

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION**

ORDER NO. 98-205

**WASTE DISCHARGE REQUIREMENTS
FOR
E&B NATURAL RESOURCES
AND
JASMIN MUTUAL WATER DISTRICT
JASMIN OIL FIELD, QUINN OIL LEASE
KERN COUNTY**

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

1. E&B Natural Resources, a California corporation, operates an oil production facility (Jasmin Oil Field, Quinn Oil Lease) within boundaries of the Jasmin Mutual Water District (JMWD). E&B Natural Resources submitted a Report of Waste Discharge (RWD), dated 14 July 1997, to change the location of wastewater disposal. E&B Natural Resources and JMWD are hereafter jointly referred to as Discharger.
2. Waste Discharge Requirements (WDRs) Resolution No. 68-209, adopted by the Board on 11 April 1968, prescribes discharge requirements for oil field production water to seven unlined sumps. The Resolution is not consistent with current plans and policies of the Board, and does not describe the Discharger's current discharge or proposed change in wastewater disposal location.
3. The facility is in the west 1/2 of Section 15 and the west 1/2 of Section 22, T25S, R27E, MDB&M, approximately 30 miles north of Bakersfield, 20 miles south of Porterville, and 10 miles east of Delano, near the intersection of Highway's 155 and 65 (see Attachment A). The site lies within the South Valley Floor Hydrologic Unit and Kern Uplands Hydrologic Area (No. 558.90), as depicted on interagency hydrologic maps, prepared by the Department of Water Resources in August 1986. Surface water drainage occurs as sheet flow and in natural drainage courses to the west. There are no named surface waters or drainage courses in the immediate vicinity of JMWD boundaries.
4. Oil wells in the area discharge production water (15 wells pumped about 187,000 barrels in March 1998) through pipes to a wash tank on-site (see Attachment B). Oil rises to the top of the tank while water (called process water after separation) is discharged to two unlined sumps (each sump is about 150 feet by 50 feet) in series just west of the wash tank. The oil is discharged to five oil tanks in parallel. The process water is pumped from sump No. 2 uphill to two additional unlined sumps in series, sump Nos. 3 and 4

**WASTE DISCHARGE REQUIREMENTS
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY**

2

(each about 40 feet by 60 feet), about 300 feet south of sump Nos. 1 and 2. Sump Nos. 1 through 4 are completely enclosed by "chicken wire." Process water is then discharged (by gravity through a four inch pipe) to unlined sump No. 5 (about 75 feet by 125 feet) just west of sump No. 4. The process water is discharged (by gravity through two, four inch pipes) from sump No. 5 to unlined sump No. 6 (about 75 feet by 100 feet). Process water is next pumped through an underground pipe to a reservoir (about 150 feet by 125 feet, and owned and managed by JMWD) approximately 1/2 mile south of sump No. 6.

5. The capacity of the JMWD reservoir is approximately two acre-feet. The dilution ratio in the reservoir usually is approximately 80% JMWD well and imported water from a Kern-Tulare Water District (K-TWD) reservoir, and 20% process water. Water from the K-TWD reservoir is transferred to the Discharger's reservoir through a pipeline. Occasionally, during winter months, 100% of the water is process water for short periods of time. The process water remains in the reservoir for a maximum of two to three days. The reservoir water is used to irrigate hundreds of acres of orchard and citrus groves within the JMWD. When not needed for irrigation (typically during winter months), the reservoir water is spread on farm land.
6. The K-TWD reservoir is approximately 1 and 1/4 miles west of JMWD's western boundary. The K-TWD reservoir is at least 50 times larger than the Discharger's reservoir and it supplies irrigation water to thousands of acres of farm land year-round. Also, some of the reservoir water is used for cooling at the Rio Bravos Jasmin cogeneration facility, about two miles south of the intersection of Highway's 155 and 65. There are no domestic deliveries of the reservoir water, nor are there any discharges to any rivers, creeks, lakes, or any other waters of the United States or their tributaries. The source of all the freshwater delivered to K-TWD is the Friant-Kern Canal, about six miles west of the K-TWD reservoir. Mainly permanent crops are grown in the K-TWD; approximately ninety percent of the irrigation system is either drip or low pressure sprinklers.
7. In the RWD, the Discharger proposes to allow the excess JMWD reservoir water, instead of being spread during winter months, to be pumped from the JMWD reservoir, through an existing pipeline, to the K-TWD reservoir, subject to agreement between the Discharger and K-TWD. The JMWD water would be diluted by being mixed with waters in the K-TWD reservoir.
8. Process water (from a sample obtained by the Discharger on 30 September 1997) from the last unlined sump in series, prior to discharge to the JMWD reservoir, had the following characteristics:

**WASTE DISCHARGE REQUIREMENTS
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY**

<u>Constituent</u>	<u>Units</u>	<u>Concentration</u>
Fluoride	mg/l	2.0
Chloride	mg/l	55.0
pH	pH unit	7.8
Boron	mg/l	1.1
Sodium	mg/l	160.0
Conductivity ¹	µmhos/cm	680.0
Oil and Grease	mg/l	5.7

¹ Specific Electrical Conductivity at 25°C, also "EC"

9. Water from the JMWD irrigation reservoir (from a sample obtained by the Discharger on 30 September 1997) had the following characteristics:

<u>Constituent</u>	<u>Units</u>	<u>Concentration</u>
Fluoride	mg/l	0.17
Chloride	mg/l	3.3
pH	pH unit	7.69
Boron	mg/l	0.11
Sodium	mg/l	15.0
EC	µmhos	53.0

10. Process water was analyzed from the sumps in 1967. The highest and lowest Boron concentrations detected were 4.1 mg/l and 0.5 mg/l, respectively, with an average of 2.2 mg/l. Fluoride high and low values were 3.9 mg/l and 0.7 mg/l, respectively, with an average of 2.5 mg/l.
11. Regional Board staff collected process water samples from five locations (separation wash tank discharge, sump Nos. 2, 4, and 6, and the JMWD reservoir) in April 1998, finding the following characteristics:

<u>Constituent</u>	<u>Units</u>	<u>Concentration (range)</u>
Boron	mg/l	0.84 - 0.91
Chloride	mg/l	56.0 - 59.0
Conductivity	µmhos/cm	560 - 590

**WASTE DISCHARGE REQUIREMENTS
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY**

<u>Constituent</u>	<u>Units</u>	<u>Concentration (range)</u>
Benzene	µg/l	ND - 4.4
Toluene	µg/l	0.6 - 8.4
Ethylbenzene	µg/l	ND - 0.86
Xylene	µg/l	ND - 28

12. The Jasmin Oil Field is in the western part of the Sierra Nevada foothills. "Young" or recent alluvium, "Old" alluvium of Pleistocene age, and the Kern River formation of Pleistocene and Pliocene age are exposed upon the ground surface. Formations explored by subsurface drilling range in age from the Kern River formation of Pleistocene and Pliocene age to the pre-Tertiary granitic basement. The Kern River series is the principal groundwater bearing unit in the oil field and the San Joaquin Valley. Both unconfined and at least partially confined groundwater bodies occur in this area.

13. Groundwater in the area is at a depth of approximately 300 feet below ground surface and meets drinking water standards. The groundwater is a bicarbonate or bicarbonate sulfate type with total dissolved solids ranging from 234 to 514 mg/l. Sodium percentage ranges from 30 to 95 mg/l, with an average of about 60 mg/l. Boron concentrations range from 0.03 to 0.36 mg/l. Groundwater flow is generally northwesterly towards the San Joaquin Valley. The gradient is approximately 35 feet per mile. Vertical movement of groundwater beneath the Jasmin oil field is locally restricted by impermeable clay lenses of very limited areal extent and partially restricted by more extensive layers and lenses of more permeable silt, sandy clay, and sandy silt. There are no known barriers to restrict the lateral movement of groundwater. The nearest operating irrigation well is adjacent to the JMWD reservoir.

14. The Water Quality Control Plan for the Tulare Lake Basin, Second Edition, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for Basin waters. These requirements implement the Basin Plan.

15. The Basin Plan contains the following maximum salinity limits for oil field wastewater in unlined sumps overlying groundwater with existing and future probable uses:

<u>Constituent</u>	<u>Units</u>	<u>Concentration</u>
EC	µmhos/cm	1,000
Chloride	mg/l	200
Boron	mg/l	1

**WASTE DISCHARGE REQUIREMENTS
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY**

5

16. The Regional Board may allow discharges of production water that are slightly in excess of maximum salinity limits (for EC, Chloride, and Boron) to the JMWD reservoir, where the Discharger has demonstrated to the Board in a public hearing that the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives.
17. The crops grown in the districts are predominantly oranges, a boron sensitive crop. The irrigation and drainage paper, *Water Quality for Agriculture*, by the Food and Agriculture Organization of the United Nations, recommends Boron sensitive crops (oranges) not be irrigated with water having Boron concentrations, by decreasing preference, exceeding the range of 0.3 to 1.0 mg/l. The Board has in similar situations, allowed particular discharges to supplement irrigation supply provided the supply water does not exceed a Boron concentration of 0.5 mg/l.
18. The beneficial uses of Valley Floor Waters, as identified in the Basin Plan, include industrial and agricultural supply, industrial process supply, water contact and non-contact water recreation, warm fresh water habitat, wildlife habitat, preservation of rare and endangered species, and groundwater recharge.
19. The beneficial uses of the groundwater are municipal, industrial, and agricultural supply.
20. The Regional Board has considered antidegradation pursuant to State Board Resolution No. 68-16 and finds that the permitted discharge is consistent with those provisions. No known barriers exist to prevent the lateral movement of process water once percolated (Finding No. 13). However, the constituent concentrations of the process water are low to begin with and, with time and distance traveled, the constituents should become negligible. Furthermore, most of the water is distributed over a broad area for irrigation. The discharge is not expected to adversely affect groundwater.
21. The average annual precipitation in the area is approximately nine inches. About one-third of the total rainfall comes in the period between April and November, and two-thirds in the months of December through March.
22. The action to revise the waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Act (CEQA) in accordance with Title 14, California Code of Regulations (CCR), Section 15301.

**WASTE DISCHARGE REQUIREMENTS
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY**

6

23. This discharge is exempt from the requirements of *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq. The exemption, pursuant to Section 20090(b), is based on the following:
 - a. The Board is issuing waste discharge requirements,
 - b. The discharge complies with the Basin Plan, and,
 - c. The wastewater does not need to be managed according to 22 CCR, Division 4.5, Chapter 11, as a hazardous waste.
24. The Board has notified the Discharger, interested agencies, and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
25. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that Resolution No. 68-209 is rescinded and E&B Natural Resources and Jasmin Mutual Water 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 to or within 100 feet of surface waters or drainage courses is prohibited.
2. Discharge other than to on-site sumps or JMWD is prohibited unless Provision C.4 is satisfied.
3. Discharge of wastes other than wastewater generated from the production of crude oil is prohibited.
4. Discharge of waste classified as 'hazardous' as defined in Section 2521(a) of Title 23, CCR, Section 2510, et seq., or 'designated,' as defined in Section 13173 of the California Water Code, is prohibited.

**WASTE DISCHARGE REQUIREMENTS
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY**

B. Discharge Specifications

1. Process water discharged to the sumps shall not exceed the following limits:

<u>Constituent</u>	<u>Units</u>	<u>Concentration</u>
EC	$\mu\text{mhos/cm}$	700
Chloride	mg/l	60
Boron	mg/l	1

2. Wastewater discharged to the JMWD reservoir shall not cause Boron concentrations (in the reservoir) to exceed 0.5 mg/l (averaged over the period of one year).
3. Public contact with wastewater shall be precluded through such means as fences and signs, or acceptable alternatives.
4. Any sump which contains oil or a mixture of oil and water shall be effectively covered or screened to preclude entry of birds or animals.
5. The facility shall be operated and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
6. A minimum of two feet of freeboard shall be maintained in the sumps and JMWD reservoir.
7. The discharge, in combination with other sources, shall not cause underlying groundwater to contain waste constituents in concentrations greater than background water quality, except for conductivity. The incremental increase in conductivity over any five-year period shall not exceed 30 $\mu\text{mhos/cm}$.

C. Discharge Provisions

1. The Discharger shall comply with the attached Monitoring and Reporting Program No. 98-205, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

**WASTE DISCHARGE REQUIREMENTS
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY**

8

2. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."
3. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability.
4. Discharge to the K-TWD reservoir is conditional upon approval of K-TWD. A minimum of ten days before initiating discharge to K-TWD, the Discharger shall provide the Board a copy of the signed agreement between the Discharger and K-TWD that allows the discharge.
5. E & B Natural Resources shall post in a conspicuous location, a clearly visible, legible permanently affixed sign with the facility and owner/operator name.
6. In the event of any change in control or ownership of land or waste discharge facilities described herein, 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 this office.

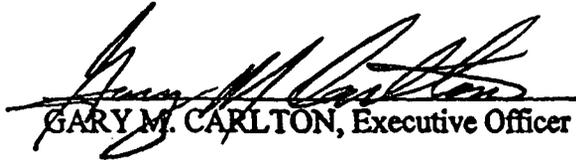
To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name, address, and telephone number of the persons responsible for contact with the 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. Transfer shall be approved or disapproved by the Executive Officer.

7. A copy of this Order shall be kept at the facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.
8. The Board will review this Order periodically and will revise these requirements when necessary.

**WASTE DISCHARGE REQUIREMENTS
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY**

9

I, GARY M. CARLTON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 23 October 1998.


GARY M. CARLTON, Executive Officer

MO:mo/fmc:10/23/98

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION**

**MONITORING AND REPORTING PROGRAM NO. 98-205
FOR
E & B NATURAL RESOURCES
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JASMIN OIL FIELD, QUINN OIL LEASE
KERN COUNTY**

SUMP MONITORING

A representative wastewater (process water) sample shall be taken from the first sump (or from the discharge from the separation wash tank). Time of collection of a grab sample shall be recorded. Monitoring shall include the following:

<u>Constituent</u>	<u>Units</u>	<u>Measurement</u>	<u>Frequency</u>
Conductivity ¹	µmhos/cm	Grab	Quarterly
Chloride	mg/l	Grab	Quarterly
Boron	mg/l	Grab	Quarterly

¹ Specific Electrical Conductivity @ 25°C, also "EC"

JMWD RESERVOIR

A sampling station shall be established opposite the inlet where a representative sample of the reservoir water can be obtained. Monitoring shall include at least the following:

<u>Constituent</u>	<u>Units</u>	<u>Measurement</u>	<u>Frequency</u>
Boron	mg/l	Grab	Quarterly

Any water discharged to K-TWD shall be recorded (volume, in acre-feet and period of time of discharge).

FACILITY MONITORING

Annually, prior to the anticipated rain season, but no later than 30 September, the Discharger shall inspect all containment and drainage facilities for damage. The Discharger shall report any damage and subsequent repairs within 30 days of completion of the repairs. Freeboard staff gauges shall be installed in the sumps and the JMWD reservoir. Fluid levels shall be checked regularly and reported quarterly.

REPORTING

Quarterly monitoring, including data for all constituents monitored quarterly, shall be submitted to the Board within 15 days after the end of each calendar quarter. Also, any water discharged to K-TWD shall be reported (acre-feet and period of time of discharge) in the quarterly report(s). In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents and the constituent values are readily discernible. The data shall be summarized in such a manner to illustrate clearly compliance or noncompliance with the discharge requirements.

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 discharge monitoring report.

The Discharger may also be requested to submit an annual report to the Board with tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

By 20 January of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

- a. The names and general responsibilities of all persons in charge of wastewater treatment and disposal.
- b. The names and telephone numbers of persons to contact regarding wastewater disposal for emergency and routine situations.

All reports submitted in response to this Order shall comply with the signatory requirements in Standard Provision B.3.

**MONITORING AND REPORTING PROGRAM
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY**

-3-

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

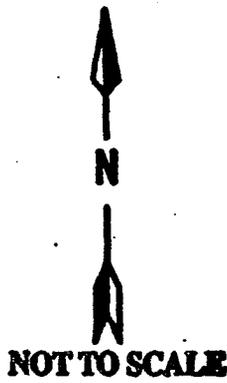
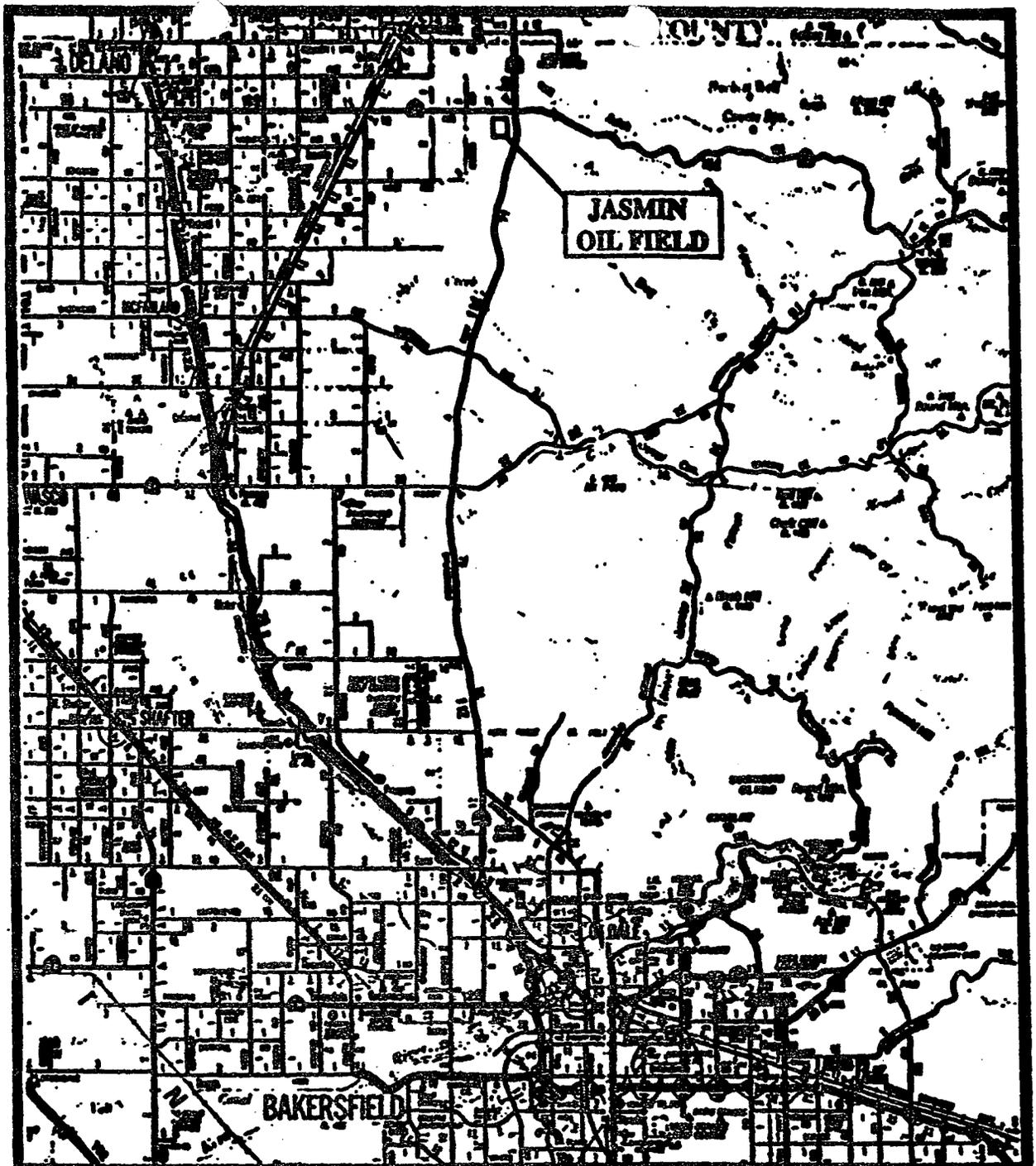
Ordered by:


GARY M. CARLTON, Executive Officer

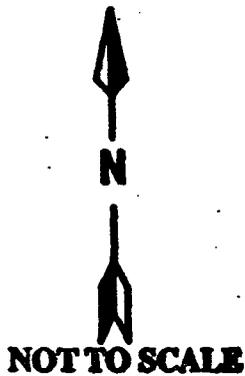
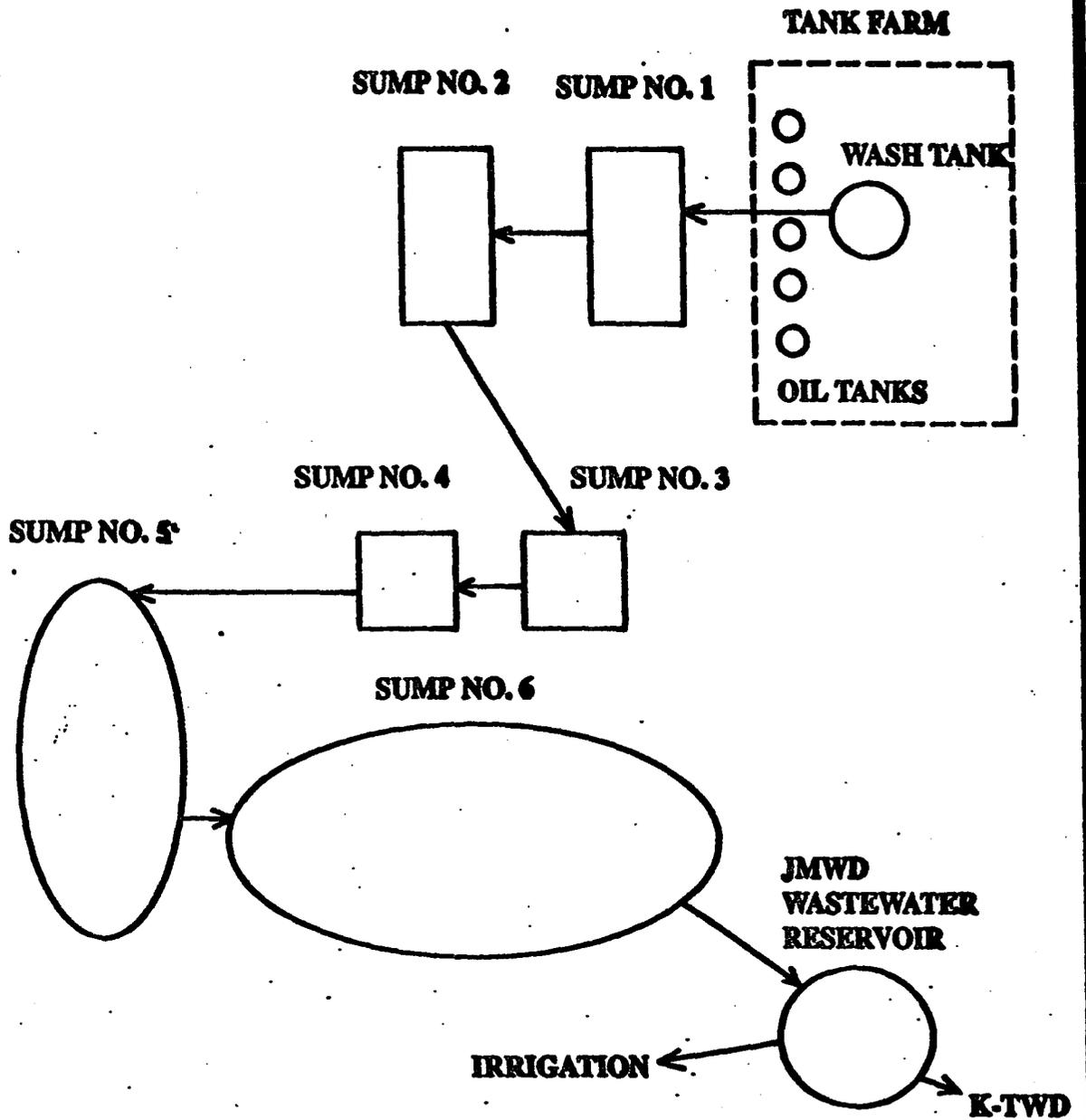
23 October 1998

Date

MO:mo/fmc:10/23/98



**ATTACHMENT A
LOCATION MAP
E&B NATURAL RESOURCES
AND
JASMIN MUTUAL WATER DISTRICT
(JASMIN OIL FIELD, QUINN OIL LEASE)
KERN COUNTY**



**ATTACHMENT B
FLOW DIAGRAM
E&B NATURAL RESOURCES
AND
JASMIN MUTUAL WATER DISTRICT
(JASMIN OIL FIELD, QUINN OIL LEASE)
KERN COUNTY**

INFORMATION SHEET

E & B NATURAL RESOURCES AND JASMIN MUTUAL WATER DISTRICT KERN COUNTY

E&B Natural Resources, a California corporation, operates an oil production facility (Jasmin Oil Field, Quinn Oil lease) within boundaries of the Jasmin Mutual Water District (JMWD). E&B Natural Resources submitted a Report of Waste Discharge (RWD), dated 14 July 1997, to change the location of wastewater disposal. E&B Natural Resources and JMWD are hereafter jointly referred to as Discharger.

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The facility is in the west 1/2 of Section 15 and the west 1/2 of Section 22, T25S, R27E, MDB&M, approximately 30 miles north of Bakersfield, 20 miles south of Porterville, and 10 miles east of Delano, near the intersection of Highway's 155 and 65. It lies within the South Valley Floor Hydrologic Unit and Kern Uplands Hydrologic Area. Surface water drainage occurs as sheet flow and in natural drainage courses to the west. There are no named surface waters or drainage courses in the immediate vicinity of JMWD boundaries.

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The capacity of the JMWD reservoir is approximately two acre-ft. The dilution ratio in the reservoir usually is approximately 80% JMWD well and imported water from a Kern-Tulare Water District (K-TWD) reservoir, and 20% process water. Water from the K-TWD reservoir is transferred to the Discharger's reservoir through a pipeline. Occasionally, during winter months, 100% of the water is process water for short periods of time. The process water remains in the reservoir for a maximum of two to three days. The reservoir water is used to irrigate hundreds of acres of orchard and citrus groves within the JMWD. When not needed for irrigation (typically during winter months), the reservoir water is spread on farm land.

The K-TWD reservoir is approximately 1 and 1/4 miles west of JMWD's western boundary. The K-TWD reservoir is at least 50 times larger than the Discharger's reservoir and it supplies irrigation water to thousands of acres of farm land year-round. Also, some of the reservoir water is used for cooling at the Rio Bravos Jasmin cogeneration facility, about two miles south of the

INFORMATION SHEET - Continued
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY

-2-

intersection of Highway's 155 and 65. There are no domestic deliveries of the reservoir water, nor are there any discharges to any rivers, creeks, lakes, or any other waters of the United States or their tributaries. The source of all the freshwater delivered to the K-TWD reservoir is the Friant-Kern Canal, about six miles west of the K-TWD reservoir. Mainly permanent crops are grown in the K-TWD; approximately ninety percent of the irrigation system is either drip or low pressure sprinklers.

In the RWD, the Discharger proposes to allow the excess process water, instead of being spread during winter months, to be pumped from the JMWD reservoir, through the existing pipeline, to the K-TWD reservoir, subject to agreement between the Discharger and K-TWD. The JMWD water would be diluted by being mixed with waters in the K-TWD reservoir. Discharge to the K-TWD reservoir is conditional upon approval of K-TWD. A minimum of ten days before initiating discharge to K-TWD, the Discharger shall provide the Board a copy of the agreement between the Discharger and K-TWD that allows the discharge.

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Groundwater in the area is at a depth of approximately 300 feet below ground surface and meets drinking water standards. The groundwater is a bicarbonate or bicarbonate sulfate type with a sodium ranging from 30 to 95 percent. Boron concentrations range from 0.03 to 0.36 ppm. Groundwater flow is generally northwesterly towards the San Joaquin Valley. The gradient is approximately 35 feet per mile. Vertical movement of groundwater beneath the Jasmin oil field is locally restricted by impermeable clay lenses of more permeable silt, sandy clay, and sandy silt. There are no known barriers to restrict the lateral movement of groundwater. The nearest operating well is adjacent to the JMWD reservoir.

The crops grown in the districts are predominantly oranges. The irrigation and drainage paper *Water Quality for Agriculture*, by the Food and Agriculture Organization of the United Nations, recommends Boron sensitive crops (oranges) to be irrigated with water having Boron concentrations not exceeding the range of 0.3 to 1.0 mg/l.

Regional Board staff collected waste water samples in April 1998. The samples were analyzed for Boron and other constituents. Boron concentrations ranged from 0.84 mg/l to 0.91 mg/l. The Order has a Discharge Specification that limits the value of Boron in the sumps to 1.0 mg/l.

**INFORMATION SHEET - Continued
E & B NATURAL RESOURCES AND JMWD
KERN COUNTY**

-3-

Wastewater discharged to the JMWD reservoir shall not cause Boron concentrations (in the reservoir) to exceed 0.5 mg/l (averaged over the period of one year).

The Regional Board has considered antidegradation pursuant to State Board Resolution No. 68-16 and finds that the permitted discharge is consistent with those provisions. No known barriers exist to prevent the lateral movement of groundwater. However, the constituent concentrations of the process water are low to begin with and, with time and distance traveled, the constituents should be negligible. Furthermore, most of the water is distributed over a broad area for irrigation. The discharge is not expected to adversely affect groundwater provided the Discharger complies with this Order.

The action to revise the waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Act (CEQA) in accordance with Title 14, California Code of Regulations, Section 15301.

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