM	ug/L	ND (<0.48)	ND (<0.048)	ND (<0.048)	-
Chrysene	EPA-8270C-SIM	ug/L	ND (<0.29)	ND (<0.029)	ND (<0.029)	-
Dibenzo[a,h]anthracene	EPA-8270C-SIM	ug/L	ND (<0.41)	ND (<0.041)	ND (<0.041)	-
Fluoranthene	EPA-8270C-SIM	ug/L	ND (<0.27)	ND (<0.027)	ND (<0.027)	-
Fluorene	EPA-8270C-SIM	ug/L	ND (<0.29)	ND (<0.029)	ND (<0.029)	-
Indeno[1,2,3-cd]pyrene	EPA-8270C-SIM	ug/L	ND (<0.43)	ND (<0.043)	ND (<0.043)	-
Naphthalene	EPA-8270C-SIM	ug/L	1.7	ND (<0.025)	ND (<0.025)	-
Phenanthrene	EPA-8270C-SIM	ug/L	ND (<0.27)	ND (<0.027)	ND (<0.027)	-
Pyrene	EPA-8270C-SIM	ug/L	ND (<0.33)	ND (<0.033)	ND (<0.033)	-
Oil and Grease	EPA-1664A HEM	mg/L	4.9	ND (<0.86)	ND (<0.86)	-
Total Petroleum Hydrocarbons	EPA-1664A SGT	mg/L	1.4	ND (<0.79)	ND (<0.79)	-
Electrical Conductivity @ 25 C (Field Test)	EPA-120.1	umhos/cm [5]	510	230	260	-
pH (field test)	EPA-150.1	pH Units	7.73	8.66	8.77	-
Dissolved Oxygen (Field Test)	SM-4500OG [6]	mg/L [7]	3.2	-	-	-
Temperature (Field Test)	SM-2550B	F [8]	145	77	79	-
Dissolved Calcium	EPA-6010B	mg/L	3.9	1.6	2.1	-
Dissolved Magnesium	EPA-6010B	mg/L	0.1	0.05	0.047	-
Dissolved Sodium	EPA-6010B	mg/L	110	56	58	-
Dissolved Potassium	EPA-6010B	mg/L	2.6	0.46	0.57	-
Bicarbonate Alkalinity as CaCO3	EPA-310.1	mg/L	140	60	55	-
Carbonate Alkalinity as CaCO3	EPA-310.1	mg/L	ND (<4.1)	22	26	-
Hydroxide Alkalinity as CaCO3	EPA-310.1	mg/L	ND (<4.1)	ND (<4.1)	ND (<4.1)	-
Chloride	EPA-300.0	mg/L	59	17	17	-
Nitrate as N	EPA-300.0	mg/L	ND (<0.021)	ND (<0.021)	ND (<0.021)	-
Sulfate	EPA-300.0	mg/L	16	13	17	-
Dissolved Total Alkalinity	Calc	Reacting %	61	72	71	-
Electrical Conductivity @ 25 C	SM-2510B	umhos/cm	505	248	262	-
Total Dissolved Solids @ 180 C	EPA-160.1	mg/L	370	220	190	-

Attachment 1 – Analytical Results for Produced Wastewater and Groundwater

			Produced Wastewater McVan Facility	Groundwater Well #6	Groundwater Well #7	Water Quality Criteria Primary MCL [1]
Constituent	**Method**	**Units**	**Result**	**Result**	**Result**	**Result**
Total Suspended Solids (Glass Fiber)	EPA-160.2	mg/L	13	5.6	6.8	-
Non-Volatile Organic Carbon	EPA-415.1	mg/L	13	0.39	ND (<0.3)	-
Hexavalent Chromium	EPA-7196	ug/L	4.3	ND (<0.7)	ND (<0.7)	10
Dissolved Boron	EPA-6010B	ug/L	760	84	83	-
Total Recoverable Antimony	EPA-200.8	ug/L	ND (<0.11)	ND (<0.11)	ND (<0.11)	6
Total Recoverable Arsenic	EPA-200.8	ug/L	4.9	ND (<0.7)	1.8	10
Total Recoverable Barium	EPA-200.8	ug/L	3.3	0.83	1.3	1,000
Total Recoverable Beryllium	EPA-200.8	ug/L	ND (<0.14)	ND (<0.14)	ND (<0.14)	4
Total Recoverable Cadmium	EPA-200.8	ug/L	ND (<0.11)	ND (<0.11)	ND (<0.11)	5
Total Recoverable Chromium	EPA-200.8	ug/L	ND (<0.5)	0.54	ND (<0.5)	-
Total Recoverable Cobalt	EPA-200.8	ug/L	ND (<0.1)	ND (<0.1)	ND (<0.1)	-
Total Recoverable Copper	EPA-200.8	ug/L	0.34	1	0.89	1,300
Total Recoverable Iron	EPA-200.7	ug/L	55	210	130	-
Total Recoverable Lead	EPA-200.8	ug/L	ND (<0.1)	2.2	0.1	15
Total Recoverable Lithium	EPA-200.7	ug/L	49	13	12	-
Total Recoverable Manganese	EPA-200.7	ug/L	5.6	4.1	4.1	-
Total Recoverable Mercury	EPA-245.1	ug/L	ND (<0.03)	ND (<0.03)	ND (<0.03)	2
Total Recoverable Molybdenum	EPA-200.8	ug/L	51	7.6	6.3	-
Total Recoverable Nickel	EPA-200.8	ug/L	21	0.39	0.25	100
Total Recoverable Selenium	EPA-200.8	ug/L	0.71	ND (<0.19)	ND (<0.19)	50
Total Recoverable Silver	EPA-200.8	ug/L	ND (<0.1)	ND (<0.1)	ND (<0.1)	-
Total Recoverable Strontium	EPA-200.7	ug/L	16	3.2	3.4	-
Total Recoverable Thallium	EPA-200.8	ug/L	ND (<0.1)	ND (<0.1)	ND (<0.1)	-
Total Recoverable Vanadium	EPA-200.8	ug/L	ND (<0.78)	ND (<0.78)	0.89	-
Total Recoverable Zinc	EPA-200.8	ug/L	ND (<1.7)	4.5	5.5	-
ðD of Water	EPA 900.0	0/00 [9] relative to VSMOw	-76.4	-71.1	-68.7	-

Attachment 1 – Analytical Results for Produced Wastewater and Groundwater

			Produced Wastewater McVan Facility	Groundwater Well #6	Groundwater Well #7	Water Quality Criteria Primary MCL [1]
Constituent	**Method**	**Units**	**Result**	**Result**	**Result**	**Result**
$\delta^{18}O$ of Water	EPA 900.0	0/00 relative to VSMOw	-10.2	-9.81	-9.6	-
Gross Alpha	EPA 900.0	pCi/L [10]	- 0.495 +/- 0.840	- 0.318 +/- 0.323	- 0.298 +/- 0.532	15
Radium - 226	EPA 903.1	pCi/L	0.0594 +/- 0.308	0.516 +/- 0.481	0.289 +/- 0.441	5
Radium - 228	EPA 904.0	pCi/L	- 0.0752 +/- 0.420	1.19 +/- 0.473	- 0.0492 +/- 0.292	5
Total Recoverable Uranium	EPA 200.8	pCi/L	ND (<0.067)	ND (<0.067)	ND (<0.067)	20

[1] Maximum contaminant level.
[2] Environmental protection agency.
[3] Micrograms per liter.
[4] ND = Non-detect; (<MDL) = Less than the minimum detection limit for that constituent.
[5] Micromhos per centimeter.
[6] Standard Method.
[7] Milligrams per liter.
[8] Fahrenheit.
[9] Parts per thousand.
[10] Picocuries per liter.

Attachment II - Oil Production and Process Chemicals and Additives Results

No.	Constituent	CASRN [1]	Result	MDL [2]	Units
1	1,2,3 Trimethylbenzene	526-73-8	- [3]	-	-
2	1,2 Benzisothiazol-3(2H)-one	2634-33-5	-	-	-
3	1,2,4-Trimethylbenzene	95-63-6	69	0.12	ug/L [4]
4	1,3,5-Trimethylbenzene	108-67-8	19	0.12	ug/L
5	1,4 Dioxane	123-91-1	ND [5]	0.1	ug/L
6	1H, 3H-Pyrano (4,3-b)(1)benzopyran-9-carboxylic acid, 4,10-dihydro-3,7,8 trihydroxy-3-methyl-10-oxo	479-66-3	-	-	-
7	1-Hexadecene	629-73-2	-	-	-
8	2-Butoxyethanol	111-76-2	1.7	1.7	mg/L [6]
9	2-Ethylhexanol	104-76-7	9.1	9.1	ug/L
10	2-Methylamino-2-methyl-1-propanol	27646-80-6	-	-	-
11	2-Propen-1-aminium, N,N-dimethyl-N-2-propenyl-, chloride, polymer with 2-hydroxypropyl 2-	67990-40-3	-	-	-
12	2-Propenoic acid, 2-methyl-, polymer with methyl 2-methyl-2-propenoate, octadecyl 2-methyl 2 propenoate and 2propenoic acid, sodium salt	145417-45-4	-	-	-
13	2-Propenoic acid, polymer with 2-propenamide, sodium salt	25987-30-8	-	-	-
14	2-Propenoic acid, telomer with 2-methyl-2-(1-oxo-2-propenyl)-1-propanesulfonic acid, sodium salt	130800-24-7	-	-	-
15	3-Butyn-2-ol, 2-methyl	115-19-5	-	-	-
16	Acetaldehyde	75-07-0	-	-	-
17	Acetic Acid	64-19-7	7.9	0.31	mg/L
18	Acetone	67-64-1	500	4.6	ug/L
19	Acrolein	107-02-8	ND	7.9	ug/L
20	Acrolein dimer	100-73-2	-	-	-
21	Acrylamide	79-06-1	-	-	-
22	Acrylic Acid	79-10-7	-	-	-
23	Alchohols, C14-15, ethoxylated	68951-67-7	-	-	-
24	Alcohol ethoxylate	68439-45-2	-	-	-
25	Alcohol ethoxylated, C-10-14	66455-15-0	-	-	-
26	Alcohols, C9-11, ethoxylated	68439-46-3	-	-	-
27	Alkanes, C11-15-iso	90622-58-5	-	-	-
28	Alkanes, C14-16	90622-46-1	-	-	-
29	Alkanolamine aldehyde condensate	4719-04-4	-	-	-
30	Alkanolamine phosphate	29868-05-1	-	-	-
31	Alkoxylated alcohol	69011-36-5	-	-	-
32	Alkyl amine	68439-70-3	-	-	-
33	Alkyl benzenesulfonate	68081-81-2	-	-	-
34	Alkyl benzenesulfonic acid	68584-22-5	-	-	-
35	Alkyl dimethyl benzyl ammonium chloride	8001-54-5	-	-	-
36	Alkylaryl sulfonate	68584-27-0	-	-	-
37	Alkylaryl sulfonates	68910-32-7	-	-	-
38	Alkylarylsulfonate amine salt	90218-35-2	-	-	-
39	Alkylbenzene mixture	68648-87-3	-	-	-
40	Almond Shell	90320-37-9	-	-	-
41	Aluminum oxide	1344-28-1	-	-	-
42	Aluminum chloride	7446-70-0	See aluminum (total) and chloride results		
43	Aluminum chloride hydroxide	12042-91-0	See aluminum (total) and chloride results		
44	Aluminum stearate	300-92-5	See aluminum (total) results, anion method NA [7]		

Attachment II - Oil Production and Process Chemicals and Additives Results

No.	Constituent	CASRN [1]	Result	MDL [2]	Units
45	Amide surfactant acid salt	-	-	-	-
46	Amides, Non-Ionics	68140-01-2	-	-	-
47	Amine derivative	61791-24-0	-	-	-
48	Amine salt	67924-33-8	-	-	-
49	Amine salt	NP-U2856	-	-	-
50	Amine sulfate	64346-44-7	See sulfate results, cation method NA		
51	Amine sulfate	926-39-6	See sulfate results, cation method NA		
52	Aminotri (methylenephosphonic acid)	6419-19-8	-	-	-
53	Ammonium alkylaryl sulfonates	68910-31-6	See ammonium as NH4 results, anion method NA		
54	Ammonium Benzoate	1863-63-4	-	-	-
55	Ammonium bisulfate	10192-30-0	See ammonium as NH4 results, anion method NA		
56	Ammonium chloride	12125-02-9	See ammonium as NH4 and chloride results		
57	Ammonium Fluoride	1341-49-7	See ammonium as NH4 and fluoride results		
58	Ammonium sulfate	7783-20-2	See ammonium as NH4 and sulfate results		
59	Amorphous silica	7631-86-9	76,000	53	ug/L
60	Antimony trioxide	1309-64-4	See antimony (total) results, anion method NA		
61	Aromatic amines	-	-	-	-
62	Barite	13462-86-7	See barium (total) and sulfate results		
63	Barium	7440-39-3	7	3.5	ug/L
64	Barium sulfate	7727-43-7	See barium (total) and sulfate results		
65	Bentonite	1302-78-9	-	-	-
66	Benzene	71-43-2	0.66	0.083	ug/L
67	Benzoic Acid	65-85-0	-	-	-
68	Benzyl chloride	100-44-7	-	-	-
69	Beryllium	7440-41-7	ND	0.5	ug/L
70	Branched DDBSA	68411-32-5	-	-	-
71	C12-C14 Isoalkanes	68551-19-9	-	-	-
72	C12-C14 Isoalkanes	68551-20-2	-	-	-
73	C14-30 Alkyl Derivatives	68855-24-3	-	-	-
74	Cadmium	7440-43-9	ND	1.1	ug/L
75	Calcium carbonate	471-34-1	See calcium (total) and carbonate alkalinity as CaCO3 results		
76	Calcium oxide	1305-78-8	-	-	-
77	Calcium sulfate	7778-18-9	See calcium (total) and sulfate results		
78	Carbon	7440-44-0	-	-	-
79	Carbon Dioxide	124-38-9	16	2	mg/L
80	Carboxymethyl cellulose	9004-32-4	-	-	-
81	Cationic acrylamide copolymer	69418-26-4	-	-	-
82	Cationic acrylamide monomer	44992-01-0	-	-	-
83	Cationic polymer	54076-97-0	-	-	-
84	Cedar Fiber	11132-73-3	-	-	-
85	cellophane	9005-81-6	-	-	-
86	Cellulose	9004-34-6	-	-	-
87	Chromium	7440-47-3	ND	1.1	ug/L
88	Citric acid	77-92-9	-	-	-
89	Citrus Terpenes	94266-47-4	-	-	-
90	Cocamide DEA	68603-42-9	-	-	-
91	Cocamide DEA	68155-07-7	-	-	-
92	Coke, petroleum, calcined	64743-05-1	-	-	-
93	Copper	7440-50-8	1.9	1.1	ug/L
94	Copper sulfate pentahydrate	7758-99-8	-	-	-
95	Cotton seed hulls	68308-87-2	-	-	-
96	Crosslinked polyol ester	129828-31-5	-	-	-
97	Cumene	98-82-8	2.8	0.14	ug/L

Attachment II - Oil Production and Process Chemicals and Additives Results

No.	Constituent	CASRN [1]	Result	MDL [2]	Units
98	Cyclohexanol	108-93-0	-	-	-
99	Cyclohexylamine	108-91-8	-	-	-
100	Cymenes	25155-15-1	-	-	-
101	DDBSA Salt	-	-	-	-
102	Diester of sulfosuccinic acid sodium salt	2673-22-5	-	-	-
103	Diethanolamine	111-42-2	-	-	-
104	Dimethyl siloxane	-	-	-	-
105	Dinonylphenyl polyoxyethylene	9014-93-1	-	-	-
106	Diphosphoric acid, sodium salt (1:4)	7722-88-5	-	-	-
107	Dipropylene glycol methyl ether	34590-94-8	-	-	-
108	Disodium ethylenediaminediacetate	38011-25-5	-	-	-
109	Diutan gum	125005-87-0	-	-	-
110	d-Limonene	5989-27-5	-	-	-
111	Dodecane	112-40-3	-	-	-
112	Drilling Paper	-	-	-	-
113	Ethanol	64-17-5	ND	18	ug/L
114	Ethanolamine thioglycolate	126-97-6	-	-	-
115	Ethoxylated amine	61791-26-2	-	-	-
116	Ethoxylated C11 Alcohol	34398-01-1	-	-	-
117	Ethoxylated octylphenol	-	-	-	-
118	Ethyl Acetate	141-78-6	-	-	-
119	Ethyl acrylate	140-88-5	-	-	-
120	Ethyl Octynol	5877-42-9	-	-	-
121	Ethylbenzene	100-41-4	1.5	0.098	ug/L
122	Ethylene Glycol	107-21-1	-	-	-
123	Fatty Acid	143-07-7	-	-	-
124	Fatty acid ester	67762-38-3	-	-	-
125	Fatty acid oxyalkylate	70142-34-6	-	-	-
126	Fatty acids, tall-oil, sodium salts	61790-45-2	-	-	-
127	Fatty alkylamines	61788-91-8	-	-	-
128	Ferrous sulfate	17375-41-6	-	-	-
129	Formaldehyde	50-00-0	22	0.31	ug/L
130	Formamide	75-12-7	-	-	-
131	Formic Acid	64-18-6	-	-	-
132	Furfuryl alcohol	98-00-0	-	-	-
133	Glutaral	111-30-8	16	16	ug/L
134	Glycerides, tall oil mono-, di, and tri	97722-02-6	-	-	-
135	Glycerine	56-81-5	-	-	-
136	Glycine, N,N, 1,2- ethanediylbis (N-(carboxymethyl)-disodium salt	139-33-3	-	-	-
137	Glycolic acid	79-14-1	-	-	-
138	Glyoxal	107-22-2	25	0.76	ug/l
139	Graphite	7782-42-5	-	-	-
140	Gypsum	13397-24-5	-	-	-
141	Heavy aromatic naphtha	64742-94-5	-	-	-
142	Heavy Catalytic Naphtha	64741-68-0	-	-	-
143	Humic acids	1415-93-6	-	-	-
144	Hydrochloric Acid	7647-01-0		See chloride results	
145	Hydrofluoric Acid	7664-39-3		See fluoride results	
146	Hydrogen Peroxide	7722-84-1	-	-	-
147	Hydroquinone	123-31-9	-	-	-
148	Hydrotreated light distillate	64742-47-8	-	-	-
149	Hydroxyethyl cellulose	9004-62-0	-	-	-
150	Hydroxyethylidenediphosphonic Acid	2809-21-4	-	-	-

Attachment II - Oil Production and Process Chemicals and Additives Results

No.	Constituent	CASRN [1]	Result	MDL [2]	Units
151	Inorganic sulfur compound	7783-18-8	-	-	-
152	Iodine	7553-56-2	-	-	-
153	Ionic surfactants	-	-	-	-
154	Isobutanolamine	124-68-5	-	-	-
155	Isopropanol	67-63-0	110	9.3	ug/L
156	Isoquinoline	119-65-3	-	-	-
157	Kerosene	8008-20-6	-	-	-
158	Krypton	7439-90-9	-	-	-
159	Krypton 85	13983-27-2	-	-	-
160	Lead	7439-92-1	ND	4	ug/L
161	Light Aliphatic Naphtha	64742-89-8	-	-	-
162	Light aromatic naphtha	64742-95-6	-	-	-
163	Lignite	129521-66-0	-	-	-
164	Limestone	1317-65-3	-	-	-
165	Lithium carbonate	554-13-2	See lithium (total) and carbonate alkalinity as CaCO3 results		
166	Lithium chlorate	13453-71-9	See lithium (total) results, anion method NA		
167	Lithium chloride	7447-41-8	See lithium (total) and chloride results		
168	Lithium hydroxide	1310-65-2	See lithium (total) results		
169	Lithium hypochlorite	13840-33-0	See lithium (total) results, anion method NA		
170	Magma Fiber	6806-10-0000	-	-	-
171	Mercury	7439-97-6	0.065	0.029	ug/L
172	Methanol	67-56-1	500	10	ug/L
173	Methyl Chloride	74-87-3	-	-	-
174	Methyl ester of sulfonated tannin	-	-	-	-
175	Methyl oxirane polymer	PE-M2464	-	-	-
176	Methylchloroisothiazolinone	26172-55-4	-	-	-
177	Mineral Oil	8012-95-1	-	-	-
178	Monoethanolamine	141-43-5	-	-	-
179	Mullite	1302-93-8	-	-	-
180	Naphthalene	91-20-3	3.9	0.36	ug/L
181	Nickel	7440-02-0	29	2	ug/L
182	Nickel sulfate	7786-81-4	See nickel (total) and sulfate results		
183	Non-Phenol Ethoxylates	9016-45-9	-	-	-
184	Nonylphenol polyethylene glycol ether	127087-87-0	-	-	-
185	Nutshell	-	-	-	-
186	Oleic acid	112-80-1	-	-	-
187	Orange terpenes	68647-72-3	-	-	-
188	Organic Acids Ethoxylated Alcohols	104-55-2	-	-	-
189	Organic surfactant	577-11-7	-	-	-
190	Oxyalkylated alkylphenol	68412-54-4	-	-	-
191	Oxyalkylated alkylphenolic resin	30704-64-4	-	-	-
192	Oxyalkylated alkylphenolic resin	30846-35-6	-	-	-
193	Oxyalkylated alkylphenolic resin	63428-92-2	-	-	-
194	Oxyalkylated alkylphenolic resin	68171-44-8	-	-	-
195	Oxyalkylated polyamine	67939-72-4	-	-	-
196	Oxyalkylated polyamine	68910-19-0	-	-	-
197	Paraffinic petroleum distillate	64742-55-8	-	-	-
198	Pentadecane, 3-methylene	56919-55-2	-	-	-
199	Pentadecane, 5-methylene	115146-98-0	-	-	-
200	Pentadecane, 7-methylene	13043-55-5	-	-	-
201	Pentasodium diethylenetriamine pentaacetate	140-01-2	-	-	-
202	Peroxyacetic acid	79-21-0	-	-	-
203	Petroleum distillates	64742-53-6	-	-	-

Attachment II - Oil Production and Process Chemicals and Additives Results

No.	Constituent	CASRN [1]	Result	MDL [2]	Units
204	Phosphate ester salt	68425-75-2	-	-	-
205	Phosphonate salt	P-84-470	-	-	-
206	Phosphonic Acid	13598-36-2	-	-	-
207	Phosphonium, tetrakis (hydroxymethyl)-, sulfate (2:1), salt	55566-30-8	-	-	-
208	Phosphoric acid	7664-38-2	-	-	-
209	Phosphoric acid ester salt	-	-	-	-
210	Piperazine	110-85-0	-	-	-
211	POE (20) Sorbitan Trioleate	9005-70-3	-	-	-
212	Polyacrylamide	9003 05 8	-	-	-
213	Polyacrylate	9003-79-8	-	-	-
214	Polyacrylic acid	9003 01 4	-	-	-
215	Polyamine	64114-46-1	-	-	-
216	Polyamine salts	68955-69-1	-	-	-
217	Polycarboxlate salt	19019-43-3	-	-	-
218	PolyDADMAC	26062-79-3	-	-	-
219	Polydimethylsiloxane emulsion	-	-	-	-
220	Polyethylene	25038-59-9	-	-	-
221	Polyethylene glycol	25322-68-3	-	-	-
222	Polyglycol diepoxide	68036-92-0	-	-	-
223	Polyglycol diepoxide	68036-95-3	-	-	-
224	Polyglycol ester	PE-M2481	-	-	-
225	Polyglycol ether	9038-95-3	-	-	-
226	Polylactide resin	9051-89-2	-	-	-
227	Polymer sodium acrylate	9033-79-8	-	-	-
228	Polyoxyalklene glycol	68123-18-2	-	-	-
229	Polyoxyalkylene	68551-12-2	-	-	-
230	Polyoxyalkylene glycol	36484-54-5	-	-	-
231	Polyoxyalkylenes	78330-21-9	-	-	-
232	Polyoxyalkylenes	61790-86-1	-	-	-
233	Polyoxyethylene nonylphenyl ether phosphate	68412-53-3	-	-	-
234	Polypropylene glycol	25322-69-4	-	-	-
235	Polyquaternary amine	42751-79-1	-	-	-
236	Polyvinyl Alcohol	9002-89-5	-	-	-
237	Potassium acetate	127-08-2	-	-	-
238	Potassium bisulfate	7646-93-7	-	-	-
239	Potassium chloride	7447-40-7	-	-	-
240	Potassium hydroxide	1310-58-3	-	-	-
241	Potassium Oxide	12136-45-7	-	-	-
242	Propargl alcohol	107-19-7	-	-	-
243	Propionaldehyde	123-38-6	-	-	-
244	Propylene glycol	57-55-6	-	-	-
245	Quartz Crystalline Silica	14808-60-7	-	-	-
246	Quaternary ammonium compound	61790-41-8	-	-	-
247	Quaternary ammonium compound	68424-85-1	-	-	-
248	Quaternized condensed alkanolamines	68609-18-7	-	-	-
249	Quinaldine	91-63-4	-	-	-
250	Salt of an organic sulfur compound	P-88-1256	-	-	-
251	Salt of fatty acid polyamine	68153-60-6	-	-	-
252	Saponite	1319-41-1	-	-	-
253	Severely Hydrotreated Paraffinic	64742-62-7	-	-	-
254	Silica crystalline tridymite	15468-32-3	-	-	-
255	Silica, crystalline, cristoballite	14464-46-1	-	-	-
256	Siloxanes and Silicones	63148-62-9	-	-	-

Attachment II - Oil Production and Process Chemicals and Additives Results

No.	Constituent	CASRN [1]	Result	MDL [2]	Units
257	Smectite	1318-93-0	-	-	-
258	Sodium acetate	127-09-3	See sodium (total) and fatty acid results		
259	Sodium Acid Pyrophosphate	7758-16-9	See sodium (total) results, anion method NA		
260	Sodium Benzoate	532-32-1	See sodium (total) results, anion method NA		
261	Sodium bicarbonate	144-55-8	See sodium (total) and bicarbonate alkalinity as CaCO3 results		
262	Sodium bisulfite	7631-90-5	See sodium (total) results, anion method NA		
263	Sodium carbonate	497-19-8	See sodium (total) and carbonate alkalinity as CaCO3 results		
264	Sodium carboxymethylstarch	9063-38-1	See sodium (total) results, anion method NA		
265	Sodium Chlorate	7775-09-9	See sodium (total) results, anion method NA		
266	Sodium chloride	7647-14-5	See sodium (total) and chloride results		
267	Sodium chloride	4647-14-5	-	-	-
268	Sodium dichloroisocyanurate	2893-78-9	See sodium (total) results, anion method NA		
269	Sodium edetate	64-02-8	See sodium (total) results, anion method NA		
270	Sodium Erythorbate	6381-77-7	-	-	-
271	Sodium glycolate	2836-32-0	See sodium (total) results, anion method NA		
272	Sodium hydroxide	1310-73-2	See sodium (total) results, anion method NA		
273	Sodium hypochlorite	7681-52-9	See sodium (total) results, anion method NA		
274	Sodium Iodide	7681-82-5	See sodium (total) and Iodide results		
275	Sodium olefin sulfonate	68439-57-6	See sodium (total) results, anion method NA		
276	Sodium Oxide	1313-59-3	-	-	-
277	Sodium polyacrylate	9003-79-3	See sodium (total) results, anion method NA		
278	Sodium polyacrylate	9003 04 7	-	-	-
279	Sodium sulfate	7757-82-6	See sodium (total) results, anion method NA		
280	Sodium tetraborate pentahydrate	12179-04-3	-	-	-
281	Sodium Thiosulfate Pentahydrate	10102-17-7	See sodium (total) results, anion method NA		
282	Sodium Thiosulfate Pentahydrate	7772-98-7	See sodium (total) results, anion method NA		
283	Sodium Trimetaphosphate	7785-84-4	-	-	-
284	Solvent Dewaxed Heavy Paraffinic	64742-65-0	-	-	-
285	Sorbitan ester	NP-SMO3_U1240	-	-	-
286	Sorbitan Mono-9-Octadecenoate	9005-65-6	-	-	-
287	Sorbitan monooleate	1338-43-8	-	-	-
288	Soybean oil, Me ester	67784-80-9	-	-	-
289	Stearic acid	57-11-4	-	-	-
290	Steel mill slag	65996-69-2	-	-	-
291	Stoddard Solvents	8052-41-3	-	-	-
292	Sulfur dioxide	7446 09 5	-	-	-
293	Sulfuric acid	7664-93-9	See Sulfate results		
294	Tall oil fatty acids	61790-12-3	-	-	-
295	Tallow alkylamines	61790-33-8	-	-	-
296	Tar bases, Quinoline derivatives, benzyl chloride- Quaternized	72480-70-7	-	-	-
297	Terpene hydrocarbon	8002 09 3	-	-	-
298	Tetradecane	629-59-4	-	-	-
299	Tetrapropylenebenzene	25265-78-5	-	-	-
300	Thiourea, polymer with formaldehyde and 1-phenylethanone	68527-49-1	-	-	-
301	Titanium dioxide	13463-67-7	-	-	-
302	Toluene	108-88-3	1.2	0.093	ug/L
303	Tridecane	629-50-5	-	-	-
304	Triethylene Glycol	112-27-6	-	-	-
305	Trimethyl Benzene	25551-13-7	-	-	-

Attachment II - Oil Production and Process Chemicals and Additives Results

No.	Constituent	CASRN [1]	Result	MDL [2]	Units
306	Triphosphoric acid, sodium salt (1:5)	7758-29-4	-	-	-
307	Trisodium nitrilotriacetic acid	5064-31-3	-	-	-
308	Undecane	1120-21-4	-	-	-
309	Urea	57-13-6	-	-	-
310	Walnut Shell	84012-43-1	-	-	-
311	Water	7732-18-5	-	-	-
312	Wood dust	-	-	-	-
313	Xanthan Gum	11138-66-2	-	-	-
314	Xenon	7440-63-3	-	-	-
315	Xenon radionuclide	14932-42-4	-	-	-
316	Total Xylenes	1330-20-7	12	0.36	ug/L
317	Zinc	7440-66-6	8	2.3	ug/L
318	Zinc chloride	7646-85-7	See zinc (total) and chloride results		
NR 1 [8]	2,4,5-TFAP	129322-83-4	17.7	0	ug/l
NR 2	Methyl Glyoxal	78-98-8	11	1.1	ug/l
NR 3	Butyraldehyde	123-72-8	170	0	ug/L
NR 4	4-Bromofluorobenzene	460-00-4	15	0	ug/L
NR 5	Dibromofluoromethane	1868-53-7	9.2	0	ug/L
NR 6	Methylene chloride	75-09-2	ND	0.48	ug/L
NR 7	p- & m-Xylenes	179601-23-1	6.3	0.28	ug/L
NR 8	o-Xylene	95-47-6	5.7	0.082	ug/L
NR 9	Total Calcium	7440-70-2	4.7	0.015	mg/L
NR 10	Total Sodium	7440-23-5	110	0.051	mg/L
NR 11	Total Potassium	7440-09-7	2.8	0.13	mg/L
NR 12	Bicarbonate Alkalinity as CaCO3	71-52-3	150	4.1	mg/L
NR 13	Carbonate Alkalinity as CaCO3	3812-32-6	ND	4.1	mg/L
NR 14	Hydroxide Alkalinity as CaCO3	14280-30-9	ND	4.1	mg/L
NR 15	Alkalinity as CaCO3	-	150	4.1	mg/L
NR 16	Chloride	16887-00-6	66	0.077	mg/L
NR 17	Fluoride	16984-48-8	0.84	0.012	mg/L
NR 18	Sulfate	14808-79-8	13	0.13	mg/L
NR 19	Electrical Conductivity @ 25 C	-	543	1	umhos/cm
NR 20	Total Suspended Solids (Glass Fiber)	-	8.7	0.56	mg/L
NR 21	MBAS	-	0.057	0.1	mg/L
NR 22	Iodide	20461-54-5	0.14	0.01	mg/L
NR 23	Ammonium as NH4	14798-03-9	5.5	0.12	mg/L
NR 24	Butyric Acid	107-92-6	ND	0.37	mg/L
NR 25	Lactic Acid	50-21-5	1.4	0.5	mg/L
NR 26	Propionic Acid	79-09-4	0.97	0.42	mg/L
NR 27	Total Aluminum	7429-90-5	270	26	ug/L
NR 28	Total Antimony	7440-36-0	ND	8.5	ug/L
NR 29	Total Lithium	7439-93-2	54	6.2	ug/L

1 Chemical abstract service registry number.
2 Minimum detection limit.
3 No results available.
4 Micrograms per liter.
5 Non-detect.
6 Milligrams per liter.
7 Not available.
8 Not required as part of the original list.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR
WASTE DISCHARGE REQUIREMENTS
(National Pollutant Discharge Elimination System)

1 March 1991

A. GENERAL PROVISIONS

1. Any violation of this Order constitutes a violation of the Federal Clean Water Act (CWA) and the California Water Code (CWC) and, therefore, may result in enforcement action under either or both laws.

2. The Clean Water Act provides that any person who violates a portion of this Order implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who willfully or negligently violates this Order with regard to these sections of the CWA is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both.

3. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another; protect the Discharger from liability under federal, state, or local laws; or guarantee the Discharger a capacity right in the receiving waters.

4. The Discharger shall allow representatives of the Regional Water Quality Control Board (hereafter Board), the State Water Resources Control Board and the Environmental Protection Agency (hereafter EPA), upon presentation of credentials, at reasonable hours, to:

   a. enter premises where wastes are treated, stored, or discharged and facilities in which any required record are kept;

   b. copy any records required to be kept under terms and conditions of this Order;

   c. inspect facilities, monitoring equipment, practices, or operations regulated or required by this Order; and

   d. sample, photograph or video tape any discharge, waste, waste unit or monitoring device.

5. If the Discharger's wastewater treatment plant is publicly owned or subject to regulation by California Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to Title 23, California Code of Regulations (CCR), Division 3, Chapter 14.

6. The Discharger shall at all times properly operate and maintain all facilities, and systems of treatment and control including sludge use and disposal facilities (and related appurtenances) that are installed or used to achieve compliance with this Order.

   Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger only when necessary to achieve compliance with this Order.

7. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

   a. violation of any term or condition contained in this Order;

   b. obtaining this Order by misrepresentation or by failing to disclose fully all relevant facts;

   c. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; and

   d. a material change in the character, location, or volume of discharge.

   The causes for modification include:

   a. New regulations. New regulations have been promulgated under Section 405(d) of the Clean Water Act, or the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued.

   b. Land application plans. When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.

   c. Change in sludge use or disposal practice. Under 40 Code of Federal Regulations (CFR) 122.62(a)(1), a change in the Discharger's sludge use or disposal practice is a cause for modification of the permit. It is cause for revocation and reissuance if the Discharger requests or agrees..

   The Regional Board may review and revise this Order at any time upon application of any affected person or the Board's own motion.

8. The filing of a request by the Discharger for modification, revocation and reissuance, or termination of this Order, or notification of planned changes or anticipated noncompliance, does not stay any condition of this Order.

The Discharger shall furnish, within a reasonable time, any information the Board or EPA may request to determine compliance with this Order or whether cause exists for modifying or terminating this Order. The Discharger shall also furnish to the Board, upon request, copies of records required to be kept by this Order.

9. If a toxic effluent standard or prohibition (including any scheduled compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the CWA, or amendments thereto, for a toxic pollutant that is present in the discharge authorized herein, and such standard or prohibition is more stringent than any limitation upon such pollutant in this Order, the Board will revise or modify this Order in accordance with such toxic effluent standard or prohibition.

   The Discharger shall comply with effluent standards and prohibitions within the time provided in the regulations that establish those standards or prohibitions, **even if this Order has not yet been modified**.

10. If more stringent applicable water quality standards are approved, pursuant to Section 303 of the CWA, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

11. This Order shall be modified, or alternately revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:

    a. contains different conditions or is otherwise more stringent than any effluent limitation in the Order; or

    b. controls any pollutant limited in the Order.

    The Order, as modified or reissued under this paragraph, shall also contain any other requirements of the CWA then applicable.

12. The provisions of this Order are severable. If any provision of this Order is found invalid, the remainder of this Order shall not be affected.

13. By-pass (the intentional diversion of waste streams from any portion of a treatment facility or collection system, except those portions designed to meet variable effluent limits) is prohibited except under the following conditions:

    a. (1) by-pass was unavoidable to prevent loss of life, personal injury, or severe property damage; (severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a by-pass; severe property damage does not mean economic loss caused by delays in production);

and

(2) there were no feasible alternatives to by□pass, such as the use of auxiliary treatment facilities or retention of untreated waste; this condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a by-pass that would otherwise occur during normal periods of equipment downtime or preventive maintenance;

or

b. (1) by-pass is required for essential maintenance to assure efficient operation;

and

(2) neither effluent nor receiving water limitations are exceeded;

and

(3) the Discharger notifies the Board ten days in advance.

The permittee shall submit notice of an unanticipated by-pass as required in paragraph B.1. below.

14. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, failure to implement an appropriate pretreatment program, or careless or improper action. A Discharger that wishes to establish the affirmative defense of an upset in an action brought for noncompliance shall demonstrate, through properly signed, contemporaneous operating logs, or other evidence, that:

a. an upset occurred due to identifiable cause(s);

b. the permitted facility was being properly operated at the time of the upset;

c. notice of the upset was submitted as required in paragraph B.1.; and

d. remedial measures were implemented as required under paragraph A.17.

In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof.

15. This Order is not transferable to any person except after notice to the Board. The Board may modify or revoke and reissue the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA.

16. Except for data determined to be confidential under Section 13267 of the CWC, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Board and EPA. Effluent data are not confidential.

17. The Discharger shall take all reasonable steps to minimize any adverse effects to waters of the State or users of those waters resulting from any discharge or sludge use or disposal in violation of this Order. Reasonable steps shall include such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge or sludge use or disposal.

18. The fact that it would have been necessary for the Discharger to halt or reduce the permitted activity in order to comply with this Order shall not be a defense for violating this Order.

19. The Discharger shall ensure compliance with any existing or future pretreatment standard promulgated by EPA under Section 307 of the CWA, or amendment thereto, for any discharge to the municipal system.

20. The discharge of any radiological, chemical or biological warfare agent or high-level, radiological waste is prohibited.

21. A copy of this Order shall be maintained at the discharge facility and be available at all times to operating personnel. Key operating personnel shall be familiar with its content.

22. Neither the treatment nor the discharge shall create a condition of nuisance or pollution as defined by the CWC, Section 13050.

B. GENERAL REPORTING REQUIREMENTS

1. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, daily maximum effluent limitation, or receiving water limitation of this Order, the Discharger shall notify the Board by telephone ~~(916) 255-3000~~ *[Note: Current phone numbers for all three Regional Board offices may be found on the internet at http://www.swrcb.ca.gov/rwqcb5/contact_us.]* within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Board waives confirmation. The written notification shall state the nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the current noncompliance and, prevent recurrence including, where applicable, a schedule of implementation. Other noncompliance requires written notification as above at the time of the normal monitoring report.

2. Safeguard to electric power failure:

   a. The Discharger shall provide safeguards to assure that, should there be reduction, loss, or failure of electric power, the discharge shall comply with the terms and conditions of this Order.

   b. Upon written request by the Board the Discharger shall submit a written description of safeguards. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means. A description of the safeguards provided shall include an analysis of the frequency, duration, and impact of power failures experienced over the past five years on effluent quality and on the capability of the Discharger to comply with the terms and conditions of the Order. The adequacy of the safeguards is subject to the approval of the Board.

   c. Should the treatment works not include safeguards against reduction, loss, or failure of electric power, or should the Regional Board not approve the existing safeguards, the Discharger shall, within ninety days of having been advised in writing by the Board that the existing safeguards are inadequate, provide to the Board and EPA a schedule of compliance for providing safeguards such that in the event of reduction, loss, or failure of electric power, the Discharger shall comply with the terms and conditions of this Order. The schedule of compliance shall, upon approval of the Board, become a condition of this Order.

3. The Discharger, upon written request of the Board, shall file with the Board a technical report on its preventive (failsafe) and contingency (cleanup) plans for controlling accidental discharges, and for minimizing the effect of such events. This report may be combined with that required under B.2.

   The technical report shall:

   a. Identify the possible sources of spills, leaks, untreated waste by-pass, and contaminated drainage. Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.

   b. Evaluate the effectiveness of present facilities and procedures and state when they became operational.

   c. Predict the effectiveness of the proposed facilities and procedures and provide an implementation schedule containing interim and final dates when they will be constructed, implemented, or operational.

   The Board, after review of the technical report, may establish conditions which it deems necessary to control accidental discharges and to minimize the effects of such events. Such conditions shall be incorporated as part of this Order, upon notice to the Discharger.

4. The Discharger shall file with the Regional Board a Report of Waste Discharge at least 180 days before making any material change in the character, location, or volume of the discharge. A **material change** includes, but is not limited to, the following:

    a. Adding a major industrial waste discharge to a discharge of essentially domestic sewage, or adding a new process or product by an industrial facility resulting in a change in the character of the waste.

    b. Significantly changing the disposal method or location, such as changing the disposal to another drainage area or water body.

    c. Significantly changing the method of treatment.

    d. Increasing the discharge flow beyond that specified in the Order.

5. A publicly owned treatment works (POTW) whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the Discharger shall notify the Board by **31 January**. A copy of the notification shall be sent to appropriate local elected officials, local permitting agencies and the press. Within 120 days of the notification, the Discharger shall submit a technical report showing how it will prevent flow volumes from exceeding capacity or how it will increase capacity to handle the larger flows. The Regional Board may extend the time for submitting the report.

6. A manufacturing, commercial, mining, or silvicultural discharger shall notify the Regional Board as soon as it knows or has reason to believe:

    a. That any activity has occurred or will occur that would result in the discharge of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels":

        (1) 100 micrograms per liter (µg/l);

        (2) 200 µg/l for acrolein and acrylonitrile; 500 µg/l for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/1) for antimony;

        (3) five times the maximum concentration value reported for that pollutant in the Report of Waste Discharge; or

        (4) the level established by the Board in accordance with 40 CFR 122.44(f).

b. That it expects to begin to use or manufacture, as an intermediate or final product or by-product, any toxic pollutant that was not reported in the Report of Waste Discharge.

7. A POTW shall provide adequate notice to the Board of:

   a. any new introduction of pollutants into the POTW from an indirect discharger that would be subject to Sections 301 or 306 of the CWA if it were directly discharging those pollutants, and

   b. any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order.

   c. Any planned physical alterations or additions to the permitted facility, or changes planned in the Discharger's sludge use or disposal practice, where such alterations, additions, or changes may justify the application of permit conditions that are different from or absent in the existing permit including notification of additional disposal sites not reported during the permit application process, or not reported pursuant to an approved land application plan.

   Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

8. The Discharger shall give advance notice to the Board of any planned changes in the permitted facility or activity that may result in noncompliance with this Order.

9. The Discharger shall submit technical reports as directed by the Executive Officer.

10. Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this Order, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both.

C. PROVISIONS FOR MONITORING

1. All analyses shall be performed in accordance with the latest edition of *Guidelines Establishing Test Procedures for Analysis of Pollutants*, promulgated by EPA (40 CFR 136) or other procedures approved by the Board.

2. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the Discharger, analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the

laboratory. A manual containing .the steps followed in this program must be kept in the laboratory and shall be available for inspection by Board staff. The Quality Assurance-Quality Control Program must conform to EPA guidelines or to procedures approved by the Regional Board.

Unless otherwise specified, all metals shall be reported as Total Metals.

Unless otherwise specified, bioassays shall be performed in the following manner:

a. Acute bioassays shall be performed in accordance with guidelines approved by the Board and the Department of Fish and Game or in accordance with methods described in EPA's manual for measuring acute toxicity of effluents (EPA/620/4-85/013 and subsequent amendments).

b. Short-term chronic bioassays shall be performed in accordance with EPA guidelines (EPA/600/4-89/001 and subsequent amendments).

3. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Board and EPA.

4. The Discharger shall conduct analysis on any sample provided by EPA as part of the Discharge Monitoring Quality Assurance (DMQA) program. The results of any such analysis shall be submitted to EPA's DMQA manager.

5. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to mixing with the receiving waters. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.

6. All monitoring and analysis instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy.

7. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or be imprisoned for not more than two years per violation, or by both.

8. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of five years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive Officer.

9. The records of monitoring information shall include:

    a. the date, exact place, and time of sampling or measurements,
    b. the individual(who performed the sampling of measurements,
    c. the date(s) analyses were performed,
    d. the individual(s) who performed the analyses,
    e. the laboratory which performed the analyses,
    f. the analytical techniques or methods used, and
    g. the results of such analyses.

D. REPORTING REQUIREMENTS FOR MONITORING

1. The Discharger shall file with the Board technical reports on self-monitoring performed according to the detailed specifications contained in the Monitoring and Reporting Program attached to this Order.

2. Monitoring reports shall be submitted on forms to be supplied by the Board to the extent that the information reported may be entered on the forms. Alternate forms may be approved for use by the Board.

3. The results of all monitoring required by this Order shall be reported to the Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order. Unless otherwise specified, discharge flows shall be reported in terms of the monthly average and the daily maximum discharge flows.

4. The results of analyses performed in accordance with specified test procedures, taken more frequently than required at the locations specified in the Monitoring and Reporting Program, shall be reported to the Board and used in determining compliance.

5. Upon written request of the Board, the Discharger shall submit a summary monitoring report to the Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year(s).

6. All reports shall be signed by a person identified below:

    a. **For a corporation**: by a principal executive officer of at least the level of senior vice-president.

    b. **For a partnership or sole proprietorship**: by a general partner or the proprietor, respectively.

    c. **For a municipality, state, federal or other public agency**: by either a principal executive officer or ranking elected or appointed official.

    d. A duly authorized representative of a person designated in 6a, 6b or 6c of this requirement if:

(1) the authorization is made in writing by a person described in 6a, 6b, or 6c of this provision,

(2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position), and

(3) the written authorization is submitted to the Board.

Each person signing a report required by this Order or other information requested by the Board shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

The Discharger shall mail a copy of each monitoring report and any other reports required by this Order to:

California Regional Water Quality Control Board
Central Valley Region
~~3443 Routier Road, Suite A~~
~~Sacramento, CA 95827-3098~~

Note: Current addresses for all three Regional Board offices may be found on the internet at http://www.swrcb.ca.gov/rwqcb5/contact_us.

In addition, dischargers designated as a "major" discharger shall transmit a copy of all monitoring reports to EPA (see address in Provision G.10).

E. DEFINITIONS:

1. The **daily discharge rate** is obtained from the following calculation for any calendar day:

$$\text{Daily discharge rate (lbs/day)} = \frac{8.34}{N} \sum_{1}^{N} Q_i C_i$$

In which N is the number of samples analyzed in a day. Q_i and C_i are the flow rate (mgd) and the constituent concentration (mg/1), respectively, which are associated with each of the N grab samples that may be taken in a day. If a composite sample is taken, C_i is the concentration measured in the composite sample and Q_i is the average flow rate occurring during the period over which samples are composited.

2. The **monthly or weekly average discharge rate** is the total of daily discharge rates during a calendar month or week, divided by the number of days in the month or week that the facility was discharging.

   Where less than daily sampling is required by this permit, the monthly or weekly average discharge rate shall be determined by the summation of all the daily discharge rates divided by the number of days during the month or week for which the rates are available.

   For other than weekly or monthly periods, compliance shall be based upon the average of all rates available during the specified period.

3. The **monthly or weekly average concentration** is the arithmetic mean of measurements made during a calendar month or week, respectively.

4. The **daily maximum discharge rate** means the total discharge by weight during one day.

5. The **daily maximum concentration** is the greatest concentration found in grab or composite samples analyzed for one day.

6. A **grab sample** is an individual sample collected in less than 15 minutes.

7. Unless otherwise specified, a **composite sample** is a combination of individual samples collected over the specified sampling period:

   a. at equal time intervals, with a maximum interval of one hour, and

   b. at varying time intervals (average interval one hour or less) so that each sample represents an equal portion of the cumulative flow.

   The duration of the sampling period shall be specified in the Monitoring and Reporting Program. The method of compositing shall be reported with the results.

8. **Sludge** means the solids, residues, and precipitates separated from, or created in, wastewater by the unit processes of a treatment system.

9. **Median** is the value below which half the samples (ranked progressively by increasing value) fall. It may be considered the middle value, or the average of the two middle values.

10. **Overflow** means the intentional or unintentional diversion of flow from the collection and transport systems, including pumping facilities.

F. PRETREATMENT PROGRAM REQUIREMENTS (Applies to dischargers required to establish pretreatment programs by this Order.)

The Discharger shall be responsible for the performance of all pretreatment requirements contained in 40 CFR Part 403 and shall be subject to enforcement actions, penalties, fines, and other remedies by the Environmental Protection Agency (EPA), or other appropriate parties, as provided in the Clean Water Act, as amended (33 USC 1351, et. seq.) (hereafter Act).

The Discharger shall implement and enforce its Approved publicly owned treatment works (POTW) Pretreatment Program. The Discharger's Approved POTW Pretreatment Program is hereby made an enforceable condition of this permit. EPA may initiate enforcement action against an industrial user for noncompliance with applicable standards and requirements as provided in the Act.

The Discharger shall enforce the requirements promulgated under Sections 307(b), (c), and (d) and Section 402(b) of the Act. The Discharger shall cause industrial users subject to Federal Categorical Standards to achieve compliance no later than the date specified in those requirements or, in the case of a new industrial user, upon commencement of the discharge.

1. The Discharger shall perform the pretreatment functions as required in 40 CFR Part 403 including, but not limited to:

   a. Implement the necessary legal authorities as provided in 40 CFR 403.8(f)(1).

   b. Enforce the pretreatment requirements under 40 CFR 403.5 and 403.6.

   c. Implement the programmatic functions as provided in 40 CFR 403.8(f)(2), in particular, the publishing of a list of significant violators.

   d. Provide the requisite funding and personnel to implement the pretreatment program as provided in 40 CFR 403.8(f)(3).

G. ANNUAL PRETREATMENT REPORT REQUIREMENTS (Applies to dischargers required to establish pretreatment programs by this Order.)

The Discharger shall submit annually a report to the Regional Board, with copies to US EPA Region 9 and the State Board, describing the Discharger's pretreatment activities over the previous 12 months. In the event that the Discharger is not in compliance with any conditions or requirements of this Order, including noncompliance with pretreatment audit/compliance inspection requirements, then the Discharger shall also include the reasons for noncompliance and state how and when the Discharger shall comply with such conditions and requirements.

An annual report shall be submitted by **28 February** or as otherwise specified in the Order and include at least the following items:

1. A summary of analytical results from representative, flow proportioned, 24-hour composite sampling of the POTW's influent and effluent for those pollutants EPA has identified under Section 307(a) of the CWA which are known or suspected to be discharged by industrial users.

   The Discharger is not required to sample and analyze for asbestos until EPA promulgates an applicable analytical technique under 40 CFR 136. Sludge shall be sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent sampling and analysis. The sludge analyzed shall be a composite sample of a minimum of 12 discrete samples taken at equal time intervals over the 24-hour period. Wastewater and sludge sampling and analysis shall be performed at least annually. The discharger shall also provide any influent, effluent or sludge monitoring data for nonpriority pollutants which may be causing or contributing to Interference, Pass-Through or adversely impacting sludge quality. Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CFR 136 and amendments thereto.

2. A discussion of Upset, Interference, or Pass-Through incidents, if any, at the treatment plant which the Discharger knows or suspects were caused by industrial users of the POTW. The discussion shall include the reasons why the incidents occurred, the corrective actions taken and, if known, the name and address of, the industrial user(s) responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any additional limitations, or changes to existing requirements, may be necessary to prevent Pass-Through, Interference, or noncompliance with sludge disposal requirements.

3. The cumulative number of industrial users that the Discharger has notified regarding Baseline Monitoring Reports and the cumulative number of industrial user responses.

4. An updated list of the Discharger's industrial users including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The Discharger shall provide a brief explanation for each deletion. The list shall identify the industrial

users subject to federal categorical standards by specifying which set(s) of standards are applicable. The list shall indicate which categorical industries, or specific pollutants from each industry, are subject to local limitations that are more stringent than the federal categorical standards. The Discharger shall also list the noncategorical industrial users that are subject only to local discharge limitations. The Discharger shall characterize the compliance status through the year of record of each industrial user by employing the following descriptions:

a. complied with baseline monitoring report requirements (where applicable);

b. consistently achieved compliance;

c. inconsistently achieved compliance;

d. significantly violated applicable pretreatment requirements as defined by 40 CFR 403.8(f)(2)(vii);

e. complied with schedule to achieve compliance (include the date final compliance is required);

f. did not achieve compliance and not on a compliance schedule; and

g. compliance status unknown.

A report describing the compliance status of each industrial user characterized by 'the descriptions in items c. through g. above shall be submitted for each calendar quarter **within 21 days of the end of the quarter**. The report shall identify the specific compliance status of each such industrial user and shall also identify the compliance status of the POTW with regards to audit/pretreatment compliance inspection requirements. If none of the aforementioned conditions exist, at a minimum, a letter indicating that all industries are in compliance and no violations or changes to the pretreatment program have occurred during the quarter must be submitted. The information required in the fourth quarter report shall be included as part of the annual report. This quarterly reporting requirement shall commence upon issuance of this Order.

5. A summary of the inspection and sampling activities conducted by the Discharger during the past year to gather information and data regarding the industrial users. The summary shall include:

   a. the names and addresses of the industrial users subjected to surveillance and an explanation of whether they were inspected, sampled, or both and the frequency of these activities at each user; and

   b. the conclusions or results from the inspection or sampling of each industrial user.

6. A summary of the compliance and enforcement activities during the past year. The summary shall include the names and addresses of the industrial users affected by the following actions:

    a. Warning letters or notices of violation regarding the industrial users' apparent noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the apparent violation concerned the federal categorical standards or local discharge limitations.

    b. Administrative orders regarding the industrial users noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.

    c. Civil actions regarding the industrial users' noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.

    d. Criminal actions regarding the industrial users noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.

    e. Assessment of monetary penalties. For each industrial user identify the amount of the penalties.

    f . Restriction of flow to the POTW.

    g. Disconnection from discharge to the POTW.

7. A description of any significant changes in operating the pretreatment program which differ from the information in the Discharger's approved Pretreatment Program including, but not limited to, changes concerning: the program's administrative structure, local industrial discharge limitations, monitoring program or monitoring frequencies, legal authority or enforcement policy, funding mechanisms, resource requirements, or staffing levels.

8. A summary of the annual pretreatment budget, including the cost of pretreatment program functions and equipment purchases.

Duplicate signed copies of these reports shall be submitted to the Board and the

State Water Resources Control Board
Division of Water Quality
P.O. Box ~~944213~~ 100
Sacramento, CA ~~94244-2130~~ 95812

and the

Regional Administrator
U.S. Environmental Protection Agency W-5
75 Hawthorne Street
San Francisco, CA 94105

Revised March 1993 to update phone number of Central Valley Regional Board
Reprinted – June 2000