

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2015-0127

WASTE DISCHARGE REQUIREMENTS

FOR
CALIFORNIA RESOURCES PRODUCTION CORPORATION
AND NORTH KERN WATER STORAGE DISTRICT

OIL FIELD PRODUCED WATER RECLAMATION PROJECT
KERN COUNTY

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

1. On 25 March 2015, Kennedy/Jenks Consultants (Kennedy/Jenks) submitted a Report of Waste Discharge (RWD) on behalf of the California Resources Production Corporation (CRC), a Delaware Corporation, and the North Kern Water Storage District (District), hereafter jointly referred to as Discharger. CRC and District are proposing that CRC provide oil field produced water (produced water) from its Kern Front Oil Field to the District to augment its water supplies for irrigation and groundwater recharge.
2. CRC is an oil and natural gas exploration and production company with production facilities in the Kern Front Oil Field. CRC owns and operates the CRC Section 23 Treatment Facility in the Kern Front Oil Field at 9522 Oilfield Road, Bakersfield, CA 93308 (Sections 23&26, T28S, R27E, Mount Diablo Baseline & Meridian, (MDB&M); Assessor's Parcel Number (APN) 481-130-35), as shown in Attachment A, which is attached hereto and made part of this Order by reference.
3. The District currently provides water for groundwater recharge and the irrigation of crops on approximately 55,000 acres in Kern County Attachment A shows the District Boundaries and the Rosedale Spreading Basin (Rosedale Basin), a 608-acre facility used for groundwater recharge (Sections 22 and 27, T28S, R26E, MDB&M; APNs 091-190-17 and 091-120-04).
4. This Order places regulatory restrictions on the discharge of treated produced water to about 55,000 acres of irrigated farmland and about 1,500 acres of spreading basins, including the 608-acre Rosedale Spreading Basin (Rosedale Basin). In order to bring the produced water to the irrigated farmland and spreading basins, the District conveys water from the CRC Section 23 Treatment Facility through CRC pipelines and/or canals and utilizes the Lerdo canal to blend the produced water with surface or groundwater. The CRC and District are jointly responsible for compliance with these Waste Discharge Requirements (WDRs).

Background and Current Practices

5. The District was formed in 1935 with the intent to "build-up and maintain the groundwater storage underlying the District". This was to be accomplished through the acquisition of rights to water accruing to pre-1914 water rights on the Kern River and through construction of facilities to manage these water supplies for the benefit of landowners within the District. In 1952, the District acquired the right in perpetuity to all water accruing to these Kern River water rights, subject primarily to place of use restrictions and monthly usage caps. The District uses imported surface water and pumped groundwater for irrigation. During months when irrigation requirements are low,

excess surface water is discharged to approximately 1,500 acres of spreading basins, including the Rosedale Basin.

6. The primary source of the surface water used by the District is the Kern River. The quality of the Kern River water is summarized in the following Table. The Kern River results are from 49 sampling events from February 2009 through November 2011. The exception is arsenic which is from two samples collected in 2011. The upper number shown is the average and the range is shown below in parentheses.

Kern River Water Quality

<u>Constituents</u>	<u>Units</u> ¹	<u>Results</u>
Electrical Conductivity	umhos/cm	170 (80 – 290)
Boron	mg/L	0.2 (nd ² – 3.1)
Chloride	mg/L	6.4 (nd ² – 10)
Sodium	mg/L	15 (nd ² – 30)
Arsenic	ug/L	nd ²
Sulfate	mg/L	17 (3.3 – 41)

1. umhos/cm = micromhos per centimeter; mg/L = milligrams per liter; ug/L = micrograms per liter,

2. nd = not detected by the laboratory.

7. The District has 100 groundwater wells throughout the District that are used for irrigation water supply and are also sampled and analyzed for water quality during years when groundwater is being extracted. Attachment B, attached hereto and made a part of this Order by reference, shows the locations of the wells within the District. The wells are completed at a range of depths and the well locations represent areas adjacent to unlined canals, lined canals, areas where recharge to groundwater occurs, and areas with effects of pumping. The quality of the groundwater in the District is discussed in greater detail in the Groundwater Considerations section of this Order beginning on page 12.
8. The amounts of surface water and groundwater used by District vary by year according to the timing and availability of surface water. When surface water supply is low, groundwater wells are used to increase water supply for the District. The period from 1991 to 2014 was used to assess year-to-year variability because complete records are available for this period. The table below shows surface water and groundwater supply records for irrigation and for discharge to the Rosedale Basin.

<u>Year</u>	<u>Kern River to Irrigation</u> <u>ac-ft/yr</u> ¹	<u>Groundwater to Irrigation</u> <u>ac-ft/yr</u> ¹	<u>Kern River to Spreading</u> <u>Basins</u> <u>ac-ft/yr</u> ¹
1991	57,607	36,183	0
1992	44,754	51,851	1,501
1993	133,785	0	2,705
1994	51,174	71,748	305
1995	124,873	0	62,202
1996	140,781	0	22,861

<u>Year</u>	<u>Kern River to Irrigation</u> <u>ac-ft/yr¹</u>	<u>Groundwater to Irrigation</u> <u>ac-ft/yr¹</u>	<u>Kern River to Spreading</u> <u>Basins</u> <u>ac-ft/yr¹</u>
1997	135,657	0	31,920
1998	95,135	0	76,278
1999	79,502	30,621	7,938
2000	97,235	21,182	0
2001	77,144	29,366	0
2002	101,129	11,033	206
2003	107,865	0	0
2004	78,132	45,230	54
2005	138,753	0	33,715
2006	140,039	0	60,815
2007	38,892	95,061	14,616
2008	100,791	49,197	38
2009	105,655	42,004	2,025
2010	133,530	0	1,202
2011	137,532	0	65,203
2012	65,459	80,672	2,943
2013	17,852	114,381	177
2014	4,100	119,599	742
Total	2,207,376	798,128	387,447
Average	91,974	33,255	16,144

1. $\frac{\text{ac-ft}}{\text{yr}} = \text{acre} \times \text{feet per year}$.

9. The District has established irrigation water quality limits for flows that go to the irrigators in the District. The following table summarizes these limits. The values for electrical conductivity (EC), Boron, and Chloride are lower than proposed Groundwater Limits for the project.

**North Kern Water Storage District
 Proposed Irrigation Limits**

<u>Constituent</u>	<u>Units</u>	<u>District Limit</u>
Electrical Conductivity	umhos/cm	650
Boron	mg/L	0.5
Chloride	mg/L	100
Sodium	mg/L	140

10. CRC recovers crude oil in the Kern Front Oil Field from approximately 850 oil production wells in the Kern Front Oil Field. The process produces significant amounts of produced water that is treated at CRC's Section 23 Treatment Facility. Attachment C, which is attached hereto and made part of this Order by reference, provides a flow schematic of the treatment processes at the facility. Treatment consists of gas separation, free-water knock-out tanks, air flotation (WEMCO units) and skimming. Following treatment, produced water is currently discharged to one of three uses:

further treatment followed by steam flooding in the oil field, disposal by deep well injection, or discharge to an irrigation reuse program operated by the Cawelo Water District. The proposed project described here would provide a fourth discharge alternative.

11. CRC submitted a letter, dated 3 September 2015, and an email, dated 8 December 2015, that together indicate that none of the wells that have been drilled or worked on in the Kern Front field since 2005 have been subject to either a well stimulation treatment or have had a filter pack for sand control emplaced into the well annulus using a pressurized high viscosity guar based fluid that is not a drilling mud and that does not meet the definition of a well stimulation treatment.

Proposed Discharge

12. CRC will provide up to an average of 58 acre-feet per day (ac-ft/day) or about 21,200 acre feet per year (ac-ft/yr) of produced water (Discharge 001) annually to the District. CRC produced water, surface water, and groundwater will primarily be blended in the Lerdo Canal and used to meet agricultural irrigation demands in the District. During the irrigation season, discharge of blended produced water from CRC's treatment facility will be used primarily to help meet agricultural irrigation demands in the District (Discharge 002). During the non-irrigation season, discharge from CRC's treatment facility will be discharged to spreading basins within the District, primarily the 608-acre Rosedale Basin. Additionally, in wet years when there is surplus Kern River water, produced water will be discharged to the Rosedale Basin during the irrigation season as well for groundwater recharge.
13. The quality of the CRC produced water is summarized in the following table. The oil and grease, EC, boron, chloride, and arsenic results are from 12 monthly sampling events conducted in 2014. The sodium results were from nine samples collected from January through September 2014, and the sulfate result is from one sample collected in September 2014. The results for benzene, naphthalene, and total petroleum as crude oil are from one sample collected in April 2015. For constituents with multiple samples collected, the first number shown is the average value and the range of detections is shown in the parentheses to the right.

CRC Produced Water Quality

<u>Constituents</u>	<u>Units</u>	<u>Results</u>
Oil and Grease	mg/L	21 (15 – 22)
Electrical Conductivity	umhos/cm	772 (708 – 806)
Boron	mg/L	1.1 (0.9 – 1.2)
Chloride	mg/L	85 (77 – 90)
Sodium	mg/L	172 (155 – 185)
Arsenic	ug/L	76 (68 – 86)
Sulfate	mg/L	2.7
Benzene	ug/L	1.2
Napthalene	ug/L	0.84
Total Petroleum Hydrocarbons as Crude Oil	ug/L	20,000
Molybdenum	mg/L	12
Radium 226	pCi/L ¹	1.01
Radium 228	pCi/L ¹	1.81

1. pCi/l = picocurie per liter.

14. The estimated blended water quality of the discharge to irrigation is shown in the following table. The calculations were made using surface water and groundwater flow averages from 1991 to 2014 that will be blended with the CRC design produced water discharge. Both a flow weighted average over the 24 years of record and the average annual concentration for 24 years are shown.

Estimated Blended Irrigation Water Quality

<u>Constituent</u>	<u>Units</u>	<u>Flow Weighted Average¹</u>	<u>Annual Average²⁾</u>
Electrical Conductivity	umhos/cm	363	364
Arsenic	ug/L	15	15
Boron	mg/L	0.30	0.3
Chloride	mg/L	32	32
Sodium	mg/L	48	49

1. Flow weighted average water quality discharged to the Lerdo Canal (RWD Table 4-9).

2. Average of 24 annual water quality values discharged to the Lerdo Canal (RWD Table 4-9)

15. During the non-irrigation season, discharge to the Rosedale Basin will consist primarily of CRC treated produced water. CRC produced water without blending will be discharged to the spreading basins in January when the District drains the Lerdo Canal for a two week annual maintenance period. The produced water flow is not expected to be more than 812 ac-ft for the two week time period; however, it could be as much as 1,740 ac-ft if the discharge continues for as many as 30 days. During this maintenance period, no Kern River water or groundwater is discharged to the Rosedale Basin; only produced water and process wastewater from Grimmway Enterprises (Grimmway), a carrot processor in Shafter, will be discharged.
16. Grimmway’s carrot processing discharge is regulated by WDRs R5-2015-0057. While not a part of the discharge proposed under this Order, the quality of the Grimmway discharge presented below was included by Kennedy/Jenks in the estimating of the quality of the blended waters discharged to the Rosedale Basin as discussed in Finding 16. The approximate location of the Grimmway facility and pipeline to transport its wastewater to the Rosedale Basin is shown on Attachment D, which is attached hereto and made part of this Order by reference. The quality of the Grimmway wastewater in 2013 is shown in the following table. The EC results shown are the 2013 annual averages from 12 monthly sampling events. The remaining constituents were from 2013 quarterly monitoring events. The first number shown is the average value and the range of detections is shown in the parentheses to the right.

Grimmway Carrot Processing Wastewater Quality

<u>Constituents</u>	<u>Units</u>	<u>Results</u>
Electrical Conductivity	umhos/cm	2189 (1970 – 2250)
Total Dissolved Solids	mg/L	1403 (1170 – 1900)
Boron	mg/L	Non detect
Chloride	mg/L	378 (330 – 420)
Sodium	mg/L	337 (293 – 388)
Sulfate	mg/L	490 (370 -800)
Calcium	mg/L	153 (99 – 249)

17. Discharge water quality to the Rosedale Basin was estimated in the RWD based on 24 years of historical data in order to demonstrate the effect of varying Kern River flows on the overall blended water quality discharged to the Rosedale Basin. The table below shows the estimated water quality assuming CRC produced water flow of 21,200 ac-ft/yr, Grimmway process wastewater flow at 158 ac-ft/yr, and the range of Kern River flow from 0 to 65,000 ac-ft/yr.

Estimated Rosedale Basin Effluent Quality

<u>Constituent</u>	<u>Units</u>	<u>Flow Weighted Average⁽¹⁾</u>	<u>Annual Average⁽²⁾</u>
Electrical Conductivity	umhos/cm	213	462
Arsenic	ug/L	9.1	27
Boron	mg/L	0.23	0.44
Chloride	mg/L	13	53
Sodium	mg/L	25	82
Sulfate	mg/L	20	39

1. Flow weighted average blended water quality discharged to the Rosedale Basin (RWD Table 4-8).

2. Average of 24 annual blended water quality values discharged to the Rosedale Basin (RWD Table 4-8).

Water Reclamation Policies

18. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition – revised January 2004*, (hereinafter Basin Plan) specifically provides 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.”
19. The Basin Plan further provides as follows: “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.”
20. Resolution No. R5-2009-0028 *In support of Regionalization, Reclamation, Recycling and Conservation for Wastewater Treatment Plants* was adopted by the Central Valley Water Board in April 2009 to promote wastewater reuse projects such as the CRC District project authorized by this Order.
21. The Water Conservation Act of 2009, Senate Bill (SBX7-7), requires 20 percent reduction in statewide water use by 2020 to be achieved through implementation of Best Management Practices (BMPs) and optimization of water reclamation opportunities in the urban, industrial, and agricultural sectors. The proposed project is consistent with these goals.

Site-Specific Conditions

22. The total land area within the District is approximately 60,000 acres. In 2012, nonagricultural lands in the service area were about 12 percent of the total area. Of the remaining 88 percent of irrigated area, approximately 80 percent were planted in permanent crops of nuts, vineyards, and fruit. The District provided crop acreage estimates in the RWD and those are shown in the following table.

<u>Crop</u>	<u>Acres</u>
Almonds	30,289
Grapes, Table	5,818
Alfalfa hay	3,678
Roses	2,961
Pistachios	2,601
Misc. Vegetables	1,723
Open Land	1,568
Apples	1,256
Cotton	754
Grain, Wheat	626
Pomegranates	334
Pecans	188
Grain, Corn	182
Others	156
Peppers	152
Olives	83
Cherries	27
Total Crops	52,396

23. The land surface in the District slopes gently to the southwest in the southern portions of the District; to the west in the central portion of the District; and to the northwest in the northern portion of the District. Elevations within the District range from about 400 feet above mean sea level in the northwestern portion of the District to about 300 feet above mean seal level along the western boundary. The elevation at the Rosedale Basin is about 375 feet above mean sea level.
24. According to Federal Emergency Management Agency (FEMA) map numbers 06029C1800E and 06029C1825E, the Rosedale Basin and CRC's produced water Treatment Facility, respectively, are outside of the 100-year return frequency flood zones. According to FEMA Map Numbers 06029C0725E and 06029C1280E, portions of the proposed irrigated acreage in the northern portion of the District along Poso Creek and both spreading basins set along Poso Creek are within a 100-year return flood event. Considering the quality of the produced water and that surface waters are already used so that the blended discharge will meet District irrigation standards, inundation by floodwaters of the two northern most spreading basins would not threaten the underlying groundwater quality.

25. According to the Web Soil Survey published by the United States Department of Agriculture, Natural Resources Conservation Service, soils in the northern portion of the District consist primarily of Wasco sandy loam and the McFarland loam, with lesser amounts of Lewkalb sandy loam, Milham sandy loam, Driver coarse sandy loam, and the Kimberlina fine sandy loam. Soils in the Rosedale are in similar percentages, but the Lewkalb sandy loam is not present.
26. The Wasco sandy loam is a Class 2s soil that has moderate limitations that reduce the choice of plants or that require moderate conservation practices. The "s" subclass indicates the soil is limited mainly because it is shallow, droughty, or stony. The Wasco sandy loam is described as well drained with a high capacity to transmit water. The McFarland loam is a Class 1 soil that has few limitations that restrict usage. The McFarland loam is listed as prime farmland if irrigated that is well drained with a moderately high capacity to transmit water.
27. The District 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 data is 54.6 inches with monthly averages 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.

Basin Plan, Beneficial Uses, and Water Quality Objectives

28. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition*, revised January 2004 (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 beneficial use of water in the Districts spreading basins and distribution systems is by design agricultural supply. Surface water flows in the District 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; industrial service supply; industrial process supply; groundwater recharge; water contact recreation; non-contact water recreation; warm freshwater habitat; wildlife habitat; and enhancement of rare, threatened, or endangered species.
29. The District 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 as municipal and domestic supply (MUN), agricultural supply, industrial process supply, and industrial service supply.
30. 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.
31. 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 maximum contaminant levels (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.

32. The Basin Plan establishes narrative water quality objectives for Chemical Constituents, Taste and Odors, and Toxicity. The Toxicity objective, in summary, requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses.
33. The Basin Plan states that when compliance with a narrative objective is required to protect specific beneficial uses, the Central Valley Water Board will, on a case-by-case basis, adopt numerical limitations in order to implement the narrative objective.
34. 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 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. The list of crops in Finding 21 is not intended as a definitive inventory of crops that are or could be grown in the area affected by the discharge, but is representative.
35. The Basin Plan contains the following salt management requirements that are applicable to the groundwater within the District:
 - a. The Basin Plan policy for disposal of oil field 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 oil field 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 oil field 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.
 - c. The Basin Plan includes water quality objectives for the incremental increase in groundwater EC for specific Hydrographic Units. To this end, the Basin Plan Table III-4 states that the maximum average annual increase in salinity as measured by EC shall not exceed 6 umhos/cm in the Poso hydrographic unit. The average annual increase in EC will be determined from monitoring data by calculation of a cumulative average and annual increase over a 5-year period.

36. 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 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 is applied for this permit.
- b. **Electrical Conductivity:** This Order applies the Basin Plan effluent limit for produced water of 1,000 μ mhos/cm as an annual average for discharge to the Lerdo Canal (Discharge 002). This same limit is appropriate for discharge to the Rosedale Basin because, during some dry years when little or no Kern River water is available to discharge to the Rosedale Basin, the blended discharge, consisting largely of CRC produced water and Grimmway process wastewater, will have annual average EC levels that approach this limit. During wet years, high Kern River water flows will be blended in the discharge to the spreading basin and the flow weighted average EC will be very low (Finding 16).
- c. **Boron:** This Order applies the Basin Plan effluent limit of 1.0 mg/L for oil field wastewater as an annual average for Discharge 002. This same limit is appropriate for discharge to the Rosedale Basin because, during some dry years when little or no Kern River water is available to discharge to the Rosedale Basin, the blended discharge, consisting largely of CRC produced water and Grimmway process wastewater, will have annual average boron concentrations that approach this limit. During wet years, high Kern River water flows will be blended in the discharge to the spreading basin and the flow weighted average boron will be very low (Findings 13 and 16).
- d. **Chloride:** This Order applies the Basin Plan effluent limit of 200 mg/L for oil field wastewater as an annual average for Discharge 002. This same limit is appropriate for discharge to the Rosedale Basin because, during some dry years when little or no Kern River water is available to discharge to the Rosedale Basin, the blended discharge, consisting largely of CRC produced water and Grimmway process wastewater, will have annual average chloride concentrations that approach this limit. During wet years, high Kern River water flows will be blended in the discharge to the spreading basin and the flow weighted average chloride will be very low (Findings 13 and 16).
- e. **Sodium:** The CRC produced water sodium concentration averages 172 mg/l. Therefore the effluent limit at Discharge 002 is set at an average annual sodium concentration of 175 mg/l. Blended concentrations discharged to the Rosedale Basin during Individual low Kern River flow years will have average annual sodium concentrations as high as 165 mg/l (and high Kern River flow years will have average annual sodium concentrations of 20 mg/l or less). Therefore, the same annual average sodium concentration, 175 mg/l, is proposed for discharge to the Rosedale Basin. During some dry, low flow years, the average annual sodium concentration may exceed the effluent limit of 175 mg/l. This value is supported by the antidegradation analysis (Finding 51).

- f. **Arsenic:** The Discharger completed an arsenic soil-adsorption removal evaluation based on recent laboratory and field studies done at the Cawelo Water District (CWD) which is adjacent to the District, and has the same soils and subsurface condition: similar lithology, percentage of fine-textured soils and approximately 300 feet of unsaturated sediments above groundwater. The CWD study results for arsenic adsorption capacity of local area soils and soil and subsurface conditions at the District are provided in the Report of Waste Discharge. This analysis demonstrates that the unsaturated soils underlying the Rosedale Basin and the irrigated areas have sufficient capacity to adsorb all arsenic from the proposed project discharge containing a concentration as high as 120 ug/L. Discharges from the CRC Section 23 Treatment Facility will not contain arsenic concentrations approaching 120 ug/L. The results demonstrate that there will be no change in the arsenic concentration in underlying groundwater associated with project discharges. Therefore, this Order does not contain arsenic limits.

Groundwater Considerations

37. 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 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.
38. The California Legislature enacted A.B. 3030 during the 1992 session, subsequently codified in Water Code section 10750, *et seq.* Water Code section 10750 states, in part, that:
- “Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provision of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a Groundwater Management Plan pursuant to this part within all or a portion of its service area.”
39. Water Code section 60224 empowers the District to take any action needed for protection and preservation of underlying groundwater supplies including:
- The prevention of contaminants from entering groundwater supplies;
 - The removal of contaminants from groundwater supplies;
 - The locating and characterizing of contaminants which may enter the groundwater supplies;
 - The identification of parties responsible for contamination of groundwater; and
 - The performance of engineering studies.

40. The District adopted an updated Groundwater Management Plan (Plan) in August 2012 with an overarching goal of *“preserving the groundwater resource as a viable source of water supply to support overlying uses into the foreseeable future through local control and management.”* Objectives of the plan are:
- Maintain groundwater levels at economically viable pumping depths for the overlying agricultural uses.
 - Protect groundwater quality in general and minimize increases in salinity.
 - Avoid conditions conducive to inelastic land surface subsidence.
 - Protect and preserve surface water rights and contracts.
 - Protect and preserve surface water quality.
41. Monitoring elements of the Groundwater Management Plan include:
- Semi-annual monitoring of groundwater levels of wells within the District;
 - Quarterly monitoring of groundwater quality of District wells during years when their use is required;
 - Monthly sampling of water in the District’s canals;
 - Subsidence monitoring following significant pumping seasons; and
 - Preparation of quarterly and annual monitoring reports.
42. The District adopted an Agricultural Water Management Plan (AWMP) in August 2014 in accordance with the requirements of the Water Conservation Bill of 2009 (SBX7-7, Water Code §10820). The AWMP presents the Districts existing and planned activities and programs designed to improve water use efficiency.
43. To sustain existing irrigated agriculture, the District supplements the landowner’s use of groundwater with imported surface water, groundwater, and the treated produced water from CRC. Through its authority and Plan, the District proposes to manage the project within its boundaries to meet Basin Plan objectives. The Basin Plan allows blending of wastewater with surface and groundwater to promote reuse of wastewater in areas with water shortages provided it is otherwise consistent with water quality policies.

District Groundwater Considerations

44. The District is located in the recharge area of the Kern County Subbasin. The aquifer system in the District area consists of unconfined conditions in the upper few hundred feet, and confined conditions at greater depths depending on the local extent of the clay layers. Within this region, there are three general zones of clay lenses named the “300-foot clay”, the “700-foot clay”, and the “900-foot clay” as shown in the geologic cross sections in the 2012 North Kern Groundwater Management Plan. The 300-foot clay is not entirely continuous and so allows for downward groundwater movement. The 700-foot clay is generally thicker and more contiguous than the 300-foot clay. In the eastern side of the basin, including the District, fresh water occurs to depths of approximately 1,500 feet. Hydrologic conditions of the District differ from those of adjacent areas to the west where shallow clay layers restrict surface water percolation.

45. Based on groundwater elevation contours for 2009 and 2011, the groundwater flow direction in the southern half of the District, including beneath the Rosedale Basin, has generally been from the southeast to the northwest, with a gradient of 12 to 15 feet per mile (ft/mi), as shown in Attachment E, which is attached hereto and made part of this Order by reference. In the northern half of the District, the groundwater flow direction has generally been from east to west, with a gradient of 7 to 10 ft/mi. The groundwater flow gradient in the vicinity of the Rosedale Basin was estimated to be 17 ft/mi based on 2012 groundwater elevation measurements (Attachment E). The transmissivity of the aquifer is estimated to be 160,000 to 460,000 gallons per day per foot and the hydraulic conductivity is approximately 53 to 152 feet per day. Based on these estimates of aquifer properties and using the 2012 hydraulic gradient estimate of 17 ft/mi, the flow of the groundwater underlying the Rosedale Basin is estimated to be between 3.8 and 11 mgd.
46. Subsurface conditions in the Rosedale Basin were evaluated using available well logs, and logs for a series of six shallow borings placed in the dominant soil types present in the spreading basin. Available well logs for three of the seven wells located within the Rosedale Basin were analyzed. Soil textures in the upper 100 feet below the ground surface (bgs) are generally silty or clayey sands, textures between 100 and 350 feet bgs are generally sands and gravels, and below 350 feet bgs, there are varying layers of sands, gravels, and clays. The 300-foot clay, 700-foot clay, and 900-foot clay layers appear to be present beneath the Rosedale Basin, with a possible additional clay layer present at around 500-feet bgs. The well logs and boring logs were also analyzed to determine the ratio of coarse-grained material (sands and gravels, including trace clays or silts) to fine-grained materials (clays and silts). Overall, the ratio was determined to be 52 percent coarse-grained material to 48 percent fine-grained material. The surface soils and alluvium present at the Rosedale Basin are primarily poorly graded sands underlain by silty and sandy alluvium to a depth of 30 feet bgs.
47. The Dischargers are proposing to monitor seven deep extraction wells that are within the 680-acre Rosedale Basin as shown on Attachment F, which is attached hereto and made part of this Order by reference. Central Valley Water Board staff added MW-4, a shallow monitoring well installed within the central portion of the Rosedale Basin that will be used to monitor first encountered groundwater when present.
48. The following table shows groundwater results for wells within the District and those that are specifically within the Rosedale Basin. The first number shown is the average and the range is to the right in parentheses.

North Kern Water Storage District - Groundwater Quality

<u>Constituent</u>	<u>Units</u>	<u>District Wells</u>	<u>Rosedale S.B. Wells</u>
Electrical Conductivity	umhos/cm	659 (160 – 2500)	429 (240 – 890)
Boron	mg/L	0.11 (0.1 – 0.48)	0.13 (0.1 – 0.22)
Chloride	mg/L	72 (9 – 470)	47 (9 – 100)
Sodium	mg/L	80 (20 – 390)	74 (13 – 160)
Sulfate	mg/L	130 (12 – 750)	74 (22 – 230)
Arsenic	ug/L	Not analyzed	2.44 (2 – 3.5)

49. The Cawelo Water District is immediately upgradient of and adjacent to the District. The background groundwater quality used for the CWD Project (WDR Order R5-2012-0058) is shown in the following table:

Background Groundwater Quality

<u>Constituent</u>	<u>Units</u>	<u>CWD Background¹</u>
Electrical Conductivity	umhos/cm	618
Arsenic	ug/L	3.4
Boron	mg/L	0.14
Chloride	mg/L	87.7
Sodium	mg/L	55.7

¹. Source: Cawelo Water District, 2011, *Famoso Basins Antidegradation Analysis*.

Antidegradation Analysis

50. 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 less 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 Best Practicable Treatment or Control (BPTC) to minimize degradation; and
 - d. The degradation is consistent with the maximum benefit to the people of the state.
51. For the purposes of determining whether the discharges regulated by this Order have the potential to degrade high-quality groundwater, the blended water that will be discharged pursuant to this Order has been compared to the groundwater beneath the Rosedale Basin (using the 2013-2014 average groundwater quality for seven wells completed beneath the Rosedale Basin) and the CWD's background water quality, which is directly upgradient of the District and unaffected by discharges from the District. The water quality constituents that may be expected to degrade groundwater are arsenic, boron, chloride, sodium, sulfate, and EC. With the exception of sulfate, these constituents are known to be present in produced water. Sulfate was added to the analysis because the Grimmway process wastewater is high in sulfate.
52. The following table compares discharge constituent levels with measured groundwater quality, background groundwater quality from an adjacent water district, and applicable water quality objectives (WQOs). The discharge water quality is based on the flow weighted average of 24 years of actual surface water deliveries that incorporate the variations in annual precipitation and variations in annual Kern River water supply.

	<u>EC</u> umhos/cm	<u>Arsenic</u> ug/L	<u>Boron</u> mg/L	<u>Chloride</u> mg/L	<u>Sodium</u> mg/L	<u>Sulfate</u> mg/L
Blended Groundwater Recharge	213	9.1	0.23	13	25	20
Groundwater Beneath Rosedale Basin	429	2.4	0.13	47	74	74
CWD Background	618	3.4	0.14	88	56	-
Groundwater Quality Water Quality Objectives	900	10	0.75	175	115	250

53. The Rosedale Basin discharge has lower flow weighted levels of EC, chloride, sodium, and sulfate than the average of the seven wells in the Rosedale Basin. The constituents at concentrations greater than underlying groundwater are arsenic and boron. As mentioned in Finding 35.f, it is anticipated based on soil and subsurface conditions at the Rosedale Basin that soil adsorption of arsenic will result in no impact to groundwater. The boron in flows discharged to the Rosedale Basin, 0.23 mg/l, exceeds that of underlying groundwater but is much lower than the WQO of 0.75 mg/l.
54. This Order establishes effluent and groundwater 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.
55. The Discharger implements the following treatment or control measures to minimize the potential for the waste discharges to degrade groundwater:
- Treatment of produced water to lower oil and grease concentrations in order to ensure that oil and grease are not present in the water that will be blended and used for irrigation and discharged to the spreading basins.
 - Real-time monitoring of oil and grease concentrations in the treatment process to either divert out-of-specification produced water to other discharge methods (such as underground injection) or to recirculate the out-of-specification produced water for further treatment.
 - Blending of produced water supplies so that the blended concentrations are protective of designated beneficial uses of the underlying aquifers.
 - Use of water management practices and monitoring at the irrigation and groundwater recharge points of discharge to ensure that groundwater, surface water, and crops are protected.
- The Board finds that these treatment and control practices represent BPTC of the wastes that may threaten to degrade waters of the state.
56. The discharges as regulated by this Order will provide the following benefits:
- Provide up to 21,200 Ac-ft/yr (6.9 billion gallons) of produced water for irrigation and groundwater recharge. This could result in the same amount of water conservation because existing water supplies would not need to be utilized for these purposes.
 - Provide a significant benefit for agriculture that would not be realized if the produced water was discharged to deep wells for disposal.

- c. Result in the protection and maintenance of surface water and groundwater resources. Groundwater recharge, in particular, can reduce the rate of groundwater decline in the project area and decrease pumping costs for any groundwater extraction needed.
 - d. Make available an additional water supply to support the agricultural economy of the District and the Central Valley region.
 - e. Provide a 'drought proof' water supply that will be available without regard for weather-related uncertainty. This has additional benefit for crop production planning.
 - f. Convert flows that otherwise would be disposed of by well injection to a beneficial use as irrigation water supply. In addition, this reuse program also provides the oil industry with a reliable and environmentally beneficial way to manage produced water.
57. 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 less 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. 56.

Other Regulatory Considerations

58. Based on the threat to water quality and complexity of the discharge, the facility is determined to be classified as 2-B. California Code of Regulations, title 23, section 2200, defines these categories to include any of the following:
- a. Category 2 threat to water quality: "Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance."
 - b. Category B complexity: "Any discharger not included in Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units."
59. Title 27 of the California Code of Regulations (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 water from CRC to the District via either the Lerdo Canal or the Rosedale Basin 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. The oil and grease collected on floating booms at the CRC Section 23 Treatment Facility and associated CRC canals is considered a “designated waste” as defined in Title 27 and the discharge of these wastes is not exempt from the requirements of Title 27. However, this Order does not authorize the discharge of these wastes to land, but instead requires that the booms be routinely collected and disposed of appropriately at a landfill that is regulated under the requirements of Title 27 and that is authorized to accept such designated wastes. The oil captured by the removal system is stored in tanks and sold as a product, and this Order does not provide authorization to discharge the oil contained in the tanks, either.
61. 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 Monitoring and Reporting Program R5-2015-0127 are necessary to assure compliance with these WDRs. The Discharger owns and operates the facility that discharges the waste subject to this Order.

62. In accordance with the requirements of the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the District prepared an Initial Study and Mitigated Negative Declaration (IS/MND) for the construction and operation of facilities to accept, convey, and use the Kern Front Oil Field produced water for irrigation and groundwater recharge. The IS/MND was circulated for public review and comment from 26 March 2015 through 24 April 2015 (State Clearinghouse No. 2015031098). The Board, acting as a responsible agency, was consulted during the development of these documents. The District certified the IS/MND and issued a Notice of Determination on 30 April 2015.
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 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.

Public Notice

- 65. All of the above and the supplemental information and details in the attached Information Sheet, which is incorporated herein, were considered in establishing the following conditions of discharge.
- 66. The CRC, District, 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.
- 67. 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, California Resources Corporation, North Kern Water Storage District, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. Discharge Prohibitions

- 1. Discharge of wastes other than treated produced water at the location and in the manner described in the Findings and authorized herein is prohibited.
- 2. The bypass or overflow of wastes to surface waters is prohibited.
- 3. The discharge of water from canals used to transport industrial wastewater (Lerdo Canal).to canals used to transport municipal and domestic water sources (Friant-Kern Canal and/or others) is prohibited.
- 4. Neither the discharge nor its treatment shall create a nuisance or pollution as defined in Water Code section 13050.
- 5. Discharge of waste classified as ‘hazardous’, as defined in the California Code of Regulations, title 23, section 2510 et seq., is prohibited.

B. Effluent Limitations

- 1. The discharge of treated produced water from CRC to the District (**Discharge 001**) shall not exceed the following for the constituents listed:

<u>Constituent</u>	<u>Units</u>	<u>Daily Maximum</u>	<u>Annual Average</u>
Flow	mgd	18.5	-
Electrical Conductivity	umhos/cm	-	1,000
Boron	mg/L	-	1.0
Chloride	mg/L	-	200
Sodium	mg/L	-	175
Oil & Grease	mg/L	35	-

2. The discharge of blended CRC produced water, Grimmway process wastewater, and Kern River surface water to the District’s farmlands (**Discharge 002**) and the discharge to the Rosedale Basin shall not exceed the following for the constituents listed:

<u>Constituent</u>	<u>Units</u>	<u>Annual Average</u>
Electrical Conductivity	umhos/cm	1,000
Boron	mg/L	1.0
Chloride	mg/L	200
Sodium	mg/L	175

C. Discharge Specifications

1. Wastewater treatment and use of blended, reclaimed, produced water for groundwater recharge shall not cause pollution or a nuisance as defined by Water Code section 13050.
2. The Discharger shall operate all systems and equipment to optimize treatment of wastewater and the quality of the discharge.
3. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of groundwater limitations (see Section D.2).
4. Produced water shall not be discharged to a canal used to transport municipal and domestic water sources (Friant-Kern Canal and/or others).
5. The discharge of the produced water shall not create objectionable odors perceivable beyond the limits of the Rosedale Basin property at an intensity that creates or threatens to create nuisance conditions.
6. Recharge basins 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.
7. All spreading basins shall be managed to prevent breeding of mosquitos. In particular,
 - a. An erosion control plan should assure that coves and irregularities are not created around the perimeter of the water surface.
 - b. Weeds shall be minimized through control of water depth, harvesting and herbicides.
 - c. Dead algae, vegetation and other debris shall not accumulate on the water surface.
 - d. 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.

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

D. Groundwater Limitations

1. The discharge of produced water, in combination with other sources, shall not cause groundwater underlying the District to contain waste constituents in concentrations that adversely affect beneficial uses. In no case shall the discharge, in combination with other sources, cause average EC in groundwater on a basin-wide basis to increase by more than six (6) $\mu\text{mhos/cm}$ per year. The average annual increase in EC will be determined from monitoring data by calculation of a cumulative average and annual increase over a 5-year period.
2. The discharge of produced water shall not cause groundwater in the area potentially affected by discharges to the spreading basins to contain waste constituents in concentrations greater than the following:

<u>Constituent</u>	<u>Units</u>	<u>Limitation</u>
Electrical Conductivity	umhos/cm	1,000
Arsenic	ug/L	10
Boron	mg/L	0.75
Chloride	mg/L	175
Sodium	mg/L	115

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 a part of this Order.
2. The Discharger shall comply with Monitoring and Reporting Program (MRP) R5-2015-0, 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 keep at the District office and the CRC Treatment Facility, copies of this Order including its MRP, Information Sheet, attachments, and Standard Provisions, for reference by operating personnel. Key operating personnel shall be familiar with its contents.
4. The District and CRC must at all times properly operate and maintain their respective 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.

5. All technical reports and work plans required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of a person registered to practice 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.
6. 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.
7. 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.
8. 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.
9. The Discharger shall submit the technical reports and work plans required by this Order for Central Valley Water Board staff consideration and incorporate comments they may have in a timely manner, as appropriate. The Discharger shall proceed with all work required by the following provisions by the due dates specified.
10. The Discharger shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with this Order.

11. 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.
12. By **14 March 2016**, the Discharger shall submit a technical report describing a proposed methodology, including statistical analyses, for determining groundwater quality goals to quantify degradation caused by discharges of produced water to the Rosedale Basin. The proposed methodology is subject to the approval of the Executive Officer.
13. The Discharger shall submit an Report of Waste Discharge at least 90 days prior to discharging produced water from any well that has either been subject to a “well stimulation treatment” (as defined by Cal. Code Regs., tit. 14, § 1761, including hydraulic fracturing, acid fracturing, and acid matrix stimulation) or where a filter pack has been emplaced into the well annulus using a pressurized high-viscosity fluid that is not a drilling mud and that does not meet the definition of “well stimulation treatment.” In the Report of Waste Discharge, the Discharger shall demonstrate that constituents of concern associated with the “well stimulation treatment” and/or high viscosity fluids are not present in the produced water at concentrations that threaten to impair groundwater, result in nuisance conditions, or cause public health impacts. Based on the Discharger’s submittal, the Executive Officer shall make a determination as to whether the discharge of such produced water is considered a “material change in the character of the discharge” such that the Board must modify these WDRs, or whether the discharge may commence pursuant to this Order. No discharge of produced water from the well shall occur prior to the Executive Officer’s determination. The discharge of any produced water from the wells that have undergone a frac packing may only be authorized in writing by the Executive Officer following a demonstration by the Discharger that frac packing fluids are not present in the produced water from the specific well of wells that have been frac packed.
14. 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 California Code of Regulations, 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, PAMELA C. CREEDON, 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 11 December 2015.

Original signed by:

PAMELA C. CREEDON, Executive Officer

Order Attachment

- A. Site Location Map
- B. NKWSD Well Locations
- C. CRC Process Flow Diagram
- D. Project Area Map
- E. Groundwater Contour Map
- F. Rosedale Spreading Basin Groundwater Monitoring Wells

Monitoring and Reporting Program R5-2015-0127

Information Sheet Order R5-2015-0127

Standard Provisions (1 March 1991) (separate attachment to Discharger only)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2015-0127
FOR

CALIFORNIA RESOURCES PRODUCTION CORPORATION
AND NORTH KERN WATER STORAGE DISTRICT

OIL FIELD PRODUCED WATER RECLAMATION PROJECT
KERN COUNTY

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

The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts, or the Executive Officer issues, a revised MRP. Changes to sample location shall be established with concurrence of Central Valley Water Board staff, and a description of the revised locations shall be submitted for approval by the Executive Officer.

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

Field test instruments (such as pH) 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 California Department of Public Health's Environmental Laboratory Accreditation Program. The Discharger may propose alternative methods for approval by the Executive Officer.

If monitoring consistently shows no significant variation in magnitude of a constituent concentration or parameter after at least 24 months of monitoring, the Discharger may request this MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency.

A glossary of terms used within this MRP is included on page 8 and an extended analytical suite for oil-field produced water (produced water) constituents is included as Table 1 on pages 9 through 11.

The Discharger shall monitor the following locations to demonstrate compliance with the requirements of this Order:

Monitoring Point Name	Monitoring Location Description
DIS-001	Discharge 001 - Location where a representative water quality sample of the CRC treated produced water can be obtained following treatment in the Section 23 treatment facility, but before discharge into any District facilities (Lerdo Canal, other canals, and/or any of the spreading basins).
DIS-002	Discharge 002 - Location where a representative water quality sample of the blended waters (produced water, and/or surface water, and/or groundwater) can be obtained downstream of the blending area in the Lerdo Canal and prior to discharge into any of the Districts Farmlands.
Monitoring wells: MW-99-0-22, MW-99-0-17, MW-99-2-4, MW-99-2-6, MW-99-2-8, MW-99-4-5, and MW-4	Eight groundwater wells and any additional wells added to the groundwater monitoring network, within the Rosedale Spreading Basin.

EFFLUENT MONITORING

The collected samples shall be representative of the volume and nature of the discharges. Time of collection of the samples shall be recorded. If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge (but not more than twice a month), the Discharger shall monitor and record data for all of the constituents listed below, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge.

DISCHARGE 001 – CRC OIL FIELD PRODUCED WATER MONITORING

The Discharger shall monitor the volume and quality of the treated produced water downstream of the CRC Station 23 treatment facility and prior to discharge to any of the Districts conveyance facilities (canals, pipelines, and spreading basins) where the produced water is blended with surface water. Effluent monitoring for Discharge 001 of the treated CRC produced water shall include at least the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Continuous	Flow	mgd	Metered
Continuous	Electrical Conductivity	umhos/cm	Metered
Monthly	Arsenic	mg/L	Grab
Monthly	Boron	mg/L	Grab
Monthly	Chloride	mg/L	Grab

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Monthly	Sodium	mg/L	Grab
Monthly	Oil and Grease	mg/L	Grab
Monthly	Total Suspended Solids	mg/L	Grab
Monthly	pH	pH Units	Grab
Quarterly	General Minerals	mg/L ¹	Grab
Quarterly	Produced Water Constituents ²	Varies	Grab

¹ mg/L or ug/L, as appropriate

² Produced water constituents are listed in Table 1 which is included on pages 9 through 11.

DISCHARGE 002 – IRRIGATION SEASON MONITORING

The Discharger shall monitor the volume and quality of the blended waters (CRC produced water, surface water, and/or groundwater) downstream of the mixing area in the Lerdo Canal and prior to discharge to the District farmlands. The overall concentration of the discharge shall be calculated based on the flow weighted average of each individual discharge to the Lerdo Canal. Effluent monitoring for Discharge 002 shall include at least the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Continuous	Produced Water	ac-ft	Metered
Continuous	Kern River Surface Water	ac-ft	Metered ¹
Continuous	Groundwater	ac-ft	Metered ¹
Continuous	Total Discharge	ac-ft	Calculated
Monthly	Electrical Conductivity	umhos/cm	Grab
Monthly	Arsenic	mg/L	Grab
Monthly	Boron	mg/L	Grab
Monthly	Chloride	mg/L	Grab
Monthly	Sodium	mg/L	Grab
Monthly	Total Suspended Solids	mg/L	Grab
Monthly	pH	pH Units	Grab
Quarterly	General Minerals	mg/L	Grab
Quarterly	Produced Water Constituents ²	Varies	Varies

¹. Metered or alternatively calculated by the District based on pump efficiencies or weir observations.

². Produced water constituents are listed in Table 1 which is included on pages 9 through 11.

GROUNDWATER MONITORING

The Discharger shall monitor eight groundwater wells (seven groundwater extraction wells and one first encountered groundwater monitoring well) completed in the Rosedale Spreading Basin, as shown on Attachment F. After measuring water levels and prior to collecting samples, each well shall be adequately purged to remove water that has been standing within the well screen and casing that may not be chemically representative of formation water. Depending on the hydraulic conductivity of the geologic setting, the volume removed during purging is typically from 3 to 5 volumes of the standing water

within the well casing and screen, or additionally the filter pack pore volume. Low-flow sampling techniques (purging only the volume of the dedicated tubing) can be used with prior approval from the Executive Officer.

The following wells, the locations of which are shown on Attachment F, shall be used in the required assessment.

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

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

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Semi-Annually	Depth to Groundwater	Feet ¹	Measured
Semi-Annually	Groundwater Elevation	Feet ²	Computed
Quarterly ³	pH	pH Units	Grab
Quarterly ³	EC	umhos/cm	Grab
Quarterly ³	Arsenic	ug/L	Grab
Quarterly ³	Boron	mg/L	Grab
Quarterly ³	Chloride	mg/L	Grab
Quarterly ³	Sodium	mg/L	Grab
Quarterly ³	General Minerals	mg/L ⁴	Grab
Quarterly ³	Produced Water Constituents ⁵	Varies	Grab

1. To the nearest hundredth of a foot.

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

3. Samples shall be collected for chemical analysis from the extraction wells on a quarterly basis while in use (i.e., during dry years). Samples from groundwater monitoring wells shall be collected every quarter.

4. mg/L or ug/L, as appropriate.

5. Produced water constituents are listed in Table 1 which is included on pages 9 through 11.

The Discharger shall maintain its groundwater monitoring well network. The depth to groundwater under the Rosedale Spreading Basin is highly variable due to the existing groundwater recharge/extraction activities that occur in the area. If groundwater monitoring well MW-4 is dry, the District will sample two of the extraction wells set in the Rosedale Spreading Basin as an alternative.

REPORTING

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

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

The Central Valley Water Board has gone to a Paperless Office System. All regulatory documents, submissions, materials, data, monitoring reports, and correspondence should be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents that are less than 50MB should be emailed to: centralvalleyfresno@waterboards.ca.gov. Documents that are 50MB or larger should be transferred to a disk and mailed to the appropriate regional water board office, in this case 1685 E Street, Fresno, CA, 93706.

To ensure that your submittals are routed to the appropriate staff, the following information block should be included in any email used to transmit documents to this office:

Program: Non-15, WDID:5C15NC00206, Facility Name: California Resources Production Corporation and North Kern Water Storage District, Order: R5-2015-0127.

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. The data shall be summarized in such a manner that illustrates clearly, whether the Discharger complies with waste discharge requirements.

In addition to the details specified in Standard Provision C.3, monitoring information shall include the method detection limit (MDL) and the Reporting limit (RL) or practical quantitation limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated.

If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form. Such increased frequency shall be indicated on the Discharge Monitoring Report Form.

Laboratory analysis reports do not need to be included in the monitoring reports; however, the laboratory reports must be retained for a minimum of three years in accordance with Standard Provision C.3.

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

In the future, the State or Central Valley Water Board may notify the Discharger to electronically submit and upload monitoring reports using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site <http://www.waterboards.ca.gov/ciwqs/index.html> or similar system. Electronic submittal to CIWQS, when implemented, will meet the requirements of our Paperless Office System.

A. **All Quarterly Monitoring Reports** shall include the following:

Effluent reporting:

1. The results of the effluent discharges (Discharges 001 and 002) as specified on pages 2 through 3.
2. For each month of the quarter, calculation of the maximum daily flow and the monthly average flow.
3. For each month of the quarter, calculation of the 12-month rolling average EC of the discharge using the EC value for that month averaged with the EC values for the previous 11 months.

Groundwater reporting:

1. The results of groundwater monitoring specified on pages 3 and 4.
2. For each well sampled, a table showing constituent concentrations for the last five quarters, up through the current quarter.
3. A groundwater contour map based on groundwater elevations for that quarter. The map shall show the gradient and direction of groundwater flow under/around the facility and/or effluent disposal area(s). The map shall also include the locations of monitoring wells and wastewater storage and discharge areas.

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

Facility Information:

1. The names and general responsibilities of all persons in charge of wastewater handling and disposal.
2. The names and telephone numbers of persons to contact regarding the Facility for emergency and routine situations.
3. A statement certifying when the meters and monitoring instruments and devices were last calibrated, including identification of who performed the calibrations (Standard Provision C.4).
4. A statement whether the current operation and maintenance manual, and contingency plan, reflect the Facility as currently constructed and operated, and the dates when these documents were last reviewed for adequacy.
5. A summary of any changes in processing that might affect waste characterization and/or discharge flow rates.

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Original signed by:

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

11 December 2015

(Date)

GLOSSARY

BOD ₅	Five-day biochemical oxygen demand		
CBOD	Carbonaceous BOD		
DO	Dissolved oxygen		
EC	Electrical conductivity at 25° C		
FDS	Fixed dissolved solids		
NTU	Nephelometric turbidity unit		
TKN	Total Kjeldahl nitrogen		
TDS	Total dissolved solids		
TSS	Total suspended solids		
Continuous	The specified parameter shall be measured by a meter continuously.		
24-Hour Composite	Unless otherwise specified or approved, samples shall be a flow-proportioned composite consisting of at least eight aliquots.		
Daily	Samples shall be collected every day.		
Twice Weekly	Samples shall be collected at least twice per week on non-consecutive days.		
Weekly	Samples shall be collected at least once per week.		
Twice Monthly	Samples shall be collected at least twice per month during non-consecutive weeks.		
Monthly	Samples shall be collected at least once per month.		
Bimonthly	Samples shall be collected at least once every two months (i.e., six times per year) during non-consecutive months		
Quarterly	Samples shall be collected at least once per calendar quarter. Unless otherwise specified or approved, samples shall be collected in January, April, July, and October.		
Semiannually	Samples shall be collected at least once every six months (i.e., two times per year). Unless otherwise specified or approved, samples shall be collected in April and October.		
Annually	Samples shall be collected at least once per year. Unless otherwise specified or approved, samples shall be collected in October.		
mg/L	Milligrams per liter		
mL/L	Milliliters [of solids] per liter		
µg/L	Micrograms per liter		
µmhos/cm	Micromhos per centimeter		
mgd	Million gallons per day		
MPN/100 mL	Most probable number [of organisms] per 100 milliliters		
General Minerals	Analysis for General Minerals shall include at least the following:		
	Alkalinity	Chloride	Sodium
	Bicarbonate	Hardness	Sulfate
	Calcium	Magnesium	TDS
	Carbonate	Potassium	
	General Minerals analyses shall be accompanied by documentation of cation/anion balance.		

Table 1 – Wastewater and Groundwater Monitoring				
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
<u>Groundwater Elevation</u>	feet & hundredths, MSL ¹	Quarterly		Quarterly
<u>Field Parameters</u>				
Temperature	°F ²	Quarterly		Quarterly
Electrical Conductivity	µmhos/cm ³	Quarterly		Quarterly
pH	pH units	Quarterly		Quarterly
<u>Monitoring Parameters</u>				
Total Dissolved Solids (TDS)	mg/L ⁴	Quarterly	160.1	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly	120.1	Quarterly
Boron, dissolved	mg/L	Quarterly	6010B	Quarterly
<u>Standard Minerals</u>				
Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Bicarbonate Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Carbonate Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Hydroxide Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Sulfate, dissolved	mg/L	Quarterly	300.0	Quarterly
Nitrate-N, dissolved	mg/L	Quarterly	300.0	Quarterly
Calcium, dissolved	mg/L	Quarterly	6010B	Quarterly
Magnesium, dissolved	mg/L	Quarterly	6010B	Quarterly
Sodium, dissolved	mg/L	Quarterly	6010B	Quarterly
Potassium	mg/L	Quarterly	6010B	Quarterly
Chloride	mg/L	Quarterly	300.0	Quarterly
<u>PAHs</u> ⁵	µg/L ⁶	Quarterly	8270	Quarterly
<u>Total Petroleum Hydrocarbons (TPH)</u>	µg/L	Quarterly	418.1	Quarterly
<u>Volatile Organic Compounds</u>				
Full Scan	µg/L	Quarterly	8260B	Quarterly

Table 1 – Wastewater and Groundwater Monitoring				
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
<u>Stable Isotopes</u>				
Oxygen (¹⁸ O)	pCi/L ⁷	Quarterly	900.0	Quarterly
Deuterium (Hydrogen 2, ² H, or D)	pCi/L	Quarterly	900.0	Quarterly
<u>Radionuclides</u>				
Radium-226	pCi/L	Quarterly	SM ⁸ 7500-Ra	Quarterly
Radium-228	pCi/L	Quarterly	SM 7500-Ra	Quarterly
Gross Alpha particle (excluding radon and uranium)	pCi/L	Quarterly	SM 7110	Quarterly
Uranium	pCi/L	Quarterly	200.8	Quarterly
<u>Constituents of Concern</u>				
Lithium	mg/L	Quarterly	200.7	Quarterly
Strontium	mg/L	Quarterly	200.7	Quarterly
Iron	mg/L	Quarterly	200.8	Quarterly
Manganese	mg/L	Quarterly	200.8	Quarterly
Antimony	mg/L	Quarterly	200.8	Quarterly
Arsenic	mg/L	Quarterly	200.8	Quarterly
Barium	mg/L	Quarterly	200.8	Quarterly
Beryllium	mg/L	Quarterly	200.8	Quarterly
Cadmium	mg/L	Quarterly	200.8	Quarterly
Chromium (total)	mg/L	Quarterly	200.8	Quarterly
Chromium (hexavalent)	mg/L	Quarterly	7196A	Quarterly
Cobalt	mg/L	Quarterly	200.8	Quarterly
Copper	mg/L	Quarterly	200.8	Quarterly
Lead	mg/L	Quarterly	200.8	Quarterly
Mercury	mg/L	Quarterly	7470A	Quarterly

Table 1 – Wastewater and Groundwater Monitoring				
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
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

- ¹ Mean Sea Level
- ² Degrees Fahrenheit
- ³ Micromhos per centimeter
- ⁴ Milligrams per liter
- ⁵ Polycyclic aromatic hydrocarbons
- ⁶ micrograms per liter
- ⁷ Picocuries per liter
- ⁸ Standard Methods

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 ($\mu\text{g/l}$);
 - (2) 200 $\mu\text{g/l}$ for acrolein and acrylonitrile; 500 $\mu\text{g/l}$ for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/l) 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:

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

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/l), 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

INFORMATION SHEET

ORDER NO. R5-2015-0127
CALIFORNIA RESOURCES PRODUCTION CORPORATION AND
NORTH KERN WATER STORAGE DISTRICT
OIL FIELD PRODUCED WATER RECLAMTION PROJECT
KERN COUNTY

Background

The California Resources Production Corporation (CRC) generates oil field produced water (produced water) from about 850 oil production wells in the Kern Front Oil Field. The produced water is treated to reduce the oil and grease content at CRCs Section 23 treatment facility. The North Kern Water Storage District (District) and CRC are proposing to use produced water from CRC's Kern Front Oil Field leases for crop irrigation and groundwater recharge purposes within the District. CRC and the District submitted a Report of Waste Discharge (RWD) in support of the proposed project in March 2015.

The District was formed in 1935 to manage ground-water storage underlying the District". In 1952, the District acquired the right in perpetuity to all water accruing to these Kern River water rights, subject primarily to place of use restrictions and monthly usage caps.

The District uses imported surface water and pumped groundwater for irrigation. The District currently provides irrigation water to about 55,000 acres during the summer months and to over 1,500 acres of spreading Basin during the winter or during wet years as shown in Attachment A (Site Location Map). During months when irrigation requirements are low, excess surface water is discharged to approximately 1,500 acres of spreading Basin, but will primarily be discharged to the 608-acre Rosedale Spreading Basin (Rosedale Basin).

Proposed Discharge

CRC is proposing to provide an average of 58 acre feet per day (ac-ft/day) or about 21,200 acre feet per year (ac-ft/yr) of produced water (Discharge 001) to the District to blend with their other water supplies (Kern River water, other surface waters, and groundwater pumped from District wells). The majority of the produced water will be blended in the Lerdo canal and used for the irrigation of crops during the summer months (Discharge 002). In the winter months or during wet years, the oil-field produced water (Discharge 001) will be delivered to up to 1,500 acres of spreading Basin, primarily the 608 acre Rosedale Basin.

The Rosedale Basin will also receive wastewater from a Grimmway Farms carrot production facility that is regulated by Waste Discharge Requirements Order R5-2015-0057. The District estimates Grimmway will discharge 158 ac-ft/yr (0.43 ac-ft/day) to the Rosedale Basin. The CRC produced water and the Grimmway wastewater are proposed to be discharged at the north end of the Rosedale Basin in Canal 9-0-18 or Canal 9-2. If there is available surface water, it will be blended, but the majority of the two waste streams will be discharged directly for groundwater recharge without blending.

The proposed project includes the construction of a 2.5 mile, 24-inch pipeline to deliver produced water to the District, the use of several existing canals for blending and delivery of the produced water for irrigation, and five spreading basins for groundwater recharge.

The quality of the CRC produced water, Discharge 001, is summarized in the following tables.

CRC Produced Water Quality

	Oil and Grease	EC	Boron	Chloride	Sodium	Arsenic	Sulfate
	<u>mg/L¹</u>	<u>umhos/cm²</u>	<u>mg/L¹</u>	<u>mg/L¹</u>	<u>mg/L¹</u>	<u>ug/L³</u>	<u>mg/L¹</u>
	21	772	1.1	85	172	76	2.7
	(15 – 32)	(708 - 806)	(0.9 – 1.2)	(77 – 90)	(155 – 185)	(68 - 86)	---
Proposed Eff. Limits	35	1,000	1.0	200	175	---	250

1. mg/L = milligram per liter.
2. umhos/cm = micromhos per centimeter.
3. ug/L = micrograms per liter.

CRC Produced Water Quality

Benzene	TPH – Crude Oil	Napthalene	Molybdenum	Radium 226	Radium 228
<u>ug/L</u>	<u>ug/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>pCi/L</u>	<u>pCi/L</u>
1.2	20,000	0.84	12	1.01	1.81

The CRC produced water is generally of good quality. Benzene is in excess of the Primary maximum contaminant level (MCLs) of 1.0 ug/L. However, with blending the produced water with Kern River and/or groundwater it is anticipated to lower the concentrations to below the effluent limits and or MCLs. The RWD included the estimated water quality of the blended waters (produced water, surface water, and groundwater) and the results are presented in the following table.

Estimated Blended Irrigation Water Quality

Constituent	Units	Flow Weighted Average¹	Annual Average²⁾
Electrical Conductivity	umhos/cm	363	364
Arsenic	ug/L	15	15
Boron	mg/L	0.30	0.3
Chloride	mg/L	32	32
Sodium	mg/L	48	49

1. Flow weighted average water quality discharged to the Lerdo Canal (RWD Table 4-9).
2. Average of 24 annual water quality values discharged to the Lerdo Canal (RWD Table 4-9)

Effluent results for the Grimmway discharge to the Rosedale Basin are presented in the following tables.

Grimmway Wastewater Results			
EC	Total Dissolved Solids	Boron	Arsenic
<u>umhos/cm</u>	<u>mg/L</u>	<u>mg/L</u>	<u>ug/L</u>
2,189	1403	Non-detect	---
(1970 – 2250)	(1170 – 1900)		---

Grimmway Wastewater Results		
Chloride	Sodium	Sulfate
<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>
378	337	490
(330 – 420)	(293 – 388)	(370 - 800)

The Grimmway discharge to the Rosedale Spreading basin has higher concentrations of EC, chloride, sodium, and sulfate than does the CRC produced water. However, the volume of the discharge from Grimmway to the Rosedale Basin (158 ac-ft/yr or 0.43 ac-ft/day) is a very small percentage of the various water sources discharged to the Rosedale Basin. The anticipated daily average of CRC produced water will be 58 ac-ft/day during the non-irrigation season with an additional average of 16.1 ac-ft/yr of Kern River water discharged to the Rosedale Basin. Considering the volume and the quality of the other water sources, the Grimmway discharge is not anticipated to cause any exceedances of the proposed groundwater limitations for this project.

REGULATORY CONSIDERATIONS

Basin Plan, Beneficial Uses, and Regulatory Considerations

The Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2004 (the “Basin Plan”) designates beneficial uses, establishes narrative and numerical water quality objectives, contains implementation plans and policies for protecting all waters of the Basin, and incorporates, by reference, plans and policies of the State of California Water Quality Control Board. The beneficial uses for the groundwater in the area of the District are municipal and domestic supply, agricultural supply, industrial process and service supply.

The beneficial uses for the surface water in the District (South Valley Floor Hydrologic Unit, North Kern Hydrologic Area) are agricultural supply, industrial process supply, industrial service supply, water contact recreation, non-contact water recreation, warm freshwater habitat, wildlife habitat, rare and endangered species habitat, and groundwater recharge.

In June 1970, the Department of Water Resources (DWR) submitted a *Report on Poso Creek Water Quality Evaluation, Kern County*. The report evaluated the effect of produced water discharges from the Mt. Poso, Poso Creek, Round Mountain, and Kern Front Oil Fields on the Poso Creek Basin. The quality of the discharges varied widely. Mt. Poso and Round Mountain generated produced water with chlorides of 500 to 1,100 mg/L. Discharges from the Poso Creek Oil Field generated produced water with chloride concentrations of 215 to 715 mg/L. Chloride concentrations in produced water from the Kern Front Oil Field ranged from 60 to 100 mg/L. In 1969, chlorides in oil field discharges (720 mg/L average) totaled 26,050 tons, corresponding roughly to 75,000 tons of salt. Measured chlorides indicated that chloride in groundwater increased from less than 20 mg/L in 1916 to over 600 mg/L in 1969. This report served as a basis for a Regional Water Board Resolution adopted on 23 November 1970. Resolution 71-122 limited the maximum EC, chloride, and boron concentration in “waste waters discharged to Poso Creek or its tributaries and to... unlined sumps...” to 1,000 umhos/cm, 200 mg/L and 1.0 mg/L, respectively. The Central Valley Water Board’s implementation of Resolution 71-122 effectively stopped uncontained discharge of produced water with unacceptable high salt concentrations in an area it called the Poso Creek Subarea.

Follow-up sampling showed the impact of the high salt discharges persisted in 1980. A 1980 map depicts groundwater chloride concentrations along Lerdo Highway exceeding 400 mg/L.

The Basin Plan notes the entire basin is essentially closed, and salts discharged within the basin accumulate. It recognizes that salt in basin groundwater will increase over time and adopts a strategy of controlled degradation (as opposed to prevention). As a measure of the acceptable rate of degradation, the Basin Plan establishes as a water quality objective a maximum annual degradation rate no greater than six (6) umhos/cm per year for the Poso Groundwater Hydrographic Unit (Hydrologic Area Nos. 558.70, 558.80, and 558.90). The existing and proposed discharge occurs in the North Kern Hydrologic area (558.80) and the Kern Uplands Hydrologic Area (558.90).

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 water 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 water 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.

When adopting into the Basin Plan the EC, chloride, and boron limits of 1000 umhos/cm, 200 mg/L, and 1.0 mg/L, respectively, for discharges to the Poso Groundwater Hydrographic Unit and for discharges produced water to land, the Board considered the degradation that would occur and found it to be consistent with State Water Resources Control Board Resolution 68-16, otherwise known as the State's Antidegradation Policy. The limits reflect Best Practicable Treatment or Control for these constituents.

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 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 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 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). Resolution 68-16 requires that the constituents contributing to degradation be regulated to meet best practicable treatment or control (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.

Other Requirements/Policies

On 1 June 1994, the US Environmental Protection Agency, US Bureau of Reclamation, State Water Board, Department of Water Resources, Department of Public Health, Conference of Directors of Environmental Health, and Water Reuse Association of California signed a *Statement of Support for Water Reclamation* and resolved that agencies would reduce reclamation disincentives and regulatory constraints on water reclamation. Central Valley Water Board plans and policies support the efficient use of

the State's limited water supplies provided the beneficial uses of water are maintained and water quality objectives are met.

Resolution No. R5-2009-0028 *In support of Regionalization, Reclamation, Recycling and Conservation for Wastewater Treatment Plants* was adopted by the Central Valley Water Board in April 2009 to promote wastewater reclamation projects such as the CRC District project.

The Water Conservation Act of 2009, Senate Bill (SBX7-7), requires 20 percent reduction in statewide water use by 2020 to be achieved through implementation of Best Management Practices (BMPs) and optimization of water reclamation opportunities in the urban, industrial, and agricultural sectors. The proposed project is consistent with these goals.

The California Legislature enacted Assembly Bill 3030 during the 1992 session, subsequently codified in Water Code section 10750, *et seq.* Water Code section 10750 states, in part, that:

“Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provision of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a Groundwater Management Plan pursuant to this part within all or a portion of its service area.”

Water Code section 60224 empowers the District to take any action needed for protection and preservation of groundwater supplies within the District including;

1. The prevention of contaminants from entering the District groundwater supplies
2. The removal of contaminants from groundwater supplies of the District;
3. The location and characterizing of contaminants which may enter the groundwater supplies of the District,
4. The identification of parties responsible for contamination of groundwater; and
5. The performance of engineering studies.

To sustain existing irrigated agriculture, the District proposes to supplement its existing surface water supplies and groundwater with the reclamation of treated produced water as described herein. Through this approach, the District proposes to manage water used within its boundaries in a manner that meets Basin Plan objectives.

Groundwater Conditions

Within the District, groundwater is recharged through percolation from the ground surface. There is a long term trend of declining groundwater levels in District. Since the commencement of the District conjunctive reuse project in the 1950s, groundwater

levels have stabilized somewhat because spreading basin recharge causes rising groundwater levels during “wet” periods and decreasing levels during “dry” periods when there is no recharge and groundwater pumping increases.

The depth to water is highly variable due to the groundwater banking and subsequent groundwater extraction activities. The depth to groundwater has been reported to range from as deep as 430 feet bgs adjacent the Rosedale Basin in 2013, and as high as 80 feet bgs within the Rosedale Basin in 2011. The discharge to the Rosedale Basin causes large fluctuations in the groundwater elevation and the measured depth to water and is likely indicative of water banking activities conducted by the District.

The direction of flow is variable, but based on groundwater elevation contours for 2009 and 2011, the groundwater flow direction in the southern half of the District, including beneath the Rosedale Basin, has generally been to the northwest, with a gradient of 12 to 15 feet per mile (ft/mi). In the northern half of the District, the groundwater flow direction has generally been to the west, with a gradient of 7 to 10 ft/mi. The groundwater flow gradient in the vicinity of the Rosedale Basin was estimated to be 17 ft/mi based on 2012 groundwater elevation measurements. The transmissivity of the aquifer is estimated to be 160,000 to 460,000 gallons per day per foot and the hydraulic conductivity is approximately 53 to 152 feet per day.

The March 2015 RWD includes Appendix C that contains groundwater results for 100 of the District wells including seven wells, set within the Rosedale Basin. The averages of the groundwater monitoring are shown below.

Rosedale Basin					
Groundwater Quality					
Well Area	EC	Boron	Chloride	Sodium	Sulfate
	<u>umhos/cm</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>
District	659 (160 – 2500)	0.11 (0.1 – 0.48)	72 (9 – 470)	80 (20 – 390)	130 (12 to 750)
RSB	429 (240 – 890)	0.13 (0.1 – 0.22)	47 (9 – 100)	74 (13 – 160)	74 (22 – 230)
Proposed GW Limits	1,000	0.75	175	115	250

The results show that water quality is of good quality both in the District and beneath the Rosedale Basin. This Order requires the Dischargers to monitor the seven extraction wells set within the Rosedale Basin, plus an additional shallow groundwater monitoring well (MW-4) also installed within the Rosedale Basin.

Surface Water Conditions

The primary source of surface water used for irrigation in the District is the Kern River. The quality of the Kern River water from February 2009 through November 2011 is summarized in the following table.

Kern River Water Quality						
	EC	Boron	Chloride	Sodium	Arsenic	Sulfate
	<u>umhos/cm</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>ug/L</u>	<u>mg/L</u>
	170	0.2	6.4	15	nd	17
	(80 – 290)	(nd -3.1)	(nd – 10)	(nd – 30)	nd	(3.3 to 41)
Proposed Eff. Limits	1,000	1.0	200	175	10	250

The results indicate the Kern River water is of good quality, with no exceedances of the proposed effluent limits or MCLs

DISCHARGE PROHIBITIONS, EFFLUENT LIMITATIONS, DISCHARGE SPECIFICATIONS, AND PROVISIONS

The proposed Order would prohibit discharge of wastes other than the treated produced water and would prohibit the bypass or overflow of wastes to surface waters.

Discharge Prohibitions

The proposed Order includes Discharge Prohibitions A.3 through A.5 regarding the transport of produced water and the use of wells that were previously “stimulated” as follows:

3. Discharge Prohibition A.3 prohibits the discharge of water from canals used to transport industrial wastewater (Lerdo Canal).to canals used to transport municipal and domestic water sources (Friant-Kern Canal and/or others).
4. Discharge Prohibition A.4 prohibits the discharge to land of any fluids from wells that have undergone a “well stimulation treatment”, as defined by California Code of Regulations, title 14, section 1761 (including hydraulic fracturing, acid fracturing, and acid matrix stimulation) is prohibited.
5. Discharge A.5 prohibits the discharge of fluids associated with the frac-packing process (i.e., emplacement of a filter pack into the well annulus using a pressurized high-viscosity fluid that is not a drilling mud and that does not meet the standard of well stimulation) to land. The discharge of produced water from wells that have been frac-packed is prohibited, unless the Discharger meets the requirements of Provision E.13. Provision E.13 allows the Discharger to request a specific well or wells be included in the program, provided the Discharger

demonstrates that the well or wells do not contain chemicals associated with frac-packing.

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 permit.
- b. **Conductivity (EC):** This Order applies the Basin Plan effluent limit for produced water of 1,000 μ mhos/cm as an annual average for Discharges 001 and 002. This same limit is appropriate for Discharge 002 because, during some dry years when little or no Kern River water is available to discharge to the Rosedale Basin, the discharge consisting largely of CRC produced water will have annual average EC levels that approach this limit. During wet years, high Kern River water flows will be blended in the discharge to the spreading Basin and the flow weighted average EC will be very low.
- c. **Boron:** This Order applies the Basin Plan effluent limit of 1.0 mg/L for oilfield wastewater as an annual average for Discharges 001 and 002. The limit is applicable to Discharge 002 as discussed above.
- d. **Chloride:** This Order applies the Basin Plan effluent limit of 200 mg/L for oilfield wastewater as an annual average for Discharges 001 and 002. The limit is applicable to Discharge 002 as discussed above.
- e. **Sodium:** The CRC produced water sodium concentration averages 172 mg/l. Therefore the effluent limit at for the discharges (Discharge 001 and Discharge 002) is set at an average annual sodium concentration of 175 mg/l. Blended concentrations discharged to the Rosedale Basin during Individual low Kern River flow years will have average annual sodium concentrations as high as 165 mg/l and high Kern River flow years will have average annual sodium concentrations of 20 mg/l or less. During some dry, low flow years, the average annual sodium concentration will exceed the water quality objective of 115 mg/l. This value is supported by the antidegradation analysis (Finding 51).

- f. **Arsenic:** The Discharger completed an arsenic soil-adsorption removal evaluation based on recent laboratory and field studies done at the Cawelo Water District (CWD) which is adjacent to the District, and has the same soils and subsurface condition: similar lithology, percentage of fine-textured soils and approximately 300 feet of unsaturated sediments above groundwater. The CWD study results for arsenic adsorption capacity of local area soils and soil and subsurface conditions at the District are provided in the Report of Waste Discharge. This analysis demonstrates that the unsaturated soils underlying the Rosedale Basin and the irrigated areas have sufficient capacity to adsorb all arsenic from the proposed project discharge containing a concentration as high as 120 ug/L. Discharges from the CRC Treatment Facility will not contain arsenic concentrations approaching 120 ug/L. The results demonstrate that there will be no change in the arsenic concentration in underlying groundwater associated with project discharges. Therefore, this Order does not contain arsenic limits.

The effluent limits described above are presented below in tabular form.

Discharge 001

From CRC to the District

<u>Constituent</u>	<u>Units</u>	<u>Daily Maximum</u>	<u>Annual Average</u>
Flow	mgd	18.5	---
EC	umhos/cm	---	1,000
Boron	mg/L	---	1.0
Chloride	mg/L	---	200
Sodium	mg/L	---	175
Oil and Grease	mg/L	35	---

Discharge 002

Irrigation Season (002)

<u>Constituent</u>	<u>Units</u>	<u>Daily Maximum</u>	<u>Annual Average</u>
EC	umhos/cm	---	1,000
Boron	mg/L	---	1.0
Chloride	mg/L	---	200
Sodium	mg/L	---	175

Groundwater Limits

This Order prescribes groundwater limitations that implement water quality objectives for groundwater from the Basin Plan. The limits proscribe the discharge, in combination with other sources, from causing groundwater underlying the District to contain waste constituents in concentrations that adversely affect beneficial uses. As the District occupies a large portion of the Poso Hydrographic Unit, this Order applies the Basin Plan incremental EC limit that states in no case shall the discharge, in combination with

other sources, cause average EC in groundwater on an average basin-wide basis to increase by more than six (6) umhos/cm per year over a five year period.

This Order also proscribes the discharge from causing groundwater to contain waste constituents in concentrations greater than the following in the area affected by discharges to the Basin:

<u>Constituent</u>	<u>Units</u>	<u>Level</u>
EC	umhos/cm	1,000
Arsenic	ug/L	10
Boron	mg/L	0.75
Chloride	mg/L	175
Sodium	mg/L	115

Given the District's ability and obligation to manage the quality of groundwater within its management area, the limitations will ensure the protection of groundwater quality for the crops that can reasonably be grown within the District.

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.

The proposed Order includes effluent and groundwater monitoring. The monitoring requires the District to report on the overall quality of groundwater managed by the District. It also requires the District to monitor specific wells near the Rosedale Basin to validate the District's modeling effort and to ensure the protection of groundwater being recharged by the Rosedale Basin.

Provisions

Provision E. 12 requires the submittal of a technical report determining the intrawell groundwater quality goals to quantify degradation caused by discharges of oilfield produced water to the Rosedale Basin. The proposed methodology is subject to the approval of the Executive Officer.

Provision E.13 allows the Discharger to request a specific well or wells be included in the program, provided the Discharger demonstrates that the well or wells do not contain chemicals associated with well stimulation and/or frac-packing.

Reopener

The conditions of discharge in the proposed 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. The proposed Order would 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

District Considerations

The antidegradation analysis approach used for this project consists of a comparison of water quality of the proposed project discharge to the Rosedale Basin with background groundwater quality represented in two ways: a) the 2013-2014 average groundwater quality for 7 wells completed beneath the Rosedale Basin, and c) the background groundwater quality values for the CWD service area (R5-2012-0058) which is directly upgradient of the District. The water quality constituents evaluated are arsenic, boron, chloride, sodium, sulfate, and EC. With the exception of sulfate, these constituents are known to be present in produced water at levels that should be evaluated. Sulfate was added to the analysis because the Grimmway process wastewater is high in sulfate.

The following table compares discharge constituent levels with measured groundwater quality, background groundwater quality from an adjacent water district, and Water Quality Objectives. The discharge water quality is based on the flow weighted average of 24 years of actual surface water deliveries that incorporate the variations in annual precipitation and variations in annual Kern River water supply.

	Electrical Conductivity <u>umhos/c</u> <u>m</u>	Arsenic, <u>ug/</u> <u>L</u>	Boron, <u>mg/</u> <u>L</u>	Chloride, <u>mg/</u> <u>L</u>	Sodium, <u>mg/</u> <u>L</u>	Sulfate, <u>mg/</u> <u>L</u>
Blended Groundwater for Recharge Groundwater for Beneath RSB CWD	213	9.1	0.23	13	25	20
Background Groundwater for Quality Water Quality Objectives	429	2.4	0.13	47	74	74
	618	3.4	0.14	88	56	-
	900	10	0.75	175	115	250

The Rosedale Basin discharge has lower flow weighted levels of EC, chloride, sodium, and sulfate than the average of the seven wells in the Rosedale Basin. The constituents at concentrations greater than underlying groundwater are arsenic and

boron. Based on soil and subsurface conditions at the Rosedale Basin, soil adsorption of arsenic should result in no impact to groundwater. The boron in flows discharged to the Rosedale Basin, 0.23 mg/l, exceeds that of underlying groundwater but is much lower than the WQO of 0.75 mg/l. The blended discharge water quality was also better than that of the CWD background groundwater quality.

The antidegradation analysis above was also supported by additional calculations of a five year drought condition that occurred between 2001 and 2005. Groundwater and vadose zone mixing calculations were used to demonstrate that, during this period when three of five years did not have surface water discharge to the Rosedale Basin, the spreading basin discharge flows did not result in underlying groundwater concentrations higher than the WQOs.

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.

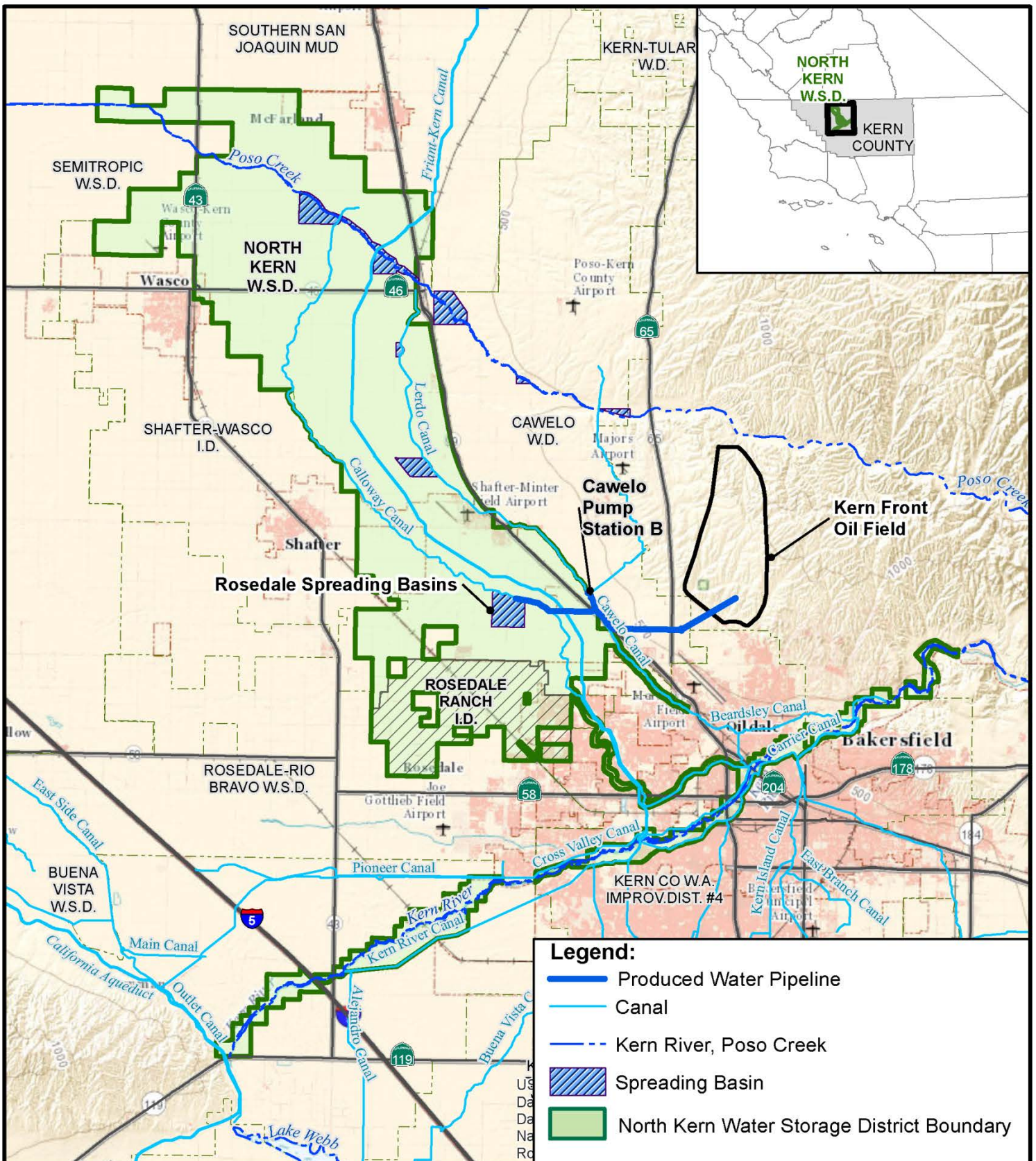
Unless exempt, release of designated waste is subject to full containment pursuant to Title 27 requirements. Title 27 Section 20090(b) exempts discharges of designated waste to land from Title 27 containment standards and other Title 27 requirements provided the following conditions are met:

- a. The applicable regional water board has issued waste discharge requirements, or waived such issuance;
- b. The discharge is in compliance with the applicable basin plan; and
- c. The waste is not hazardous waste and need not be managed according to Title 22, CCR, Division 4.5, Chapter 11, as a hazardous waste.

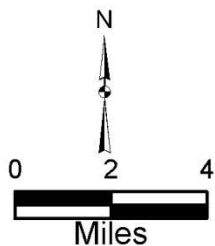
The discharge of produced water from CRC's Section 23 treatment facility meets the above requirements and is, therefore, exempt from Title 27.

CEQA

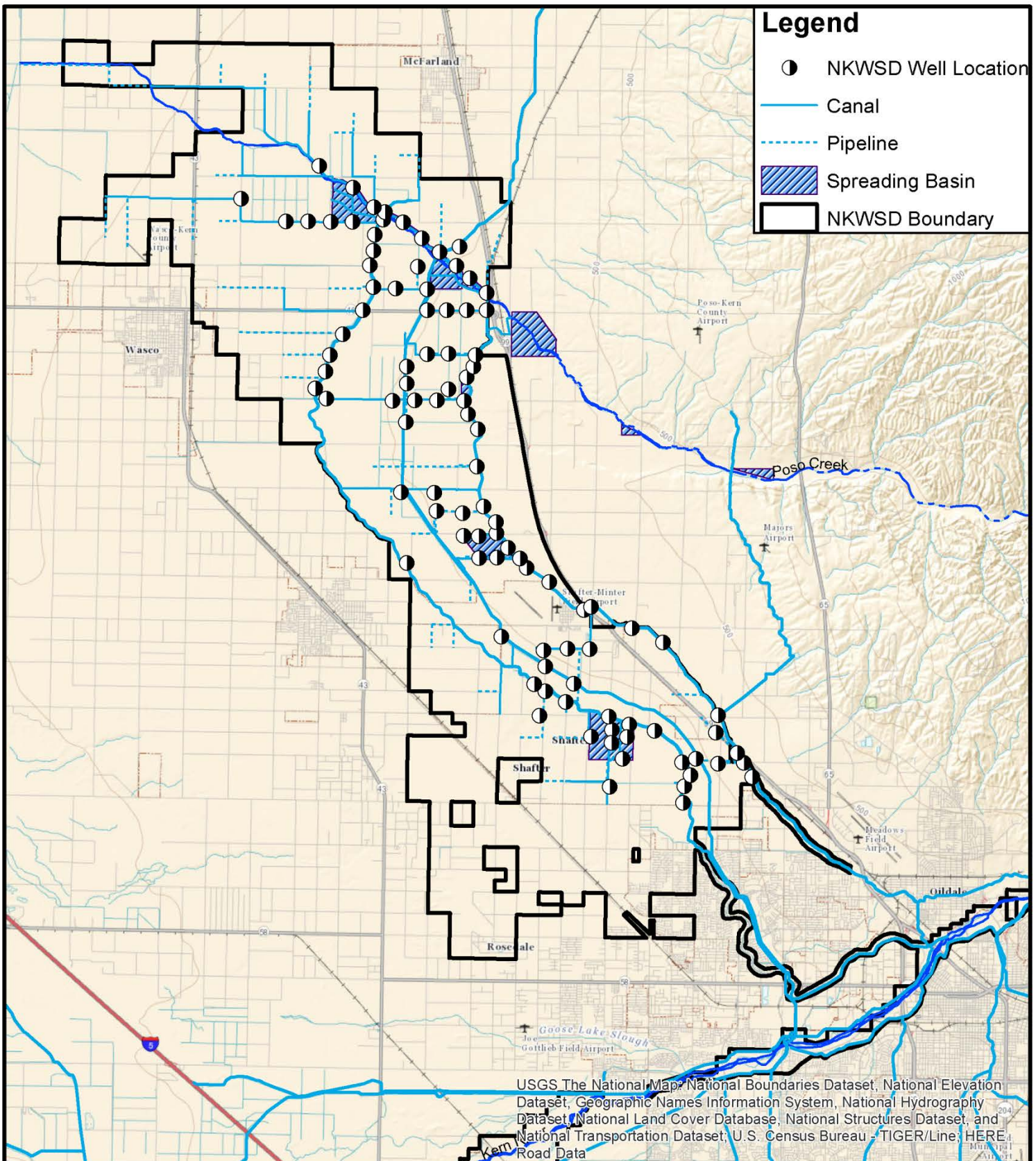
In accordance with the California Environmental Quality Act (CEQA) (Public Resources Code section 21000, et seq.), the District prepared and circulated an Environmental Review and Mitigated Negative Declaration for the project in March 2015. The District issued a Notice of Determination adopting the Mitigated Negative Declaration for the project on 30 April 2015.



Map Source: ESRI
 Figure Source: Kennedy/Jenks Consultants, 2015.



SITE LOCATION MAP
 ORDER NO. R5-2015-0127
 WASTE DISCHARGE REQUIREMENTS
 FOR
 CALIFORNIA RESOURCES PRODUCTION CORPORATION
 AND NORTH KERN WATER STORAGE DISTRICT
 PRODUCED WATER RECLAMATION PROJECT
 KERN COUNTY **ATTACHMENT A**



NKWSD WELL LOCATIONS
 ORDER NO. R5-2015-0127
 WASTE DISCHARGE REQUIREMENTS
 FOR
 CALIFORNIA RESOURCES PRODUCTION CORPORATION
 AND NORTH KERN WATER STORAGE DISTRICT
 PRODUCED WATER RECLAMATION PROJECT
 KERN COUNTY
ATTACHMENT B

**KERN FRONT OIL
FIELD PRODUCED
WATER DISCHARGE**

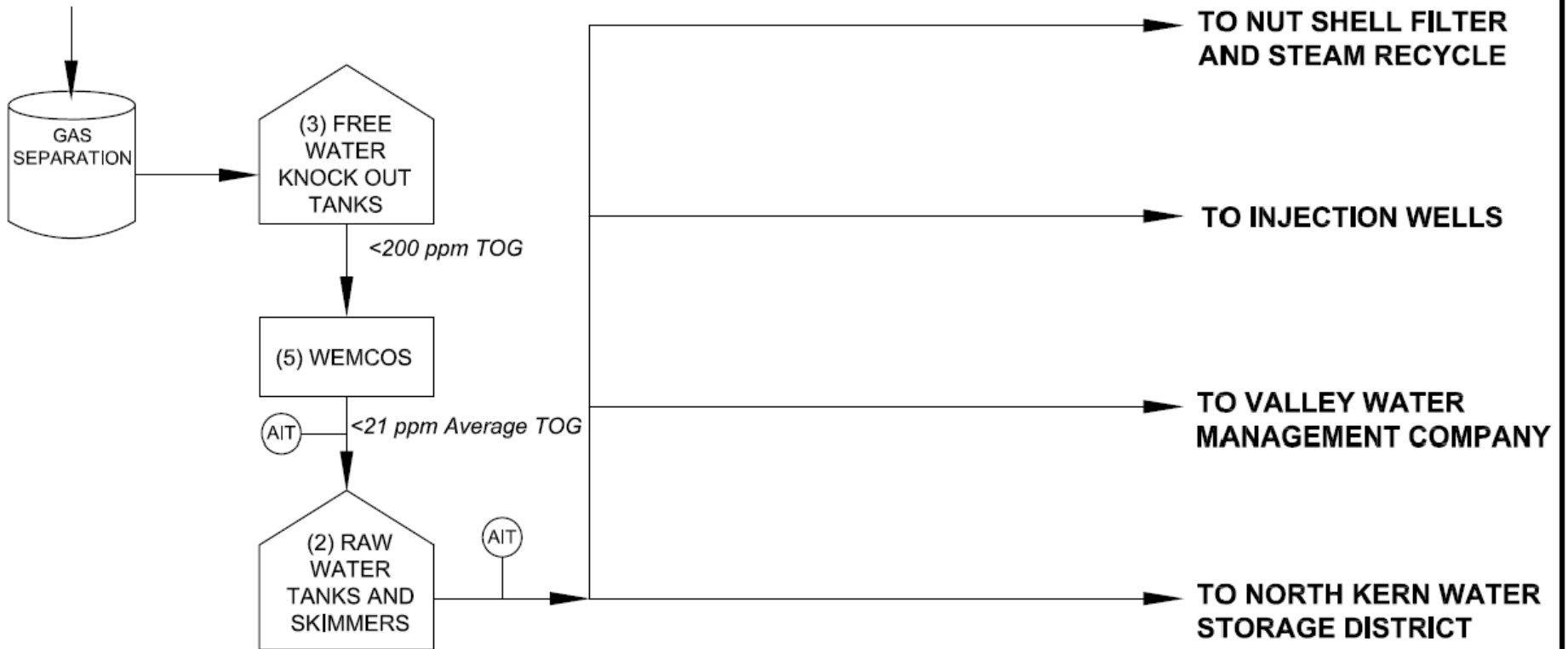


Figure Source: Kennedy/Jenks Consultants, 2015.

Note:
1) AIT = Laser Inducted Fluorescence Analyzer

CRC PROCESS FLOW DIAGRAM

ORDER NO. R5-2015-0127

WASTE DISCHARGE REQUIREMENTS

FOR

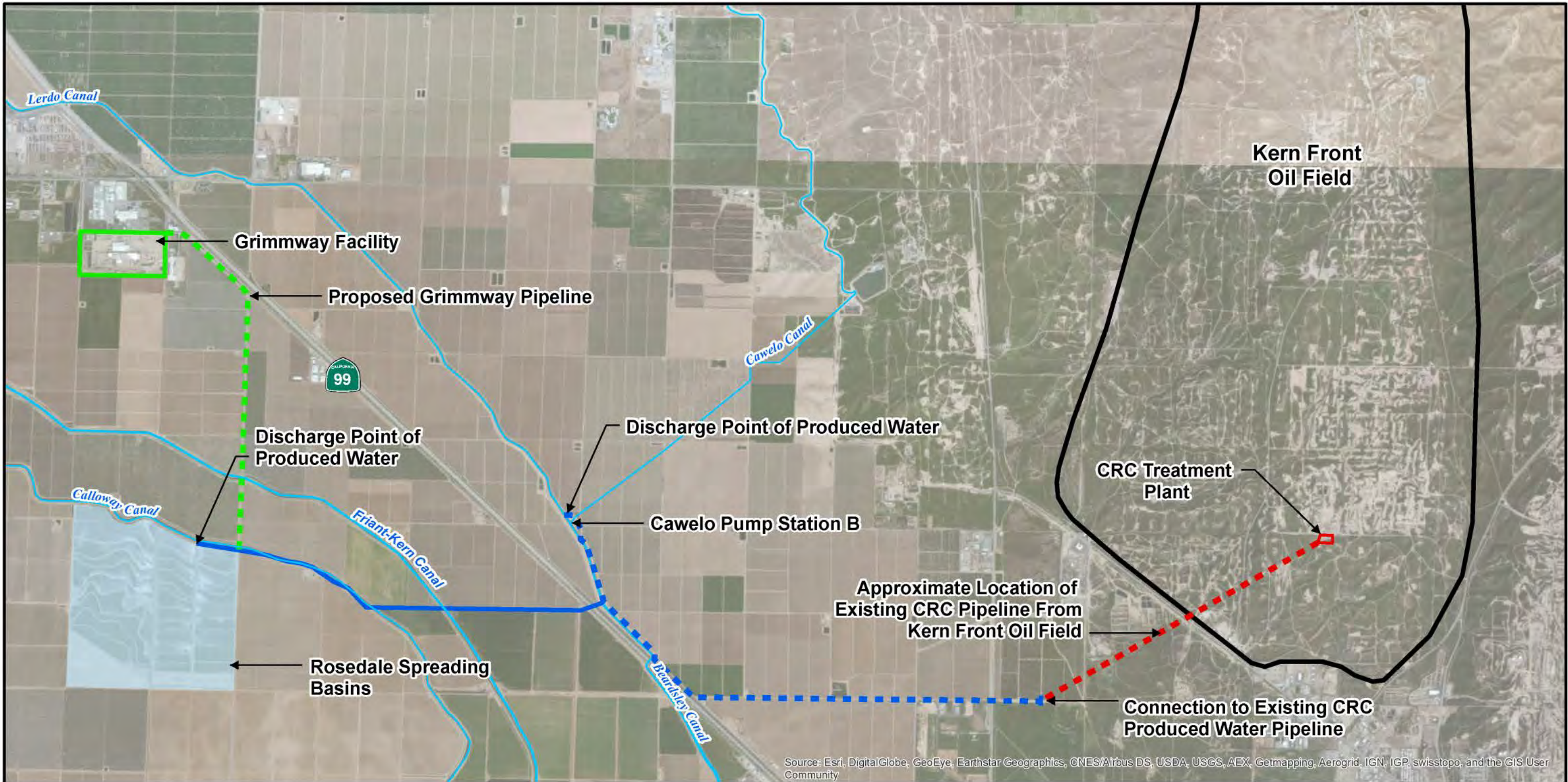
CALIFORNIA RESOURCES PRODUCTION CORPORATION

AND NORTH KERN WATER STORAGE DISTRICT

PRODUCED WATER RECLAMATION PROJECT

KERN COUNTY

ATTACHMENT C



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend:

- - - Approximate Location of Proposed Grimmway Pipeline
- Proposed Location of Pipeline from Lerdo Canal to Rosedale Spreading Basins
- - - Proposed Location of Pipeline from CRC Connection to Lerdo Canal
- - - Approximate Location of Existing CRC Pipeline
- Approximate Boundary of Kern Front Oil Field
- Grimmway Carrot Processing Facility
- CRC Produced Water Treatment Plant
- Rosedale Spreading Basins

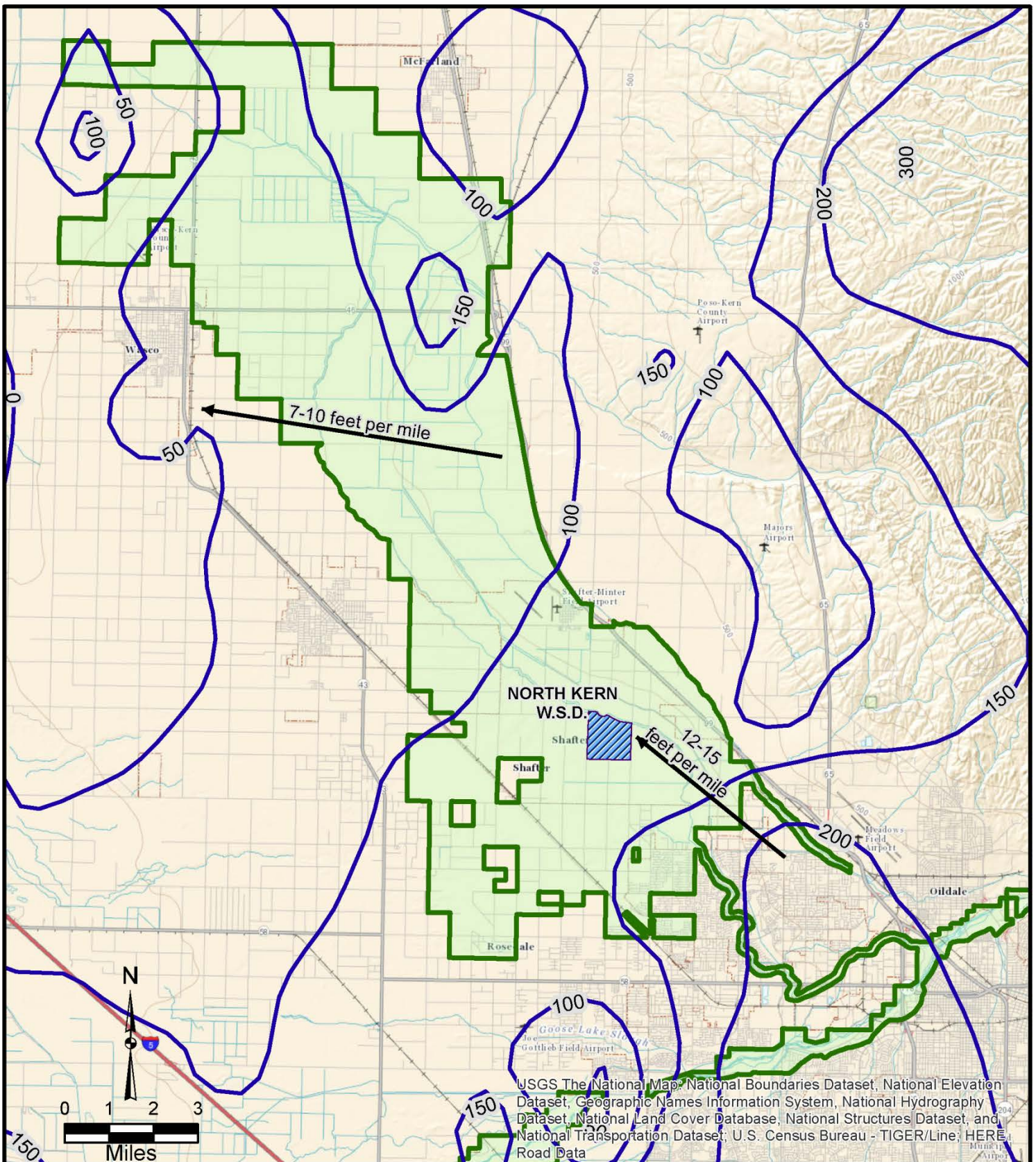
N

0 1,500 3,000
Feet

PROJECT AREA MAP
 ORDER NO. R5-2015-0127
 WASTE DISCHARGE REQUIREMENTS
 FOR
 CALIFORNIA RESOURCES PRODUCTION CORPORATION
 AND NORTH KERN WATER STORAGE DISTRICT
 PRODUCED WATER RECLAMATION PROJECT
 KERN COUNTY





Map Source: ESRI
 Figure Source: Kennedy/Jenks Consultants, 2015.

ATTACHMENT D



Source: California Department of Water Resources, Water Data Library
 Figure Source: Kennedy/Jenks Consultants, 2015.







Legend

-  Groundwater Flow Direction and Approximate Gradient
-  Groundwater Elevation Contour, Spring 2011
-  Rosedale Spreading Basins
-  North Kern Water Storage District

GROUNDWATER CONTOUR MAP
 ORDER NO. R5-2015-0127
 WASTE DISCHARGE REQUIREMENTS
 FOR
 CALIFORNIA RESOURCES PRODUCTION
 CORPORATION, AND NORTH KERN WATER STORAGE
 DISTRICT
 PRODUCED WATER RECLAMATION PROJECT
 KERN COUNTY
ATTACHMENT E

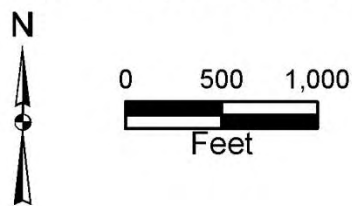


Legend:

-  Monitoring Well #4
-  North Kern WSD Well Location
-  Produced Water Pipeline
-  Pipeline
-  Service Canal
-  Rosedale Spreading Basins

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, ICP, swisstopo, and the GIS User Community

Source: North Kern Water Storage District
 Figure Source: Kennedy/Jenks Consultants, 2015.



**ROSEDALE SPREADING BASIN
 GROUNDWATER MONITORING WELLS**
 ORDER NO. R5-2015-0127
 WASTE DISCHARGE REQUIREMENTS FOR
 CALIFORNIA RESOURCES PRODUCTION CORPORATION
 AND NORTH KERN WATER STORAGE DISTRICT
 PRODUCED WATER RECLAMATION PROJECT
 KERN COUNTY **ATTACHMENT F**

**Native American Tribal Government Consultation List
Kern County
January 13, 2015**

Santa Rosa Rancheria Tachi Yokut Tribe
Rueben Barrios Sr., Chairperson
P.O. Box 8
Lemoore , CA 93245
Tache
Tachi
Yokut

(559) 924-1278
(559) 924-3583 Fax

Kern Valley Indian Council
Julie Turner, Secretary
P.O. Box 1010
Lake Isabella , CA 93240
Southern Paiute
Kawaiisu
Tubatulabal
Koso
Yokuts

(661) 366-0497
(661) 340-0032 Cell

Tule River Indian Tribe
Neil Peyron, Chairperson
P.O. Box 589
Porterville , CA 93258
Yokuts
chairman@tulerivertribe-nsn.gov
(559) 781-4271
(559) 781-4610 Fax

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Ct.
Salinas , CA 93906
Foothill Yokuts
Mono
Wuksache
kwood8934@aol.com
(831) 443-9702

Kitanemuk & Yowlumne Tejon Indians
Delia Dominguez, Chairperson
115 Radio Street
Bakersfield , CA 93305
Yowlumne
Kitanemuk
deedominguez@juno.com
(626) 339-6785

Chumash Council of Bakersfield
Arianne Garcia, Chairperson
P.O. Box 902
Bakersfield , CA 93302
Chumash
chumashtribe@sbcglobal.net
(661) 836-0486
(661) 836-0487

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838
Newhall , CA 91322
Fernandeño
Tataviam
Serrano
Vanyume
Kitanemuk
tsen2u@hotmail.com
(661) 753-9833 Office
(760) 885-0955 Cell

Kern Valley Indian Council
Robert Robinson, Co-Chairperson
P.O. Box 401
Weldon , CA 93283
Tubatulabal
Kawaiisu
Koso
Yokuts
brobinson@iwvisp.com
(760) 378-4575 Home
(760) 549-2131 Work

Tejon Indian Tribe
Katherine Montes Morgan, Chairperson
1731 Hasti-acres Drive, Suite
Bakersfield , CA 93309
Yowlumne
Kitanemuk
Kawaiisu
kmorgan@bak.rr.com
(661) 758-2303
(661) 215-6530 Fax

Tubatulabals of Kern Valley
Robert L. Gomez, Jr., Tribal Chairperson
P.O. Box 226
Lake Isabella , CA 93240
Tubatulabal
(760) 379-4590
(760) 379-4592 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Section 65352.3 and 65362.4. et seq.